



David MAGHRADZE
Laura RUSTIONI
Jozef TUROK
Attilio SCIENZA
Osvaldo FAILLA

Caucasus and Northern Black Sea Region Ampelography



VITIS

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To complete a book written by several authors from different countries and speaking different languages is not a simple activity. If the book is an ampelography the work is even more complex due to the need of harmonize the terminology used by the different authors among them and in relation to the international standard. A further critical aspect is the comparisons between description and photos.

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List of the authors and collaborators of the book

| | |
|-----------------------------------|--|
| AMANOV Mail Veli death in 2007 | Research Institute of Viticulture and Winemaking Mekhtiabad village Absheron district 0100. Baku. AZERBAIJAN |
| CHIPASHVILI Ramaz | Institute of Horticulture, Viticulture and Oenology 6 Marshal Gelovani Ave. 0159. Tbilisi. GEORGIA Tel: +995 32 520966 E-mail: ramazi19_57@yahoo.com http://www.ihvo.ge |
| CHIZHOVA Aleksandra | National Institute of Vine and Wine 'Magarach' 31 Kirov str. 98600. Yalta. Crimea. UKRAINE Tel: +380 654 325591 Fax: +380 654 230608 E-mail: select_magarach@ukr.net http://www.magarach.ua |
| CHKHARTISHVILI Nodar | Institute of Horticulture, Viticulture and Oenology 6 Marshal Gelovani Ave. 0159. Tbilisi. GEORGIA Tel: +995 32 523011 E-mail: n.chkhartishvili@yahoo.com http://www.ihvo.ge |
| CORNEA Vladimir | National Institute for Viticulture and Oenology 59 Vieru str. MD 2070 Chisinau. MOLDOVA Tel: +373 022 285003 Fax: +373 022 285003 E-mail: v_cornea@yahoo.com |
| FAILLA Osvaldo | University of Milan – Department of Crop Production Via Celoria 2. I-20133. Milano. ITALY Tel. +39 02 5031 6565 Fax. +39 02 5031 6553 E-mail: Osvaldo.Failla@unimi.it http://www.diprove.unimi.it/ |
| FOGARTY Francis | University of Milan – Department of Crop Production Via Celoria 2. I-20133. Milano. ITALY Tel. +39 02 5031 6565 Fax. +39 02 5031 6553 E-mail: francis@vallanawines.com http://www.diprove.unimi.it/ |
| FOGARTY Marina Olwen | University of Milan – Department of Crop Production Via Celoria 2. I-20133. Milano. ITALY Tel. +39 02 5031 6565 Fax. +39 02 5031 6553 E-mail: marina@vallanawines.com http://www.diprove.unimi.it/ |
| FORNI Gaetano | Lombard Museum of History of Agriculture Via Celoria 2. I-20133. Milano. ITALY Tel. +39 02 5031 6565 Fax. +39 02 5031 6553 E-mail: Gaetano.Forni@fastwebnet.it |
| GASPARYAN Samvel | Armenian Academy of Viticulture, Wine-making and Fruit-growing Isakov st. 44/36. 375114. Yerevan. ARMENIA Tel. +3741 530475 E-mail: S-Gasparyan@yandex.ru |
| GUELGAR Helena | National Institute of Vine and Wine 'Magarach' 31 Kirov str. 98600. Yalta. Crimea. UKRAINE Tel: +380 654 325591 Fax: +380 654 230608 E-mail: magarach@rambler.ru http://www.magarach.ua |

| | |
|--------------------|--|
| GURASASHVILI Vasil | Institute of Horticulture, Viticulture and Oenology 6 Marshal Gelovani Ave. 0159. Tbilisi. GEORGIA Tel: +995 32 520966 E-mail: v.gurasashvili@yahoo.com http://www.ihvo.ge |
| MAGHRADZE David | Institute of Horticulture, Viticulture and Oenology 6 Marshal Gelovani Ave. 0159. Tbilisi. GEORGIA Tel: +995 32 520966 E-mail: d_maghradze@geo.net.ge http://www.ihvo.ge |
| MAMMADOV Afig | Genetic Resources Institute of the Azerbaijan National Academy of Sciences 155, Azadlig Ave. AZ1106, Baku. AZERBAIJAN Tel: +994 12 562 91 71 Fax: +994 12 449 92 21 E-mail: afiqmuellim@rambler.ru http://www.cac-biodiversity.org/aze/ |
| MDINARADZE Irma | Institute of Horticulture, Viticulture and Oenology 6 Marshal Gelovani Ave. 0159. Tbilisi. GEORGIA Tel: +995 32 520966 E-mail: i_mdinaradze@yahoo.com http://www.ihvo.ge |
| MELYAN Gagik | Armenian Academy of Viticulture, Wine-making and Fruit-growing Isakov st. 44/36. 375114. Yerevan. ARMENIA Tel: +374 1 727460 Fax: +374 1 232441 E-mail: melyan58@mail.ru |
| MUSAYEV Mirsa | Genetic Resources Institute of the Azerbaijan National Academy of Sciences 155, Azadlig ave. AZ1106, Baku. AZERBAIJAN Tel: +994 12 562 91 71 Fax: +994 12 449 92 21 E-mail: mirza_musayev4@yahoo.com |
| POLULYAKH Alla | National Institute of Vine and Wine 'Magarach' 31 Kirov str. 98600. Yalta. Crimea. UKRAINE Tel: +380 654 32 55 91 Fax: +380 654 230608 E-mail: alla-polulyah@ukr.net http://www.magarach.ua |
| ROSHKA Nataliya | National Institute of Vine and Wine 'Magarach' 31 Kirov str. 98600. Yalta. Crimea. UKRAINE Tel: +380 654 327943 Fax: 380 654 230608 E-mail: select_magarach@ukr.net http://www.magarach.ua |
| RUSTIONI Laura | University of Milan – Department of Crop Production Via Celoria 2 I-20133. Milano. ITALY Tel. +39 02 5031 6556 Fax. +39 02 5031 6553 E-mail: Laura.Rustioni@unimi.it http://www.diprove.unimi.it/ |
| SALIMOV Vugar | Research Institute of Viticulture and Winemaking Mekhtiabad village Absheron district, 0100. Baku. AZERBAIJAN Tel: +994 12 435331 E-mail: vugar_salimov@yahoo.com |

| | |
|--------------------|---|
| SAVIN Gheorghe | National Institute for Viticulture and Oenology 59 Vieru str. MD 2070 Chisinau. MOLDOVA Tel: +373 022 285003 Fax: +373 022 285003 E-mail: ghsavin@yahoo.com |
| SCIENZA Attilio | University of Milan – Department of Crop Production Via Celoria 2 I-20133. Milano. ITALY Tel. +39 02 5031 6559 Fax. +39 02 5031 6553 E-mail: Attilio.Scienza@unimi.it http://www.diprove.unimi.it/ |
| SEMEREKOVA Elmira | Research Institute of Viticulture and Winemaking Mekhtiabad village Absheron district 0100. Baku. AZERBAIJAN Tel: +994 12 435331 E-mail: azvino@yandex.ru |
| TROSHIN Leonid | Kuban State Agrarian University 13 Kalinin str. 350044 Krasnodar. RUSSIAN FEDERATION Tel: +7 8612 215904 Fax: +7 8612 215885 E-mail: lptroshin@mail.ru http://www.vitis.ru http://kubsau.ru/chairs/viniculture |
| TSERTSVADZE Nugzar | Institute of Horticulture, Viticulture and Oenology 6 Marshal Gelovani Ave. 0159. Tbilisi. GEORGIA Tel: +995 32 520966 http://www.ihvo.ge |
| TUROK Jozef | Bioversity International. Regional Office for Europe Via dei Tre Denari, 472/a 00057. Maccarese (Fiumicino). Rome. ITALY http://www.bioversityinternational.org <u>Present address</u> CGIAR Program Facilitation Unit for Central Asia and Caucasus International Center for Agricultural Research in the Dry Areas (ICARDA) P.O. Box 4564 Tashkent 100000. UZBEKISTAN Tel: +998 71 2372130 69 04 Fax: +998 71 1207125 E-mail: J.TUROK@cgiar.org http://www.icarda.cgiar.org/cac/ |
| VAKHTANGADZE Tamar | Institute of Horticulture, Viticulture and Oenology 6 Marshal Gelovani Ave. 0159. Tbilisi. GEORGIA Tel: +995 32 520966 E-mail: tvakhtangadze@yahoo.com http://www.ihvo.ge |
| VOLYNKIN Vladimir | National Institute of Vine and Wine 'Magarach' 31 Kirov str. 98600. Yalta. Crimea. UKRAINE Tel: +380 654 32 79 43 Fax: +380 654 23 06 08 E-mail: volynkin@ukr.net http://www.magarach.ua |
| ZVIAGIN Andrey | Kuban State Agrarian University 13 Kalinin str. 350044 Krasnodar. RUSSIAN FEDERATION Tel: +7 8612 215904 Fax: +7 8612 215885 E-mail: ziag@mail.ru http://www.kubsau.ru/chairs/viniculture |

Meaning and methods of this book: A guide for the reader

D. MAGHRADZE¹⁾, L. RUSTIONI²⁾, A. SCIENZA²⁾, J. TUROK³⁾, O. FAILLA²⁾

¹⁾ Institute of Horticulture, Viticulture and Oenology, Tbilisi, Georgia

²⁾ University of Milano, Department of Crop Production, Milano, Italy

³⁾ Bioversity International. Regional Office for Europe, Maccaresse, Roma, Italy

This book is an ampelography of selected native grape varieties of the six countries involved in the project 'Conservation and sustainable use of grapevine (*Vitis vinifera* L.) genetic resources in the Caucasus and Northern Black Sea region', coordinated by the European Office of the International Plant Genetic Resources Institute 'Bioversity International' (former IPGRI) in 2004-2008. The project aimed at the identification, collection, characterization and conservation of the rich diversity of grapevine genetic resources throughout the Caucasus and the Northern Black Sea region, as a basis to improve local viticulture and winemaking industry. The six partners of the project are Azerbaijan, Armenia, Georgia, Moldova, Russia and Ukraine.

Among the many activities developed in the framework of the project, which will be described in detail in the next chapter, it was decided to publish a regional ampelography of selected local varieties of grapevine (*Vitis vinifera* L.), with the object to provide the highest information about the range of biodiversity that can be traced in the local varietal assortments.

Different criteria were used in order to select the varieties. Priority was given to those that played an important role in the past local viticulture, but which are now endangered. Moreover, according to each country's specific situation, also local varieties less endangered, as well as minor accessions with an unclear historical background or obtained by local breeding activities, could be included. This assessment was taken to allow each country to describe its own germplasm according to its specificity. For practical reasons, the number of varieties per country was limited to approximately fifty.

Another criterion to be respected by the authorship was to include only the varieties available in the grapevine collections maintained by the institutions involved in the project. Moreover, the variety descriptions, as well as the photos, had to be original and derived from the specimens in the collections, most of which were renewed during the project.

A concise, as well as highly informative, description layout was agreed among partners, according to the aim of the work. Each variety had to be described not merely from the morphological point of view: information about its historical background, agronomic features and qualitative traits had to be given, as well as about its present and past importance.

For an appropriate comprehension of the data in the variety descriptions, some remarks need to be done.

'Ampelography' is a branch of viticultural science aiming at the description of grape varieties for their identification and characterization. The description of a variety though, is a very wide objective. In fact, a variety is the result of a process of human selection within a range of genetic variability, which in the specific case of grapevine, like of other fruit crops, has its origin in sexual reproduction or in gene mutation. In the first case someone (a viticulturist or a breeder) selects a seedling, spontaneously or intentionally born. After a positive evaluation, it is vegetatively propagated by cutting, layering or grafting. In the second case a vine shoot, showing a particular and distinguishable trait (compared to the other vine shoots) called "bud mutation", is selected and again vegetatively propagated.

So, it is important to underline that a variety may have its setting if a human being makes the decision to select a particular individual, according to its features (phenotype). But this is generally not sufficient, in fact the newly selected genotype, seedling or plant from a mutated bud has to be multiplied in order to spread the new variety throughout space and time. More than one viticulturist is involved in this second step, therefore the setting of a new variety is an ethnological process.

When does a new genotype really have to be considered a new variety? The answer is not easy. Probably, the first act is the naming of the new strain. We should believe that when a viticulturist names a new selection, he has recognized its peculiar traits. However, this is not enough: it is when a community of viticulturists shares the variety and adopts the same name that we should really consider that a new variety is set.

From its place of birth, a grapevine variety may spread more or less extensively. During its spreading, according to historical experience, it may change its name in many ways - for instance - undergoing more or less literal translations into the languages of the new regions, adopting a name that refers to its place of origin, changing the name completely according to attributes seized in the new lands or following other linguistic pathways. All these events give rise to synonyms for varieties, which sometimes are really different from the initial names.

During its spreading, a variety may be successful in a new viticultural land, while in its birthplace it may be neglected and abandoned. Similarly, in its birthplace, a local variety, which was extensively grown in the past, may nowadays be rare. As a result, for more than one variety, it is difficult, if not impossible, to ascertain the real birthplace and the original name. This is why more than one region may claim to be its true homeland. In other cases, even if the place of origin of a variety is commonly recognised, more than one country next to its homeland may consider it as an own local variety, due to the long historical importance of the latter in that land.

As an example 'Boyakhany' N. and 'Yagubi' Rg. grapes are described in the Azerbaijan chapter, but according to the Ampelography of Soviet Union (Limited distributed varieties, vol. 1, 1963 and vol. 3. 1966) these are Armenian varieties. A more complex example is that of 'Askeri' B. grapes will here described in the Azerbaijan chapter, but there are various theories on the origin of this variety including Azerbaijan (NEGRUL 1973), Armenia (NAZELI 1947 and 1962), Middle Asia (TROSHIN 2006) and Iran (IVANOVA 1986).

For these reasons, some varieties are included in more than one chapter and some countries have described several varieties that are not native.

According to these considerations, besides the 'Name' and possible 'Synonyms' of each variety, the 'Meaning of the name', if known, and 'Historical notes and cultural importance' are the first part of the variety description.

Based on the general morphology of varieties, the Russian ampelographer A.M. NEGRUL (1946) proposed a classification of grapevines into three main eco-geographical groups, named as '*proles*' (or later '*convar*'). Each one is divided into 'sub-*proles*' (or 'sub-*convar*') according to the following scheme:

| Proles (<i>convar</i>) | Sub- <i>proles</i> (sub- <i>convar</i>) |
|--------------------------|--|
| <i>orientalis</i> | <i>caspica, antasiatica</i> |
| <i>pontica</i> | <i>balcanica, georgica</i> |
| <i>occidentalis</i> | <i>gallica, iberica</i> |

The classification is based on the assumption that each eco-geographical group has a distinct phylogenetic derivation from different populations of wild grapevine (*Vitis vinifera* ssp. *sylvestris*).

While Negrul's classification was not extensively adopted by the western European ampelographers, it was completely embraced by the former Soviet countries. For this reason, all the varieties described in this book are classified according to Negrul's scheme.

After several cycles of vegetative propagation, a number of gene mutations is inevitably accumulated within a variety. The extent of the phenomenon is related to the number of propagation occurrences. So, for ancient and widely grown varieties, we have to consider a series of clonal lines, which may differ for a range of morphological and physiological traits. This kind of information is presented in the item 'Taxonomy and intra-variety variability'.

'Essential ampelographic description' focuses on the most important organs: shoot tips at flowering, mature leaf, flower type, bunch and berry at ripening. The authors have been requested to follow, as much as possible, the various editions of harmonised Descriptors for Grapevine (*Vitis* spp.), published by the IPGRI (1997), OIV (1983), UPOV (1999) and GENRES Project (2001). In these sections though, there is also a wide use of particular terminology, either adopted in historical references or accepted by the former Soviet school of ampelographers: the editors' decision was to maintain these terms in order to enrich the texts with original features.

'Phenology' was limited to the four main phases of the annual cycle of the plant. It is referred to the average period expected in the grapevine collection sites where data were recorded.

'Vegetative and yielding characteristics' and 'Juice characteristics' contain a range of data that vary for the different countries. In general, data are referred to the records in the collections and, for the widespread varieties, also to the most frequent growing conditions.

'Climate and cultivation requirements', 'Resistance to diseases and unfavourable weather' and 'Wine and grape characteristics' take into account, when available, the experience either acquired by the authors directly or through literature.

For what concerns the terminology used to describe the degree of susceptibility to fungal diseases, it should be underlined that only *Vitis vinifera* cultivars were described. This means that the term "resistance", when used by the authors to describe the cultivar behavior, facing to *Plasmopara viticola* or *Erysiphe necator*, should be more correctly referred to the concept of "high tolerance". We preferred, when used, to leave the term "resistance", in respect the original authors texts.

This book is the first voluminous ampelography devoted to Caucasian and Northern Black Sea grapevine varieties written in English. Before this, several works were published in local languages, in Russian or in European languages like French, German or Italian. It is mainly addressed to scientists and viticulturists with several purposes. In agreement with the aim of the project, our first intention is to promote the conservation and sustainable use of grapevine genetic resources in the region. We intend to encourage the 'on farm conservation' of the elite germplasm varieties in the native countries. We believe this is the proper way to conserve biodiversity and to evaluate its yielding and qualitative potential. Moreover, we aim at encouraging scientists to evaluate the wide variability in the variety assortments described in this ampelography. Such variability should be considered as a source of useful genes for a grapevine breeding aiming at quality improvement, diversification and resistance to biotic and abiotic stresses.

In the history of human civilization, the role of viticulture and its products, wine above all, is well known, as well as its importance nowadays from many points of view: economical, cultural and social. In conclusion, we hope that the efforts that the partners of the project together with the authors of this book have made until now, for conservation and documentation of this unique germplasm, may be useful for the future of the grapevine. It is actually to the grapevine that

we owe this tribute; as for thousands of years it has never stopped providing human beings with a wide range of delicious drinks, foods as well as pleasant shade and beautiful ornamental lianas in courtyards and gardens.

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Project of Bioversity International on conservation and sustainable use of grapevine genetic resources in the Caucasus and northern Black Sea region: Activities and results

D. MAGHRADZE¹⁾, J. TUROK²⁾

¹⁾ Institute of Horticulture, Viticulture and Oenology, Tbilisi, Georgia

²⁾ Bioversity International. Regional Office for Europe, Maccaresse, Roma, Italy

Abstract

Conservation of grapevine biodiversity in the Caucasus and northern Black Sea Region is particularly urgent because of: 1) the large number of traditional local varieties out of cultivation; 2) the relevance of these resources for the development of European modern cultivars; 3) the financial difficulties in the countries; 4) the occurrence of *Vitis vinifera* ssp. *sylvestris* throughout the region; 5) wine production as a major potential source of income for the local population in the region. In 2004-2008, significant progress has been made within a collaborative project, financially supported by the government of Luxembourg, aimed at strengthening the capacity of the countries of the region (Armenia, Azerbaijan, Georgia, Moldova, Russia, and Ukraine) to ensure the long-term maintenance of *Vitis* genetic resources, including the cultivated traditional varieties and the wild resources. The activities include identifying, collecting, characterizing, and conserving the diversity of grapevine genetic resources as a basis to improve local viticulture and winemaking industry.

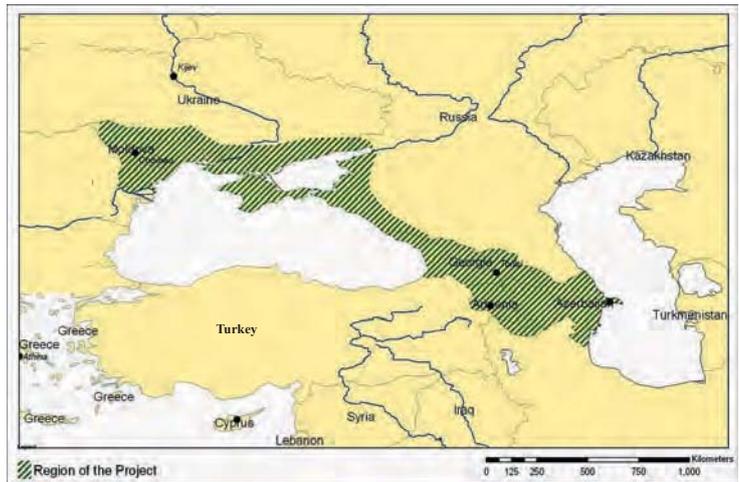


Fig. 1: The map of project area covering Armenia, Azerbaijan, Georgia, Russia, Moldova and Ukraine.

Introduction

The domestication of grapevine was probably carried out simultaneously in different parts of the world. One of the main centres where this process began is the area between the Black Sea and the Caspian Sea, known as the Caucasus (McGOVERN 2003, COSTANTINI *et al.* 2005, 2006, FORNI 2005, 2006). The region is rich in grapevine diversity; moreover it is the homeland of the wild species *Vitis vinifera* ssp. *sylvestris*, the ancestor of the cultivated grapevine *V. vinifera* ssp. *sativa* (VAILOV 1926, NEGRUL and KATS 1946). However, despite the richness and the importance of the grapevine in the region's culture and economy, few resources were invested to collect, characterize and conserve the grapevine diversity. This is why a collaborative project called 'Conservation and sustainable use of grapevine genetic resources in the Caucasus and Northern Black Sea region' was launched in 2003, to help the countries build up their national knowledge about the use and conservation of grapevine genetic resources and to facilitate an international collaborative action. The project was coordinated by the Bioversity International's (former IPGRI) Regional Office for Europe and was financially supported by the Government of Luxembourg.

The conservation of grapevine biodiversity in the Caucasus and Northern Black Sea Region is particularly urgent for many reasons: 1. the large number of traditional local varieties out of cultivation; 2. the relevance of these resources for the development of European modern cultivars; 3. the financial difficulties in the countries where unstable economies do not allow an adequate protection throughout the region of the local varieties' biodiversity; 4. the occurrence of the grapevine's wild ancestor, *V. vinifera* ssp. *sylvestris*; 5. wine production as a major potential source of income for the local population (IPGRI's Report 2003, Web-IPGRI).

It is possible to give some examples of the necessity of this conservation: of the 274 native and selected varieties from the Russian Federation, described in the Ampelography of the Soviet Union (1947-1970), only 104 varieties were collected in the National Ampelographic Collections of Russia. Of the 525 listed native varieties of Georgia (KETS KHOVELI *et al.* 1960), only 414 were described in the same Ampelography of the Soviet Union (1947-1970) and only 248 remained in the old collections on the territory of Georgia until 2003. During the last decade of the 20th century the central collection of Armenia, with 22 ha and 850 varieties, was eliminated because of land privatization.



Fig. 2: Opening of the Bioversity International project in Tbilisi, Georgia, in Autumn of 2003.



Fig. 3: The participants of the 2nd project meeting in Crimea visited ancient Greek settlement in Kherstones.

The main goal of this initiative is to strengthen the national capacity of the involved countries to ensure the long-term maintenance of *Vitis* genetic resources, including both the traditional varieties and the wild resources. In particular, the aim is to identify, collect, characterize and conserve the rich diversity of grapevine genetic resources throughout the Caucasus and the northern Black Sea region, as a basis to improve the local viticulture and the wine making industry (Web-Bioversity).

The countries of the project - Armenia, Azerbaijan, Georgia, Moldova, Russia and Ukraine - have a long tradition in the conservation of PGR and related scientific disciplines. Contributions in kind have also been offered for fellowships and research support by various institutions across Europe: Department of Crop Production (DIPROVE) of the University of Milan, Italy; Centre de Recherche Public Gabriel Lippman in Luxembourg (CRP-GL), Istituto Italiano per l'Africa e l'Oriente (IsIAO), Italy through a partnership with the European Cooperative Program for Crop Genetic Resources Networks (ECP/GR) and the Working Group *Vitis*.

Results

I n v e n t o r y o f c o l l e c t i o n s : Each country made a comprehensive inventory of all the native grapevine varieties belonging to the project partner countries. The mission was to evaluate the 13 collections and their current preservation, using the FAO/IPGRI Multi-crop Passport Descriptors (2001) system. The inventory includes a short explanation of the main agronomic characters and vegetative conditions in 2004.

D a t a b a s e : The joint project database was established on the basis of the inventory data. It contains 3354 local accessions. The data were prepared for publication under the supervision of Dr E. Maul and their publishing started on the web-page of the 'Vitis International Varieties Catalogue' (<http://www.vivc.de>) in 2007. At the moment, all information is available on this database.



Fig. 4: Wine testing of Moldavian wines.



Fig. 5: Discussion of project topics.

In parallel, the Moldavian Institute of Viticulture and Oenology created a local database with Visual Fox Pro and called it 'Information System for Grapevine Genetic Resources'. It contains passport facts, ampelographic and ampelometric data with photos, and the results of annual studies on accessions from the collection of the Institute. Collaborative activities for transferring the available data in the National PGR Database of Georgia were started.

I d e n t i f i c a t i o n : Twenty-four autochthonous varieties from Crimea, collected in previous years but that had never been characterized, were investigated with ampelographic characters by the National Institute for Vine and Wine 'Magarach'. The same institution organized new expeditions in Sudak and discovered another 19 autochthonous varieties in 2005.

Searching and identification of local varieties in old vineyards inside the countries was achieved by almost all the other participants: between 2003 and 2005, Armenia collected 200 accessions for its new field grapevine collection in five Phylloxera-free regions of the country (Ararat, Armavir, Aragatsotn, Syunik, Vayots Dzor). In 2007, another 30 rare and unknown varieties were discovered. The same year, Azerbaijan discovered 38 rare varieties in Absheron, Garabag and Nakhchivan. The latter varieties were described by parameters of bunch, berry, must, phenology and resistance to the main fungal diseases. In the previous year, another 27 varieties were evaluated in the same way. Georgia discovered 21 rare local varieties grown by farmers in 2006 and 13 varieties in 2007.

Two hundred accessions of various origins were identified in new Russian collections in 2007 and the total number of identified genotypes reached 1430. Approbation and identification of accessions were carried out also in the new Vashlijvari collection in 2006 and 2007.

M o b i l i z a t i o n : The Georgian Institute of Horticulture, Viticulture and Oenology re-introduced about 100 Georgian autochthonous varieties from the collections of Moldova, Ukraine and Italy. The Armenian Academy of Viticulture, Winemaking and Fruit Growing organized several expeditions in its five regions, mobilizing 100 autochthonous varieties and about 120 of their clones for its new Ararat collection. The Azerbaijan Research Institute of Viticulture and Winemaking collected rare local varieties inside the country and re-introduced some local varieties from Moldova. The National Grapevine Collection of Russia, located in the 3 sites of Anapa, Krimsk and Kuban of Krasnodar Krai, mobilized 89 genotypes (39 local varieties among those) from the internal regions, from the 'Magarach' collection (Ukraine) and from foreign countries in 2005-2007. Moldova enriched its collection with 7 exemplars of wild grapevine, introduced from Georgia and Azerbaijan and identified several institutions and collections in Romania and Moldova as sources of local varieties and of their clones. Ukraine propagated 19 autochthonous varieties from the old collection 'Solnechnaia Dolina', located in the Sudak region.

Georgia checked its native varieties in the collections of Uzbekistan, France and Slovakia, while Moldova checked its varieties in Romania: as a result, the available ampelographic information and photos were collected and correspondent lists were made in order to reintroduce them.

C o n s e r v a t i o n : Two new collections of local varieties were established: in Georgia (360 accessions, including several accessions of wild vine and local breeding varieties) between 2003 and 2005 and in Armenia (200 accessions) in 2005. Project partners from Ukraine, Moldova and Italy helped Georgia with the compilation of the Vashlijvari collection through the re-introduction of Georgian native varieties.

The Genetic Resources Institute of Azerbaijan established a new field collection of native varieties in 2007 and planted 33 varieties from the collection of the Azerbaijan Research Institute of Viticulture and Winemaking. The partners from Moldova enlarged the Chisinau collection by 15 varieties in 2006. The other countries, where a collection was already established, engaged themselves in a hard work of preservation and maintenance.

The Azerbaijan Institute of Viticulture and Winemaking enlarged its Absheron collection by 36 new accessions and multiplied 30 varieties in a nursery in 2005, in order to include them in a field collection. The following year, the same institution started new plantations of autochthonous varieties in two experimental stations in Gyanja and Shamakhy and used 'on-farm' preservation in two private farms. Moldova also made some progress in the 'on-farm' preservation and evaluation of varieties and wines. The budget of the project included guaranteed and constant funding for management and agricultural practices of the major collections in every country.

The main concern was the evaluation of the vegetative and phytosanitary status of the varieties. New accessions were added and damaged genotypes were restored in the collections. Particular care was taken after the hard winter in 2006 in Krasnodar (Russia), Chisinau (Moldova) and Crimea (Ukraine). A traditional technique of propagation was used for multiplication and restoration of accessions (grafting, rooting, laying) as well as soilless culture (Ukraine) and *in vitro* method (Armenia, Moldova, Russia, Ukraine). Russia alone propagated 202 weak genotypes *in vitro* in 2006-2007. The latter method was successfully used also for receiving healthy (virus-free) plant material by Russia (2007). Ukraine multiplied 19 local Crimean varieties using the same method and included them in the collection. Georgian partners recovered old varieties of Vasil Bestavashvili, bred in the first half of the 20th century.

Characterization: Each country started a description of the native grapevine varieties with the use of the IPGRI (1997) and GENRES 081 (2001) ampelographic descriptors and agronomic traits. Digital images of young shoots, leaves and clusters were produced by all partners, and used for describing the varieties. The Moldova Institute also established the herbarium.

Moldova's National Institute for Viticulture and Oenology researched 34 autochthonous varieties with phenology, basic agronomic traits of plant, yielding and resistance towards pathogens, as well as 6 new local varieties ('Kishmish Lucisty', 'Apiren Alb', 'Apiren Roz', 'Apiren Roz Extratimpuriu', 'Apiren Basarabean', 'I-15-15'). Negative effect of high temperature stress on vegetative conditions of local varieties was studied, therefore sensible and more resistant varieties were marked.

In 2005, Russia started the characterization of 140 local varieties and of 30 wild forms using the IPGRI descriptors for grapevine. A classification of 104 Russian varieties was made, sorting the latter by region of origin, color of berry and use of grape.

The Ukrainian Institute 'Magarach' investigated 160 varieties of the *proles Pontica subproles Georgica* Negr. group. In 2006, the Ukrainian partners classified 84 autochthonous varieties according to Negrul's scheme, to the length of the vegetative period and to the use of the grape. The same year, 13 autochthonous varieties were characterized by main agronomic traits, resistance to mildew and environmental factors. Hence, in 2007, 21 native varieties from Crimea were studied by their morphological and agronomical characters, phenology, resistance to fungal diseases and frost. Thirty-four local breeding varieties from Ukraine were investigated by the 6 recommended SSR markers according to THIS *et al.* (2004) at the CRP-GL in Luxembourg (HEUERTS *et al.* 2008). Seven local varieties were investigated according to the anthocyanin analyzes by HPLC in Crimea.

Azerbaijan investigated 35 local varieties according to phenology, bud loading and fertility, growth of shoots, yielding capacity, bunch and seed characteristics of varieties. Twenty-five table and seedless varieties were evaluated for resistance to drought and salinization - 4 varieties were selected because of their significant resistance; intra-varietal research of the Ag Shani variety was done. Resistance of 74 varieties against *Erysiphe necator* and *Plasmopara viticola* was also evaluated.

At the University of Milan, 150 Georgian autochthonous varieties were investigated using 6 SSR markers (MAGHRADZE *et al.* 2009 a), chemo-taxonomy analyses (ROSSONI *et al.* 2007) and ampelographic techniques. One hundred and fifty ampelographic cards were completed, anthocyanin profiling of 84 varieties was characterized and SSR dendrograms were constructed. The wide group of native varieties was researched by morphological and agronomical characteristics in the Vashlijvari collection for the period 2006-2007 and the correspondent descriptors were completed; pollen parameters were studied for 30 native varieties, including several female varieties and clones. Nineteen local varieties from the Guria region of Western Georgia were characterized by phenology and main agro-climatic parameters.

Armenia completed IPGRI/OIV ampelographic cards for 41 local varieties with photos. All participant countries prepared ampelographic descriptions of important native varieties with photos (bunch, leaf, young shoot) to be published in English in a new book about the Project. Based on the descriptions of local varieties of grapevine, which are in the Anapa collection, the book 'Native Grapevine Varieties of Russia' was published in Russian with photos (TROSHIN 2007). This book was admitted as a handbook for agronomy students by the Education-Methodical Association of High Schools of Russia. In Armenia, experimental micro-winemaking was also performed for the enological evaluation of native varieties.

Three hundred accessions of the Krasnodar collections were evaluated for frost resistance after the hard 2006 winter (-27 / -30.7 °C air temperature, -38 °C underground temperature). The same year, severe conditions were recorded also in Moldova (-27 / -30 °C for 2-3 days) and in Crimea (-22.5 °C); therefore cold-resistant local genotypes were selected by the Chisinau Institute of Vine and Wine and by the 'Magarach' Institute - the latter evaluated 84 genotypes.

Some joint activities were carried out in order to improve the ampelographic software 'SuperAmpelo' with the collaboration of its author SOLDAVINI (2009) and its usage was recommended to the other project partners.

Wild grapevine: The inventory of wild grapevine was carried out organizing expeditions in each country. This led to the discovery and description of a large number of wild populations.

The Ukrainian Institute 'Magarach' discovered and described 163 forms in Crimea at altitudes of 50-700 m a.s.l.; 25 among these were rooted in a greenhouse and planted in the collection or multiplied by seed *in vitro*. Forms of wild-growing grape from the Yalta and Alushta populations were described. The parameters were the characteristics of the apex of the young shoot (OIV codes 001-005) and of the adult leaf (OIV codes 065-093): these data were used for the differentiation of the genotypes and classification of the wild grapevine of the region.

The Georgian IHVO discovered and described 180 plants in West and East Georgia between 2004 and 2007, describing them by ampelographic methods. Forty-five accessions among those were multiplied for further conservation in *ex situ* collection. Russia investigated 19 centers of location and discovered 67 wild growing plants and native varieties in Northern Caucasus in the period between 2004 and 2007.

The Research Institute of Viticulture and Winemaking of Azerbaijan had a wide program for the investigation and evaluation of wild grapevine on the whole country territory. It discovered about 1286 plants, described their ampelographic characters and resistance, summarized researches in several publications and in the Doctoral dissertation of M. AMANOV (2006 a, 2006 b).

Moldova described some new sites of wild vines within the country, initiated morphological investigation of accessions from Kopen-Dag (Turkmenistan) in its Chisinau collection; planted new accessions from Georgia in 2005; obtained and evaluated seedlings in greenhouse in 2006-2007. Among these, 28 seedlings from the Zberoaia and the Barboieni population were planted in the Chisinau collections in 2006.

Armenia investigated the Syunik region, studied 25 individuals more in detail and planted 10 new accessions in the Ararat collection in 2007.

The exposed plants were described by the FAO/Bioversity Multicrop Passport Descriptors *in situ*. Ukraine, Georgia, Russia and Armenia used the GPS system and several maps for tracking the wild plants. Phytogeographic characters of the territory where those plants are spread have been described. Photos for the descriptions of plant, young shoot, inflorescence, leaf, flower, bunch and berries of wild plants have been taken in order to perform ampelographic descriptions and measurements in a laboratory. Seeds and herbariums of wild plants were collected.

Experimental wines from wild forms were produced by Armenia and Azerbaijan and they were studied under the main enological parameters.

Developing knowledge: To improve regional knowledge, the project set up 'Vitis Fellowships' programmes over a three-year period with the aim of transferring basic knowledge about grapevine research in the region. Three fellowships were realised for researchers as follows: a ten months fellowship for Georgian researchers was organized in the DIPROVE of the University of Milan and two fellowships were organised for researchers from Ukraine and Russia for two months each in the CRP-GL in Luxembourg.

Project meetings: Five meetings of the project partners were organized in Tbilisi (2003), Yalta (2004), Chisinau (2005), Luxembourg (2006) and Krasnodar (2007) with the purpose to provide an update on the progress made in implementing the project work plan, to communicate the main project outcomes and to agree on the work plan for the following year. The meetings were attended by the project partners, project facilitators, meeting observers and guests. All meetings were accompanied by field trips to collections, cellars or wineries.

These meetings did not only involve the project participants, but also the representatives of local governments, the Academy of Agricultural Sciences, the staff of the host institutions, a wide number of researchers-viticulturists and observers from France, Turkey, Greece and Sweden.

Public Awareness Event: In order to improve the public awareness of the project, a special web-page for grapevine on the web-site of Bioversity International was created: http://www.bioversityinternational.org/Plants_and_Animals/Temperate_Fruits_and_Nuts/Grapevine_Project/index.a.

The Russian project partner offered additional information about the grapevine project in Russian on the web-site 'Vitis' (<http://www.vitis.ru/pubs.asp?r=10>), on which many publications about the meetings were published.

Information about the project and its outcomes was reported in different contexts: public awareness event at the CRP-GL in Belvaux (Luxembourg, May 2005), 9th International Conference on Grape Genetics and Breeding (Udine, Italy, July 2006) (MAGHRADZE *et al.* 2009 b), The second European workshop on National Plant Genetic Resources Programmes (Luxembourg, November 2006), The first working meeting of the European Grapevine Project 'GrapeGene06' in the Headquarter of the INRA (Versailles, France, March 2007), Second Vavilov conference on PGR (St. Petersburg, November 2007), in the headquarter of FAO (Rome, April 2007), at the Istituto Agrario San Michele all'Adige (San Michele all'Adige, Italy, April 2007), in the Headquarter of Bioversity International (Rome, April 2004, June 2006, March 2007).

In order to raise public awareness, the project facilitated participation of the partner countries in international conferences. This way, research results were presented on several occasions: First International Conference on Crop Wild Relative (Agrigento, Italy, September 2005) (CHKHARTISVILI *et al.* 2005), International symposium 'Viticulture and Wine-making in XXI Century' (Odessa, Ukraine, 2005), 9th International Conference on Grape Genetics and Breeding (Udine, Italy, July 2006; MAGHRADZE *et al.* 2009 a), First Italian Conference of Viticulture (Ancona, Italy, June 2006; ROSSONI *et al.* 2007), 18th EUCARPIA Genetic Resources Section Meeting (Piestany, Slovak Republic, May 2007) (RISSOVANNAIA *et al.* 2007), 2nd N. Vavilov conference on Plant Genetic Resources, 17th International Symposium on Non-Traditional Plant Growing, Ecology and Health (Alushta, Ukraine, 2007) (MELYAN 2007).

The Bioversity International's Regional Office for Europe and the project participants systematically presented the project and its activities to the wide auditory by informative publications or interviews (TUROK *et al.* 2006, MAGHRADZE *et al.* 2006, MAGHRADZE and CHKHARTISVILI 2006, TROSHIN *et al.* 2007, and others).

In order to arise public interest towards Georgian germplasm and its conservation, a poster of native varieties was produced.

Publications and translations: The main scientific basis for the collaborative activities undertaken in this project refer to the book 'La vite e l'uomo - dal rompicapo delle origini al salvataggio delle reliquie' (DEL ZAN *et al.* 2004), containing basic information about the viticulture of the region's countries and with descriptions of essential varieties.

More detailed description of the native varieties from the partner countries is given in this illustrated book of the project. In the book, the varieties will be described on the basis of the following criteria: distribution, synonyms, history, intra-varietal variation, main ampelographic characteristics, phenology, characteristics and peculiarities of cultural practices, requirements for climate and cultivation conditions, susceptibility to diseases and unfavorable weather and technological conditions.

As a separate publication, 'Materials of the second working meeting of the IPGRI's project on grapevine' (2004) was issued. The project also stimulated the printing of two books in Russia - 'Native grapevine varieties of Russia' (2007) and 'The top grapevine cultivars of Eurasia' (2006) - prepared under the supervision of Leonid Troshin.

All project partners published or submitted several articles for publications, based on obtained research materials within the project activities or about their native grapevine germplasm, stimulated by the project ideas (VOLINKIN *et al.* 2004, CHKHARTISHVILI *et al.* 2006, GOGITIDZE *et al.* 2006, NOSUL'CHAK *et al.* 2006, POLULIAKH and VOLYNKIN 2006, VASHAKIDZE 2006, VOLYNKIN 2006, GORISLAVETS *et al.* 2007 and others). Informative publications about the Project's activities were issued in English, Italian, Russian and Georgian (IPGRI's Report 2003, MAGHRADZE 2005, MAGHRADZE *et al.* 2006, MAGHRADZE and CHKHARTISHVILI 2006, TUROK *et al.* 2006).

Two manuals for grapevine description and two articles (COSTANTINI *et al.* 2006, FORNI 2006) have been translated from English into Georgian and published. A "Practical guide for planting and managing grapevine collection" has been prepared and translated from English into Russian. The articles by THIS *et al.* (2007) and VOULLAMOZ *et al.* (2006) were translated into Georgian and were submitted for publication.

Archaeology: Archaeobotanical research in the field of ancient grapevine biodiversity was facilitated in the region and information about grapevine fossils from Georgia and Ukraine was collected. Data of Ukrainian material was presented during the second project meeting in Ukraine (CARTER and PASHKEVICH 2004; COSTANTINI 2004) and data from Georgia was summarised in a bilingual scientific article (COSTANTINI *et al.* 2006). A protocol for seeds investigation was developed. Two trainings on seed investigation were organized in the ISIAO, Rome.

Ratified agreements: Relationship and activities that started thanks to the Project, became a reason for signed agreements between the Ukrainian Institute 'Magarach' and the Georgian IHVO and between the Moldavian National Institute of Viticulture and Oenology and the Georgian IHVO for joint investigation of the grapevine germplasms and for the exchange of plant materials for research purposes.

Scientific literature: Acquisition of scientific literature was one of the main sections of the Project's budget for all the partner countries, in order to allow them to update libraries with new books and scientific journals in the field of viticulture and PGR management.

The Reports: Each of the project partners and the project facilitator prepared scientific and financial reports for every year of activity, describing the main results of their works. A summary of the project meetings was briefly written in the reports of the meetings, together with the plan for the following year of activities (Meeting reports 2003, 2004, 2005, 2006).

Conclusions: main results

Project partners in the countries worked to implement conservation activities aimed at collection, maintenance and restoration of the identified grapevine genetic resources, which included: checking and identification of local varieties in the foreign collections and in old vineyards; compilation of the project database; inventory, investigation and conservation of wild vine; characterization; collections' management. In particular: a) A wide number of local varieties of Azerbaijan, Armenia, Georgia, Moldova, Russia and Ukraine were effectively preserved in the collections thanks to constant financial support; b) A successful collaborative network among institutions was organized, this way the researchers from Eastern Europe could enlarge their scientific knowledge in the research centers of Western Europe; c) Local varieties of grapevine and wild vines from the regions were involved in the joint investigation; d) Information about the project, presented to a wide auditory, increased interest in the biodiversity of the local grapevine germplasms; e) Ampelography of local varieties will be published in English for the first time.

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Main implementer institutions:



Bioversity International - Regional Office for Europe
Via dei Tre Denari, 472/a
00057. Maccarese (Fiumicino). Rome. ITALY
Tel./Fax: +39 (0)6 61979661
<http://www.bioversityinternational.org>



University of Milan (UNIMI) - Department of Crop Production
Via Celoria 2 I-20133. Milano. ITALY
Tel. +39 (0)2 5031 6565 Fax. +39 (0)2 5031 6553
<http://www.diprove.unimi.it>



Genetic Resources Institute (AGRI), National Academy of Sciences of Azerbaijan
155, Azadlig ave. AZ1106, Baku. AZERBAIJAN
Tel: +994 12 562 91 71 Fax: +994 12 449 92 21
[http:// http.www.cac-biodiversity.org/aze/](http://http.www.cac-biodiversity.org/aze/)



Research Institute of Viticulture and Winemaking
Mekhtiabad village
Absheron district, AZ 0118, Baku. AZERBAIJAN
Tel. +994 12 443 53 31 Fax. +994 12 443 56 30



Armenian Academy of Viticulture, Wine-making and Fruit-growing NGO
Isakov st. 44/36, 375114. Yerevan. ARMENIA
Tel. +374 94 813528 Fax: +374 31 56970



Institute of Horticulture, Viticulture and Oenology (IHVO)
6 Marshal Gelovani Ave. 0159. Tbilisi. GEORGIA
Tel.: +995 32 520966 Fax.: +995 32 520677
<http://www.ihvo.ge>



National Institute for Viticulture and Oenology
59, Vieru str. MD-2070. Chisinau. MOLDOVA
Tel./Fax: +373 22 285003



Kuban State Agrarian University
13 Kalinin str. 350044. Krasnodar. RUSSIAN FEDERATION
Tel. +7 861 221 58 85
<http://www.vitis.ru>
<http://kubsau.ru/chairs/viniculture>



National Institute of Vine and Wine 'Magarach'
31 Kirov str. 98600. Yalta. Crimea. UKRAINE
Tel. +380 654 325591 Tel./Fax: +380 654 230608
E-mail: magarach@rambler.ru
<http://www.magarach.ua>



Centre de Recherche Public-Gabriel Lippmann (CRP-GL).
41 rue du Brill L-4422 Belvaux. LUXEMBOURG
Tel. +352 47 02 61 - 1
Fax: +352 47 02 64
<http://www.crp.gl.lu/>



JKI - Julius Kühn-Institut
Federal Research Centre for Cultivated Plants
Institute for Grapevine Breeding Geilweilerhof
76833 Siebeldingen. GERMANY
Tel: +49 6345 41122 Fax: +49 6345 919050
<http://www.jki.bund.de>



Bioarchaeologic Research Center
National Museum of Oriental Art
Via Merulana 248. 00185. Rome. ITALY
Tel. +39 (0)6 46974853
<http://www.museorientale.beniculturali.it/>

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The origin of "Old World" viticulture

G. FORNI

Lombard Museum of History of Agriculture, Sant'Angelo Lodigiano, Lodi, Italy

How was grapevine domesticated?

The role of ethology and ethnology in the documentation of the processes of agro-viticultural genesis: The best way to understand the importance of a certain agricultural activity is to focus on all its aspects, on its cosmo-ecologic traits, story and origins. This is precisely what we will do in this contribution.

The general habit of considering just archaeology and palaeontology when studying the birth and the first evolution of a culture is completely unjustified. All data provided by these sciences, as by scientific research in general, are inherently provisional, as further researches will always correct and improve the previous ones. This is why knowledge about the origin of viticulture will always be improving in space and time.

The comparative use of different disciplines gives more solid results. In this view, the inductions derived from the analysis of the ethologic relationship man-grapevine in its primordial stage are particularly useful. Despite the evolution of the behaviours of *Homo sapiens* and *Vitis vinifera*, change is much slower and it depends on the evolution of each species. Change, in fact, occurs on the paleontological time scale, which is much bigger than the archaeological one (FORNI 2004 a, 2008).

Obviously, all ethologic documentation must be crossed with any available ethnological documentation, creating even more solid basis made of interdisciplinary and/or multidisciplinary arguments. The adoption of the 'dump heap model' is a typical example of this approach: it is based on the instinctive behaviour, confirmed by ethnographic observation and historical documentation, of the human nomad groups who threw their rubbish and defecated away from their camps. The fact that dump heaps are the optimal habitat for the wild grapevine is a very solid starting point for the study of the origins of viticulture.

Eventually, it becomes clear that while a purely archaeological/paleontological analysis can only offer partial results, the etho/ethno/archaeological approach offers a more complete reconstruction. In our perspective, such reconstruction must begin on the basis of an even more global study upon the origin of alcoholic drinks in general.

Alcoholic drinks: their cultural genesis and the ethno-archaeological foundations: All civilizations are characterized by their own alcoholic drink (FOURNIER and D'ONOFRIO 1991, FORNI 1996, 2007 a). The first thing to point out is: what is the use and how is an alcoholic drink born within a given culture? Alcoholic drinks are basically natural products, in a certain sense they are spontaneous products. All soft and sugary fruits - not just grapes - if stored in hard or flexible recipients, pressed and squeezed by their own weight, produce abundant liquid that in the right conditions ferments. Soon, a great quantity of alcoholic drink is ready: it is instinctive to drink it. Moreover in primitive cultures, it is instinctive to ascribe the immediate state of drunkenness - followed by ecstasy and hallucination - to a magical or even divine intervention. This state of drunkenness is different from the one caused by mushrooms like *Amanita muscaria* or by repetitive rhythmic sounds: the former is more participative, it is easier to reach, it does not cause immediate intoxication and it does not require any particular professional knowledge. In this sense, it can be considered as a part of daily routine and lifestyle.

Besides the pressing and fermentation of sugary juices from all sorts of fruit (the Italian term *astemio* = *teetotaller* originally meant a person who did not drink rowan wine: *a* = without; *temetum* = rowan wine, a plant that in the dialect of the Alps is called *temel*. This topic of rowan being substituted by grapevine is extraordinarily important, we will see the details later), alcoholic drinks can be obtained in thousands of other ways by any people in any place. Nordic ancient peoples, for instance, used to ferment birch lymph (Fig. 1) obtained by bark carving; many other fermentable liquids are easy to obtain by diluting honey in water, by milk or by germinating cereal grain (barley, corn, rice, wheat, sorghum, millet). In fact, during germination some enzymes transform the non fermentable starch contained in cereal is transformed in fermentable sugar. In our countries, beer is obtained by germinating cereal. Even human saliva contains enzymes able to transform starch into sugar: this is why it is possible to obtain alcoholic drinks from mashes of pre-chewed cereal or tubers, like the American Indians' *chicha* (Fig. 2), obtained by chewing and diluting sweet corn in warm water, as it was documented by the Milanese explorer GEROLAMO BENZONI (1565). This confirms that the easiness of producing alcoholic drinks helps the performance of religious collective practices, where the state of drunkenness, ecstasy and hallucination is present in all participants. Up to this point, we have mainly considered the most frequent processes and situations of prehistory, within non-hierarchical civilizations with animistic and shamanistic religions. Most of these were hunter or nomad peoples, with some cases of proto-cultivation in temporary villages. This was the typical cultural situation of the civilizations set in the Near East, close to the area where we have found the first traces of an intensive use of grapes. The

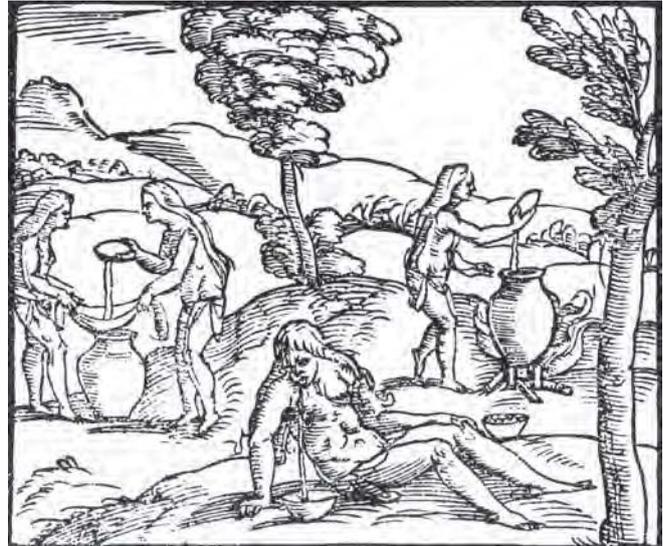
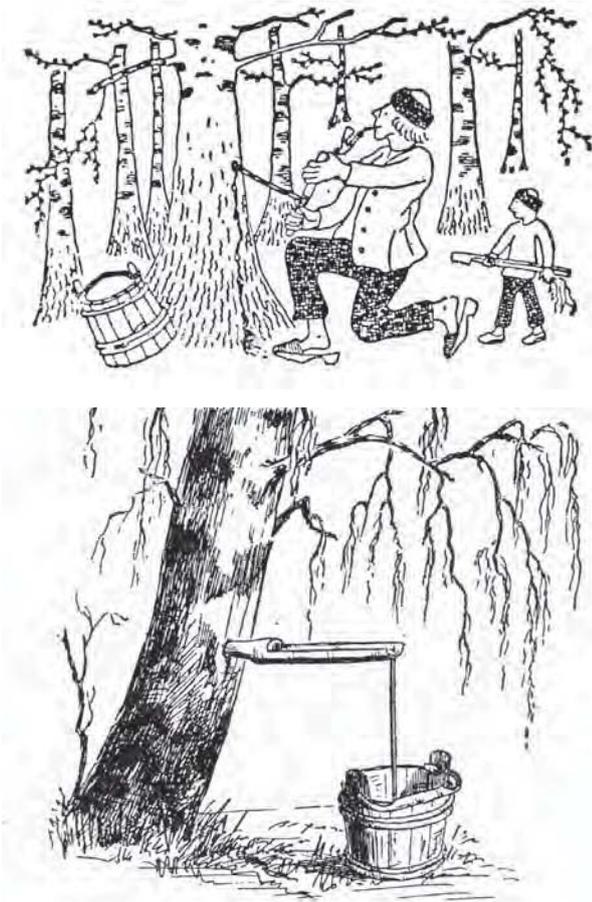


Fig. 1 (left): In Central-Mediterranean Europe, during Mesolithic, Neolithic and Bronze, sugary drinks like lymph from trees of different species, especially of birch, probably preceded any other sugary drink. In this picture we can see the extraction of lymph from a birch: in Latvia this practice is still performed (from LIGERS 1953).

Fig. 2 (top): In pre-plough civilizations, beer was generally produced by chewing cereal: saliva helps to transform non fermentable starch in fermentable sugar. Here we can see the production of *chicha*, the beer of the Redskins, thanks to the engraving of G. BENZONI (1572).

wild grapevine was spread as a wild or a para-domestic plant, in the woods where - given the semi-nomad attitude of those peoples - it was embryonically cultivated *in situ* for protection or, exceptionally, sporadically in temporary gardens. Wine was produced in small quantities and consumed immediately. The low alcohol content prevented any serious social problem due to effects that can be ascribed to the general abuse of drinks with high alcohol content. In polytheistic, classical and in Christian civilizations, the situation was different: the full domestication of grapevine allowed to produce more sugary grapes, therefore more alcoholic wines.

From the genesis of agriculture to the genesis of viticulture. The 'dump heap model' and the role of women and children: From the chronological and phyto-sociological point of view, no vegetal or animal is isolated from the biological world where it lives: each one is part of an ecosystem where all beings interact and modify each other. The set of modifications directly or indirectly induced by men in the genome of animals and plants (and so hereditary), constitutes the genetic component of that process which, eventually, as it became intentional and intensive, was called domestication. It has to be pointed out though, that the usual distinction between what is natural and what is 'anthropized' is merely a 'convenient arrangement': it is useful for temporary, practical purposes of scientific or anthropological research, as *Homo sapiens* himself is obviously a part and an expression of nature.

The birth of agriculture is usually set in the Neolithic, but also during the Palaeolithic, man interacted with his own ecosystem: the nomad prehistoric hunters, together with their relicts that we have found, used to move periodically along the same routes, stopping off in the same places. During his temporary stops man would interfere with vegetation in a more active way compared to when he was moving. For this reason, the trampling on the ground (concentrated in several points) and the remains of rubbish accumulated in appropriate places - the so called dump heaps - determined a specific type of flora around the camps. In fact, such remains of roots, bulbs, tubers, various grains, cores, stones etc., constituted a set of useful residuals and plants that would germinate or bud, giving birth to a spontaneous garden (Fig. 3).

The acknowledgement of such facts has given rise to one of the most fundamental ethologic-ethnographic theories about the origin of agriculture: the Anglo-Saxon Authors call it the 'dump heap model'. Among its distinguished supporters we can quote ANDERSON (1952), HAWKES (1969), HARLAN (1975), BLUMLER and BYRNE (1991).

BLUMLER (1996) underlines the limits of such model, his main argument is that generally, only nitrophile plants are prevalent in dump heaps. It must not be forgotten that for prehistoric nomad (hunter or pastoral) peoples they were the designated place for defecation. The book of Deuteronomy (23, 12-14), a biblical book dating back to the Iron Age, provides us with a precious



Fig. 3: Seedlings of grapevines grown in a country garden where a bunch of grapes had been thrown.

testimony. This book codifies traditions dating back to prehistory (SCHNIEDEWIND 2004) connected to a nomad and pastoral people, the Israelites of that time: "Let there be a place outside the tent-circle to which you may go for corporal needs... Then let your tents be holy, so that he may see no unclean thing among you, and be turned away from you". It must be highlighted that this way, many useful vegetal seeds, including grapevine seeds, were accumulated in those places through defecation of humans and of birds attracted by garbage. Even nowadays, on those terraces and balconies where starlings, pigeons and blackbirds go and rest after abundant meals in the close vineyards, it is not so unusual to notice spontaneous shoots of grapevines in the vases of ornamental plants.

Moreover, as everyone knows, gastric juices increase the seeds germinability, particularly of olive stones and grapevine seeds. Such garbage then constitutes the ideal *habitat* to start not only a domestication of useful herbaceous and arboreal species, but also of the animals. In fact, we must not forget that rubbish contained also animal remains (bones etc.) attracting carnivores, like wolves. The latter became dogs. Plants of rubbish attracted herbivores: in the passage from the ice age to the post ice age, at first we have the reindeer and the deer and after sheep, goats, hens, cattle, equines, but also granivores etc.; moreover, garbage is very interesting for omnivores like swine (FORNI 1990).

The 'dump heap model' is particularly interesting for investigating the origins of viticulture. As we know, wild grapes prosper in humid places, rich in humus and in decomposing organic remains (OLMO 1995, ZOHARY and HOPF 2000). We must consider that camps, together with their dump heaps, were always set close to rivers or springs: therefore in rather humid environments. As a consequence, men and women who picked and ate wild grapes would spread the seeds through defecation. The latter would germinate in such restricted spontaneous gardens. The interest of people in these germinations led them to learn about specific biological features of the wild grapevine that were useful for its domestication, and particularly:

- It is a prevalently dioecious plant, therefore the individuals which carry the male flowers, producing only pollens, are separated from the female flowers, carrying only the ovary, thus the fruits. Only a small part is hermaphrodite, having both flowers with pollens and the ovary.
- It multiplies rapidly through vegetative propagation. The new plants that derive are basically identical to the original vines.
- On the contrary, plants originated by seedling show a consistent variability compared to the original plants.
- Grapevine has a weedy form.

The last point, underlined by ZOHARY and HOPF (2000), has to be carefully considered. A weedy plant is a vegetal species with a strong tendency to spread and prevail. It spreads enormously even if one does nothing to encourage it: this is the case of grapevine in dump heaps. The rhythmic return of the nomads to the same places, and so to the same dump heaps, allowed women, who were in charge of picking, together with children (BIASUTTI 1959), to notice the massive development of grapevine in dump heaps together with its features.

It is evident that, as peoples started to set in a more definitive way, dump heaps became bigger, with a consequent increase of the size of wild grapevines, which became the object of higher and more constant attention. The consequence of such an observation was an implicit clonal selection, which became more and more intense with the evolution of hamlets into villages and the consequent development of dump heaps. Nowadays, documentaries

on television show unbelievable scenarios, where in the huge rubbish dumps close to the metropolis of the poorest parts of the world women, children, dogs, and even men, pick anything which is suitable as food or which is useful.

The correlation between garbage and wild grapevine is well documented by palaeo-linguistics. In the most ancient Mediterranean languages, with residuals in modern languages, the typical behaviour and the habitat of the wild grapevine we have just described seem to be well documented. In fact, in Etruscan-Nuragian (BONFANTE and BONFANTE 1983, PITTAU 1984, 1995) the name of the populated centres (spur-spure) and the name for what is dirty (spurie) like dump heaps, has a relationship with the Sardinian dialect for wild grapes (sporra, spurra, ispolu, ispòrula). A residual trace is found also in Latin: *sporcus* = dirty, *spurius* = bastard, *ex matre publica*; *spurium* = sexual organ of a prostitute; in Italian 'sporco', 'spurio'; in Spanish 'espurio', 'desborrar' etc. In the end, as the wild grapevine was so wide spread in dump heaps, it is indicated with terms which are close to the ones used to call the prostitutes hanging around suburbs.

Before the conclusion of this paragraph, it is important to make one thing clear. The relationship man/wild grapevine, in such primordial stages, took place also in other areas, in woods or other controlled environments where grapevine was spread. The precious function of dump heaps was to capture the attention of the hunters-pickers and of the proto-cultivators on the growing cycle of grapevine, on its multiple morphology, from its budding to its development, almost as in a laboratory of pedagogic viticulture.

Winemaking from grapes of protected vines (para-domestic vines): MCGOVERN (2003) writes: "Too often, the historians of wine ... have not had a firm grounding in the science and art of archaeological interpretation. It is not enough to take the word of the excavator that his or her site dates to such and such a period ... or even that domesticated grape seeds have been recovered ... there is a great temptation to fill in the gaps in our knowledge with unwarranted inferences ... Inaccuracies are then taken for facts, and errors are perpetuated from one book to the next". Just before saying this, MCGOVERN had said that the first viticulturists were those "who could afford to wait five years or more for the first vintage before recouping ..." Through these statements, the author explains the reason why, having received from Revaz Ramishvili, viticulture professor at the University of Georgia, a sample of grapevine seeds from the Neolithic site of Shulaveris-Gora, dated back with radiocarbon to 6000 b.C. (MCGOVERN 2003), even if the shape of the seeds was narrow and long, and so typical of domestic grapevine according the index of Stummer, he did not conclude that viticulture was born in Georgia in that period. This happened both because the index of Stummer is statistical (Fig. 4) and the samples he had were just a few, and also because the social structures of Neolithic Georgia were not well stabilized. For similar reasons, (MCGOVERN 2003) he did not ascribe the origin of viticulture to any of the areas around the hilly North-Western Mesopotamia at the end of the VI millennium. This happened in spite of the fact that he had demonstrated the presence of many principal components of wine: tartaric acid, calcium tartrate and terebinth resin (as Pliny tells us in the XIV book of his *Naturalis Historia*, it was used to delay or avoid acetification) on the fragment of a pot found in Hajji Firuz Tepe: a Neolithic site dated 5400-5000 b.C., located in the same area, in the Northern Zagros Mountains, near the springs of the first right feeders of the Tigris. In spite of having stated that the Neolithic period of the Near East (from the IX to the end of the V millennium b.C.) was the first in prehistory with all the necessary conditions for a wide spread habit of winemaking: the knowledge of various techniques of manipulating foods (fermentation, heating, addition of spices, etc.) and the possibility of producing ceramic and tools for performing such techniques, the author concludes that all this does not demonstrate if the wine of Hajji Firuz was produced with domestic grapevine (*Vitis vinifera vinifera*) or with the wild grape (*Vitis vinifera sylvestris*) which is still widely spread in the area. After his complex researches based on organic chemistry, liquid chromatography, spectrography and all the modern molecular archaeology techniques, MCGOVERN (2003) can only conclude that in that territory at that time there was at least the habit of picking grapes from protected wild grapevines, and of making wine without having to plant or cultivate a vineyard. The latter activities were possible, but not documented.

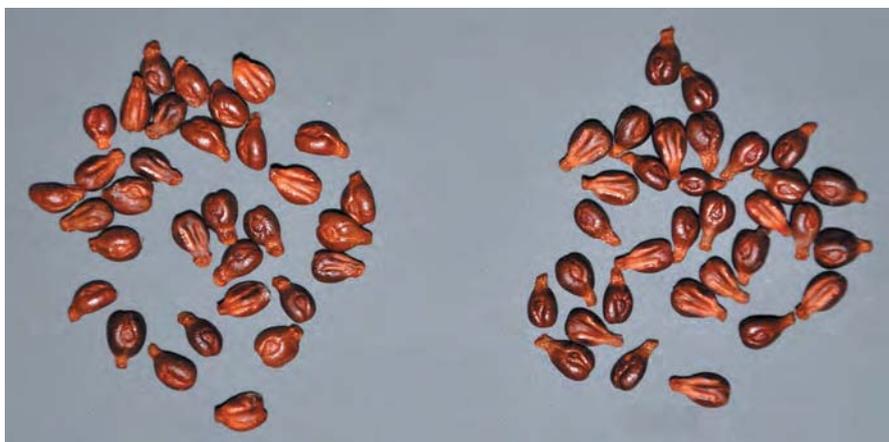


Fig. 4: The seeds of the domestic grapevine (to the right) are longer and more pointy, wild grapevine seeds (to the left) are larger and rounder. On this basis, Stummer elaborated a morphometric index for classifying fossil seeds.

For a typology of the early stages of viticulture. Embryonic viticulture, proto-viticulture and grapevine based economy: In order to explain the different types of man-grapevine relationships, a foreword is necessary. We have to define (FORNI 2007 b, FORNI 2004 b):

a) Pickers: People who pick useful vegetal, in our case, grapes. We must point out that, at least in the beginning, wild grapevine was not a very attractive plant: the quality of the berries was very uneven and, often, scarce. In some regions though, near the Caucasus and to the south-east of the Caspian sea (as NEGRUL 1938 had highlighted) better ecotypes could be found.

b) Embryonic viticulture: one of the most amazing examples of 'embryonic' viticulture intended as the protection of useful plants is offered to us by Homer (Odyssey IX, 108-111): "Now the Cyclopes neither plant nor plough, but trust in providence, and live on such wheat, barley, and grapes as grow wild without any kind of tillage, and their wild grapes yield them wine as the sun and the rain may grow them". Embryonic viticulture is analyzed by OLMO (1995) from a historical point of view. According to the author, when remarkably pleasant ecotypes were available, a particular care and protection of these wild grapevines in dump heaps or forests was inevitable, starting from the Palaeolithic-Mesolithic and, of course, Neolithic. For OLMO, it is likely that embryonic protection viticulture preceded cereal culture, because the former did not require, as the latter, the continuous presence of the farmer to prepare the soil, sow, kill the weeds, mow, thresh, grind, cook ... Also embryonic viticulturists, as many embryonic farmers who we know thanks to ethnography (FORNI 1961), protected the useful plants by eliminating the useless ones, selecting the best, by cutting the dead or unproductive branches and by protecting them from herbivores (Fig. 5). If we talk of viticulture and winemaking, it is fully acceptable to agree with Olmo's theory about embryonic viticulturists becoming such as they became *conscious* in the forests first, and in Neolithic dump heaps later, of the feeding utility certain grapevines (females and hermaphrodites bearing the best fruits). This process led to para-domestication, but it took a long time, as people had to learn both the importance of preserving the male plants, even if scarcely productive, and that hermaphrodite plants did not need males. This stage preceding domestication (in Caucasus and in other areas of Anterior Asia (MCGOVERN 2003) it could last even for several centuries) can be archaeologically traced through many vine related remains: grape seeds etc., and because of the massive increase of winemaking practices in several areas of Caucasus. Moreover, the presence of domestication signals must be pointed out, even if these are not confirmed by an adequate growing and winemaking context (ZOHARY 1995). It is also likely that the grape seeds of hermaphrodite vines have more typical domesticated characters compared to dioecious plants. The last step of embryonic viticulture is realizing that it is better to multiply the plants through vegetative propagation and, consequently, to encourage hermaphrodite plants instead of males.

c) Proto-viticulture: while "embryonic viticulturists" were merely "protectors" of the best plants, we call "proto-viticulturists" those people who, even in a very basic way, practiced viticulture in its complete cycle: preparation of the ground, plantation, cultivation during unproductive years, grubbing up of the old vines. This is not enough: proto-viticulturists had to realize the difference between multiplication by seedling or by vegetative propagation. The first was generally more creative and innovative, as pollens give the possibility to combine a higher number of genes, and in some cases it gave rise to the most appreciable features. Vegetative propagation on the other hand, helps preservation, as the second generation has the same traits of the first. Therefore, once the proto-viticulturists had found the best traits, he was able to preserve them, thanks to vegetative propagation.

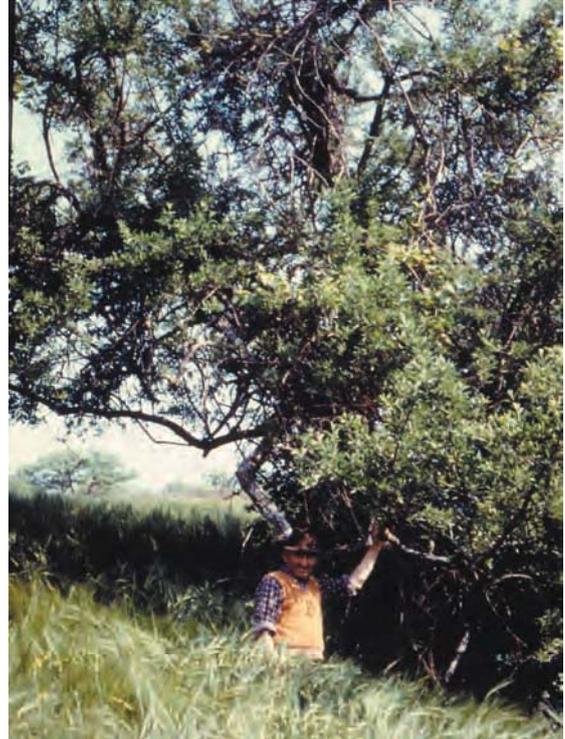


Fig. 5: Ethnographic testimony of Italian domesticoid grapevines. The picture was taken in 1988, it shows a Tuscan farmer (Poggi del Sasso, GR) beside one of the many examples of wild grapevines that he was protecting and from which he would make wine every year.

When and where the technological, cultural and socio economic level of proto-viticulture and winemaking was reached: But when was the full cycle of grapevine cultivation carried out for the first time, comprising selection, multiplication and planting of the best plants? Where was 'integral viticulture' performed for the first time? The grapevine cultivation is really different from annual crops, even cereal, because of the length, the size of any operation and the technological consequences implied. This could happen

only with the fully stabilized and evolved cultures of the Final Neolithic: those who had the plough, the turning point of a cultural step forward. The plough symbolizes a new, more solid economy, a technological innovation and the passage to tetradic agriculture (cereal, grapevine, fig, olive tree). Only agro anthropologists can realize this: farmers with a plough, using animal energy, could exploit four times bigger fields compared to what they could exploit using a hoe (SHERRATT 1997). This allowed professional diversification of human aggregations, the evolution of hamlets into villages and the establishment of fixed communities, while farmers who used the hoe (WERTH 1954) were generally semi-nomads and precarious, with no familiarity at all with such practices as plantation, selection, care during the periods when the plants were not bearing a crop. This is why any activity like viticulture or general plant cultivation, except for the protection of the spontaneous existing exemplars, has to be absolutely excluded. In his last work "La traction animale et la transformation de l'Europe néolithique" (SHERRATT 2006) the late lamented Andrew Sherratt, an expert of the role of the plough, summarized several decades of researches dedicated to the study of the chronology, the history and the social and technological consequences of the use of animal energy in agriculture. The first step of this event was the domestication of cattle during the VIII millennium b.C., although it took another couple of millennia to generalize the consequences that allowed the cultivation "d'autres plantes ... en divers points du Croissant Fertile: les arbres fruitiers, riches en sucres ou en huile (le palmier dattier, la vigne et l'olivier)". He makes it clear that such innovations helped the evolution of the complexity of economic structures, the beginning of micro villages of farmers, that evolved in real villages and then proper towns, with merchants, artisans, social, religious and military services (as a town developed riches, it needed protection). Social stratification and oligarchy began as well. According to MCGOVERN (2003), it is to these peoples whom we owe the passage from embryonic viticulture to a complete cyclical viticulture, from planting to grubbing up. This happened because only they "had the resources and leisure to adopt what may be called a vinicentric approach to life and the world. They could plant vineyards and make wine, even if it took years, and they could enjoy wine whenever they wanted, and moreover they had to defend and preserve the product". These essential observations, that are often ignored by oeno-historians, turn out to be precious in order to set in space and time the origin of viticulture. We have said that the turning point of such an innovation was the use of plough, invented in the Near East, around Mesopotamia (the first picture of a plough was found on a pot dated back to 3500 b.C. The fragment was found in Uruk in Mesopotamia, but in the surroundings, in Khuzestan, traces of two millennia older fossil furrows were found) (SHERRATT 1997, FORNI 2002). It is in the Near East, in the area comprising Oriental Anatolia, Syria and the area around Northern Mesopotamia that the first viticulture emerged, towards the middle of the VI millennium b.C.). That is the territory where, nowadays, we can still find wild grapevine. It is still full of traces of a precocious Neolithic (like in Catal Hüyük) when a mature stage was reached, where the influence of the winemakers of wild protected grapevines of the not too far Southern Caucasus was strong. This process of emersion of proto-viticulture did not prevent, in following times, from the same process taking place elsewhere, wherever there were spontaneous grapevines, starting from the places where agriculture had become stabile, allowing the passage from embryonic viticulture to proper viticulture. The first farmers practicing proper viticulture were influenced by the charm of the varieties that for the first time became available in this primary centrum of the Near East and that as time went by, became more and more refined. In fact, dried grapes, and so grape seeds and canes, could be easily conserved in humid sand so that they could easily be transported even to relatively far away countries.

Understanding the origin of the process: The contribution of NEGRUL and of molecular research: In order to fully and objectively understand the complexity of the birth of viticulture and wine making, it is important to have at least synthetic knowledge of the great historic-ampelographic background studied by A. M. NEGRUL during the 30s of the 20th century. Only this way we will be able to make use of the recent contributions of biomolecular researches. As several contributions have previously reported (MCGOVERN 2003, SCIENZA 2004a, KATEROV 2004, MELCONIAN, DEL ZAN 2004), NEGRUL (1938; 1946; 1958; 1960) found three *Vitis vinifera* main groups on the basis of *Vitis vinifera* ecotypes. He called such groups *Proles*, and they include both wild and domestic grapevines. This way, he refers to *Proles orientalis* in the area between Central Asia and the Caspian Sea (Azerbaijan and Armenia included), to *Proles occidentalis*, in Central and Western Europe, to *Proles pontica*, in Eastern Europe, Georgia and Turkey. The ecotype *P. occidentalis* has a stronger resistance to cold temperatures and smaller berries, it is more acid and with a scarce sugar content compared to *P. orientalis*. *P. pontica* shows intermediate characteristics: scarce acidity and a discrete sugar level makes it particularly suitable for winemaking, even as a wild grape. Following such paradigm, we have to point out an apparent contradiction in MCGOVERN (2003) in his conclusions, the author seems to prefer the theory of a monocentric origin of grapevine domestication. Before stating this though, he highlights "recent DNA microsatellite studies of more than 100 cultivars from Greece, Croatia, Northern Italy, Austria, Germany, France, Spain and Portugal showed that the grape of each region was generally distinct, implying that the wild component in each area had contributed in the genotype or was separately domesticated. As the same time, cultivars in France and Austria-Germany were farther removed from those of the Iberian Peninsula and Greece, whereas of those of Croatia and Italy were intermediate between those two larger groups. As some of the researchers ... have pointed out, the testing of ancient cultivars is needed to refine the assignments. The preliminary results, however, might be interpreted as already pointing in the direction of the introduction of a cultivar from the eastern end of the Eurasian grape's distribution and its subsequent interbreeding with local grapes", referring to ongoing studies based on the frequencies of microsatellite molecular markers of over one hundred grape varieties - that each grapevine from every region is genetically different. This could mean that either the wild component

of each area gave a contribution to the genotype or that it was domesticated elsewhere. At the same time, while French, Austrian and Germanic grapevines are not close to the Spanish or Greek ones, the Croatian and Italian ones are in between these two big groups. It is necessary to analyze the ancient grapevine's DNA if we want to give more precise attributions. On these preliminary bases, it will be possible to state that the origin of occidental varieties lies in the grapevines of the oriental area of distribution of Euro-Asian varieties and in a following hybridization with local wild grapevines. Why have we written "apparent contradiction?" Because McGOVERN points out a triple problem:

- a) Where did winemaking start for the first time? He was among those who correctly separated this problem from the domestication of grapevine. McGOVERN answers this question thanks to his researches in Haiji Firuz Tepe, in the Southern Caucasus.
- b) Where did grapevine domestication take place for the first time? McGOVERN says that it was born in Anterior Asia, between the Southern Caucasus, the Tauro Mountains and the North Western Zagros Mountains.
- c) McGOVERN makes it clear that the process, stimulated by the hybridization with oriental grapevines, took place later on in Europe: from the Pontic area to the Balkans, Italy, Spain and so on.

The apparent contradiction depends on the fact that McGOVERN does not make it clear that domestication could have had an early beginning in the Near East (as he documented), but that it took place also in other Euro-Mediterranean and Middle Asian areas. Here, during the Neolithic, domestication took place thanks to local embryonic viticulture influenced by the near cultures who performed a fully developed viticulture. This kind of process then has both monocentric and polycentric aspects.

As it is evident from McGOVERN's contribution, viticulture for winemaking does not develop independently in the ancient world. It represents a typical basic feature of Mediterranean agriculture, based on cereal, grapevine, olive and fig. The latter was used also to add flavour to wine (McGOVERN 2003). The use of mixed wines was very widely spread in the whole Euro-Asiatic area. McGOVERN writes also that in Northern Europe, honey, flower and other fruits, like blueberries, were fermented all together.

The passage from the cultivation of cereal and legumes to the cultivation of trees (olive, grapevine, fig) did not penalize the former, thanks to the contribution of animal energy, as we said before. Economy became stronger thanks to professional differentiation; social stratification increased together with the number of people and their needs. Grapevine, fig and olive grow also where cereal doesn't or even together with it. Moreover, they require labour when men are not busy with cereal or legumes. Differentiation led to a higher productive stability: a bad cereal crop could be a good one for grapes, fig, olive and *vice versa*.

Eventually, palaeo-demographers (FORNI 2008) agree that while population was lower in a pre-agricultural age (one individual per square kilometre), during Neolithic it could reach 10-15 people per square kilometre if cereal and legumes were well cultivated, or even 50 people if fig, olive and grapevine were integrated. A very important aspect of this revolution was the change of diet. During the Bronze Age, all products that were not cereal, legumes, oil and wine started to become very important: the potential increase of production expressed in calories was of 40 %.

Para-domestication ranges and domestication centres

The contribution of the School of Milan. NEGRUL's premises: McGOVERN's view was confirmed and clarified by the biomolecular researches of IMAZIO *et al.* (2007); we identify these authors as the School of Milan, since Milan is the location of the Institutes where they work. The VINUM project that these authors are developing, in cooperation with other universities (mainly from Tuscany), aims at identifying the vineyards derived from a direct (intentional) domestication and those derived by genetic introgression between wild grapevine and other grapevines. By introgression they mean (SCIENZA 2007) "a spontaneous cross through which a part of the DNA of cultivated grapevines enters wild grapevines or *vice versa*". It is useful to add other considerations: MARIOTTI LIPPI and MORI SECCI (2007) point out that introgression takes place when the individuals of a variety or subspecies live together with a high number of individuals of another one, which usually maintains its own identity. DEL ZAN *et al.* (2004) add that, in order to be significant, introgression must be the result of recurrent crossings.

In this view, it is clear that in general there is a big difference between the genetic structure of cultivated and spontaneous grapevines in the same location. But there are also cases where great similarities have been recorded between local bred and wild grapevines in the same area. IMAZIO *et al.* (2004) quote the example of two traditional Sardinian grapevines in the area of Nuoro (among them, SCIENZA 2007, quotes the example of 'Bovale piccolo') having a genetic structure with relevant similarities with local grapevines. SCIENZA (2007) gives a similar report about traditional grapevines of the Verona area, like the 'Oseleta', the Spanish 'Mantuo' and other several important central European grapevines, born from the spontaneous crossing of local wild or para-domestic grapevines with domestic imported oriental varieties. Moreover, the germplasm of the Near East (the centre of primary domestication) is characterized by three main genetic structures that can be found in the germplasm of cultivated grapevines of other regions, even of the occidental ones - though enriched with other genetic combinations. A very important discovery of the authors, in the area of Grosseto, was that the wild grapevines found in the area of the ancient Etruscan sites have a richer genetic biodiversity compared to the germplasm of exemplars found in other areas. This demonstrates that introgression, or genome modification, was induced by wild grapevines populations living close to the cultivated ones.

Six para-domestication ranges and six domestication and diversification centres: The map (FORNI 2004) shows the thousand-year-old evolution of the man-grapevine relationship in Eurasia. Anyway, it is a provisional map and it can be improved (Fig. 6). The most important step was the passage to a stable agriculture in the Near East, when there was the passage from an embryonic viticulture to proper viticulture.

The scheme shows six main para-domestication ranges in the Euro-Mediterranean and Central-West Asian territory. Each one refers to a place where spontaneous grapevines were an interesting object for local people. Such attention became protection and use, sometimes up to intensive winemaking from more or less para-domesticated wild grapevine (e.g. in the Southern Caucasus). Grapevines of the single ranges are characterized by a good genetic homogeneity of ecotypic character. Their features are mainly those underlined by NEGRUL (see the huge work by NEGRUL elaborated by KATEROV 2004). The author essentially refers to domestic grapevines, but he thinks that the fundamental features of the latter derive from the wild grapevines from which they originated. This is why we say that the features of the *Proles orientalis* are dominant in wild and para-domestic grapevines of the first range. There spontaneous grapevines (*Vitis vinifera* ssp *sylvestris* var. *aberrans*) have big bunches, oval berries, sometimes white, short-day plant behaviour and a long vegetative period. In para-domestic forms, the individuals with recessive characters are favourite: lack of seeds, big bunches, low acidity. In the western area especially, the smallest seeds show a great mix with the *Proles pontica*.

This is prevalent in the second range, where Negrul defines the wild grapevine as *Vitis vinifera* ssp *sylvestris* var. *balcanica*. In the fifth and seventh range, the vegetative period is shorter, plants have long-day behaviour, the berries are smaller and rounder, acidity is higher and so is resistance to cold: typical signs showing the prevalence of the *Proles occidentalis*. The third and fourth ranges are influenced by the *Proles pontica* and, slightly, by the *Proles orientalis*, so these traits are not as evident.

As centuries and millennia passed by, many introgressions or genetic modifications took place - for both spontaneous reasons and human influence. Biomolecular researches have shown this, and it is important to highlight that in the heart of the different ranges, there was always a centre of domestication. The socio-anthropologic structure is a key factor to understand such process, which derives from the man-grapevine relationship. The activity of a centre of domestication can be unlimited if the factors that determine its origin remain there: the map shows the ages when the main ones rose. The most ancient one is the primary centre, the one we have widely explained when we analysed the origin of viticulture, setting it in Eastern Anatolia and in the North West of the area surrounding Mesopotamia. Many anthropic factors are

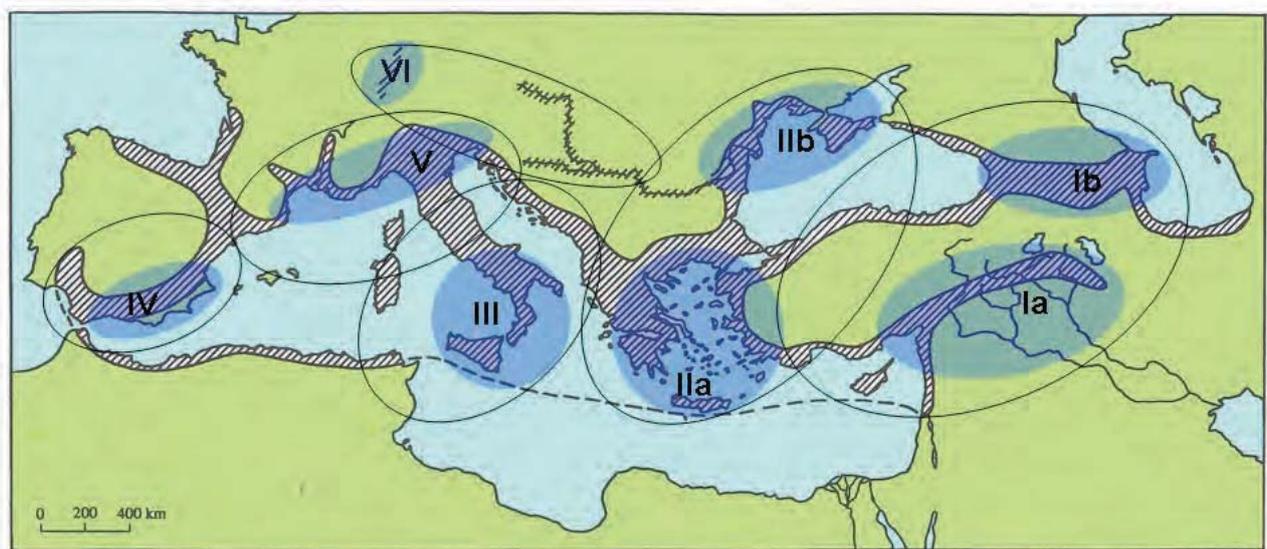


Fig. 6: The map shows the para-domestication areas (circled areas) and domestication centres (the areas shaded in blue) according to the chronology of the expansion of domestic grapevine from East to West. It was designed according to the scientific disciplines: palaeo-ethno-botanic, palaeo-agronomy and ethno-archaeology. The indicators show the diffusion routes of viticulture from one region to the others. The range in gray shows the actual range of distribution of wild grapevine. This is the approximate chronology of the fossil findings of domestic grapevines in the different ranges:

| Domestication Centre | Area | Period |
|----------------------|-------------------------------------|---|
| First/ a | Anatolian Region-circum Mesopotamia | 6 th - 5 th millennium b.C. |
| First / b | Southern Caucasus | 6 th - 4 th millennium b.C. |
| Second / a | Southern Balkans and Aegean Region | 5 th - 4 th millennium b.C. |
| Second / b | Circum-Pontic Region | 4 th - 3 rd millennium b.C. |
| Third | Southern Italy | 3 rd - 2 nd millennium b.C. |
| Fourth | South Eastern Iberia | 2 nd - 1 st millennium b.C. |
| Fifth | Northern Italy | 1 st millennium b.C. |
| Sixth | Central Europe | Roman Empire Age |

involved in the formation of a domestication centre: a lively and diffused interest of the local farmers for para-domestic or domestic grapevine (if it is the case of a secondary centre) and its products (FORNI 2004 b). Farmers are interested in allochthonous grapevines (in the case of a secondary centre) and they intensify cultivations (this means going beyond protection, as intensification involves the whole productive cycle) starting from multiplication and planting etc. All these factors are linked to many conditions: demographic density, fashion and high class drinking habits of the local people. A domestication centre is usually set along the main economical routes, near harbours and villages. If they are secondary centres, they usually collect and concentrate (SCIENZA 2007) grapevines of different origin (SCIENZA and FAILLA 1996), different variety and domestication stage: eventually, introgression between domestic and para-domestic grapevines, brings the latter to the domestic stage. In the meantime, new varieties are set through introgression (unaware) or deliberate crossing. Such secondary centres must be considered also as diversity centres, where the variability of the ampelographic traits can be ascribed to several factors, including viroses, selection of farmers for a particular purpose, pedoclimatic diversities etc.

These centres alternate accumulation of grapevines (implosion phase) and diffusion (explosion phase), and they are sources of new varieties (SCIENZA and FAILLA 1996, SCIENZA 2007).

The Euro-Mediterranean area is the most studied. Here, secondary centres have been individuated in correspondence with the six para-domestication ranges, of which they constitute the heart (FORNI 2004 a, 2007 b, SCIENZA 2007). Such centres have been documented because in each of them has been found a grape variety considered autochthonous by traditional science (genetic molecular research is currently in progress). They are all linked together, starting from the primary centre in the Near East. It is rather unnecessary to quote all data by MCGOVERN (2003) and, especially, by SCIENZA and FAILLA (1996). They have reconstructed the most likely route of a precise grapevine: 'Marzemino', from Anatolia down to the delta of the river Po and further. It must be pointed out that 'Marzemino' is linked by "a peculiar genetic affinity with 'Teroldego' and 'Syrah', witnessed by a common origin in the Oriental Mediterranean" (SCIENZA 2004 a). Obviously, the affinity linking 'Mondeuse' to 'Syrah' and 'Teroldego' to 'Lagrein' involves in the oriental origin all the related grapevines. SCIENZA (2004 a) has also pointed out a linguistic affinity (beyond the genetic one), since the prefix *mor*, from the Greek *mavro* = black, is often found nowadays in the varieties connected to the ancient Greek emporia: 'Morastrel' (Iberian oriental coast), 'Mourvedre' (Marseille), 'Moradella' (Oltrepò pavese), 'Minustellu', 'Muristello' (Corsica, Sardinia). He also highlighted the traffic routes along which many oriental varieties which are currently spread in the West were diffused: the Egnazia Road, that from the Bosphorus - and so from Anatolia - through Macedonia, Southern Balkans and Albania reaches Apulia. The southern trait of the Amber Road, from the Danube's basin - and so from the Black Sea - down to the Po delta. Here we find Eracle's Road, reaching Provence and Iberia through the Po Valley and the Maritime Alps.

More in detail, SCIENZA (2007) highlights all the southern wine routes in the Mediterranean and along its northern coasts (SCIENZA 2007). All these routes show the relationships between the primary domestication centre and the others. The primary centre has a dipolar structure, as the domestication pole, situated between the Tauro Mountains and Syria, rapidly joined the Southern Caucasus pole, where centuries ago winemaking from wild and para-domestic grapes was developed, particularly from *Vitis vinifera* ssp. *sylvestris* var. *aberrans*.

In the fundamental work "La vite e l'uomo" (DEL ZAN *et al.* 2004), historians are provided with a precious documentation about the complex man-grapevine relationship from the Neolithic up to nowadays.

Following NEGRUL's example, the indication of the varieties found in the different vine growing regions, therefore in the domestication centres, starting from the local wild or para-domestic grapevines, has turned out to be very useful. However, there are still many points that archaeo-botanic and biomolecular genetic have not been able to clarify: some problems are actually huge. Let us think about the relevant difference in the first spontaneous grapevines shown by Negrul's ampelographic researches: from the *Vitis vinifera* L. ssp. *sylvestris*, autochthonous of Euro-Mediterranean and Pontic Europe, we get to its *aberrans* variety, which is spread in the Caspian area. Are the valuable traits of the latter merely the result of a natural selection during the last Ice Age (softer in the Caspian area than in the West)? Are such traits due to para-domestication or even to residuals of ancient domestications? Moreover, even if it is impossible to answer such questions at this stage, a difference should be made between autochthonous grape varieties derived from domestication of local wild or para-domestic grapevines, and those derived by the crossbreeding between already domesticated local varieties and allochthonous imported ones.

Along with the oriental origins of 'Marzemino', 'Syrah' and 'Lagrein', shown by SCIENZA, the primary centre of domestication can be linked (LEVADOUX 1956) also to 'Regina' (KATEROV 2004) and to 'Muscats' (DEJEU 2004).

Eventually, we have to mention some of the numerous varieties from those centres that the authors of the volume "La vite e l'uomo", edited by DEL ZAN *et al.* (2004) have found thanks to historical researches. Ampelographers ascribe all these varieties to the *Proles orientalis subproles caspica* like, according to DEJEU (2004), the 'Assil Kara' from Daghestan and the 'Fetească', 'Neagra' and 'Alba', or even the *Proles orientalis subproles antasiatica* like the 'Coarna Neagra'.

DEL ZAN *et al.* (2004) consider 'Khourmas Aspros', 'Koiniariko', 'Opsimos Soufliou' and 'Amasia' original from Anatolia and Anterior Asia; while 'Baian Shirei', 'Matrasa' and 'Mkhargrdzeli' are considered (MELCONIAN *et al.* 2004) to be from the Southern Caucasus, deriving from *Vitis vinifera* ssp. *sylvestris*. Likewise the Georgian variety 'Usachelouri' shows botanical and genetic traits similar to wild grapevine, while 'Ojaleshi', 'Rkatsiteli', 'Grasă di Cotnari' and others belong to *Vitis vinifera Proles pontica*.

Like for the primary centre, the secondary domestication centre is articulated in two poles: one in the Southern Balkans and one in the North Western Pontic area: from Crimea to the Danube's river mouths. Such poles are a mir-

ror of the northern part of the Southern Caucasus and Southern Anatolian poles of the primary centre. It would be too long to list the varieties considered autochthonous of the two poles of this centre. It would be enough to remember, beyond the 'Biblio' from Tracia, the many grapevines that, in the Euro-Mediterranean field, still preserve the denomination "Greek" - thus remembering that some are from the primary centre. A very interesting research is the one carried out by Labra and his colleagues (LABRA *et al.* 2002) on the frequency of components of European germplasm of different geographical origin. Results show that the genetic heritage of a consistent group of varieties comes from the Southern Balkans (see also SCIENZA 2004 a). DEJEU (2004) groups in the *Proles pontica subproles balcanica* the 'Zghiară', 'Plăvaie', 'Galbenă', 'Francușă', 'Creată' and the 'Cadarcă'. KATEROV (2004) ascribes to *Proles pontica* also the following Bulgarian varieties: 'Vinenka', 'Shiroka melnishka', 'Shevka', 'Pamid', 'Misket cherven', 'Mavrud', 'Kokorko', 'Keratsuda', 'Gamza', 'Dimyat', while AVRAMOV and DEL ZAN (2004) ascribe to *Proles pontica subproles balcanica* the following Serbian varieties: 'Bagrina', 'Kratoshija', 'Kreatza', 'White Krstach', 'Plovdina', 'Rutitza', 'Vranatz', 'Zachinak'.

Moreover, DEL ZAN (2004) ascribes the Slovenian 'Sipon' and 'Zametovka' to *subproles balcanica*.

For Greece, LOGOTHETIS (1974) has traced the names of about ninety varieties that had been quoted by ancient authors. It is likely that many of them have been spread by the Greek settlers in the Italian Magna Grecia. Among them, we can quote the famous 'Biblia' followed by 'Pramnia', 'Kapneos', 'Ampelos', 'Anthedonias', 'Megasykros', 'Sipyalis', 'Limnia'.

The varieties considered to be autochthonous of the *tertiary centre*, which includes peninsular Italy, Sicily, some parts of Northern Africa (Algeria, Tunisia) and Sardinia, are 'Asprinio' of Aversa (Caserta), 'Cianfrusco', 'Impigno' and may be 'Ottavianello', 'Magliocco', 'Nero d'Avola', 'Nerello', 'Gaglioppo', and 'Agljanico' (SCIENZA 2004 b).

Moreover, 'Carricante', 'Catarratto', 'Grillo', 'Guardavalle', 'Mantonico' and 'Marcigliano', the 'Malvasia' grapes and some others.

As they came to Italy, Greek settlers must have noticed that local people already practiced a rudimental viticulture, beyond simple protection (VAN DER MERSCH 1994, COSTANTINI 2007). Reciprocal introgressions must have brought benefits to local varieties, with a genetic enrichment from para-domestic varieties of the same range (see also Theocritus, Anth. IX, 437) but also from varieties of the primary and secondary centres, through the routes that we have already quoted. It is rather impressive that, of 400 Greek and Italian genotypes, only very few show a relationship (SCIENZA 2004 a). Such diversity though does not prove them to be autochthonous, as probably it is due to evolutionary processes that followed their immigration (SCIENZA 2004 a).

Viticulture on trellis, generally ignored by Oriental peoples, was autochthonous in Southern Italy according to SCIENZA (2004 a). The protohistoric Greeks though, already practiced the training of grapevines on structures, at least as far as Homer tells us (Iliad XVIII, 561 ff.), in the passage where the poet gives the following description of the grapevine shown on Achilles' shield: "golden branches on silver poles". We will go back to this centre and to the quinquenary one talking about the birth of viticulture in Italy.

Such varieties as 'Mantuo', 'Tempranillo', 'Mandriago' and 'Valenci blanco' have to be ascribed to the quaternary centre, the Iberian one (SCIENZA 2004 a). In the meantime, thanks to biomolecular researches, Basque varieties were found (IMAZIO *et al.* 2007) having genetic affinity with the Caucasian or the Medio Oriental ones. According to BLANCO (1993) the archaeological documentation related to viticulture before the arrival of the Phoenicians and of the Greeks must be referred to varieties of autochthonous domestication.

The varieties which are considered autochthonous of the quinquenary centre, which goes from Provence to Friuli (SCIENZA 2004 a, PETERLUNGER *et al.* 2004) are the Piedmontese 'Cruet' (or 'Crovet'), the 'Lambrusco' varieties, 'Oseleta', 'Abrostine', the 'Refosco' varieties, 'Picolit', 'Pignolo', 'Negrat', 'Glere', 'Corvino', 'Groppello' etc. As we have said before, we will go back to the tertiary and quinquenary centre talking of the origin of viticulture in Italy.

As far as the sexenary centre is concerned, the one which has developed around the middle basin of the Rhine, we can say, with SCIENZA (2004a), that important Central European varieties rose here thanks to the crossbreeds between para-domestic local grapevines and imported domestic varieties.

At this stage, it is important that in general there is no relevant distinction between the differences induced by the domestication of wild grapevines and the ones induced on already existing domestic ones. Therefore, if we consider the ones induced on domestic grapevines as a following step of the domestication process, we will see that there can be centres of secondary domestication without any passage from wild grapevine or local para-domestic to a domestic status.

Continuous, diffuse domestication and diversification: ranges and centres as most relevant hubs of the process. Problems and questions: It is now important to understand precisely what we mean by domesticated grapevine, considering what we have already said in the first pages. It is a process through which hereditary traits are induced on a living being, with the aim of making it suitable for the purposes of men. Among these we should quote the transformation of grapevine in a hermaphrodite plant, the improvement of the size of the bunch and of the berry, reduction of acidity. Such modifications can be obtained in different ways; like genetic combinations led by men trying to "fix", through selection, any useful spontaneous mutation etc. We have to add that if domestic vines live close to wild or para-domestic ones, there can be an introgression starting a wide spread domestication process, as the genome of domestic grapevines "introgresses" the heritage of the wild ones. Some genetic traits are specific of domesticity, others are not: for instance, the shape of the leaf. This is another reason why introgression is not always obvious. A consequence is that in many regions, viticulture has a local prevalent or strong genetic imprinting.

This was reported by LEVADOUX (1956) and NEGRUL in several works that we have already quoted. From a botanical point of view, it is very interesting what MARIOTTI LIPPI and MORI SECCI (2007) write: "The hypothesis that the grapevines we have nowadays have kept the same genetic traits of the original plants, with no crossings with any plant selected by men, is very unlikely". This means that avoiding any influence between domestic and wild grapevines is nowadays impossible.

These considerations lead us to better define the concept of para-domesticity. Normally, this term refers to protected wild grapevines: protection implies the selection of the plants showing the best traits. This can be done through mutations, crossings etc. Fixing such hereditary traits is what we call a domestication process, but we cannot study the too many subtle distinctions that can be made. Therefore, we have to consider as para-domestic not only grapes that preserve the positive features of the wild grapevines, but also those having hereditary positive features which are scarcely relevant, like wild grapevines with the introgression of domestic genetic components given by close cohabitation or at an initial stage of domestication.

Domestication ranges and domestication centres can eventually be considered only as territories where the domestication process acquires a major relevance, both for the starting up of the process and for its development.

The scheme we have traced shows the domestication process as something relatively simple, whereas it is actually full of problems and questions which have been studied in depth by SCIENZA *et al.* (2004 a). Another problem is the conservation of the genetic traits of cultivated grapevine: it is reduced by such obstacles as genetic erosion and genetic drift, introgression, multiplication by seedling and consequent character segregation, besides mutations. Domestication is a continuous and permanent process. In the last steps (we only mean viticulture) we find the actual Genetically Modified Organisms. This is one of the reasons why it is difficult to demonstrate the genetic relationship between the actual Southern Italian grape varieties on one side, and the Oriental and Greek ones on the other. In over 25 centuries, genetic evolution has deeply changed the characters of both.

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Viticulture and winemaking in Armenia

G. MELYAN, S. GASPARYAN

Armenian Academy of Viticulture, Wine-making and Fruit-growing, NGO Yerevan, Armenia

The country

The Republic of Armenia is located in Southern Caucasus between 38°51' and 41°18' latitude and 43°29' and 46°37' longitude. It borders with Georgia to the north, with Azerbaijan to the east, with Iran to the south and with Turkey to the west. The total surface of the country is 29,800 km².

In spite of its relatively small territory, the country shows a wide set of natural conditions. Armenia lies in the south temperate zone, however the mountains cause obvious local scale effects creating a wide range of climates. Armenian weather is often bad for crops: droughts, arid winds, thunderstorms, hailstorms, late spring and early autumn frosts are rather common.

The complex interaction of natural conditions within the small territory of the country induced and affected the formation of quite a peculiar range of soil types, from the solonchaks of the semi-desert zone to the mountain meadow soils of alpine type.

Approximately 3 % of the country's total surface is located below 650 m a.s.l. and nearly half of the territory is located up to 2000 m a.s.l. or higher. However, 90 % of this surface is at 1000 m a.s.l.

The principal viticultural and winemaking region is the Ararat Valley, around the midstream of the river Araks (including the areas of current-day Ararat and Armavir regions, on an altitude ranging from 830 to 1300 m a.s.l.). The sum of the annual active temperature is of 4,000-4,200 °C here. The annual precipitation is 250-300 millimeters.

Antiquity of grapevine cultivation

"And on the seventh month [...] the Ark landed on the top of Month Ararat [...] and Noah began to grow plants and planted a vineyard. Then he made wine, it came out so good that he could not stand the temptation [...] he drank of it and got intoxicated". This is the first testimony on Armenian grapes and wine, as old as the world and as reliable as the Old Testament. Millennia later, researches proved that the cultivation of grapevine had its origins on the highlands of Armenia and this is supported by artifacts from archaeological excavations (HAROUTUNIAN 2005).



Fig. 1: Rock-cut wine presses used in Agarak for grape-pressing and winemaking during the second half of the Ist millennium b.c. (HARUTYUNYAN *et al.* 2005).



Fig. 2: Decorated carafes for wine from Shengavit (III mil. BC), Karnout (III mil. BC) and Karmir Blour (XI-IX cc. BC) (HARUTYUNYAN *et al.* 2005).

Viticulture and winemaking in 19th and 20th centuries

No other viticultural region in the Caucasus has a range of grape varieties as rich as that of Eastern Armenia. Up to the end of the 19th century, local varieties were predominant. In 1893 more than 10,000 plants of European varieties like Alicante, Cabernet, Muscat, Semillon and Saperavi were imported and planted in the vineyards of the Ejmiatsin Monastery.

In 1870, 2890 desyatin (Desyatin: Russian unit of measurement for land equal to 1.09 ha) of land were covered by vineyards in the province of Yerevan, with an average yield of 3.2 tons per year. In 1896, the Yerevan province already had 7378 *desyatin* of vineyards. Before the First World War, the total area of vineyards was 9,200 ha. By 1936, the vineyards had expanded to the area of 16,300 ha.

In 1888 there were 112 pomace brandy and fruit vodka distilleries in the district of Yerevan. In 1899, L. SHUSTOV, a Russian businessman, purchased the Tairov wine and brandy factory in Yerevan and some other plants. By the beginning of the 20th century, he was producing about 50 % of brandy and spirits in Armenia.

During the Soviet period, the wineries became publicly owned. The biggest winery L. SHUSTOV was renamed as "Ararat" in 1921. The "Ararat Trust" was established in 1922 and it included all the wineries of Armenia. The trust had its representatives in Moscow, Leningrad (St. Petersburg), Kiev, Rostov na Donu, Samara and other cities.

After the Second World War, new wineries were established in the viticultural regions of Armenia and in 1940, 1.117 decaliters of wine were produced reaching 9.263 decaliters in 1980. Even if Armenia owned only 1 % of the Soviet Union's vineyards, it produced more than 12 % of the country's elite brandy. At the end of the 1980s and especially after the collapse of the Soviet Union, the wine production of Armenia suffered drastically (HARUTYUNYAN *et al.* 2005).



Fig. 3: Map showing the main grape growing regions of Armenia.

Viticulture and winemaking in the beginning of 21st century

Viticulture is one of the most developed fields of Armenian agriculture, generating significant trade incomes from export. The current promising scenario is radically different from the one that was prevalent just ten years ago, when only 13,000 ha were under grapevine cultivation (remarkably less compared to the 37,000 ha cultivated in 1981). Two reasons led to the reduction of viticulture: M. Gorbachev's encouragement to uproot vineyards all over the Soviet Republics in order to fight alcoholism, and the economic difficulties after the independence of Armenia in 1991, leading to the abandonment of a large number of vineyards. The privatization of the famous Yerevan Brandy Company "YBC" Pernord Ricard, producer of the renowned brand "Dvin" (of which the former Great Britain Prime Minister Mr. Winston CHURCHILL was a regular consumer) marked the beginning of a series of investments (such as purchasing of the "Vedi-Alco Company") in the sector. As a result, the area of vineyards was increased reaching 17,000 ha: currently, 85 % of this surface is used for high quality brandy production. In fact, this sector is particularly developed: today the Country produces more brandy than in 1990. At present, there are 7 companies producing brandy and 25 companies producing wine in Armenia (SCHIRINIAN 2008).

So, the main direction of viticulture and winemaking of Armenia is brandy making.

Viticulture in terms of figures

The altitude of the main vineyards in the country is 850-1100 meters a.s.l., with 17,000 ha of cultivated surface. Among those, 14,120 ha (83.1 %) are planted with wine grape and 2,880 ha (16.9 %) with table grape. Of the 55 cultivated grapevine varieties, 30 are white and 25 are black. Thirty-one varieties are used for wine making, 21 are used as table grape and 3 for raisin making. Fifty-one cultivars have local origins and 4 cultivars are allochthonous. The average amount of annual grape production for Armenia is 205,000 tons.



Fig. 4: A modern vineyard planting.



Fig. 5: Propagation of grapevine varieties in nursery.

Winemaking in terms of figures

The main grape varieties for winemaking in Armenia are: 'Charentsi', 'Kakhet', 'Kangun', 'Karmrahyut', 'Hakhtanak', 'Meghrabuyr', 'Mskhali', 'Sev Areni', 'Voskehat'. The main types of wines are ordinary white and red table wines, semi-sweet table wines, sparkling wines (KASOOMOV and KASOOMYAN 1998) while no Controlled Origin Wines are present in the country. The total amount of annual wine production is 73,000 hl of which 41,600 hl (56.9 %) are used for domestic consumption, with an average of 1.3 liter/person. The main market for the rest of the wine is Russia. The inhabitants of the country keep the tradition of homemade wine alive, about 10 % of the total wine production.

The most famous Armenian wine names are Areni Country, Areni Marani, Bagratuni, Gandzak, Ijevan, Nerkeni, Old Yerevan, Vayots Dzor, Vernashen.

Brandy making

The total amount of annual brandy production is 120,000 hl. The main grape varieties for brandy making are 'Banants', 'Kakhet', 'Kangun', 'Lalvari', 'Meghrabuyr', 'Mskhali', 'Masis', 'Rkatsiteli', 'Voskehat'. The most famous brandy names are Akhtamar, Ani, Ararat, Arma, Dvin, Makar, Nairi, Noy, Vaspurakan, Yerevan.

Table grape

The total amount of annual table grape production is 54,000 t in Armenia, and it is consumed mainly as fresh fruit. The main table grape cultivars of the country are 'Armenia', 'Ayvazyani Muskateni', 'Degin Yerevani', 'Masis', 'Mskhali', 'Shahumyani', 'Vani', 'Vardaguyn Yerevani'.

Grape collections

As a result of land privatization, the central collection of Armenia with 22 ha and 850 varieties, was eliminated in the 1990s. Nowadays, we have three ampelographic collections in Armenia:

1. The collection of the Scientific Center for Soil Science and Agro-chemistry (Armavir Region, Yeraschahun);
2. The collection of the Scientific Center for Viticulture, Fruit Growing and Wine-Making (Armavir Region, Nalbandyan);
3. The new ampelographic collection in the Ararat village of the Ararat wine factory (Region of Ararat).

In all the collections, 140 varieties are preserved, among which 125 are local and 15 are foreign. Of the local ones, 70 are old autochthonous varieties, this means 50 % of all preserved 140 varieties.

Activities of protection and research of grape germplasm in the collections are limited due to financial issues.

Old autochthonous varieties

According to references, there are more than 400 native varieties among which only 70 (17.5 %) are preserved in our collection. Ampelographic descriptions of most varieties are available, including also agronomical and technological aptitudes of the main varieties.

Nowadays there are 10 cultivated varieties: 'Ararati', 'Chilar', 'Garan Dmak', 'Kakhet', 'Karmir Kakhani', 'Marmari', 'Mskhali', 'Sev Areni', 'Vardaguyn Yerevani', 'Voskehat'. The total surface covered by these varieties within the country is unknown because a recent agro census is not available.



Fig. 6: A grapevine collection of the Scientific Centre of Soil Science and Agro-chemistry (Armavir Region, Yeraschahun).

Wild grapevine *Vitis vinifera* ssp. *sylvestris*

The wild grapevine *Vitis vinifera* ssp. *sylvestris* is present in Armenia, but it has not been studied sufficiently in this territory. A sporadic observation though has highlighted that the areas of growing of the wild grapevine have sharply decreased.

The agreement (2004-2007) between Bioversity International and the Armenian Academy of Viticulture, Winemaking and Fruit-growing NGO made it possible to discover, give an ampelographic description and conserve the wild grapevine in the southern part of Armenia.

As a result of this investigation, it became clear that there are many forms of wild grapevine *Vitis vinifera* ssp. *sylvestris* in Armenia. Among these, 10 wild forms were planted in the Ararat ampelographic collection.



Fig. 7: A wild grapevine (*Vitis vinifera sylvestris*).

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Armenia: native varieties of grapevine

G. MELYAN

Armenian Academy of Viticulture, Wine-making and Fruit-growing, NGO Yerevan, Armenia

1. Apoyi Khaghogh B.
2. Ararati B.
3. Arevar B.
4. Burastani R.
5. Chilar B.
6. Chragi Yerkser N.
7. Garan Dmak B.
8. Hastamashk B.
9. Kakhet N.
10. Karmir Kakhani Rg.
11. Karmir Koteni N.
12. Karmir Kteni Rg.
13. Khatoun Kharji B.
14. Marmari B.
15. Meghru Vaghahas B.
16. Mskhali B.
17. Repse N.
18. Rzgi B.
19. Salli N.
20. Sev Ararati N.
21. Sev Areni N.
22. Sev Aygeni N.
23. Sev Krop N.
24. Sev Sateni N.
25. Seyrak Areni N.
26. Spitak Arakseni B.
27. Spitak Shabi B.
28. Spitak Sateni B.
29. Sveni N.
30. Tozot N.
31. Vagheni B.
32. Vanki B.
33. Vardaguyn Yerevani R.
34. Voskehat B.

Notes: N. Noir (black), B. Blanc (white), Rg. Rouge (red), G. Gris (gray), R. Rose (pink)

Apoyi Khaghogh B.

Synonyms

Unknown

Meaning of the name

Grape of Apoyi ('Apoyi' is a name).

Historical notes and cultural importance

'Apoyi Khaghogh' is an uncommon grapevine variety. It is distributed in single vines scattered within the old vineyards of the Yeghegnadzor district.

Taxonomy and intra-variety variability

Proles *orientalis*, subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green and hairless. The first young distal leaves are light green with a pale wine-red hue and hairless.

The mature leaf is medium size, circular, five lobed, of medium depth and slightly funnel-shaped. The leaf blade is dark green with a slight reticular wrinkle, sometimes blistered, and the inner-surface is hairless. The lateral leaf sinuses are deep and medium, closed, ovate or with triangular lumen; or open lyre-shaped with almost parallel sides and a pointed or one-toothed bottom. The petiole sinus is on the whole closed with narrow elliptic or elliptic lumen. The teeth on the ends of the lobes are triangular with a round tip. The lateral teeth are serriform or triangular, have convex sides. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is big, conical-cylindrical and medium dense.

The berry is medium size, round and yellowish-green. The skin is medium thick. The flesh is juicy.

Phenology

Time of bud burst: second ten days days of April

Time of blooming: end of May

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: medium

Yield per plant: 6.0-7.0 kg

Bunch weight: 210-230 g

Bud fertility: 0.7

Climate and cultivation requirements

This variety does not require specific soil conditions.

Resistance to diseases and unfavourable weather

'Apoyi Khaghogh' is partially resistant towards fungal diseases.

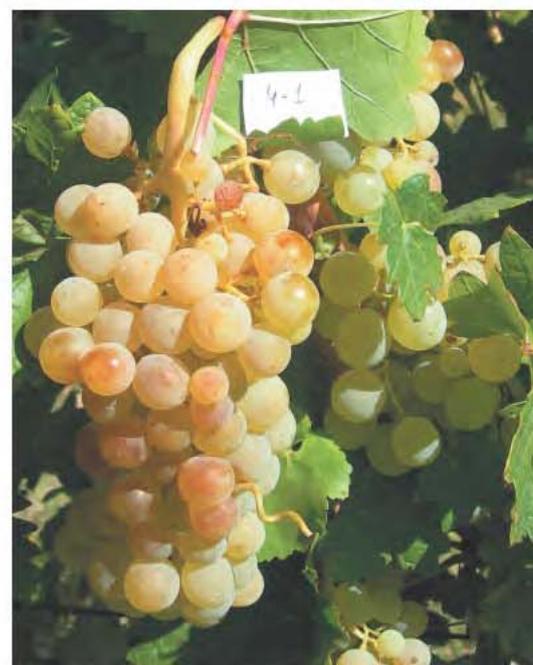
Juice characteristics

Sugar content: 21.0-22.0 %

Total acidity: 4.5-5.5 g·L⁻¹

Wine and grape characteristics

Grapes from 'Apoyi Khaghogh' are used in blend with grapes from other varieties for white table wine production, as well as for fresh consumption.



Ararati B.

Synonyms

'Hachabash', 'Khachabach', 'Taifi'

Meaning of the name

The name derives from a toponym.

Historical notes and cultural importance

'Ararati' is mostly spread in the vineyards around the city of Yerevan and in the districts of Armavir, Ashtarak, Ejmiatsin, Ararat and Artashat.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no registered clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light-green with a light wine-red hue and hairless. The first young distal leaves are glossy, green with wine-red edges and hairless.

The mature leaf is big, rounded, three to five lobed with deep and medium lobes. The upper leaf surface is green and slightly blistered. The leaves are generally hairless, slight bristle hairs cover the leaves only on the basal part of the shoot. The lateral leaf sinuses are medium and deep, closed without lumen; or with a narrow elliptic lumen, sometimes open lyre-shaped or chinked. The petiole sinus is closed without lumen or with a narrow elliptic lumen; sometimes open, lyre-shaped with a roundish base. The teeth on the ends of the lobes are narrow-triangular with a pointed tip. The lateral teeth are triangular with a wide base. The petiole is greenish – yellow, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is big, conical, sometimes cylindrical–conical, branched and usually dense.

The berry is big and very big, ovate with a groove on the top, greenish, in the sun acquires light amber colour with pink tint. The skin is firm. The flesh is juicy. The flavour is pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: beginning of June

Time of veraison: beginning of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 7.5-8.5 kg

Bunch weight: 250-300 g

Bud fertility: 0.8

Climate and cultivation requirements

In the same cultivation conditions 'Ararati' grows better than 'Voskehat', 'Mskhali' and 'Garan Dmak'. In the fertile and irrigated soils of the Ararat Plateau the best plant spacing is 3 x 2 m. The fruity canes should be pruned on 5-7 buds. The recommended pruning load is 50-60 buds per vine.

Resistance to diseases and unfavourable weather

This variety has a low resistance towards *Plasmopara viticola* and *Erysiphe necator*. It has medium resistance to anthracnose (*Elsinoë ampelina*).

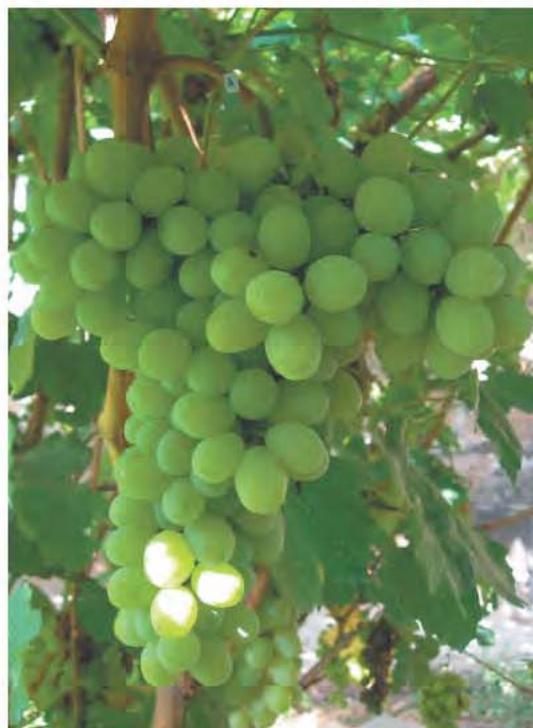
Juice characteristics

Sugar content: 21.0 - 22.0 %

Total acidity: 4.5-5.0 g·L⁻¹

Wine and grape characteristics

'Ararati' is a typical table grape variety. It has beautiful bunches and berries, pleasant organoleptic features and high resistance to transport.



Arevar B.

Synonyms

'Gyunei'

Meaning of the name

Sunny, as fervent as the Sun.

Historical notes and cultural importance

'Arevar' is an uncommon table grape variety. It is distributed in single vines scattered within the old vineyards of the Artashat district.

Taxonomy and intra-variety variability

Proles *orientalis*, subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is green with slight arachnoid hairs. The first young distal leaves are green with a bronze hue and hairless.

The mature leaf is medium size, oblong, sometimes circular, medium or deeply five lobed and hairless. The upper leaf surface is yellow-greenish, plain and slightly glossy. The lateral leaf sinuses are medium or deep, closed without a lumen or open, creased or lyre-shaped with a sharp bottom. The petiole sinus is open, lyre-shaped, round or with plane bottom. The teeth on the ends of the lobes and the lateral teeth are narrow triangular. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is big, cylindrical-conical, medium dense or dense.

The berry is large, mainly ovate or elliptic, sometimes rounded, yellowish-green, golden on the sun-side. The skin is firm. The flesh is juicy and semi-crispy. The flavour is pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: it begins at end of May

Time of veraison: end of July

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: higher than medium

Yield per plant: 5.5 - 6.5 kg

Bunch weight: 300 g

Bud fertility: 0.7

Climate and cultivation requirements

'Arevar' reaches full cane maturation. It doesn't require specific soil and climate conditions.

Resistance to diseases and unfavourable weather

This variety has low resistance to frost and diseases.

Juice characteristics

Sugar content: 19.5-20.5 %

Total acidity: 6.0-6.5 g·L⁻¹

Wine and grape characteristics

'Arevar' grapes are used for fresh consumption.



Burastani R.

Synonyms

'Tokhanshalu'

Meaning of the name

No hypotheses have been proposed yet.

Historical notes and cultural importance

'Burastani' is an uncommon table grape variety. It is spread as single vines in old vineyards of the Artashat district.

Taxonomy and intra-variety variability

Proles *orientalis*, subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is pale-green with thin cobwebby hairs. The first young distal leaves are pale green with a slight bronze hue and wine-red edges.

The mature leaf is medium size, oblong, slightly five lobed, funnel or furrow-shaped. The leaf blade is reticular-wrinkled, seldom blistered. The lateral leaf sinuses are shallow, closed with a wide elliptic lumen and a sharp bottom, sometimes almost without any lumen. The petiole sinus is almost closed with ovate or an elliptic-shape lumen or with a narrow chinked lumen. The teeth on the ends of the lobes are triangular, both sides convex with a pointed tip. The lateral teeth are of the same shape, but smaller. The lower surface of the leaf blade is covered by short bristles. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is small, conical or cylindrical-conical, medium dense.

The berry is medium size, ovate and pink-amber. The skin is medium thin.

The flesh is juicy and crispy. The flavour is medium.

Phenology

Time of bud burst: first decade of April

Time of blooming: it begins at the end of June

Time of veraison: first half of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

Yield per plant: 5.5-6.0 kg

Bunch weight: 220-230 g

Bud fertility: 0.8

Climate and cultivation requirements

This variety requires no particular soil or plot condition, however it gives high quality products on stony and calcareous soils and over a slope.

Resistance to diseases and unfavourable weather

'Burastani' shows partial resistance towards fungal diseases and pests.

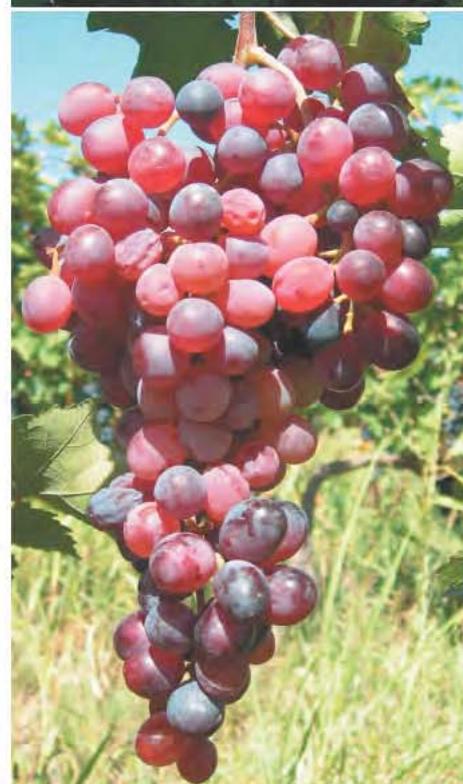
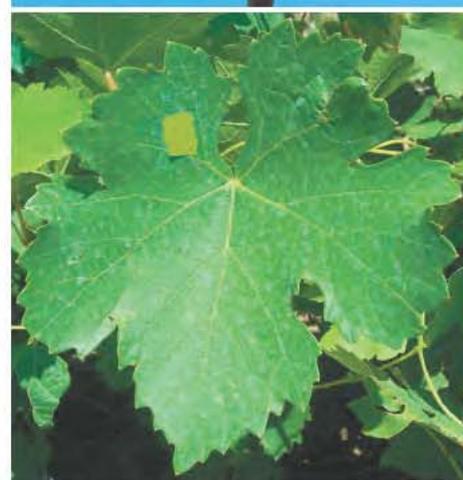
Juice characteristics

Sugar content: 23.0-24.0 %

Total acidity: 2.5-3.0 g·L⁻¹

Wine and grape characteristics

'Burastani' grapes are used both for fresh consumption and winemaking in blend with grapes from other varieties.



Chilar B.

Synonyms

'Chilar', 'Chilali', 'Skhtorouk'

Meaning of the name

No hypotheses have been proposed yet.

Historical notes and cultural importance

'Chilar' is an uncommon wine grape variety. It may be found almost in all the viticultural areas of the Ararat Plateau, however there are no existing 'Chilar' mono-varietal vineyards.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is pink. The first young distal leaves are light green with a strong wine-red colour. The upper and lower leaf sides are covered by cobwebby hairs.

The mature leaf is medium size, oblong-ovate, five lobed, sometimes three lobed, deeply or medium dissected. The upper leaf surface is green or yellow, shiny, wrinkled in the middle and hairless. The lateral leaf sinuses are medium or deep, mostly open, chinked with a sharp bottom. The petiole sinus is closed with elliptic lumen, sometimes open, elliptic with a round base. The teeth on the end of the lobes and the lateral teeth are triangular. The latter are smaller. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, oblong-cylindrical or cylindrical-conical, foxtail-like, dense or loose.

The berry is medium size or large, oval, sometimes ovate-shaped, or roundish-oval, in general greenish. In rocky and lime soils it is bright green-yellow, on the sun side it has brown spots. The skin is quite firm and elastic, covered by a thin bloom. The flesh is juicy with a special harmonious aroma.

Phenology

Time of bud burst: second half of April

Time of blooming: it starts towards the end of May

Time of veraison: beginning of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: average

Yield per plant: 3.0-4.0 kg

Bunch weight: 160-170 g

Bud fertility: 0.6

Climate and cultivation requirements

'Chilar' requires no particular soil or plot conditions, however it gives high quality products on stony and calcareous soils and over a slope.

Resistance to diseases and unfavourable weather

This variety shows no resistance towards fungal diseases and frost.

Juice characteristics

Sugar content: 22.4-24.7 %

Total acidity: 5.5-6.8 g·L⁻¹

Wine and grape characteristics

'Chilar' is suitable for the production of high-quality strong dessert wines. It also gives lighter table wines in the Kotayk region.



Chragi Yerkser N.

Synonyms

Unknown

Meaning of the name

Dragonfly-tail.

Historical notes and cultural importance

'Chragi Yerkser' is a double-usage late grapevine variety. It is distributed in small amounts of single vines or vine-groups inside the old vineyards of the Meghri district.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.
There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is slightly downy, light green with slightly wine-red edges. The young leaves are light green with a bronze hue and with wine-red edges.

The mature leaf is large to medium size, circular and medium five lobed. The leaf is funnel-shaped, slightly involute. The upper leaf surface is dark green, slightly glossy, reticular-wrinkled with a partial goffering. The lateral leaf sinuses are shallow with open, slightly visible or slot-like margin. The petiole sinus is open, lyre-shaped, pointed or, rarely, with rounded bottom. It can also be closed with oval shaped lumen and a sharp bottom. The teeth on the ends of the lobes are triangular with a wide base and a rounded top. The lateral teeth are triangular, both sides are convex with a sharp bottom. The lower leaf surface is hairless. The petiole is yellowish-green with a wine-red layer and spots, equal to the middle vein or a little shorter.

The flower is hermaphrodite.

The bunch is very big and long (40 cm or longer), cylindrical, sometimes has double branches, medium dense or dense.

The berry is large, round, black, covered by a thick bloom. The skin is firm. The flesh is juicy. The taste is pleasant.

Phenology

Time of bud burst: second ten days of April

Time of blooming: end of May

Time of veraison: beginning of August

Time of ripening: second half of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 4.0-4.5 kg

Bunch weight: 300-350 g

Bud fertility: 0.5

Climate and cultivation requirements

No data are available.

Resistance to diseases and unfavourable weather

'Chragi Yerkser' is partially resistant to *Plasmopara viticola* and *Erysiphe necator*, it can be slightly damaged by European grapevine moth (*Lobesia botrana*). Cold resistance is very poor.

Juice characteristics

Sugar content: 22.0-24.0 %

Total acidity: 4.4-6.0 g·L⁻¹

Wine and grape characteristics

Grape of 'Chragi Yerkser' is mainly used for making well-coloured table and dessert wines, as well as for fresh consumption.



Garan Dmak B.

Synonyms

'Halivorouk', 'Anali Khaghogh', 'Dik Kharji', 'Ankoch Kharji', 'Tsantsar Kharji'

Meaning of the name

Fat lamb tail.

Historical notes and cultural importance

'Garan Dmak' is a variety with late time of ripening.

This variety is mostly spread in the Armavir region. In other districts of the Ararat Plateau it is found only as single vines or vine-groups.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspica* Negr.

There are no known clones for this variety.

Essential ampelographic characteristics

The tip of the young shoot is light-green with a pale wine-red hue, almost hairless. The first young distal leaves are light green with a wine-red hue and with cobwebby hair on the lower leaf surface. The other leaves are hairless.

The mature leaf is medium size, almost circular, medium and deeply five lobed. The upper leaf surface is rough, plain, sometimes blistered, dark green, slightly glossy and hairless. The lateral leaf sinuses are medium deep, sometimes deep or shallow, open or closed, the closed ones are without lumen or with a narrow elliptic lumen; the open ones are just only expressed and chinked. The petiole sinus is open or closed: the closed one is lyre-shaped; the open one is with an oval lumen. The teeth on the ends of the lobes are triangular with a pointed tip. The lateral teeth are triangular and serriform with a pointed tip. The petiole is greenish with a violet hue, longer than the middle vein.

The flower is hermaphrodite.

The bunch is medium, cylindrical and conical, sometimes winged or shouldered and usually dense.

The berry is medium size, round, yellowish-green and sometimes golden.

The skin is rough. The flesh is juicy with a delicate pleasant flavour.

Phenology

Time of bud burst: first ten days of April

Time of blooming: end of May

Time of veraison: end of July

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

Yield per plant: 4.5-7.0 kg

Bunch weight: 210-230 g

Bud fertility: 0.8

Climate and cultivation requirements

Soil conditions strongly influence quality and quantity of 'Garan Dmak' grapes. In rocky, clayey and semi-desert soils quality is sufficient. The optimal planting distance is 2.5 x 1.5 m. The optimal bud load is 40-50 buds per vine.

Resistance to diseases and unfavourable weather

This variety has low-resistance for fungal diseases and winter colds.

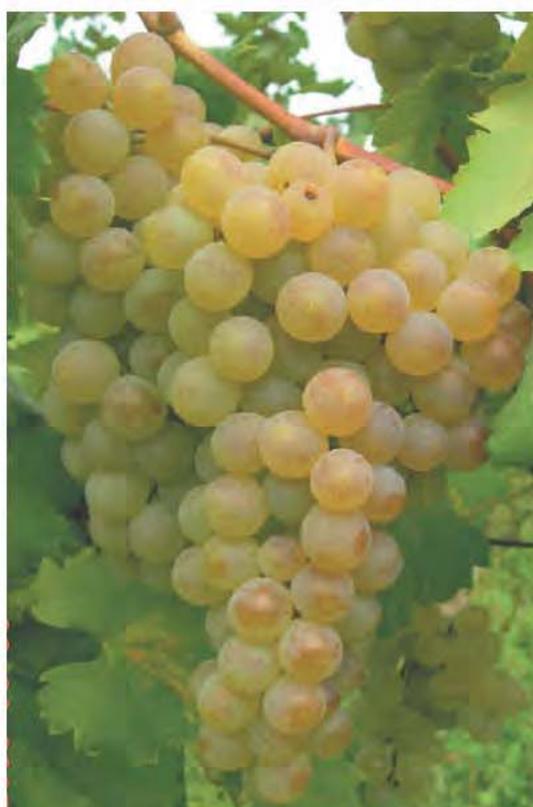
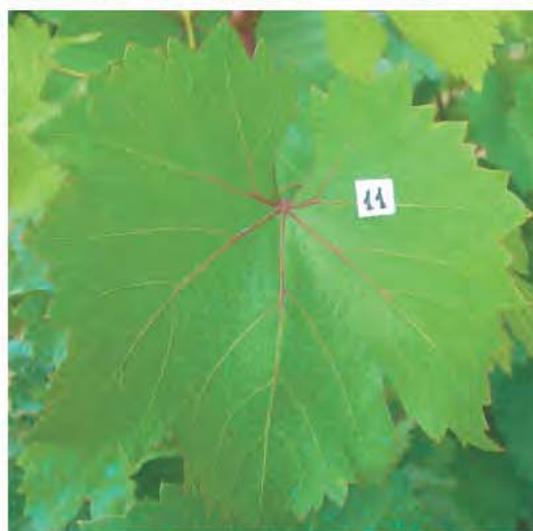
Juice characteristics

Sugar content: 22.0-25.0 %

Total acidity: 4.6-6.4 g·L⁻¹

Wine and grape characteristics

'Garan Dmak' grapes are used for making light and strong table wines.



Hastamashk B.

Synonyms

'Shirshira', 'Khozakashi', 'Kyalati', 'Chaushtari'

Meaning of the name

With a thick skin.

Historical notes and cultural importance

'Hastamashk' is distributed in single vines or vine-groups in the districts of Ejmiatsin, Ashtarak and Artashat.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green with a wine-red hue and covered by hairs. The first young distal leaves are greenish with a wine-red hue, glossy, covered by cobwebby hairs.

The mature leaf is medium size, rounded and deeply five lobed. The upper leaf surface is green, reticular-wrinkled with goffering. The lower leaf side is light green and hairless. The petiole sinus is closed with elliptic lumen or open with lyre-shape and sharp bottom. The teeth on the ends of the lobes are triangular and slightly convex on both sides. The lateral teeth are cupola-shaped (convex). The petiole is a little longer than the middle vein. The flower is hermaphrodite.

The bunch is medium size and big, cylindrical-conical, branched, dense or very dense.

The berry is big or very big, oval, sometimes rounded, greenish-yellow and with wine-red hues. The skin is thick. The flesh is juicy.

Phenology

Time of bud burst: second half of April

Time of blooming: beginning of June

Time of veraison: beginning of August

Time of repining: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-drooping

Vigor of shoot growth: higher than medium

Yield per plant: 3.5-4.5 kg

Bunch weight: 370-380 g

Bud fertility: 0.7

Climate and cultivation requirements

Cane maturation of 'Hastamashk' is good. Growth vigour strongly depends on specific soil and site conditions: in dry, stony soils this variety shows a medium growth while in rich and relatively well watered soils growth is more vigorous.

Resistance to diseases and unfavourable weather

This variety shows a low susceptibility to fungal diseases. Cold-resistance is poor.

Juice characteristics

Sugar content: 23.5-25.5 %

Total acidity: 4.7-5.3 g·L⁻¹

Wine and grape characteristics

'Hastamashk' grapes are used for fresh consumption.



Kakhet N.

Synonyms

'Sev Kakhet', 'Sev Milagh'

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Kakhet' is a late-ripening wine variety. It is widely spread in the region of Artashat.

Taxonomy and intra-variety variability

Proles pontica subproles *georgica* Negr.

Numerous clones of 'Kakhet' have been detected during cultivation, but none has been registered yet.

Essential ampelographic characteristics

The tip of the young shoot and the first young distal leaves are white due to cobweb hairs. The teeth are hairless.

The mature leaf is medium size, circular, deeply five lobed. The upper leaf surface is green, coarse and blistered. The lower leaf surface is downy. The lateral leaf sinuses are mostly deep, closed, ovate or with triangular lumen and a pointed or round bottom. The petiole sinus is open and lyre-shaped. The teeth in the ends of the lobes are triangular with a rounded tip. The lateral teeth are triangular, serriform with a pointed tip. The petiole is yellowish-green and hairless, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is small, sometimes medium, cylindrical or cylindrical-conical, dense, sometimes loose.

The berry is medium size, roundish, sometimes elliptic, dark blue, almost black, sometimes with a wine-red hue and glossy. The skin is rough, elastic, covered by a thick bloom, rich in tannins. The flesh is pulpy and juicy. The juicy is colourless.

Phenology

Time of bud burst: first ten days of April

Time of blooming: starts towards the end of May

Time of veraison: beginning of August

Time of ripening: third ten days of September or beginning of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: weak

Yield per plant: 8-10 kg

Bunch weight: 260-280 g

Bud fertility: 0.8

Climate and cultivation requirements

'Kakhet' grows well in low-land conditions. It does not grow well in semi-desert and stony soils. The best plant density is 2.5 x 1.5 m. 'Kakhet' shows a comparatively weak growth; hence it should be pruned on 2-3 buds per cane.

Resistance to diseases and unfavourable weather

'Kakhet' is virtually unaffected by *Erysiphe necator*, but it is very sensitive to *Plasmopara viticola*. Frost resistance of this variety is poor.

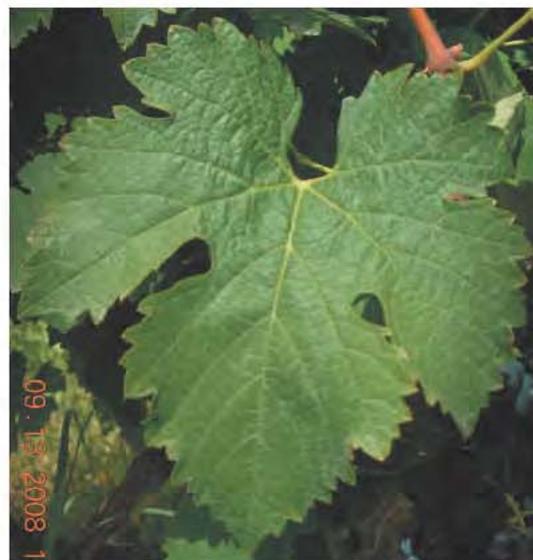
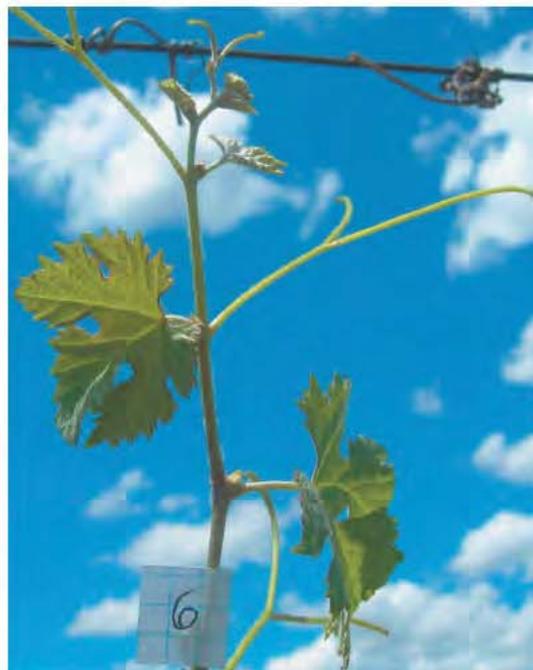
Juice characteristics

Sugar content: 21.5-24.7 %

Total acidity: 5.5-8.0 g·L⁻¹

Wine and grape characteristics

'Kakhet's colour peculiarities make it a very good variety for the production of red table wines. A good example is Artashat: a well coloured, velvet red



wine. It has a long good reputation. Also renowned Kagor and Porto style wines are made from 'Kakhet'. These wines have an alcohol content ranging from 11.0° to 13.5-14°, with an average acidity of around 6.8 g·L⁻¹. The wine is also suitable for brandy making.

Karmir Kakhani Rg.

Synonyms

'Alakhki', 'Soghomoni', 'Karmir Sahabi', 'Mkhitari', 'Karmir Milagh'

Meaning of the name

Suspended red.

Historical notes and cultural importance

'Karmir Kakhani' is an uncommon table grape variety, and it is found in the viticultural regions of the Ararat valley.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is greenish-yellow and hairless. The first young distal leaves are greenish-yellow with a red-wine hue and blistered.

The mature leaf is circular, three to five lobed and hairless. The upper leaf surface is green with a yellowish hue, flat, seldom with a weak blistering. The lateral leaf sinuses are medium, generally closed or sometimes open: the closed sinuses are without lumen or with elliptic lumen and a sharp bottom; the open sinuses are lyre-shaped, almost with parallel sides and a sharp bottom, sometimes V-shaped. The petiole sinus is generally closed with elliptic lumen, seldom open, lyre-shaped. The teeth on the end of the lobes are triangular with pointed tip. The lateral teeth are triangular, sometimes triangular and both sides convex. The petiole is yellowish – green with a wine-red hue, shorter than the middle vein.

The flower is female.

The bunch is large, conical, winged, sometimes cylindrical-conical, dense or loose (density depends on pollination).

The berry is large, generally cylindrical or barrel-shaped and reddish-violet. The skin is elastic, covered by thick bloom and it is easy to peel. The flesh is slightly juicy and crispy.

Phenology

Time of bud burst: second half of April

Time of blooming: starts at the beginning of June

Time of veraison: first ten days of August

Time of ripening: starts towards the end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: average or higher than medium

Yield per plant: 5.5-6.5 kg

Bunch weight: 450-550 g

Bud fertility: 0.75

Climate and cultivation requirements

'Karmir Kakhani' does not require specific soil conditions.

Resistance to diseases and unfavourable weather

This variety has a strong susceptibility to *Plasmopara viticola* and *Erysiphe necator*, and to the European grapevine moth (*Lobesia botrana*). It is not frost-resistant.

Juice characteristics

Sugar content: 20.0-21.0 %

Total acidity: 4.5-5.0 g·L⁻¹

Wine and grape characteristics

'Karmir Kakhani' is a valuable, transport resistant, red table grape variety. The clusters are very beautiful and they can compete with any other table grape.



Karmir Koteni N.

Synonyms

Unknown

Meaning of the name

Red foot/leg.

Historical notes and cultural importance

'Karmir Koteni' is a rare native wine variety; it is spread in the old vineyards of the Goris district as single vines or vine-groups.

Taxonomy and intra-variety variability

Proles *orientalis*, subproles *antasiatica* Negr.

There are no clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light-green and hairless. The first young distal leaves are light green with a wine-red hue.

The mature leaf is generally medium, circular, medium five lobed with sublobes, slightly funnel-shaped. The leaf blade is dark green, not glossy with a slight reticular-wrinkle and scarcely blistered. The lower surface is covered by slightly visible weak bristles, which grow thicker along the veins. The lateral leaf sinuses are medium, seldom deep, on the whole open and lyre-shaped with nearly parallel sides and a sharp bottom. The petiole sinus is open, lyre-shaped or arched, deep with a sharp bottom. The teeth on the ends of the lobes are triangular with a rounded top. The lateral teeth are triangular and serriform with both convex sides and a rounded top. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is big, cylindrical-conical, seldom conical, dense or medium dense.

The berry is medium size, seldom large, round and black. The skin is medium thick. The flesh is very juicy.

Phenology

Time of bud burst: second ten days of April

Time of blooming: end of May

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 9-10 kg

Bunch weight: 240-260 g

Bud fertility: 0.7

Climate and cultivation requirements

'Karmir Koteni' requires no specific soil and site conditions.

Resistance to diseases and unfavourable weather

This variety has medium resistance to *Erysiphe necator*.

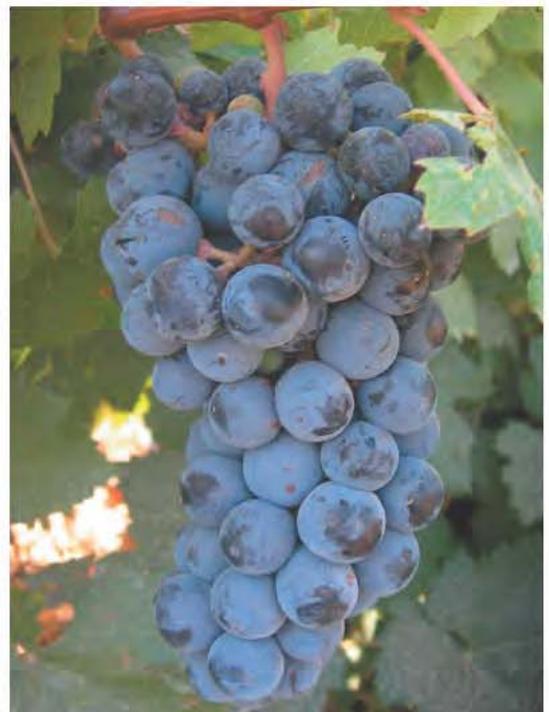
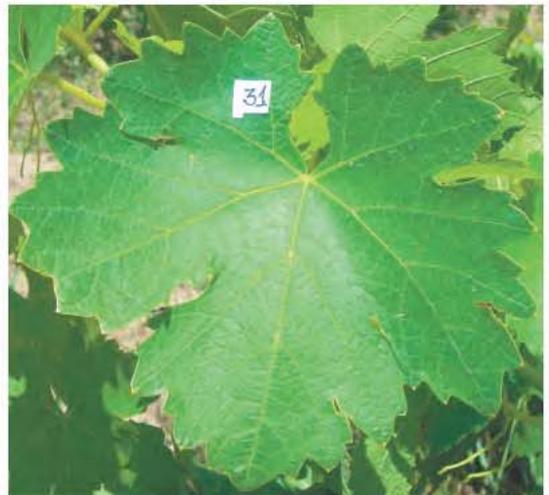
Juice characteristics

Sugar content: 19.0-22.0 %

Total acidity: 8.0-9.0 g·L⁻¹

Wine and grape characteristics

'Karmir Koteni' is used for making high quality table wine with pleasant aroma and taste.



Karmir Kteni Rg.

Synonyms

Unknown

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Karmir Kteni' is an uncommon double usage grape variety.

It is distributed in single vines or vine-groups among the old vineyards of the Yeghegnadzor and Goris districts.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green and hairless. The first young distal leaves are light green with a light pink hue.

The mature leaf is medium size, shallow, five lobed, circular or slightly enlarged. The upper leaf surface is a little funnel shaped, slightly reticular-wrinkled, almost smooth, light lustre. The lateral leaf sinuses are medium and shallow, open, lyre-shaped, almost with parallel sides and with a pointed or round bottom. The petiole sinus is mostly open, arrow shaped with even sides. The teeth on the ends of the lobes are narrow triangular with a pointed tip and triangular with a round top. The lateral teeth are triangular and serriform with a pointed tip. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium, seldom big, conical or cylindrical-conical and medium dense.

The berry is medium size, seldom big, round or slightly ovate, dark red-violet. The skin is medium thick and not firm. The flesh is slightly juicy, melting with a harmonic and very pleasant taste.

Phenology

Time of bud burst: first ten days of April

Time of blooming: beginning of June

Time of veraison: beginning of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: average

Yield per plant: 2.5-4.0 kg

Bunch weight: 260-280 g

Bud fertility: 0.6

Climate and cultivation requirements

'Karmir Kteni' does not require specific soil and site conditions.

Resistance to diseases and unfavourable weather

This variety is slightly infected by fungal diseases.

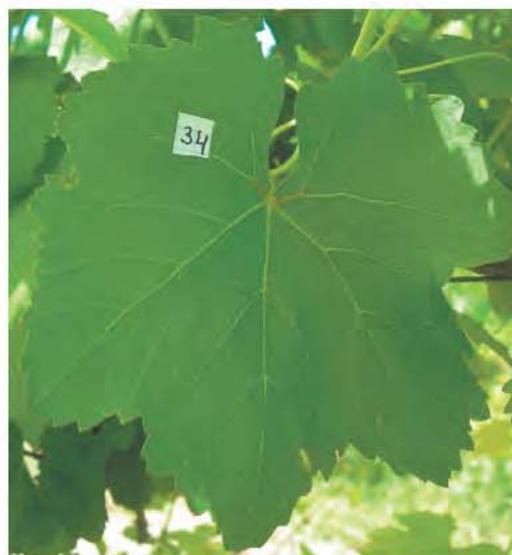
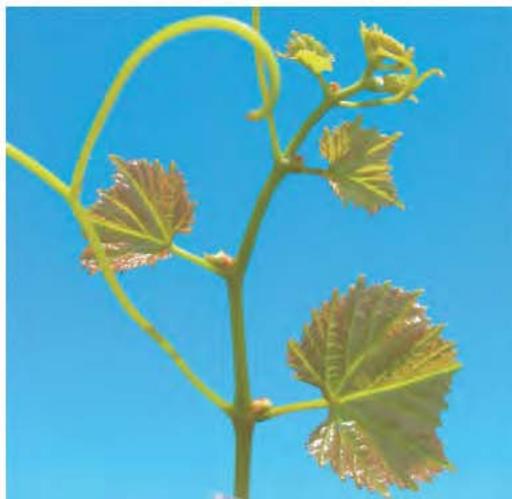
Juice characteristics

Sugar content: 26.0-30.5 %

Total acidity: 4.0-5.0 g·L⁻¹

Wine and grape characteristics

'Karmir Kteni' is used both for winemaking in blend with other varieties and for fresh consumption.



Khatoun Kharji B.

Synonyms

Unknown

Meaning of the name

Madam Kharji.

Historical notes and cultural importance

'Khatoun Kharji' is a rare wine variety.

It is distributed in single vines within the old vineyards of Yeghegnadzor.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspic* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green with hardly visible cobwebby hairs. The first young distal leaves are light green, almost yellow with a light wine-red hue and slight cobwebby hairs.

The mature leaf is medium size, almost circular and slightly five lobed. The upper leaf surface is green, reticular-wrinkled and blistered. The lower leaf surface is light green and hairless. The lateral leaf sinuses are shallow, open with angled or lyre-shaped lumen, almost with parallel sides and a sharp bottom; sometimes it is closed with a narrow elliptic lumen. The petiole sinus is closed with an elliptic lumen. The teeth on the ends of the lobes are triangular or cupola-shaped with a rounded tip. The lateral teeth are the same shape, only of a smaller size. The petiole is red, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium, cylindrical or conical, medium dense, sometimes dense.

The berry is medium size, round, yellowish-green, sometimes yellow with suntans. The skin is thick. The flesh is very juicy; the taste is pleasant with specific varietal aroma.

Phenology

Time of bud burst: first ten days of April

Time of blooming: beginning of June

Time of veraison: end of July

Time of ripening: first or second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: average

Yield per plant: 9-12 kg

Bunch weight: 175-185 g

Bud fertility: 0.96

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable climatic conditions

'Khatoun Kharji' has poor resistance to fungal diseases and frost.

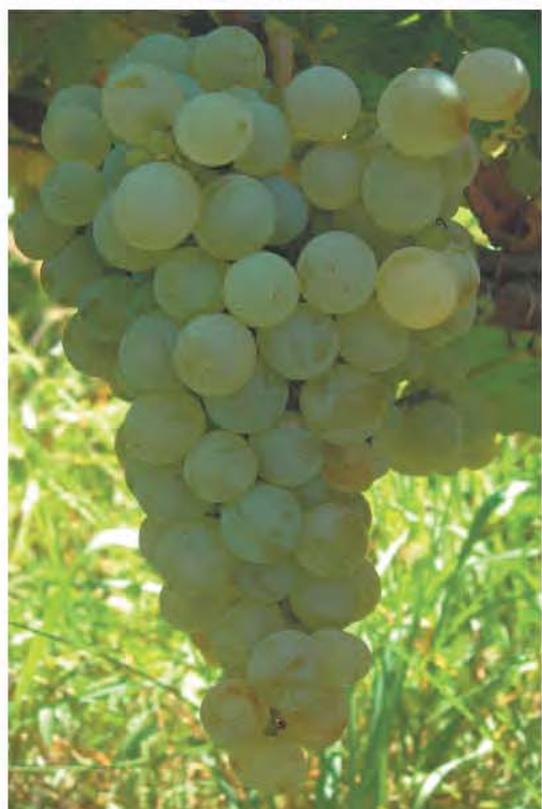
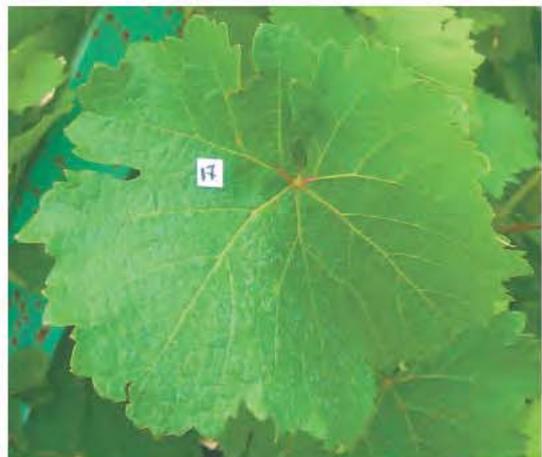
Juice characteristics

Sugar content: 26.0-28.0 %

Total acidity: 4.6-5.0 g·L⁻¹

Wine and grape characteristics

The wine made from this variety is of good quality, with a unique varietal bouquet and flavour.



Marmari B.

Synonyms

'Marmari Yerevani', 'Marmari Kishmish'

Meaning of the name

Marbled.

Historical notes and cultural importance

'Marmari' is a rare seedless grapevine variety.

It is spread around the city of Yerevan and in the vineyards of the Ashtarak district.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is greenish-yellow with thin cobwebby hairs. The first young distal leaves are greenish-yellow, hairless on both sides; the veins are covered by thin felt hairs.

The mature leaf is medium size, circular, five lobed, yellowish-greenish, motley and hairless. The varietal peculiarity is the marble-like colour pattern (motley) of all the green parts and of the berries. The motley character is strongly expressed on lateral shoots. The leaf blade is delicate, plain and slightly glossy. The lateral leaf sinuses are medium deep, sometimes deep, closed or open: the closed ones are almost without a lumen or with a narrow elliptic lumen and a sharp bottom, the open ones are chinked with a sharp bottom. The petiole sinus is open or closed: the closed one is nearly without a lumen and with a sharp bottom; the open one is elliptic with a sharp bottom. The teeth on the ends of the lobes are narrow triangular with a pointed tip or triangular with a rounded tip. The lateral teeth are triangular and serriform, comparatively with a wider base or serriform with slightly convex sides. The petiole is shorter than the middle vein.

The flower is hermaphrodite. The bunch is big, cylindrical or cylindrical-conical, sometimes winged or shouldered and dense. The berry is medium size, round, sometimes elliptic, ball-shaped or ovate, white, motley. The skin is transparent, delicate, elastic, hard to peel, it is covered by a bloom and dark spots. The flesh is crispy. The berry is seedless.

Phenology

Time of bud burst: second ten days of April

Time of blooming: starts first ten days of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 6.0-7.0 kg

Bunch weight: 300-400 g

Bud fertility: 0.7

Climate and cultivation requirements

'Marmari' does not require specific soil and site conditions.

Resistance to diseases and unfavourable weather

This variety has low resistance towards frost and diseases.

Juice characteristics

Sugar content: 23.0-24.0 %

Total acidity: 6.0-6.5 g·L⁻¹

Wine and grape characteristics

'Marmari' grapes are used only for fresh consumption. It is highly resistant to transport.



Meghru Vaghahas B.

Synonyms

Unknown

Meaning of the name

Early ripening from Megri (Megri is a district in Armenia)

Historical notes and cultural importance

'Meghru Vaghahas' is a very early ripening grapevine variety. It is rarely spread in old vineyards of the Meghri district.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is yellowish-green or white and hairless. The new-open leaves are light-green, glossy with light pinched edgings.

The mature leaf is medium size, circular and deeply five lobed. The leaf is plain with slightly involute edges, dark green and hairless. The lateral leaf sinuses are deep, closed with ovate lumen and a sharp bottom, seldom open, lyre-shaped with almost parallel sides. The petiole sinus is open with a lyre-shaped sharp bottom, seldom closed with an oval lumen. The lower leaf surface is hairless. The teeth on the ends of the lobes are large, triangular, both sides convex. The lateral teeth have the same shape, but are small. The petiole is light green, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium and big, cylindrical, sometimes winged and medium dense.

The berry is large, oval, greenish - yellow, slightly spotted. The skin is medium firm. The flesh is juicy. The taste is pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: starts end of May

Time of veraison: first ten days of July

Time of ripening: first ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3.5-4.0 kg

Bunch weight: 220-250 g

Bud fertility: 0.75

Climate and cultivation requirements

No data are available.

Resistance to diseases and unfavourable weather

Susceptibility to fungal diseases is medium. Resistance to frost is low.

Juice characteristics

Sugar content: 16-18 %

Total acidity: 3.5-4.4 g·L⁻¹

Wine and grape characteristics

Grape of 'Meghru Vaghahas' is used only for fresh consumption.



Mskhali B.

Synonyms

'Dolband', 'Spitak Khaghogh'

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Mskhali' is a double aptitude grape variety. It is spread almost in all viticultural regions of Armenia, planted as a leading variety especially in the Ararat, Artashat, Kotayk and Armavir districts.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

Many clones of 'Mskhali' have been detected, but they have not been registered yet.

Essential ampelographic characteristics

The tip of the young shoot is light green with a yellowish hue. The first young distal leaves are green with a wine-red hue and hairless.

The mature leaf is medium size, on the whole circular, sometimes enlarged, deeply five lobed. The upper leaf surface is green, sometimes dark green with a blue hue, rough with blisters, slightly shiny or matt and hairless. The lateral leaf sinuses are deep or very deep, ovate or elliptically shaped. The petiole sinus is open, lyre-shaped with sharp bottom, or closed with elliptically lumen. The teeth on the ends of the lobes are triangular and serriform with a wide base. The lateral teeth are lyre-shaped with slightly convex sides. The petiole is greenish-yellowish with a pink hue, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium size or big, cylindrical-conical or conical, sometimes branched, loose or dense.

The berry is big or medium size, round, white with yellow or yellowish-green hue. The skin is thick, transparent, covered by a slight bloom. The skin has brown points, it is elastic and it is easy to peel. The flesh is slightly juicy with a very pleasant taste.

Phenology

Time of bud burst: second half of April

Time of blooming: starts towards the beginning of June

Time of veraison: first ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 6.5-7.5 kg

Bunch weight: 230-250 g

Bud fertility: 0.75

Climate and cultivation requirements

'Mskhali's canes have good maturation ability. This variety does not require specific soil and site conditions, however it grows better on heavy and stony soils. The best plant spacing is 2.5 x 2.0 m on the irrigated soils of the Ararat Plateau. The fruity canes should be pruned to 6-8 buds.

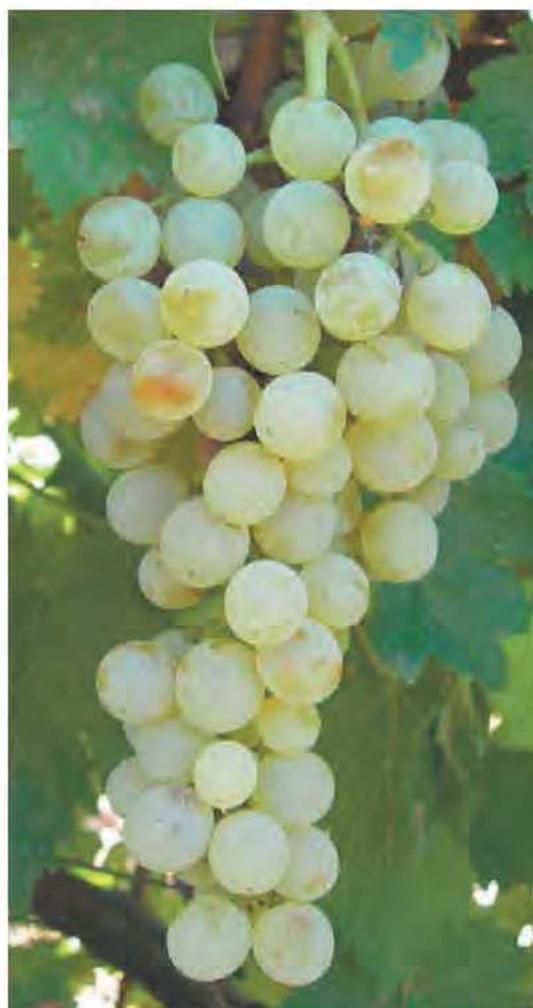
Resistance to diseases and unfavourable weather

This variety is sensitive to *Plasmopara viticola* and *Erysiphe necator*. Frost resistance is poor.

Juice characteristics

Sugar content: 19.2 - 20.5 %

Total acidity: 4.2 - 6.8 g·L⁻¹



Wine and grape characteristics

'Mskhali' is used for making high quality table, strong and dessert wines. It also provides good wine for brandy production. In addition, this variety is used as a table grape: it is very tasty, beautiful, resistant to transport and storable.

Repse N.

Synonyms
'Horomsim'

Meaning of the name

No hypotheses have been proposed yet.

Historical notes and cultural importance

'Repse' is a double usage grape variety. It is rarely spread within the old vineyards of the Meghri district as single vines or small vine-groups.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.
There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green, covered by weak bristled hairs. The first young distal leaves are light green with wine-rose tints. The mature leaf is big, circular, medium five lobed. The leaf blade is grooved. The upper leaf surface is reticular-wrinkled. The lateral sinuses are medium and deep, closed with a wide elliptic lumen and a sharp bottom; or open, lyre-shaped with nearly parallel sides and a circular bottom. The petiole sinus is open, lyre-shaped with a sharp bottom. The teeth on the ends of the lobes are triangular with a rounded top. The lateral teeth are triangular-serriform with slightly convex or convex sides. The lower leaf surface is covered by bristled hairs. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is big, conical, winged, dense and very dense.

The berry is medium or big, ovate or oval and black. The skin is firm. The flesh is juicy. The juice is colourless. The taste is of medium quality.

Phenology

Time of bud burst: second ten days of April

Time of blooming: end of May

Time of veraison: end of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 7.5-8.5 kg

Bunch weight: 260-280 g

Bud fertility: 1.0

Climate and cultivation requirements

No data are available.

Resistance to diseases and unfavourable weather

This variety has medium resistance to *Plasmopara viticola* and *Erysiphe necator*.

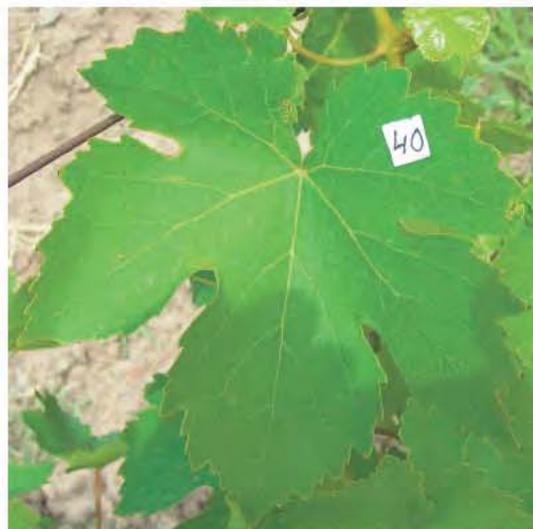
Juice characteristics

Sugar content: 20.5-22.0 %

Total acidity: 4.0-4.5 g·L⁻¹

Wine and grape characteristics

'Mskhali' is used in blend with other varieties for making table wine, as well as for fresh consumption.



Rzgi B.

Synonyms

Unknown

Meaning of the name

No hypotheses have been proposed yet.

Historical notes and cultural importance

'Rzgi' is a rather ancient table grapevine variety. It is rarely spread within the old vineyards of the Artashat region as single vines or in small vine-groups.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green and hairless. The first young distal leaves are light green, slightly glossy and hairless.

The mature leaf is medium size, circular, deeply five lobed. The leaf blade is funnel-shaped. The upper leaf surface is green with a yellowish hue, mainly plain, sometimes blistered. The lateral leaf sinuses are deep, closed with ovate-shaped lumen and a roundish bottom; or open, lyre-shaped with a roundish bottom. The petiole sinus is open with a sharp bottom. The teeth on the ends of the lobes are triangular with roundish tip. The lateral teeth are serriform. The petiole is light green, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium or small, cylindrical-conical, dense or loose.

The berry is medium or large, oval, amber-yellow with suntan on the sun-side. The skin is medium thin. The flesh is juicy and crispy. The flavour is pleasant and harmonious.

Phenology

Time of bud burst: second ten days of April

Time of blooming: end of May

Time of veraison: end of July

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 6.0-8.0 kg

Bunch weight: 230-250 g

Bud fertility: 0.7

Climate and cultivation requirements

Data is not available.

Resistance to diseases and unfavourable weather

This variety has poor resistance to *Plasmopara viticola* and *Erysiphe necator*.

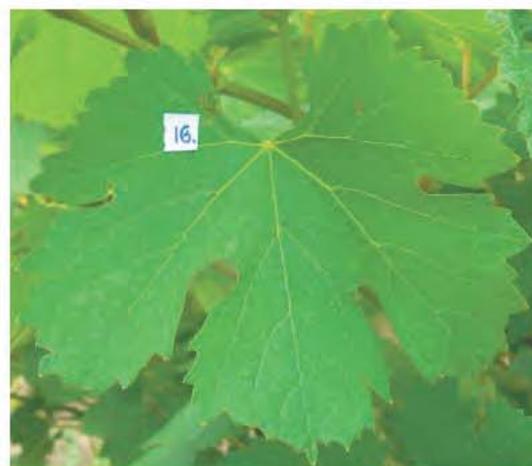
Juice characteristics

Sugar content: 21.0-22.5 %

Total acidity: 5.7-8.0 g·L⁻¹

Wine and grape characteristics

'Rzgi' grapes are used for fresh consumption.



Salli N.

Synonyms

Unknown

Meaning of the name

No hypotheses have been proposed yet.

Historical notes and cultural importance

'Salli' is an uncommon late-ripening wine variety: it is rarely spread as single vines within the old vineyards of the Yeghegnadzor district.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green with slight cobwebby hairs. The first young leaves have a wine-red hue and hardly visible bristles.

The mature leaf is medium size, almost circular, slightly or medium five lobed. The leaf blade is green, reticular-wrinkled and sometimes blistered. The upper leaf surface is light green. The lateral leaf sinuses are on the whole closed, lyre-shaped with almost parallel sides and a sharp bottom. The petiole sinus is open, lyre-shaped, triangular with a sharp bottom. The teeth on the ends of the lobes are triangular with a pointed tip or cupola-shaped with a rounded tip. The lateral teeth are triangular and serriform, seldom cupola-shaped with a rounded tip. The petiole is wine red, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical, dense or very dense.

The berry is medium size, round and black. The skin is thick, firm, covered by a moderate bloom. The flesh is juicy with astringent flavour.

Phenology

Time of bud burst: first ten days of April

Time of blooming: first ten days of June

Time of veraison: end of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 3.5-4.0 kg

Bunch weight: 160-170 g

Bud fertility: 0.6

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable weather

This variety has medium resistance to *Plasmopara viticola* and *Erysiphe necator*.

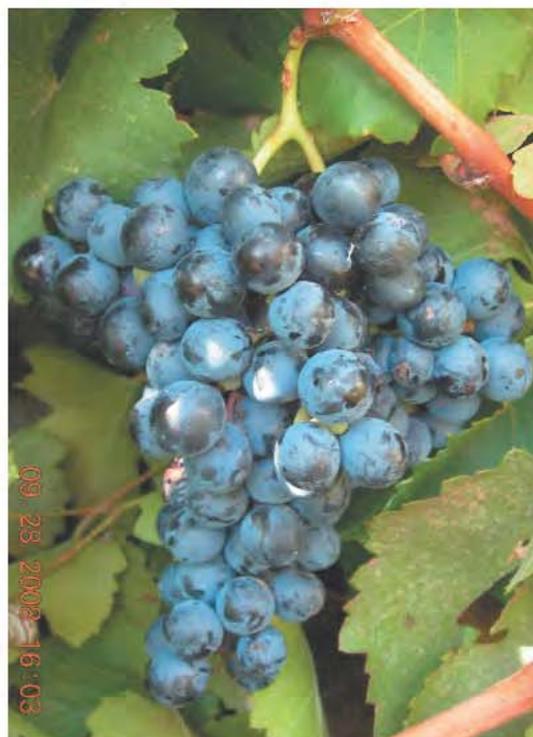
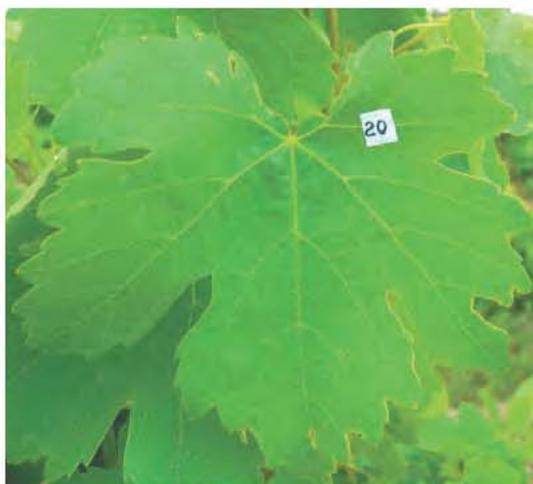
Juice characteristics

Sugar content: 20.0-21.0 %

Total acidity: 4.5-5.0 g·L⁻¹

Wine and grape characteristics

'Salli' is used in blend with other varieties for making red table wine.



Sev Ararati N.

Synonyms

'Sev Hachabash'

Meaning of the name

Black Ararati.

Historical notes and cultural importance

'Sev Ararati' was recovered in old vineyards in 1934. It is now distributed in single vines within the old vineyards.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is hairless and light green. The new opening leaves are light green with a yellow hue. The teeth edges are wine-red.

The mature leaf is big, circular and deeply five lobed. The leaf blade is dark green, slightly glossy, slightly bumped, funnel-shaped with partially involute edges. The lateral leaf sinuses are deep, closed with a wide-oval or oval lumen; seldom open, lyre-shaped with almost parallel sides and a round bottom. The petiole sinus is open and arched. The teeth on the ends of the lobes are triangular with a rounded top. The lateral teeth are triangular with a wide base and a pointed tip, transitional to cupola-shaped. The lower leaf side is hairless. The petiole is light green, equal to the middle vein or slightly longer.

The flower is hermaphrodite.

The bunch is generally big, cylindrical or conical and dense.

The berry is big, oval with furrows like the 'Ararat' variety, and it is covered by a thick bloom. The skin is thick and quite firm. The flesh is juicy. The taste is pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: beginning of June

Time of veraison: first ten days of August

Time of ripening: end of September or beginning of October.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

Yield per plant: 6.5-7.5 kg

Bunch weight: 300-380 g

Bud fertility: 0.6

Climate and cultivation requirements

Cane maturation of 'Sev Ararati' is good. Long pruning is more suitable for this variety, with 7 to 9 buds per cane. The recommended overall vine bud-load is 50-60 buds per vine.

Resistance to diseases and unfavourable weather

This variety is rather sensitive towards *Plasmopara viticola* and *Erysiphe necator* and it may suffer medium damage from European grapevine moth (*Lobesia botrana*). Frost resistance is poor.

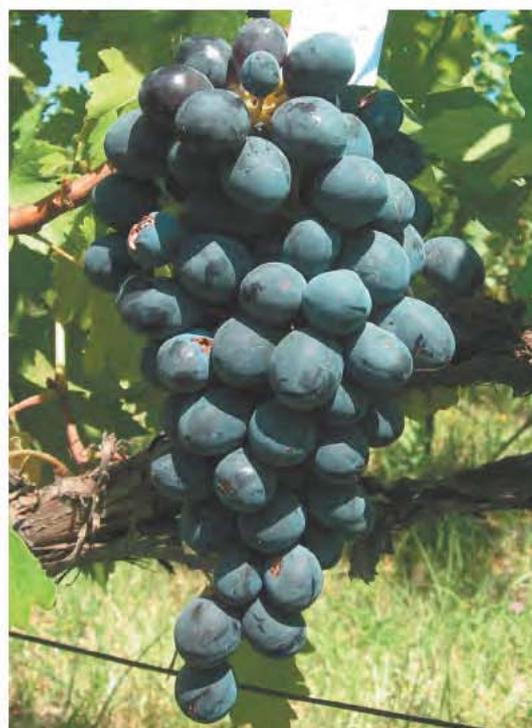
Juice characteristics

Sugar content: 22.0-26.0 %

Total acidity: 6.0 g·L⁻¹

Wine and grape characteristics

'Sev Ararati' is used only as a fresh grape.



Sev Areni N.

Synonyms

'Sev Malahi'

Meaning of the name

Black Areni.

Historical notes and cultural importance

'Sev Areni' single vines or vine-groups can be found almost in all Armenian viticultural areas, but it is mainly spread in the Yeghegnadzor region.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

Numerous biotypes of 'Sev Areni' have been detected during cultivation but there are no registered clones of this variety in Armenia.

Essential ampelographic characteristics

The tip of the young shoot is white-grey and downy. The first young distal leaves are covered by thick cobwebby hairs on both sides. The first leaf is greyish-green; the second one has a greenish-golden hue.

The mature leaf is medium size, circular, medium or deeply five lobed. The upper leaf surface is grey, slightly wrinkled, glossy and hairless. The lower leaf side is covered by bristle hairs. The lateral leaf sinuses are medium, on the whole closed with narrow and widely elliptic lumen and a sharp bottom; sometimes open, lire-shaped with a sharp bottom. The petiole sinus is open, lyre-shaped with a sharp bottom. The teeth on the ends of the lobes are triangular, both sides convex. The lateral teeth are triangular – serriform with convex sides. The petiole is hairless, light wine-red, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium, on the whole conical-shaped, sometimes winged and dense.

The berry is medium size, ovate with a rounded top, covered by a thick greyish-blue bloom. The skin is firm, easily separating from the flesh. The flesh is very juicy and colourless. The taste is pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: beginning of June

Time of veraison: first ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: average

Yield per plant: 5.0-6.0 kg

Bunch weight: 280-300 g

Bud fertility: 0.8

Climate and cultivation requirements

'Sev Areni' is a particularly remarkable variety for its good cane maturation. It grows better in light, rich in humus soils and over southern exposed slopes. The best planting spacing is 2.5 x 1.5 m. The vines should be pruned on 5-7 buds per cane. The vine load after pruning is 40-50 buds per vine.

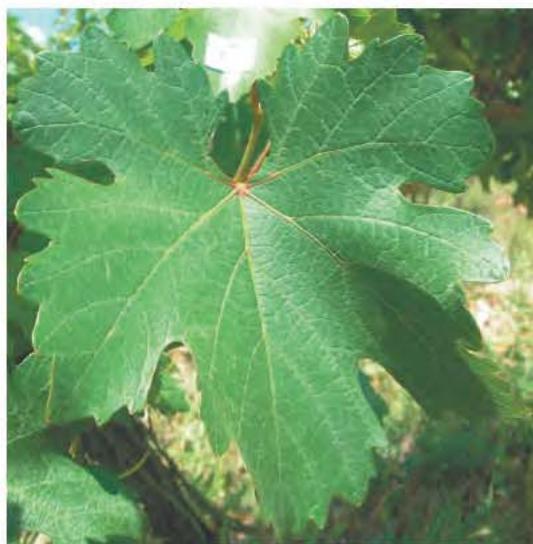
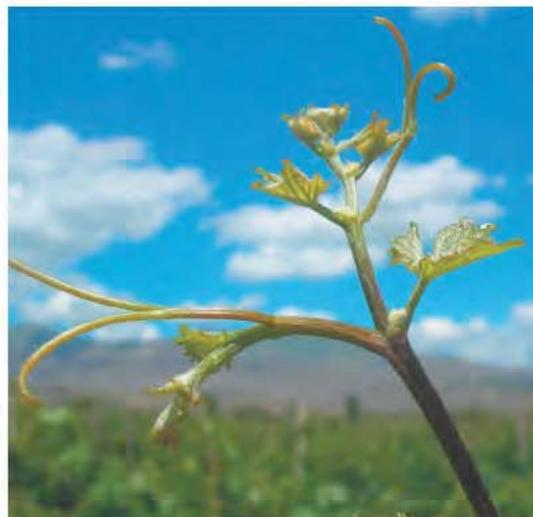
Resistance to diseases and unfavourable climatic conditions

This variety has weak resistance towards *Plasmopara viticola* and medium resistance towards *Erysiphe necator*. The frost resistance is high, reaching -20 °C.

Juice characteristics

Sugar content: 19.5-25.0 %

Total acidity: 4.5-6.0 g·L⁻¹



Wine and grape characteristics

'Sev Areni' is used for making light red table wines. These wines are notable for their fresh, velvet, pleasant bouquet and intense colour. The alcohol content is usually 10.0-11.5 % and acidity is 4.5-6.0 %. The red sparkling wine, made from 'Sev Areni', deserves a special attention. This variety is also suitable for making strong wines and dessert wines as well as grape juice.

Sev Aygeni N.

Synonyms

'Ezan Achk', 'Sultan Shira', 'Okuzgezi', 'Ezshkeni'

Meaning of the name

Black Aygeni.

Historical notes and cultural importance

'Sev Aygeni' is a table grape variety. It is seldom found, mainly as single vines within the vineyards of the districts of Artashat, Ashtarak, Ejmiatsin and in the outskirts of the city of Yerevan.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light pink, covered by cobweb hairs. The first young distal leaves are wine-red, glossy and hairless. The veins of the upper leaf surface are covered by cobweb hairs.

The mature leaf is big, circular, deeply five lobed. The leaf blade is rough, glossy and hairless. The lateral leaf sinuses are deep or very deep, mainly closed, ovate with a pointed tip. The petiole sinus is open, arched, U-shaped with a plain bottom. The teeth on the end of the main lobes are triangular with a rounded top. The lateral teeth are triangular-serriform with a rounded top. The petiole is shorter than the middle vein.

The flower is female.

The bunch is big, cylindrical or large conical, sometimes winged or shouldered, very loose or dense, depending on pollination.

The berry is round and black. The skin is coarse. The flesh is very juicy.

Phenology

Time of bud burst: second half of April

Time of blooming: starts end of May

Time of veraison: beginning of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: medium

Yield per plant: 5.5-6.5 kg

Bunch weight: 300-350 g

Bud fertility: 0.7

Climate and cultivation requirements

'Sev Aygeni' does not require specific soil and site conditions.

Resistance to diseases and unfavourable weather

This variety has low resistance to fungal diseases and frost.

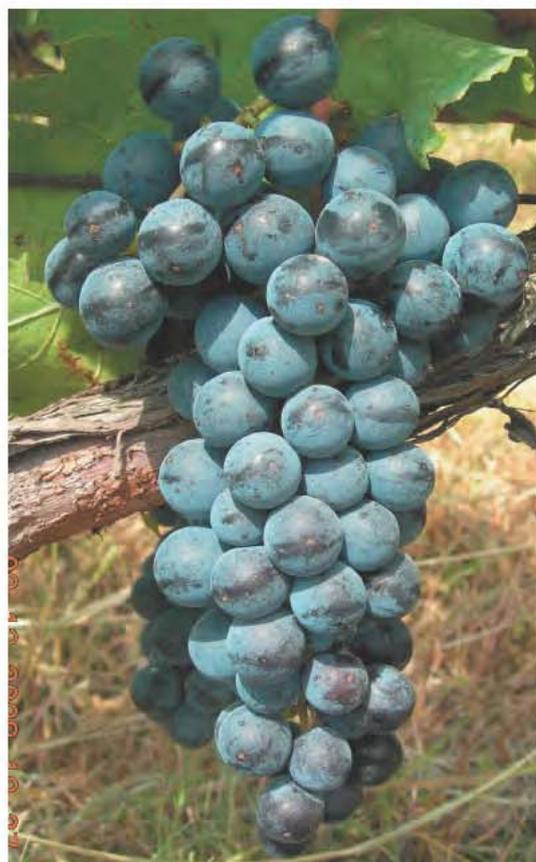
Juice characteristics

Sugar content: 20.5-24.5 %

Total acidity: 6.0-6.5 g·L⁻¹

Wine and grape characteristics

'Sev Aygeni' grapes are used for fresh consumption. Transport resistance is low.



Sev Krop N.

Synonyms

Unknown

Meaning of the name

Black Krop.

Historical notes and cultural importance

'Sev Krop' is a rare wine variety.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green with a wine-red hue and hairless, or with slightly visible hairs. The first young distal leaves are dark wine-red and glossy.

The mature leaf is big, circular, medium and deeply five lobed. The leaf blade has involute edges. The upper leaf surface is covered by little blisters or slightly wrinkled. The lower leaf side is hairless. The lateral leaf sinuses are medium deep, closed with a narrow or elliptic lumen and a circular bottom, or open, chinked and lyre-shaped with narrow lips and a sharp bottom. The teeth on the ends of the lobes are triangular with a wide base. The lateral teeth are triangular with a rounded top. The petiole is shorter or equal to the middle vein.

The flower is hermaphrodite.

The bunch is big, cylindrical or cylindrical-conical, very dense or dense.

The berry is round or slightly ovate and black. The skin is thick, covered by a thick bloom. The flesh is juicy. The juice is colourless. The flavour is pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: begins end of May

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-drooping

Vigor of shoot growth: strong

Yield per plant: 7.0-8.0 kg

Bunch weight: 220-230 g

Bud fertility: 0.7

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable weather

Leaves and bunches of 'Sev Krop' are highly susceptible to *Plasmopara viticola* and relatively weakly susceptible to *Erysiphe necator*.

Juice characteristics

Sugar content: 26.0-27.0 %

Total acidity: 5.0-5.5 g·L⁻¹

Wine and grape characteristics

'Sev Krop' is used in blend with other varieties for making highly alcoholic red wines.



Sev Sateni N.

Synonyms

'Sateni Chyorniy', 'Sev Khalili'

Meaning of the name

Black amber / amber-coloured.

Historical notes and cultural importance

'Sev Sateni' is a rare table grape variety. It is found mixed with other local varieties and mainly with 'Spitak Sateni' in small groups of vines within the old vineyards of the Ararat Plateau

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is green with a pink hue, covered by cobweb hair. The first young distal leaves are green with a pale wine-red hue, glossy with thin cobweb hairs.

The mature leaf is medium size, circular, mostly medium five lobed, dark green and hairless. The lateral leaf sinuses are on the whole medium, open and closed: the open ones are hardly visible, V-shaped and the closed ones are almost without lumen. The petiole sinus is wide, open with a rounded or a sharp bottom. The teeth on the ends of the lobes and the lateral teeth are triangular, both sides are convex or with a triangular rounded top. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is big, conical or cylindrical and dense.

The berry is big, elliptic or oblong, dark blue, covered by a thick bloom.

The skin is thick, but not firm. The flesh is juicy and crisp.

Phenology

Time of bud burst: second ten days of April

Time of blooming: beginning of June

Time of veraison: second ten days of July

Time of ripening: beginning of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 3.0-4.0 kg

Bunch weight: 220-230 g

Bud fertility: 0.7

Climate and cultivation requirements

'Sev Sateni' doesn't require specific soil conditions.

Resistance to diseases and unfavourable weather

Frost resistance is poor. Resistance to fungal diseases and pests is medium.

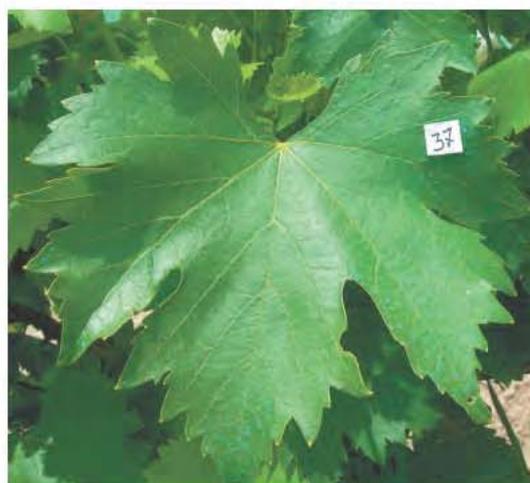
Juice characteristics

Sugar content: 20.0-21.5 %

Total acidity: 5.5-6.0 g·L⁻¹

Wine and grape characteristics

'Sev Sateni' is a beautiful, large-berried, early-ripening, transport resistant grapevine variety. It is used for fresh consumption.



Seyrak Areni N.

Synonyms

Unknown

Meaning of the name

Rare Areni.

Historical notes and cultural importance

'Seyrak Areni' is a rare winemaking grape variety. It is considered to be probably a clone of 'Sev Areni'.

It is distributed in single vines inside old vineyards of the Yeghegnadzor district.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is greyish-white with cobweb hairs. The first young distal leaves are bronze-hued. The upper leaf sides are covered by thin cobweb hair and the lower sides are covered by thick cobweb hair.

The mature leaf is medium size, shallow and medium five lobed. The leaf blade is striate, green, slightly wrinkled, glossy, hairless on the upper leaf surface, while the lower leaf surface is covered by bristle hairs. The lateral leaf sinuses are medium-deep, open or slightly closed: the open ones are lyre-shaped and the closed ones are elliptic. The petiole sinus is open with a lyre-shaped lumen and a sharp bottom. The teeth on the ends of the lobes are triangular, both sides are convex. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is small, very sparse, on the whole conical and cylindrical and sometimes winged.

The berry is small, elliptic and black. The skin is thick. The flesh is juicy.

Phenology

Time of bud burst: second half of April

Time of blooming: starts at the beginning of June

Time of veraison: first ten days of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 3.0-4.0 kg

Bunch weight: 70-80 g

Bud fertility: 0.8

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable weather

'Seyrak Areni' has a medium resistance to *Plasmopara viticola* and *Erysiphe necator*.

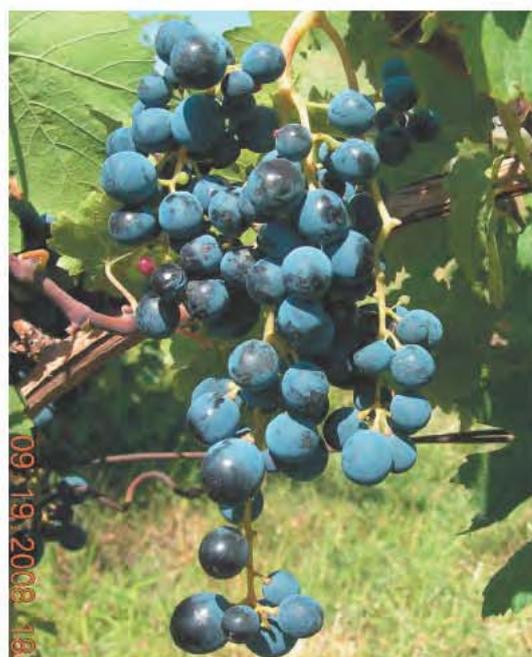
Juice characteristics

Sugar content: 21.5-23.5 %

Total acidity: 6.5-7.5 g·L⁻¹

Wine and grape characteristics

The berry of 'Seyrak Areni' is used in blend with other varieties for making table wine.



Spitak Arakseni B.

Synonyms

'Spitak Yezandari', 'Deghin Yezandari', 'Bzmari, Dzmari', 'Tezhasnouk'

Meaning of the name

White Arakseni.

Historical notes and cultural importance

'Spitak Arakseni' is an early-ripening table grape variety. It is distributed in single vines or in vine-groups almost in all Armenian viticultural areas.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is pale green with cobweb hairs. The first young distal leaves are green with a wine-red hue, glossy with slight cobweb hairs.

The mature leaf is big, circular, deeply five lobed and hairless. The lateral leaf sinuses are deep, closed or open: the closed ones have wide or narrow elliptic lumens and the open ones are lyre-shaped. The petiole sinus is open, lyre-shaped with a sharp bottom. The teeth on the ends of the lobes and the lateral teeth are narrow triangular. The petiole is green with a pink hue, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is big, cylindrical or conical, sometimes shouldered, generally dense.

The berry is large, pointed, yellow-white, golden on the sun-side. The skin is rough, elastic, covered by bloom. The flesh is juicy with a pleasant flavour.

Phenology

Time of bud burst: second ten days of April

Time of blooming: starts towards the end of May

Time of veraison: second ten days of July

Time of ripening: beginning of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong (higher than medium)

Yield per plant: 5.5-6.5 kg

Bunch weight: 210-230 g

Bud fertility: 0.8

Climate and cultivation requirements

'Spitak Arakseni' requires no specific soil and site conditions. The optimal planting distances are 2.5 x 2 m and 2.5 x 1.8 m on irrigated soils of the Ararat Plateau.

Resistance to diseases and unfavourable weather

This variety has moderate resistance to *Plasmopara viticola* and *Erysiphe necator*, while frost resistance is poor.

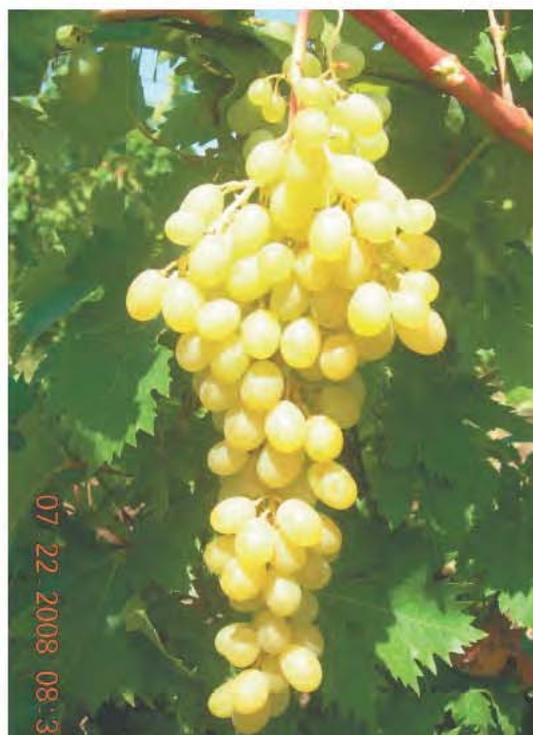
Juice characteristics

Sugar content: 22.0-25.0 %

Total acidity: 4.6-6.4 g·L⁻¹

Wine and grape characteristics

'Spitak Arakseni' is highly resistant to transport and it has beautiful bunches and berries. It is used for fresh consumption.



Spitak Shabi B.

Synonyms

Unknown

Meaning of the name

White Shabi.

Historical notes and cultural importance

'Spitak Shabi' is a rare ancient table grapevine variety. It is distributed in single vines or vine-groups inside the old vineyards of the Echmiadzin, Ashtarak and Ararat districts.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green with weak cobweb hair. The first young distal leaves are light-green with a wine-red hue.

The mature leaf is big, circular and deeply five lobed. The leaf blade is green, slightly glossy, plain, sometimes wrinkled or slightly blistered, revolute and hairless. The lateral leaf sinuses are deep, open and closed: the open ones are lyre-shaped with nearly parallel sides, circular, or with a sharp bottom, sometimes with a tooth on the base; the closed ones have generally an ovate lumen and a rounded or sharp bottom. The petiole sinus is closed with an ovate or an elliptic lumen with a sharp bottom. The teeth on the ends of the lobes are narrow and triangular with a rounded tip. The lateral teeth are serriform and convex on one side. The petiole is light green with a pale wine-red hue, shorter or equal to the middle vein.

The flower is hermaphrodite.

The bunch is big or very big, conical or conical-cylindrical, dense or medium dense.

The berry is large, ovate-cylindrical and yellowish-white. The flesh is juicy and slightly crispy. The skin is thick. The flavour is pleasant.

Phenology

Time of bud burst: second ten days of April

Time of blooming: starts in the beginning of June

Time of veraison: end of July

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3.5-5.5 kg

Bunch weight: 300-350 g

Bud fertility: 0.4

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable weather

This variety shows a sufficient degree of resistance to fungal diseases and pests.

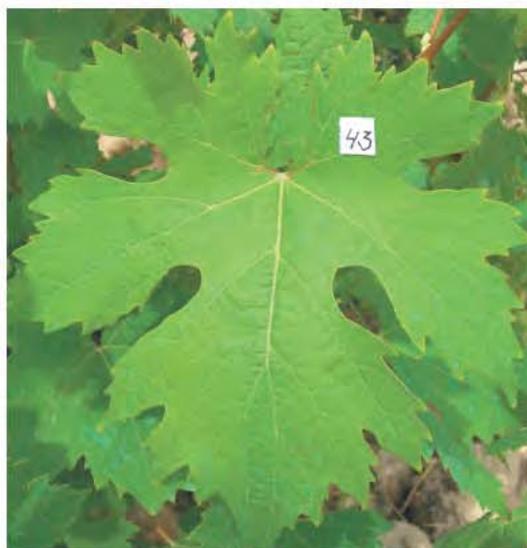
Juice characteristics

Sugar content: 22.5-23.5 %

Total acidity: 5.5-6.5 g·L⁻¹

Wine and grape characteristics

'Spitak Shabi' is used for fresh consumption. It has big and beautiful bunches and berries, and pleasant flavour. However, its peduncle is not firmly attached to the berry and therefore it is not widespread.



Spitak Sateni B.

Synonyms

'Spitak Khalili', 'Sateni Belyi', 'Sahabi Eymaz', 'Agha Gyormaz'

Meaning of the name

White Sateni.

Historical notes and cultural importance

'Spitak Sateni' is a rare table grape variety. This variety is spread in old vineyards of the Ararat Plateau.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are not known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light-green and hairless. The first young distal leaves are green with a wine-red hue with thin cobweb hair.

The mature leaf is medium size or big, circular, deeply five lobed, dark-green, glossy with slightly involute lateral lobes and hairless. The lateral leaf sinuses are on the whole closed with a narrow or a wide elliptic lumen. The petiole sinus is open, lyre-shaped, pointed, sometimes with a circular bottom. The teeth on the ends of the lobes and the lateral teeth are on the whole triangular with convex sides and a pointed tip. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium, mostly conical-cylindrical, sometimes winged and medium dense.

The berry is big, oblong, sometimes reverse ovate-shaped and ovate, yellowish-green. The skin is medium thick, covered by a plain bloom. The flesh is juicy and crisp.

Phenology

Time of bud burst: second ten days of April

Time of blooming: starts at the end of May

Time of veraison: beginning of July

Time of ripening: beginning of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

Yield per plant: 5.0-6.0 kg

Bunch weight: 350-400 g

Bud fertility: 0.8

Climate and cultivation requirements

'Spitak Sateni' does not require specific soil and site conditions.

Resistance to diseases and unfavourable weather

This variety has a poor resistance to *Plasmopara viticola*, *Erysiphe necator* and frost.

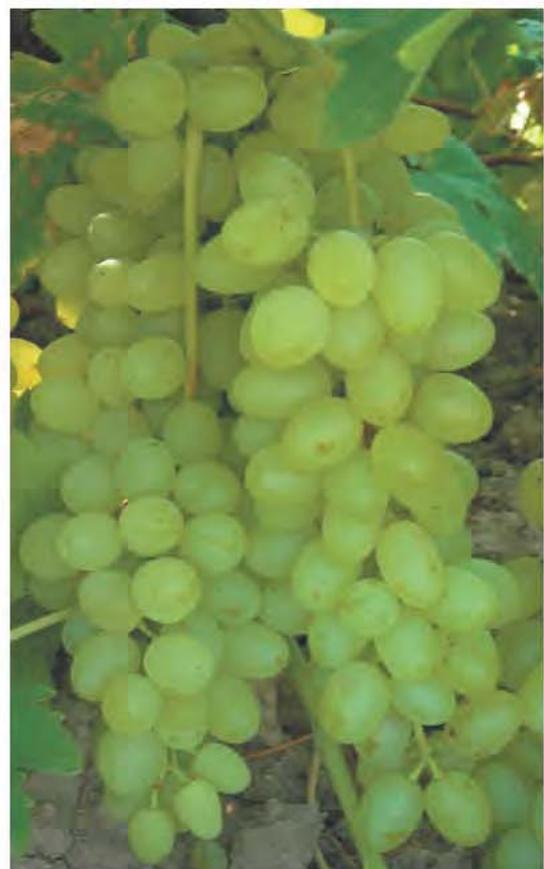
Juice characteristics

Sugar content: 18.0-20.0 %

Total acidity: 5.5-6.5 g·L⁻¹

Wine and grape characteristics

'Spitak Sateni' is one of the early-ripening Armenian grapevine varieties used only for fresh consumption. It has beautiful bunches and good transport resistance.



Sveni N.

Synonyms

Unknown

Meaning of the name

No hypotheses have been proposed yet.

Historical notes and cultural importance

'Sveni' is a rare double usage grapevine variety. It is distributed in single vines inside the old vineyards of Goris district.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green and hairless, rarely with hardly visible hairs. The first young distal leaves are light green, reddish, almost with a pink hue.

The mature leaf is medium size, seldom big, almost circular and slightly five lobed. The blade of the leaf is funnel-shaped or grooved. The upper leaf surface is dark green, slightly glossy, reticular-wrinkled, seldom blistered. The lower leaf side is hairless. The lateral leaf sinuses are very small, open, slightly visible or angled, seldom closed, almost without a lumen. The petiole sinus is open, lyre-shaped or chinked with a sharp bottom, seldom closed with a narrow elliptic lumen. The teeth on the ends of the lobes are triangular with rounded tip. The lateral teeth are of the same shape but tinier. The petiole is light green, partially painted in wine-red, shorter than the middle vein.

The flower is female.

The bunch varies from big to small, cylindrical-conical, dense or medium dense.

The berry is medium size, round and black. The skin is medium firm. The flesh is juicy. The taste is harmonious, pleasant with an original aroma.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: third ten days of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 7.0-8.0 kg

Bunch weight: 220 g

Bud fertility: 0.9

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable weather

'Sveni' has a medium susceptibility to fungal diseases and European grapevine moth (*Lobesia botrana*). Frost resistance of this variety is poor.

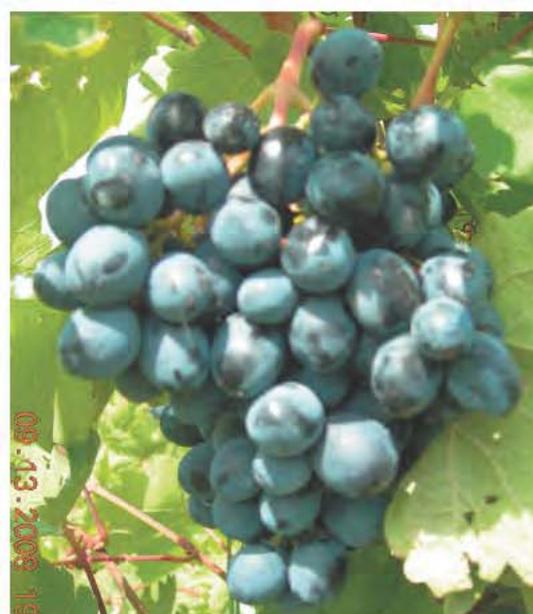
Juice characteristics

Sugar content: 20.0-22.0 %

Total acidity: 7.8-8.9 g·L⁻¹

Wine and grape characteristics

'Sveni' is used for making high quality table wines with pleasant taste and aroma.



Tozot N.

Synonyms

Unknown

Meaning of the name

Dusty.

Historical notes and cultural importance

'Tozot' is a late-ripening winemaking grape variety.

It is rare and it is found in single vines inside the old vineyards of the Goris district.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light-green and hairless. The first distal leaves are light-green with a wine-red hue.

The mature leaf is medium size, circular, medium five lobed and hairless. The upper leaf surface is green, reticular-wrinkled and goffering. The lateral leaf sinuses are deep or seldom shallow, open, lyre-shaped, almost with parallel sides and a sharp bottom, sometimes chinked, seldom closed with ovate lumen. The petiole sinus is open, arched with open and plane bottom, or closed with wide ovate opening. The teeth on the ends of the lobes are triangular with a roundish tip and a wide base. The lateral teeth are triangular, serriform and with a rounded top. The petiole is light wine-red, shorter than the middle vein.

The flower is hermaphrodite.

The bunch is small or big, conical, dense or very dense.

The berry is medium size, slightly oval or reverse-oval and black. The skin is medium thick, covered by a thick bloom. The flesh is juicy. The taste is very pleasant and harmonious.

Phenology

Time of bud burst: second half of April

Time of blooming: starts beginning of June

Time of veraison: end of July

Time of ripening: second half of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-horizontal

Vigor of shoot growth: higher than medium

Yield per plant: 9.3-11.2 kg

Bunch weight: 260 g

Bud fertility: 0.88

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable climatic conditions

'Tozot' has no resistance to diseases and frost.

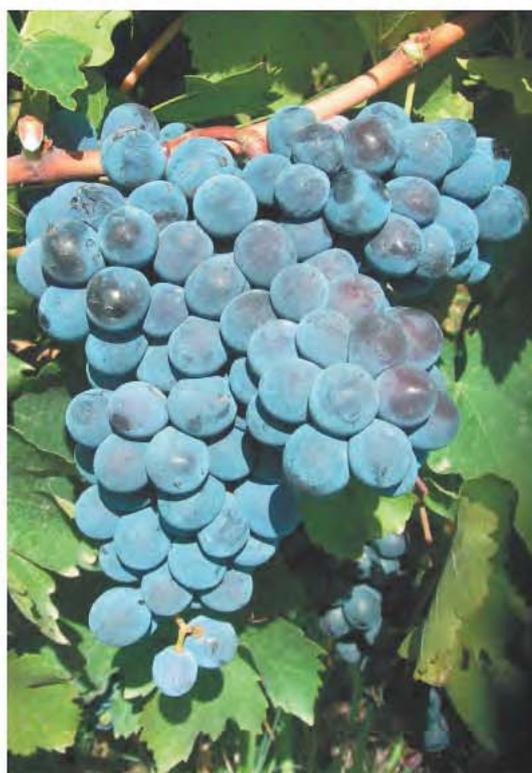
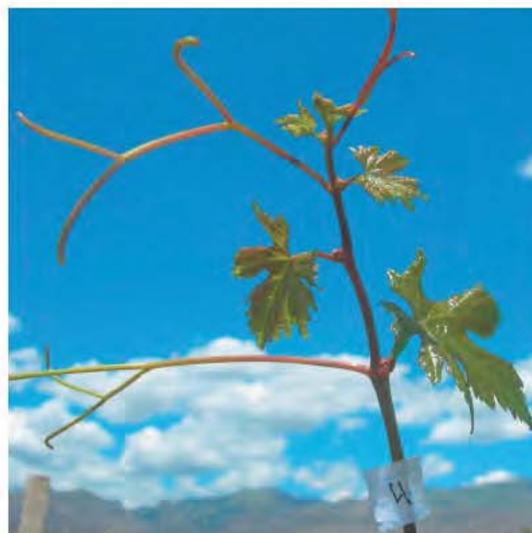
Juice characteristics

Sugar content: 24.0-26.0 %

Total acidity: 6.0-6.5 g·L⁻¹

Wine and grape characteristics

'Tozot' is used for making high-quality wines with a pleasant flavour.



Vagheni B.

Synonyms

'Novrast'

Meaning of the name

Early.

Historical notes and cultural importance

'Vagheni' is a table grape variety.

This variety is rare, and it is distributed in single vines or vine-groups within the vineyards of the Ararat Plateau.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is hairless and light green. The first young distal leaves are light green with a bronze hue and hairless.

The mature leaf is medium size and big, nearly heart-shaped, strongly five lobed and hairless, on the lower leaf surface, the veins are covered by short bristle hairs. The upper leaf surface of the blade is dark-green. The edges are yellow, not glossy, reticular-wrinkled, partially blistered, V-shaped. The lateral leaf sinuses are deep, on the whole open with a circular bottom. The petiole sinus is lyre-shaped with a sharp bottom. The teeth on the ends of the lobes are triangular with rounded top. The lateral teeth are triangular and serriform with convex sides. The petiole is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is small and medium, conical and cylindrical, branched, mostly dense.

The berry is medium size, sometimes large, ovate-elliptic, and yellowish-green. The skin is delicate with thick bloom; berries are white with spots. The flesh is pulpy, juicy with vegetal flavours.

Phenology

Time of bud burst: first ten days of April

Time of blooming: end of May

Time of veraison: first ten of August

Time of ripening: end of July or first ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 4.0-5.0 kg

Bunch weight: 170-180 g

Bud fertility: 1.1

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable weather

'Vagheni' has a poor resistance to diseases and frost.

Juice characteristics

Sugar content: 22.0-23.0 %

Total acidity: 3.5-4.5 g·L⁻¹

Wine and grape characteristics

'Vagheni' is used for fresh consumption. This variety is poorly resistant to transport.



Vanki B.

Synonyms

Unknown

Meaning of the name

Monastic.

Historical notes and cultural importance

'Vanki' is a winemaking grape variety.

It is rarely distributed in single vines inside the old vineyards of the Yeghegnadzor district.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspica* Negr.

There are no known clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot is light green, almost white with weak hairs. The first young distal leaves are green with a wine-red hue and hardly visible cobweb hairs.

The mature leaf is medium size and big, almost circular, slightly three to five lobed, sometimes almost whole. The leaf blade is reticular-wrinkled. The lower leaf surface is green with cobweb hairs. The lateral leaf sinuses are shallow, mostly open, chinked or hardly visible. The petiole sinus is open, lyre-shaped with a sharp bottom. The teeth on the end of lobes and the lateral teeth are cupola-shaped or triangular with a circular tip and both convex sides; the lateral ones are smaller. The petiole is green with a pale wine-red hue, longer or equal to the middle vein.

The flower is hermaphrodite.

The bunch is medium, conical-cylindrical and dense.

The berry is medium size, round, green or yellowish-green with a violet hue. The skin is thin, soft, and covered with bloom. The flesh is juicy. The taste is harmonious and pleasant.

Phenology

Time of bud burst: second ten days of April

Time of blooming: beginning of June

Time of veraison: first ten days of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 6.0-0.7 kg

Bunch weight: 280-300 g

Bud fertility: 0.6

Climate and cultivation requirements

Data are not available.

Resistance to diseases and unfavourable weather

This variety shows a medium resistance to fungal diseases and pests.

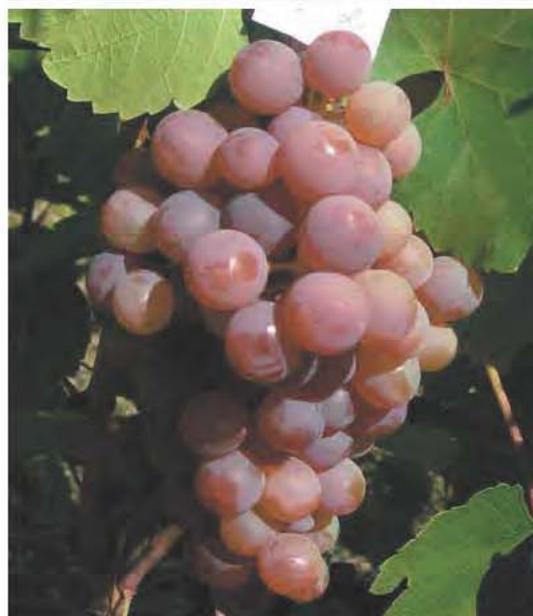
Juice characteristics

Sugar content: 22.5-23.5 %

Total acidity: 7.0-8.0 g·L⁻¹

Wine and grape characteristics

'Vanki' grapes are suitable for making high-quality table wines.



Vardaguyn Yerevani R.

Synonyms

'Yerevani Rozoviy', 'Karmir Kishmish', 'Kishmish Krasniy'

Meaning of the name

Pink Yerevani (Yerevan is the capital city of Armenia).

Historical notes and cultural importance

'Vardaguyn Yerevani' is a seedless, mid-period ripening grapevine variety. This variety is mainly spread in the surroundings of the city of Yerevan and in the vineyards of the districts of Armavir, Ashtarak, Echmiadzin, Ararat and Artashat.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

Many biotypes of 'Vardaguyn Yerevani' have been detected during cultivation, but there are no registered clones of this variety in Armenia.

Essential ampelographic characteristics

The tip of the young shoot is greenish-yellow with few cobweb hairs.

The mature leaf is medium size, circular, mostly medium or deeply five, sometimes three lobed. The upper leaf surface is light green, slightly glossy. The lower surface is hairless, only the veins are partially covered with bristles. The lateral leaf sinuses are closed or open: the closed ones are almost without lumen or with a narrow elliptic lumen; the open ones are mostly chinked, V-shaped or lyre-shaped with almost parallel sides; the lower leaf sinuses are always open. The petiole sinus is closed, elliptic with a circular bottom. The teeth on the ends of the lobes are narrow triangular with a pointed tip or triangular with a rounded top. The lateral teeth are serriform with slightly convex sides and a rounded top. The petiole is shorter than the middle vein. The flower is hermaphrodite.

The bunch is big, long-cylindrical, branched at the edge, dense or very dense. The berry is middle-size, rounded-ovate or slightly ovate, pink. The skin is thin. The flesh is pulpy, juicy and seedless.

Phenology

Time of bud burst: second ten days of April

Time of blooming: beginning of June

Time of veraison: end of July

Time of ripening: first ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 8-12 kg

Bunch weight: 300-400 g

Bud fertility: 0.8

Climate and cultivation requirements

'Vardaguyn Yerevani' has a medium vegetative period and good cane maturation. It does not require particular soil conditions and it grows well in various viticultural regions of Armenia.

Resistance to diseases and unfavourable weather

This variety is quite resistant to *Erysiphe necator*, but it is not resistant towards *Plasmopara viticola* and frost.

Juice characteristics

Sugar content: 24.0-27.0 %

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

'Vardaguyn Yerevani' is mainly used for fresh consumption. It is a highly estimated seedless grape, especially for its excellent flavour.



Voskehat B.

Synonyms

'Kharji', 'Kanachkeni', 'Katvi achik', 'Khach Kharji'

Meaning of the name

Golden berry.

Historical notes and cultural importance

'Voskehat' is a late-ripening wine grape variety.

This variety is widespread in the districts of Ashtarak, Ejmiatsin and Armavir. It is grown also in other regions as the leading variety in mono-varietal vineyards or mixed with other varieties as single vines or vine-groups.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspica* Negr.

Numerous clones of 'Voskehat' variety have been detected during cultivation, but there are no registered clones of this variety in Armenia.

Essential ampelographic characteristics

The tip of the young shoot is greenish-red, covered by delicate white cobweb hairs. The first distal young leaves are greenish-red, glossy, and hairless on both sides.

The mature leaf is medium size, circular, deeply five lobed. The upper leaf surface is green and coarse. The lower leaf surface is hairless, only the veins are covered by slight bristle hairs. The lateral leaf sinuses are deep, open or closed: the open is ovate or lyre-shaped with a sharp bottom; the closed is ovate-shaped. The petiole sinus is mostly open, lyre-shaped with a sharp bottom. The teeth on the ends of the lobes and lateral teeth are triangular. The petiole is green at the base, and then dark violet and hairless; it is shorter than the middle vein.

The flower is hermaphrodite.

The bunch is medium, short conical, winged by one, two - or rarely four - lateral bunches. The wings are well developed. The bunch is very dense, sometimes dense.

The berry is medium size, round, yellowish-white, or amber coloured with small brown spots. The skin is thick, transparent, easy to peel off the flesh. The flesh is very juicy with a pleasant taste.

Phenology

Time of bud burst: half of April

Time of blooming: end of May

Time of veraison: first ten days of August

Time of ripening: beginning of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: average and higher than medium

Yield per plant: 7.5-9.0 kg

Bunch weight: 250-270 g

Bud fertility: 0.8

Climate and cultivation requirements

'Voskehat' vines are remarkable for their longevity: there are over 150 year-old vineyards, growing and producing well. This variety's production is late in those areas with insufficient irrigation.

The growing conditions influence 'Voskehat's yield and quality more than other grapevine varieties: 'Voskehat' gives excellent quality in Ashtarak and low quality in Artashat. 'Voskehat' reaches high quality on rocky, lime, sand and semi-desert soils. Quality is highest on the slopes of Ashtarak, while it is normally lower on the plains. As a result, the vineyards in the mountains produce wonderful grapes, while in the plain they produce higher amounts of low quality grapes.



The optimal planting spacing is 2.5 x 1.5 m. The fruity canes should be pruned on 3-5 buds per cane. The recommended bud load is 40-50 buds per vine.

Resistance to diseases and unfavourable weather

'Voskehat' is strongly damaged by *Plasmopara viticola* and *Erysiphe necator* and frost resistance is poor.

Juice characteristics

Sugar content: 23.3-26.5 %

Total acidity: 4.0-6.4 g·L⁻¹

Wine and grape characteristics

'Voskehat' grapes generally give strong table and dessert wines. In some areas of the Kotayk region they are also used to make light table wines. Strong table wines have a particularly high alcohol content (usually 14-15 %, sometimes up to 17-18 %, produced with a natural winemaking method) and a relatively low acidity. These wines, especially when they are young – have a peculiar pleasant bitterness, which distinguish 'Voskehat' wines from all the others.

The light table wines have a relatively low alcohol content, ranging from 10.0 % to 11.0 %, and a high acidity. They comply the table wine standards and are highly estimated and appreciated. 'Voskehat' grapes are good for making sparkling wines as well. The high-quality, sherry-type, Ashtarak wine is generally made from 'Voskehat' grapes. This variety is also a good raw material for making Madeira, Porto, Malaga style fortified wines. It is also used as a table grape.

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Table

Some general transliterations and translations from Armenian to English

| Transliteration | Translation |
|-----------------|-------------|
| Spitak | White |
| Sev | Black |
| Deghin | Yellow |
| Kapuyt | Blue |
| Voskeguyn | Golden |
| Vardaguyn | Pink |
| Kapuyt | Blue |
| Khakhokh | Grape |
| Qachcr | Sweet |
| Chaghoghi vaz | Vine |
| Gini | Wine |

Viticulture and winemaking of Azerbaijan

V. SALIMOV¹⁾, M. MUSAYEV²⁾

¹⁾ Research Institute of Viticulture and Winemaking, Baku, Azerbaijan

²⁾ Genetic Resources Institute of the Azerbaijan National Academy of Science, Baku, Azerbaijan

Azerbaijan (Republic of Azerbaijan) is located in Southern Caucasus, 38°25' - 41°55' latitude and 44°50'-50°51' longitude. It borders on Iran and Turkey to the south, Dagestan (Russia) to the north, on Georgia to the north-west and on Armenia to the south-west. The Caspian Sea is situated to the east of the country (MUSEYIBOV *et al.* 2006).

The territory of Azerbaijan is 86,600 km². Forests cover 11 % of its territory, 1.6 % is covered by water basins, 50 % by cultivated land and the rest is covered by other land. One of Azerbaijan's main features is the exceptional diversity in flora and fauna, climate, soil, minerals, underground water, etc. It is mainly a mountainous country, but besides the high peaks above the snow line such as Bazarduzu (4466 m a.s.l.), Shahdag (4251 m a.s.l.) and Tufandag (4197 m a.s.l.), there are also wide plains and lowlands, some of which are located 26 m below the sea level. Basic elements of the Azerbaijani relief are the Large Caucasus Range, the Small Caucasus Range, the Cura-Araks lowland and the Tallish Mountain System (MUSEYIBOV *et al.* 2006).

There is a very rich flora in Azerbaijan and 66 % of all the Caucasian species are represented, including: 800 essential oil-yielding plants, 600 medicinal plants, 500 spicy-aromatic plants, 500 plants rich in vitamin, 850 dyeing plants and 1500 tanning plants. Azerbaijan is rich in relict plants dating back to the Tertiary period. Specimens of these plants can often be found in many areas and particularly in the territory of Tallish, e.g. the Iron tree (*Parrotia persica* C.A.Mey.), Acacia (*Albizzia julibrissin* Durazz.), Chestnut-leaved oak (*Quercus castanifolia* C.A.Mey.) and the Caucasus Persimmon tree (*Diospyros lotus* L.) (PRILIPKO 1954, ABUTALYBOV and HAJIYEV 1976).

Such a diversity of flora and plants is attributed to Azerbaijan's physical, geographical and climatic conditions, as well as to its complex history. The climate of Azerbaijan is characterized by diversity, as there are 8 main climates and 26 particular climate zones.

Azerbaijan is one of the most ancient centers of origin of grape culture. N.I.VAVILOV and other researchers have shown that Asia Minor - including Azerbaijan - is the homeland of grapevine cultivation. It has been determined that one of the main centers of origin of grapevine varieties, cultivated in Europe and Asia, is a territory located between the Caspian Sea and the Black Sea (VAVILOV 1960).

If we consider that nowadays the wild grapevine *Vitis vinifera* ssp. *sylvestris* Gmel. grows in Azerbaijan, it may be supposed that it was used as a food supply and as primary material for the selection of grapevine varieties. Grapevine fossils (half a million years old) were discovered by scientists of Azerbaijan during archaeological excavations near Nakhchyvan (SULEYMANOV and MAMMADOV 1982, BABAYEV 1988).

Ancient experience in grapevine cultivation allowed the Azeri to improve their secrets about vine care. Every viticultural technique is a product of local experience in different regions and historical periods. Each one has been adapted to the local conditions and this is why we have such a variety of training systems, like 'Chiyaban', 'Molla cheperi', 'Keleser', 'Serilen forma', 'Yarimgovs', 'Cherdak' or 'Yaberi' and others. Farmers select the training system in order to obtain the best grape in relation to a variety of products like wine, spirit, jam, bekmez, vinegar, abgora, sudjuk, kishmishi, sherbet and others (NEGRUL 1973, AMANOV 2001). Moreover, different varieties of fresh grape, white and red, are cultivated for national table consumption. For all these reasons, grape is considered - after wheat - as one of the most valuable crops and



Fig. 1: Typical commercial vineyard in the country.



Fig. 2: Summer pruning of vine is one of the most important activities for vine growers.

The period between 1970 and 1975 should be mentioned as a golden age for viticulture and winemaking in Azerbaijan. Since 1970, systematic improvements of the existing vineyards' state and planting of new ones have been carried out in the country. In five years, more than 50,000 ha of new vineyards were established. By 1975, the total area of vineyards in Azerbaijan reached 178,100 ha.

The total grape production in 1975 doubled (354,700 t) in comparison to 1970, and average yields increased from 4.68 to 6.51 t·ha⁻¹. The total vineyard area of 263,000 ha gave a gross yield of 148,130 t of grape. By 1980, the wine production reached 70.7 million decalitres and that of brandy was 1.16 million decalitres. At the same time, the assortment of winemaking products became wider and quality improved, as the country produced 18 brands of dry table wine, 20 brands of fortified desert wine, 11 brands of desert wine and 6 brands of brandy (PANAHOV and SALIMOV 2008a).

In 1984 the total vineyard surface (254,000 ha) yielded 2 million t of grape with an average productivity of 9.0 t·ha⁻¹ or more. The total production of the wineries was 2,100,000 t during that period. The high quality of wines and brandies of Azerbaijan was acknowledged by 30 gold and silver medals won on various wine competitions. At that time, over 150,000 specialists and workers were employed in 210 wineries and their branches. Fifty-five brands of wine, 10 brands of brandy, 4 brands of sparkling wine and other winemaking products were produced in Azerbaijan in 1984. As the winemaking industry was generating such an income, the general welfare of the local population increased.

The anti-alcoholic law of the former Soviet Union in 1985 inflicted a big loss to the economy of Azerbaijan. After this law, most of the fruit-bearing vineyards and the winemaking plants of the country were destroyed (ALIYEV 1998, PANAHOV and SALIMOV 2008a, SALIMOV *et al.* 2008).

By 1993, the total area of fruit-bearing vineyards fell to 127,000 ha, the total yield was reduced to 289,000 t with a productivity of 2.28 t·ha⁻¹ of grapes (PANAHOV and SALIMOV 2008a).

At the beginning of 21st century, a renewed attention towards viticulture and winemaking rose within the country. An important step to help the progress of activities in the free market is represented by the law of the Azerbaijan Republic "About Viticulture and Winemaking" (21.01.2002) and by the Governmental Program "About Social-Economic Development of Regions for 2004-2008". These government actions opened wide opportunities for the development of rural economy, including viticulture and winemaking. At present, vineyards in Azerbaijan cover 10,000 ha. The grape production has increased to 103,300 t per year, with a yield of 7.67 t·ha⁻¹.

The lists of the main table and wine grape cultivars of Azerbaijan are given below (Tabs 1 and 2).

Of all the wine grape varieties cultivated in Azerbaijan at the moment, 37 cultivars are white, 22 are black and 6 have a red or pink berries. There are 38 table varieties, 22 wine varieties and 5 seedless or semi-seedless varieties in total. Of these, 38 varieties are indigenous and 27 have been introduced (SALIMOV *et al.* 2008).



Fig. 3: The map demonstrates the specialization of the country in making various grape products.

Table 1

List of the main table grape cultivars of Azerbaijan

| | | | | | |
|----|-----------------------|----|-------------------|----|-------------------------------|
| 1 | Agadaiyee | 15 | Cardinal | 29 | Muscat Hamburg |
| 2 | Ag Aldara | 16 | Chehrayee Taify | 30 | Muscat Voskovoy |
| 3 | Ag Khalily | 17 | Gara Kishmish | 31 | Nagshaby |
| 4 | Ag Oval Kishmish | 18 | Gara Shany | 32 | Nail |
| 5 | Ag Shany | 19 | Girde Kishmish | 33 | Nakhchyvan Chehrayi Kishmishi |
| 6 | Ag Shasla | 20 | Gyrmyzy Merendi | 34 | Novrast |
| 7 | Agdam Gyzyly Uzumu | 21 | Gyrmyzy Saaby | 35 | Nimrang |
| 8 | Alykhanly Garagyozy | 22 | Inekemjegy | 36 | Pobeda |
| 9 | Alykhanly Kechimimesi | 23 | Italia | 37 | Shafeyi |
| 10 | Arna-Grna | 24 | Katta-Kurgan | 38 | Salyany |
| 11 | Askeri | 25 | Khuseyni | 39 | Shamakhy Marandisy |
| 12 | Azeri | 26 | Mahmudu | 40 | Sarygilya |
| 13 | Bendi | 27 | Misgaly | 41 | Sultany |
| 14 | Bey Uzumu | 28 | Muscat Alexandria | 42 | Tabrizi |

Table 2

List of the main wine grape cultivars of Azerbaijan

| | | | |
|----|--------------------|----|--------------|
| 1 | Aligoté | 12 | Meleyi |
| 2 | Alfons Lavallo | 13 | Muscat White |
| 3 | Bayanshira | 14 | Pinot Noir |
| 4 | Cabernet Sauvignon | 15 | Rkatsiteli |
| 5 | Gamashara | 16 | Riesling |
| 6 | Gara Aldara | 17 | Saperavi |
| 7 | Grenache White | 18 | Chardonnay |
| 8 | Grenache Black | 19 | Semillon |
| 9 | Isabella | 20 | Shireyi |
| 10 | Khindogni | 21 | Shirvanshahy |
| 11 | Madrassa | 22 | Tavkveri |

The indigenous seedless or semi-seedless varieties 'Askery', 'Ag Oval Kishmish', 'Nakhchyvan Chehraiye Kishmish', 'Gara Kishmish', 'Girda Kishmish', etc. are grown on private farms and are mainly consumed as fresh fruit or used to make jam. Homemade raisins are still made with a traditional method in the region of Nakhchyvan, using these varieties (SALIMOV *et al.* 2008).

The qualitative peculiarities of the grape cultivars of Azerbaijan are the basis of the production of a wide assortment of high quality wines. At moment, the wineries of Azerbaijan mainly produce table (dry, semi-sweet), fortified (dry, semi-sweet, sweet, liquor), dessert and other styles of wines.

In 2007, 12,100 decalitres of light wine and 53,000 decalitres of sparkling wine were produced. In the last 8 years (2000-2007), the average production was 458,100 decalitres of wine and 89,300 decalitres of sparkling wine. A part of dry table and dessert wine is mainly exported to Russia, Ukraine, Belarus, China, Vietnam and other countries (AGRICULTURE OF AZERBAIJAN 2008).

Since ancient times, Azeri people have always been producing various homemade products, including natural red and white wines from 'Bayanshira', 'Madrassa', 'Shirvanshahy', 'Khindogny', 'Meleyi', 'Gara Lkeny', 'Ag Shireyi' and other grape varieties. An interesting peculiarity is the so-called Gora Sharab wine, a tradition of the regions of Guba-Khachmass, Garabagh and Shaky-Zagatala. To produce this, besides cultivated grapes, people use a wild grape gathered in forests and riversides (SALIMOV *et al.* 2008).

Azerbaijan has a considerable number of different indigenous grape varieties: on the basis of the latest data, it is known that more than 400 local grapevine varieties are cultivated in Azerbaijan at present. Only 200 of these have been collected and included in field collections. Many regions of Azerbaijan are rich in valuable local grapevine varieties which have not been studied yet (SHERIFOV 2005, PANAHOV and SALIMOV 2008b).

The wild grapevine *Vitis vinifera* spp. *sylvestris* Gmel. is spread in the whole territory. Its formation is very ancient and it is characterized by specific traits; its location ranges from 12 m below the sea level (Kyur riverside, Salyan region) up to 2000 m a.s.l. (Gusar region). It grows at the slopes of mountains, in forests, along riversides and in other places. There are two kinds of wild grape in Azerbaijan: *typica* Negr. (with hairs) and *aberrans* Negr. (hairless) (AMANOV 1998, SALIMOV and MUSAYEV 2007, SALIMOV and MUSAYEV 2008).

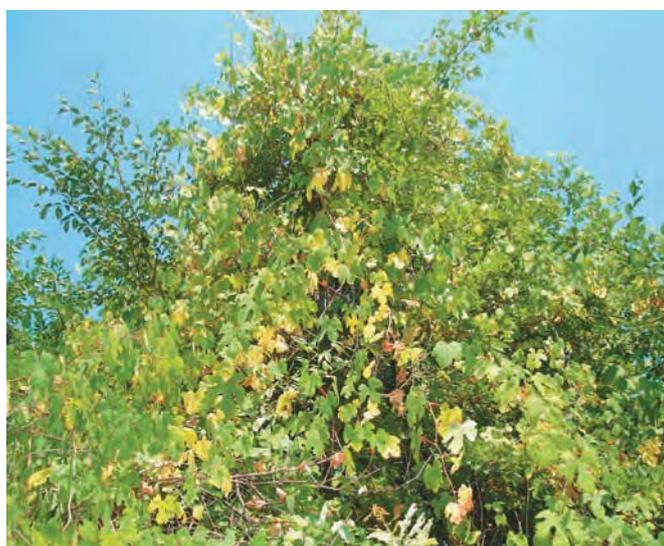


Fig. 4: Wild vine in nature.



Fig. 5: Trunk of wild vine with a 60 cm diameter

With the purpose to preserve the grapevine genetic resources of Azerbaijan, a field ampelographic collection was established by the Research Institute of Genetic Resources and by the Azerbaijan Research Institute of Viticulture and Winemaking. The collection includes native varieties, local breeding varieties, introduced cultivars and wild forms of grapevine. This collection will be constantly followed year after year.



Fig. 6: Researchers of the institute of Viticulture and Winemaking are collecting pollen of grapevine varieties for pollination of female flowers and for breeding purposes

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Azerbaijan: native varieties of grapevine

M. V. AMANOV¹⁾, V. SALIMOV¹⁾, M. MUSAYEV²⁾

¹⁾ Research Institute of Viticulture and Winemaking, Baku, Azerbaijan

²⁾ Genetic Resources Institute of the Azerbaijan National Academy of Science, Baku, Azerbaijan

English translation: E. M. SEMEREKOVA and A. T. MAMMADOV, Genetic Resources Institute of the Azerbaijan National Academy of Science, Baku, Azerbaijan

- | | |
|------------------------------|--------------------------------------|
| 1. Absheron Gelinbarmagy B. | 28. Gara Shany N. |
| 2. Absheron Gyzył Uzumu R. | 29. Goyun Gyozu B. |
| 3. Absheron Kechiemjeyi Rg. | 30. Gyavangir B. |
| 4. Ag Gyavra B. | 31. Gyrmzy Marandi Rg. |
| 5. Ag Oval Kishmish B. | 32. Haji Abbas N. |
| 6. Ag Shany B. | 33. Iri Salkhym B. |
| 7. Agdam Gyzył Uzumu R. | 34. Karga Dili N. |
| 8. Agdam Gyulabisi R. | 35. Kerimgendi B. |
| 9. Agdam Khazarisi B. | 36. Khyndogny N. |
| 10. Ala Shany R. | 37. Khyrcha Kishmish B. |
| 11. Alykhanly Garagyozy N. | 38. Kyok Kishmish B. |
| 12. Alykhanly Kechimemesi B. | 39. Madrasa N. |
| 13. Amiri B. | 40. Meleyi N. |
| 14. Arayatly Gara Uzum N. | 41. Marandi Rg. |
| 15. Arna - Grna B. | 42. Nabi Uzum B. |
| 16. Askeri B. | 43. Nakhchivan Chehrayi Kishmishi R. |
| 17. Bayanshira B. | 44. Salyany B. |
| 18. Bendi B. | 45. Sarmayi B. |
| 19. Boyakhany N. | 46. Sarygilya B. |
| 20. Cherez N. | 47. Shafeyi B. |
| 21. Dana Burnu B. | 48. Shekerbari B. |
| 22. Deve Gyozy B. | 49. Shireyi B. |
| 23. Et Marandi R. | 50. Shirvanshahy N. |
| 24. Fatmayi B. | 51. Surmeyi N. |
| 25. Gara Khazani N. | 52. Tabrizi B. |
| 26. Gara Kishmish N. | 53. Yagubi Rg. |
| 27. Gara Kyurdashy N. | 54. Zeynebi B. |

Notes: N-Noir (black), B-Blanc (white), Rg-Rouge (red), G-Gris (gray), R-Rose (pink).

Absheron Gelinbarmagy B.

Synonyms

'Khatun Bormak', 'Khatyn Bormak' (in Uzbekistan)

Meaning of the name

Lady fingers from Absheron

Historical notes and cultural importance

It is a local grape variety from the Absheron peninsula. This variety is found as single vines in the old vineyards in the villages of Absheron.

'Absheron Gelinbarmagy' grape is used as a fresh fruit. It is a prospective variety for many table-grape growing regions.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the distal leaves are slightly hairy and yellow-green in color.

The mature leaf is rounded, three or five lobed. The lateral leaf sinuses are medium deep. The petiole sinus is elliptic or lyre-shaped.

The flower is hermaphrodite.

The bunch is medium, cylindrical-conical and sparse.

The berry is oval or elongated and green-yellow. The flesh is pulpy. The skin is firm.

Phenology

Time of bud burst: first ten days of April

Time of blooming: beginning of June

Time of veraison: beginning of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 5.0-5.5 kg

Bunch weight: 250 g

Bud fertility: 0.9

Climate and cultivation requirements

Cane maturation ability is satisfactory. This variety is suitable for growing on the plains. The yield capacity of 'Absheron Gelinbarmagy' greatly increases with irrigation and 10-12 buds per cane.

Resistance to diseases and unfavorable weather

This variety is relatively resistant towards *Plasmopara viticola* and *Erysiphe necator*. It is moderately cold-resistant.

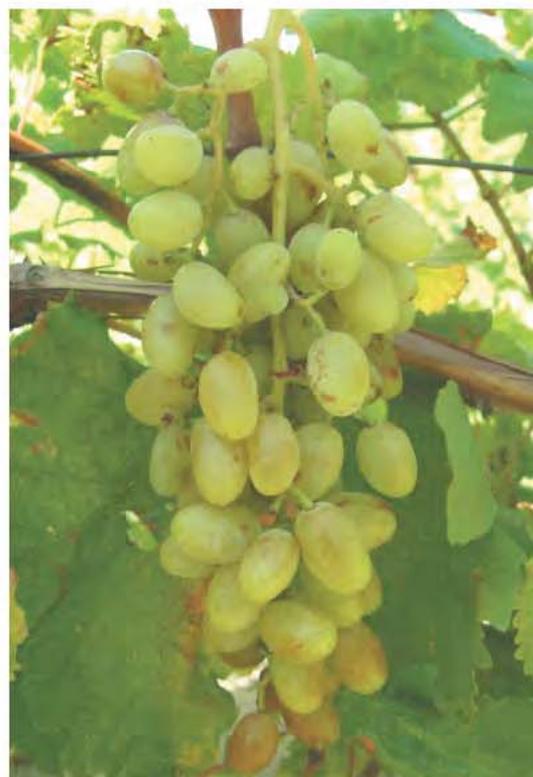
Juice characteristics

Sugar: 20.3 %

Total acidity: 5.7 g·L⁻¹

Wine and grape characteristics

'Absheron Gelinbarmagy' is a local table grape variety. It is suitable for fresh consumption and transport.



Absheron Gyzyl Uzumu Rg.

Synonyms

'Gyzyly'

Meaning of the name

Absheron's golden grapes.

Historical notes and cultural importance

'Absheron Gyzyl Uzumu' is a local variety from the Absheron region. It is found within the old vineyards, grown over high trees (Khiaban). It is also cultivated as a low vine.

Grapes from this variety are used for fresh consumption.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

Clones of this variety have not been described so far.

Essential ampelographic characteristics

The tip of the young shoot is yellow-green. Young first distal leaves are green and copper tinted.

The mature leaf is large, five lobed, slightly elongated. The lower leaf surface is covered with hairs. The lateral leaf sinuses are deep, triangular or oval. The petiole sinus is elliptic or lyre-shaped. The teeth are triangular or serriform: the teeth at the end of the main veins have a wide base and a pointed tip. The petiole is shorter than main vein, medium thick and wine-colored.

The flower is hermaphrodite. The bunch is large or medium, conical, with a wide base, winged and sparse.

The berry is elongated or oval, from white to dark pink in color. The skin is medium thick. The flesh is firm and crispy. The taste is pleasant and harmonious.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second half of August

Time of ripening: first half of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 2.5-3.5 kg

Bunch weight: 150-160 g

Bud fertility: 0.8

Climate and cultivation requirements

'Absheron Gyzyl Uzumu' is characterized by a late vegetative period and a full cane maturation. The "fan like" training system with several spurs is recommended for this variety.

Resistance to diseases and unfavorable weather

This variety is relatively resistant towards fungal diseases. It is moderately resistant to frost and drought.

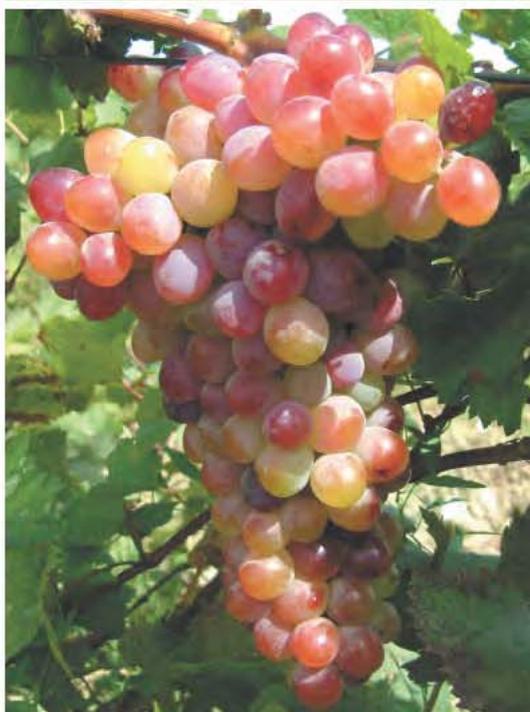
Juice characteristics

Sugar: 18.7%

Total acidity: 4.0 g·L⁻¹

Wine and grape characteristics

'Absheron Gyzyl Uzumu' is a high-quality table grape variety with an excellent taste. It is used for fresh consumption.



Absheron

Kechiemjeyi Rg.

Synonyms

Unknown

Meaning of the name

Goat nipples from Absheron.

Historical notes and cultural importance

'Absheron Kechiemjeyi' is rarely spread within the old vineyards of the Absheron peninsula, in the Shamakhy and Gyoichay districts and in Nakhchivan.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No variations, clones or biotypes of the variety have been described so far.

Essential ampelographic characteristics (DADASHOFF 1973)

The tip of the young shoot is green. The first three leaves are light green and hairless. The shoot axis is white-yellowish.

The mature leaf is medium size, cordate, seldom circular and five-lobed. The upper leaf surface is smooth and light green. The upper leaf sinuses are open, V-shaped with a shallow and pointed base. The petiole sinus is open with a rounded base. The teeth at the end of the lobes are triangular with a pointed tip. The lateral teeth are triangular or serriform. The lower leaf side is covered with weak cobwebby hairs.

The flower is hermaphrodite.

The bunch is small or medium, conical or cylindrical, branched and loose.

The berry is medium size and oval from dark red to dark pink. The skin is thick and rather firm. The flesh is medium juicy, slightly meaty, a little crispy and sweet.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: second half of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility coefficient (cluster per winter bud): 1.26

Shoot fertility coefficient (cluster per shoot): 1.44

Bunch weight: 107 g

Bunch size: 9.5 x 6 cm

Yield per vine: 8.1- 9.0 kg

Yield: 18-20 t·ha⁻¹

Climate and cultivation requirements

'Absheron Kechiemjeyi' is characterized by good cane maturation. The variety is recommended for cultivation in the Absheron peninsula as well as in non-irrigated areas of Azerbaijan, on weakly developed grey and sandy soils. In these growing conditions the yielding capacity of 'Absheron Kechiemjeyi' is medium, but the grapes have excellent flavor. The variety preserves its sensorial characteristics when it is grown on irrigated fertile brown soils. The normal bud-load for this variety is 60 buds per vine or 5-6 canes with 10-12 buds per cane.

Resistance to diseases and unfavorable weather

The variety is resistant to fungal diseases but is very sensitive to European grapevine moth (*Lobesia botrana*). Flower drop is high, berry shot is minor.



Juice characteristics

Sugar: 25.4 %

Total acidity: 5.3 g·L⁻¹

Wine and grape characteristics

Fresh grapes from this variety scored 9.2/10 on a sensorial evaluation system.

'Absheron Kechiemjeyi' grapes are suitable for winter storage and transport

on long distances.

Ag Gyavra B.

Synonyms

'Ag Kechimeme', 'Jutsalkhym', 'Kehraba Inekemjeyi', 'Iri Salkhym Inekemjeyi'

Meaning of the name

White durable.

Historical notes and cultural importance

'Ag Gyavra' is a native table grape variety of the Fizuli region of Azerbaijan, rarely spread within the vineyards of this region in single vines.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr. (AMANOV *et al.* 2006).
No biotypes or clones have been described so far.

Essential ampelographic characteristics (AMANOV *et al.* 2006)

The tip of the young shoot is light green. The first distal leaves are green and blistered. The tip of the shoot and the leaves are hairless.

The mature leaf is large, cordate and five-lobed. The leaf blade is funnel-shaped, the edges are involute. The upper leaf sinuses are deep or very deep, open, close and lyre-shape. The lower leaf sinuses are medium deep, open, lyre-shape with parallel sides and narrow mouth. The petiole sinus is open, not deep, wide-arched or arched. The teeth at the end of the lobes are very long, sharp and narrow-triangular. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is large, wide-conical or branched, medium dense or loose.

The berry is large, long, symmetrical, white, when overripe it becomes golden-yellow or amber. The skin is thick with a thin bloom. The flesh is meaty, crispy and juicy. The taste is sweet.

Phenology

Time of bud burst: first half of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 1.16

Shoot fertility coefficient (cluster per shoot): 1.57

Bunch size: 20-28 x 16-20 cm

Bunch weight: 330-340 g

Yield per vine: 17-19 kg

Yield: 40-41 t·ha⁻¹

Climate and cultivation requirements

The variety grows well in light brown and brown soils. Yield is higher in irrigated conditions. 'Ag Gyavra' needs long pruning and the multi-branched 'fan like' training system is recommended. 'Ag Gyavra' is very sensitive to water stress and therefore it needs irrigation.

Resistance to diseases and unfavorable weather

'Ag Gyavra' is tolerant to *Plasmopara viticola* and *Erysiphe necator*.

Juice characteristics

Sugar: 18.0-19.0 %

Total acidity: 5.0-5.2 g·L⁻¹

Wine and grape characteristics

Sensorial mark of fresh grapes is 9.6/10.

'Ag Gyavra' is a late-ripening table grape variety, for local consumption. Bunches keep on the vines until November-December if high trunk training systems such as Khiyaban and Cherdakh are used. These grapes are suitable for winter storage and transportation.



Ag Oval Kishmish B.

Synonyms

'Ag Kishmish' (in Azerbaijan); 'Kishmish Safet', 'Avtobi', 'Maizi', 'Bedona' (in Middle Asia countries); 'Kishmish Indiyiski' (in Astrakhan area of Russia); 'Sultaniye' (in Turkey and Palestine); 'Sultanina' (in France); 'Thomson seedless' (in California).

Meaning of the name

White oval raisin.

Historical notes and cultural importance

The origin of 'Ag Oval Kishmish' is not exactly determined. Some researchers consider that the homeland of this variety is the town of Sultani (Iran). The variety has been cultivated in the Nakhchivan area (Azerbaijan) and in Central Asia for a long time, and it is likely to come from these regions (CEYTLIN 1954)

'Ag Oval Kishmish' is among the most valuable high quality table-grape varieties. It is suitable for fresh consumption and for making raisin.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the lower side of the first three distal leaves are covered with sparse cobwebby hairs, mostly on the main veins. The distal leaves are light-green, tinted in yellow-gold. The shoot is ribbed.

The mature leaf is large, pentagonal, five lobed and light-green. The lower leaf side is hairless. The lateral leaf sinuses are shallow or medium deep, V-shaped or chinked. The petiole sinus is arched, equilateral or deep, sometimes it is vaulted, deep or squared. The teeth are both sides convex: the teeth on ends of the lobes are triangular with convex sides and sharp tip. The petiole is equal to the main vein in length, pink with light green stripes.

The flower is hermaphrodite.

The bunch is small or very large, conical, sometimes winged, sparse or medium dense.

The berry is small, seedless, oval and yellow-gold. The flesh is semi-juicy with a pleasant taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3.0-4.0 kg

Bunch weight: 220-280 g

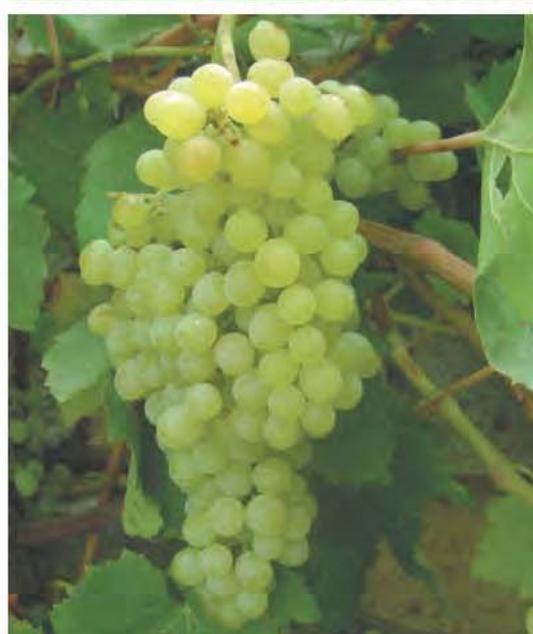
Bud fertility: 0.8

Climate and cultivation requirements

'Ag Oval Kishmish' is characterized by a medium vegetative period and full cane maturation. Due to its vigorous growth, the use of a strong trellis system is recommended.

Resistance to diseases and unfavorable weather

The variety has high resistance to *Plasmopara viticola*, *Erysiphe necator* and European grapevine moth (*Lobesia botrana*). Frost resistance is low. It is very sensitive to water deficit.



Juice characteristics

Sugar: 23.0 -26.0%

Total acidity: 4.3-2 g·L⁻¹

Wine and grape characteristics

'Ag Oval Kishmish' is a seedless grape variety suitable for fresh consumption or for making raisins.

Ag Shany B.

Synonyms

'Cazbinca Belaya' (Dagestan, Russia).

Meaning of the name

Ag: white; Shani: suitable for the king (shah).

Historical notes and cultural importance

'Ag Shany' is widely spread in the Absheron peninsula and in the neighbor regions. This table grape variety has high sensorial characteristics and it is recommended for cultivation in any table-grape cultivation area.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

Hermaphrodite forms of this variety were found within the old vineyards of Absheron. These forms are characterized by larger berries than the main form.

Essential ampelographic characteristics

The tip of the young shoot and the lower side of the distal leaves are covered with slight hairs on the lower leaf sides, grayish with red hem.

The mature leaf is large, pentagonal. Lower leaf side is hairless. The lateral leaf sinuses are shallow and triangular. The petiole sinus is overlapped. The teeth are triangular-serriform, with slightly convex sides. The teeth in the ends of the lobes are triangular-shaped with wide a base and a sharp tip. The petiole is shorter than the main vein.

The flower is female.

The bunch is medium or large, conical with wide base and winged. Bunch density depends on the pollination conditions.

The berry is oval or elongated and yellow-gold. The skin is medium thick and firm. The flesh is very soft and melting. The taste is pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first half of August

Time of ripening: second half of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3.8-4.2 kg

Bunch weight: 198-205 g

Bud fertility: 0.9

Climate and cultivation requirements

'Ag Shany' shows a medium vegetative period and full cane maturation. It is suitable for cultivation on the plains, and particularly on the sandy soils of the Absheron peninsula. The productivity of 'Ag Shany' greatly increases in irrigated conditions, with a three-wired trellis and 10-12 buds per cane. 'Ag Shany' produces the best results with 45-50 buds per vine.

Resistance to diseases and unfavorable weather

This variety's susceptibility to *Plasmopara viticola* and to Gray Mold (*Botrytis cinerea*) is low, however it is sensitive to *Erysiphe necator*. Resistance to drought and frosts is high.

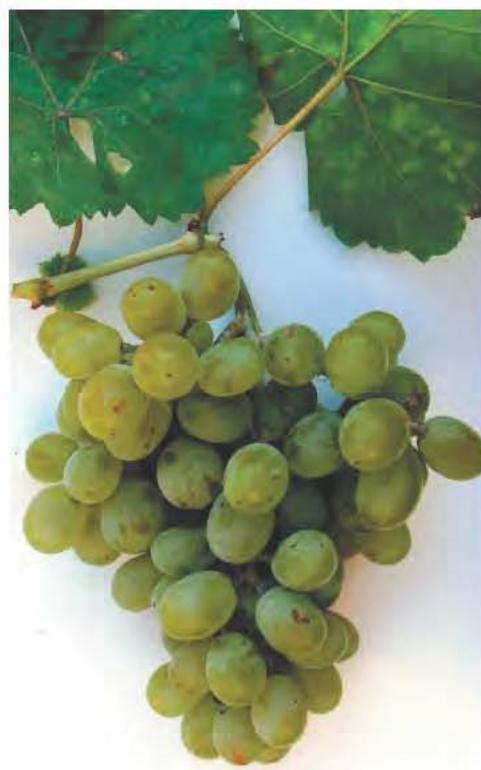
Juice characteristics

Sugar: 22.9 %

Total acidity: 3.9 g·L⁻¹

Wine and grape characteristics

'Ag Shany' is a high quality table grape variety with excellent sensorial characteristics.



Agdam Gyzyl Uzumu R.

Synonyms

Unknown

Meaning of the name

Agdam's Golden grape.

Historical notes and cultural importance

'Agdam Gyzyl Uzumu' is a native variety from the Agdam region. This is a rare grapevine variety. It is spread in the Agdam, Agjabedi, Barda districts of Azerbaijan mixed together with other varieties.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

Two variations of this variety were discovered in the Agdam district: 'Gyzyl Uzum Pink' and 'Gyzyl Uzum Dark Pink'. These variations are similar in most morphological traits and differ only in berry color.

Essential ampelographic characteristics (ATAKISHIYEV 1965)

Dense, grayish-ash or sometimes white, cobwebby hairs cover the tip of the young shoot and the following distal leaves.

The mature leaf is medium size, circular, dark green and three to five lobed. The leaf surface is smooth. The upper and lower leaf sinuses are shallow, V-shaped with a sharp base. The petiole sinus is open, arched with rounded or flat base, squared. The teeth at the ends of the lobes are narrow-triangular with a pointed tip. The lateral teeth are triangular with a pointed tip and convex sides. The lower leaf side is covered with loose cobwebby hairs.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical and medium dense.

The berry is medium size, circular, dark pink and covered with medium thick bloom. The skin is thin, firm and easy to peel. The flesh is juicy and meaty. The taste is pleasant.

Phenology

Time of bud burst: second ten days of April

Time of blooming: end of May

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 0.7

Shoot fertility coefficient (cluster per shoot): 1.3

Bunch size: 17-19 x 8-9 cm

Bunch weight: 160-186 g

Yield per vine: 4.0-4.8 kg

Yield: 11-12 t·ha⁻¹

Climate and cultivation requirements

'Agdam Gyzyl Uzumu' grows well in warm, low-land locations. It demands long pruning.

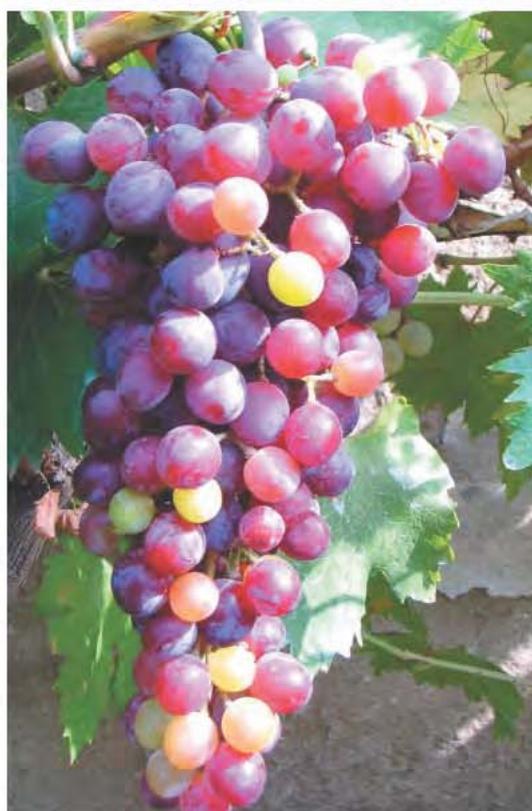
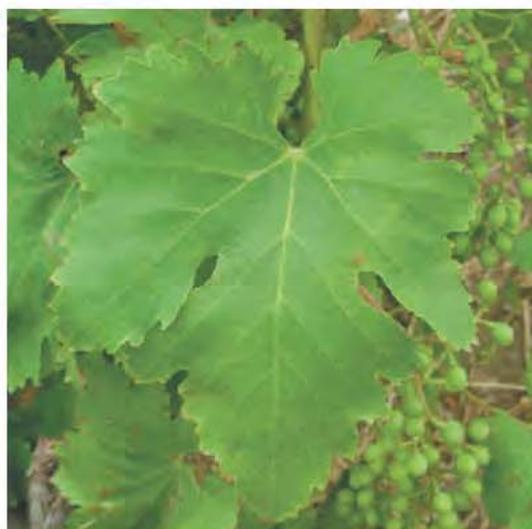
Resistance to diseases and unfavorable weather

The variety is relatively resistant to *Plasmopara viticola* and it is susceptible to *Erysiphe necator*. Drought-resistance is high.

Juice characteristics

Sugar: 17.5 -19.6 %

Total acidity: 5.0-6.4 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 9.4/10.

'Agdam Gyzy Uzun' is mainly used to make fortified sweet 'Porto' style wines and dry wines for brandy-making. This variety gives also good table wines, characterized by a slightly feeble taste, 10.0-12.0 % alcohol and 5.3-6.0 g·L⁻¹ total acidity. The wines are usually used to make brandy. This variety is also used locally for the production of a very concentrated boiled grape juice called Bekmez (Doshab) and for making jam. Due to its good sensorial characteristics, this grape is also used for fresh consumption.

Agdam Gyulabisi R.

Synonyms

'Marjeni', 'Dogereck Kyzyl', 'Baar Sibil' (in Dagestan, Russia)

Meaning of the name

Flower aroma - Gyulabi from Agdam.

Historical notes and cultural importance

'Agdam Gyulabasi' is a local variety of the Agdam district.

The variety is mostly used for making table and dessert wines. It is suitable also for making compote.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspiica* Negr.

Clones of this variety are identical according to their generative organs and some biological peculiarities. The variety's variability could come from one single progenitor, possibly the table grape variety called 'Gyulabi dagestanskyi'.

Essential ampelographic characteristics

The tip of the young shoot and the distal leaves are densely haired and with a pink edge. The leaves are green, shaded in yellow.

The mature leaf is large, kidney-shaped or rounded, five lobed. The lateral leaf sinuses are deep and triangular. The petiole sinus is closed. The teeth are rectilinear, narrow triangular. The teeth on the ends of lobes are triangular with sharp tip. The petiole is reddish-brown, and it is as long as the main vein.

The flower is hermaphrodite

The bunch is medium, cylindrical or cylindrical-conical and medium-dense.

The berry is round or oval, dark pink or purple. The skin is firm. The flesh is juicy. The taste is bitter - sweet and the flavor resembles the Muscat aroma.

Phenology

Time of bud burst: end of April

Time of blooming: middle of June

Time of veraison: middle of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 4-5 kg

Bunch weight: 230 g

Bud fertility: 0.9

Climate and cultivation requirements

The recommended bud load for 'Agdam Gyulabasi' is 9-12 buds/spur. The variety grows well on chestnut soils.

Resistance to diseases and unfavorable weather

The variety has medium resistance to *Plasmopara viticola*, *Erysiphe necator* and Gray Mold (*Botrytis cinerea*). Cold-hardiness is poor.

Juice characteristics

Sugar: 16.0-23.0%

Total acidity: 8.3-7.4 g·L⁻¹

Wine and grape characteristics

'Agdam Gyulabasi' is suitable for making high quality yellow-gold table wines. The variety is also suitable for making dessert wines.



Agdam Khazarisi B.

Synonyms

Unknown

Meaning of the name

Khazar = a local name of the Caspian Sea. Agdam = a name of the district in Azerbaijan.

Historical notes and cultural importance

'Agdam Khazarisi' is rare grape variety mostly found within the Agdam district, where it has been cultivated for a long time.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No biotypes and clones have been described so far.

Essential ampelographic characteristics (ATAKISHIYEV 1966)

The tip of the young shoot and the first three distal leaves are covered with dense cobwebby hairs, decreasing from the third leaf and below. The first leaf is yellow-green, the second and the third leaves are light green.

The mature leaf is medium size, circular and five-lobed. The upper leaf side is light-green and smooth. The upper leaf sinuses are shallow, V-shaped, sometimes closed, chinked with pointed bases. The lower leaf sinuses are slightly expressed. The petiole sinus is open, arched with pointed base or closed with lumen. The teeth at the ends of the lobes are triangular with a wide base. The lateral teeth are serriform with convex sides and a pointed tip. The lower leaf side is hairless.

The flower is female.

The bunch is large, cylindrical-conical, medium dense, sometimes very loose due to flower drop.

The berry is medium size, circular, green, tinted with yellow, brown-coloured spots appear on the skin of overripe berries. The skin is thick, firm, covered with medium dense bloom. The flesh is crispy. The juice is sufficiently pleasant, with no particular flavor.

Phenology

Time of bud burst: second ten days of April

Time of blooming: third ten days of June

Time of veraison: second ten days of August

Time of ripening: third ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility coefficient (cluster per winter bud): 0.9-1.1

Shoot fertility coefficient (cluster per shoot): 1.46

Bunch size: 16-24 x 8-12 cm

Bunch weight: 135-200 g

Yield per vine: 4.5-5.0 kg

Yield: 10-11 t·ha⁻¹

Climate and cultivation requirements

The variety gives high yield with long pruning. Fertilizers cause a significant increase in yield and in plant vigor. This variety is interesting for cultivation in the places with high temperature during vegetative period.

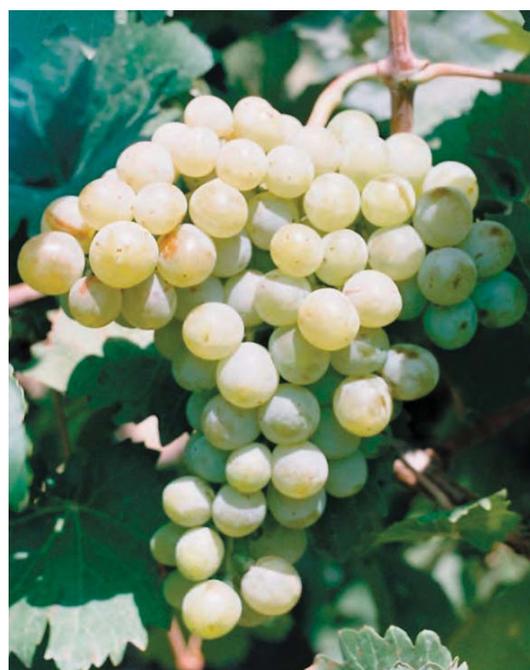
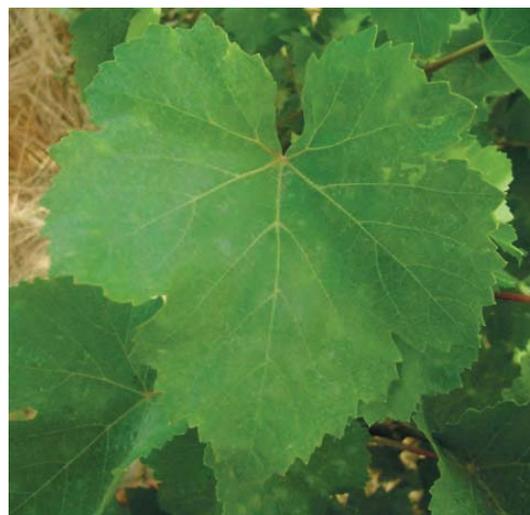
Resistance to diseases and unfavorable weather

The variety shows poor resistance towards *Plasmopara viticola* and high resistance to *Erysiphe necator*. 'Hachabash' is the best pollinator variety for 'Agdam Khazarisi'.

Juice characteristics

Sugar: 18.0-19.0 %

Total acidity: 4.0-4.8 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 9.2/10.

'Agdam Khazarisi' is widely used as a table grape variety and for the production of a specialty called 'Irchal' (concentrated grape juice with berries inside). Hanging grapes can be stored till March–April. This variety is suitable for long term storage and for transport. Under good storage conditions, taste and quality of the grapes improves over time. Among all the main table grape varieties of Azerbaijan, 'Agdam Khazarisi' is the most suitable for storage.

Ala Shany R.

Synonyms

Unknown

Meaning of the name

Shany = suitable for a king (shah). Ala = many colors.

Historical notes and cultural importance

'Ala Shany' has been grown in the Absheron peninsula for a long time. The variety is rarely spread in the vineyards of the Absheron peninsula in small plots or as single vines. It is recommended and encouraged within the Absheron peninsula itself, as well as in the Samur-Shabran region and in the Kyur-Araz lowlands of Azerbaijan. 'Ala Shany' is an interesting very early ripening table grape variety.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones or biotypes have been described so far.

Essential ampelographic characteristics (KASSIMOV 1973)

The tip of the young shoot and the first and the second distal leaves are covered with grayish-green dense bristled hair on both sides.

The mature leaf is large or medium, deeply five-lobed. The upper leaf sinuses are medium deep, closed, narrow elliptical with oval lumen. The teeth at the end of the lobes are triangular with a wide base, with a triangular-rounded tip and slightly convex sides. The petiole sinus is open, lyre-shape with pointed base. The lower leaf side is covered with medium dense, grayish-green bristle hair.

The flower is hermaphrodite.

The bunch is medium size or large, cylindrical-conical, winged and medium dense.

The berry is large, oval, sometimes rounded, dark pink; it becomes black-pink in full ripening. The skin is firm, thick, covered with a dense bloom. The flesh is meaty, crispy and juicy. The taste is harmonious and pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: third ten days of June

Time of veraison: second half of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 1.4

Bunch weight: 240-278 g

Bunch size: 14-22 x 12-16 cm

Yield per vine: 6.4-12.0 kg

Yield: 12-17 t·ha⁻¹

Climate and cultivation requirements

'Ala Shany' shows a vigorous growth when it is grown on fertile and irrigated soils. The variety requires long pruning and reacts positively to shoot tipping.

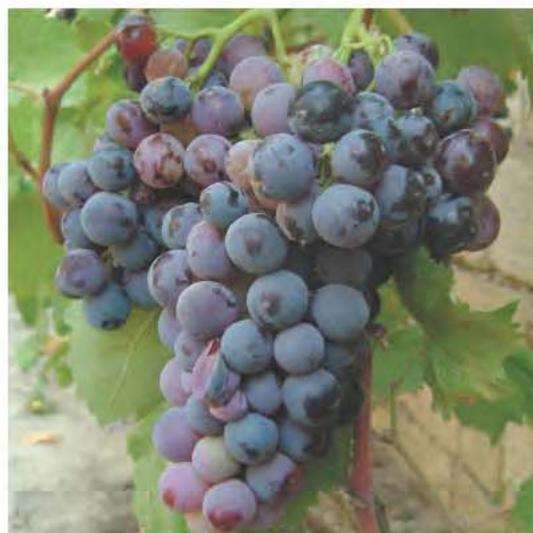
Resistance to diseases and unfavorable weather

The variety is relatively resistant to *Plasmopara viticola*, *Erysiphe necator* and drought.

Juice characteristics

Sugar: 17.0-20.0 g·L⁻¹

Total acidity: 6.0-7.0 g·L⁻¹



Wine and grape characteristics

'Ala Shany' is a late ripening table grape variety. It is locally used for fresh consumption, and it is also shipped to other cities of Azerbaijan. The grape has a pleasant harmonious taste and a wonderful appearance. Bunches and berries are large. Solidity of berries is medium.

Alykhanly Garagyozy N.

Synonyms

Unknown

Meaning of the name

Alikhanly's 'Black eyes' (Alikhanly is the name of a village in the Fizuli district).

Historical notes and cultural importance

'Alykhanly Garagyozy' is the ancient native grapevine variety of the Fizuli region of Azerbaijan and it has been cultivated in Garabagh-Mil for a long time.

Nowadays, this is a rare variety, spread in single vines growing over the trees, following the 'Khyabani' high-trunk training system.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

There are no described clones of this variety.

Essential ampelographic characteristics (AMANOV *et al.* 2003)

The tip of the young shoot and the distal leaves are dark red. The following young leaves are greenish with a copper tint.

The mature leaf is medium size, circular and three to five lobed. The leaf sinuses are shallow or medium deep and lyre-shape. The petiole sinus is open with a U-shaped base. The teeth at the end of the lobes are wide, large with convex sides, or cupola-shaped. The lateral teeth are large, triangular with convex sides and rounded tip, rarely triangular with a wide base. The peduncle is longer than the central vein. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is medium size, wide conic and dense.

The berry is medium size, oval or prolonged, black or dark blue. The skin is thick. The flesh is crispy. The juice is colorless. The taste is ordinary and pleasant.

Phenology

Time of bud burst: second ten days of April

Time of blooming: second ten days of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: vigorous

Bud fertility coefficient (cluster per winter bud): 1.11

Shoot fertility coefficient (cluster per shoot): 1.68

Bunch weight: 286 g

Bunch size: 16 x 12 cm

Yield per vine: 8.2 kg

Yield: 18.3 t·ha⁻¹

Climate and cultivation requirements

Long and medium pruning, high bud load and an expanse training system are recommended for this variety. 'Alykhanly Garagyozy' grows well on brown and dark brown soil.

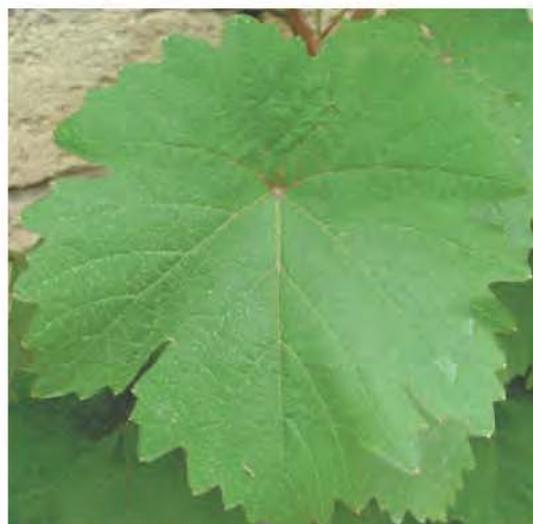
Resistance to diseases and unfavorable weather

'Alykhanly Garagyozy' is weakly susceptible to *Plasmopara viticola*. It shows high resistance to *Erysiphe necator* and medium resistance to the European grapevine moth (*Lobesia botrana*).

Juice characteristics

Sugar: 17.4 %

Total acidity: 4.26 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 9.6/10.

'Alykhanly Garagyozy' ripening timing is medium. It is a high quality table grape and it is used for local fresh consumption.

Alykhanly Kechimemesi B.

Synonyms

Unknown

Meaning of the name

Goat nipples from Alykhanly (Alykhanly is the name of a village in the Fizuli district).

Historical notes and cultural importance

'Alykhanly Kechimemesi' has been cultivated in the Fizuli district for a long time.

The variety is rarely spread in the old vineyards of the Fizuli region. It is recommended for cultivation in all regions of the Garabagh-Mil zone of Azerbaijan.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr. (SALIMOV 2000).

No clones or biotypes have been described so far.

Essential ampelographic characteristics (SALIMOV 2000)

The tip of the young shoot is green; the first, the second and the third leaves are light green and hairless. The axis of the young shoot is white-green.

The mature leaf is medium size or large, cordate, deeply five or seven-lobed with additional sinuses. The leaf blade is funnel-shaped with involute edges. The upper leaf sinuses are deep or very deep, open, lyre-shape with a narrow mouth and a pointed base; or closed with oval or elliptic lumen. The lower leaf sinuses are medium deep, open, lyre-shaped with narrow mouth and pointed base or with parallel sides and pointed base. The additional leaf sinuses are open and lyre-shaped. The petiole sinus is open, arched with a wide pointed base. The teeth at the end of the lobes are large, long, narrow-triangular with rectilinear sides and a pointed tip. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is medium size or large, branched or conical; medium-dense, loose or very loose.

The berry is large or very large, elongated, white; when overripe it becomes golden-yellow on the sun-exposed side.

Phenology

Time of bud burst: first-second ten days of April

Time of blooming: third ten days of May

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 1.23

Shoot fertility coefficient (cluster per shoot): 1.69

Bunch size: 13-15 x 8-12 cm

Bunch weight: 253 g

Yield per vine: 6.3-13.8 kg

Yield: 14.0-30.7 t·ha⁻¹

Climate and cultivation requirements

'Alykhanly Kechimemesi' grows well in light brown, brown and dark brown soils; in poor and stony soils it grows significantly less. Long pruning and the multi-branched 'fan like' training system are recommended. This variety is suitable for cultivation on the plain and pre-mountainous areas of Azerbaijan.



Resistance to diseases and unfavorable weather

The variety has medium resistance towards *Plasmopara viticola* and it has a satisfactory resistance towards *Erysiphe necator* and Gray Mold (*Botrytis cinerea*). Drought resistance and winter cold-hardiness is poor. 'Alykhanly kechimemesi' needs irrigation.

Juice characteristics

Sugar: 16.0 %

Total acidity: 5.97 g·L⁻¹

Wine and grape characteristics

Fresh grape sensorial grade is 9.0/10.

'Alykhanly Kechimemesi' is one of the best table grape varieties in Azerbaijan. It has a wonderful appearance and a pleasant taste with a harmonious combination of sugar and acidity. The grapes can be preserved on the vines. It is suitable for transportation and winter storage. The grapes are stored by hanging until March or April. The taste and quality of grapes improve over time in proper storage conditions.

Amiri B.

Synonyms

Unknown

Meaning of the name

Amir is the name of the first farmer growing this variety.

Historical notes and cultural importance

'Amiri' is a native variety from the Agdam region. According to local information, this variety is original of Low Garabagh, and it derives from wild grapes.

The variety is rarely spread in the regions of Western Azerbaijan and Low Garabagh.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones and biotypes have been described so far.

Essential ampelographic characteristics (MAMEDOV 1973)

The tip of the young shoot is light green and covered with weak hair. The first and the second leaf have a bronze tint that disappears from the third leaf; the following leaves are green.

The mature leaf is medium size, circular and five-lobed. The upper leaf side is plain and green. The upper leaf sinuses are medium-deep, close with narrow-elliptical lumen and pointed base. The lower leaf sinuses are chinked or V-shaped. The petiole sinus is open, arched, equilateral, rarely lyre-shape with a rounded base. The teeth at the end of the lobes are triangular with slightly convex sides. The lateral teeth are serriform and convex on one side. The lower leaf surface is hairless.

The flower is female.

The bunch is large, rarely medium, conical or cylindrical and medium-dense.

The berry is large, oval, greenish-yellow, covered with thin bloom. The skin is thick. The flesh is meaty, juicy, crispy and neutral.

Phenology

Time of bud burst: first half of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: first half of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: high

Bud fertility coefficient (cluster per winter bud): 0.90

Shoot fertility coefficient (cluster per shoot): 1.22

Yield per vine: 3.0-3.5 kg

Yield: 9-10 t·ha⁻¹

Bunch weight: 160-180 g

Bunch size: 18-20 x 9-10 cm

Climate and cultivation requirements

'Amiri' is characterized by vigorous growth in case of cultivation in fertile soils and in irrigation conditions. The variety needs long pruning and it reacts positively to tipping.

Resistance to diseases and unfavorable weather

Susceptibility to *Plasmopara viticola* and *Erysiphe necator* is medium. Drought-resistance is medium.

Juice characteristics

Sugar: 17.5 %

Total acidity: 5.5 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 8.8/10.

'Amiri' is mostly used for fresh consumption. It is remarkable for its wonderful appearance and harmonious taste. Due to its firm skin, this variety is suitable for long distance transport.

Arayatly Gara Uzun N.

Synonyms

'Sharabi'.

Meaning of the name

Black grape from Arayatly (Arayatly is the name of a village in the Fizuli district).

Historical notes and cultural importance

'Arayatly Gara Uzun' is a native wine variety of the Grabagh region. The variety is rarely spread in single vines in the old vineyards around the villages of Arayatly, Alykhanly, Ahmedbeili and Behmenli in the Fizuli district. It is grown on the 'Khiyabani' high trunk training system

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr. (SALIMOV 2003).

No variations, clones or biotypes have been described so far.

Essential ampelographic characteristics (SALIMOV 2003)

The tip of the young shoot is green with slight brown spots. The distal leaves are green.

The mature leaf is medium size, circular and three or five lobed. The upper leaf sinuses are medium deep, closed, frequently open with an elliptic-shaped lumen. The lower leaf sinuses are closed, often opened with an oval lumen; or lyre-shaped with narrow mouth and sharp base and shallow. The petiole sinus is open, lyre-shaped with rounded base or arched with narrow and rounded base. The teeth at the end of the lobes are large, long, narrow triangular or triangular, with a sharp tip. The lateral teeth are small, serriform and with a sharp tip. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is medium size or large, wide conic or cylindrical and dense.

The berry is medium size or large (15-18 x 14.5-17.5 mm), rounded and black. The skin is medium thick. The flesh is colorless and juicy with a pleasant taste.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: end of August - first ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: vigorous

Bud fertility coefficient (cluster per winter bud): 1.37

Shoot fertility coefficient (cluster per shoot): 1.88

Bunch size: 13-16 x 7-9 cm

Bunch weight: 180 g

Yield per vine: 7.6 kg

Yield: 16.9 t·ha⁻¹

Climate and cultivation requirements

Since the fruiting shoots of 'Arayatly Gara Uzun' often grow between the 5th and the 12th bud, long cane pruning (12-16 buds per cane) is recommended. This variety grows well on light-brown and brown soils and under irrigation conditions.

Resistance to diseases and unfavorable weather

This variety is sufficiently resistant to Gray Mold (*Botrytis cinerea*). Susceptibility to European grapevine moth (*Lobesia botrana*) is low. Resistance to *Plasmopara viticola* is medium. Drought resistance is high. Flower drop and berry shot is minor.



Juice characteristics

Sugar: 18.3 %

Total acidity: 6.0 g·L⁻¹

Wine and grape characteristics

'Arayatly Gara Uzum' is one of the most valuable wine varieties of Azerbaijan. It is suitable for making table and dessert wines, brandy and grape juices. The red table wine made from this variety deserves a special attention. The sensorial grade of the wine is 9.0-9.5/10. Also very concentrated boiled juices called Bekmez and Doshab are produced locally.

Arna - Grna B.

Synonyms

'Arevick', 'Alagura', 'Khana Kyrna' (in Armenia)

Meaning of the name

Pick every time if you wish.

Historical notes and cultural importance

'Arna - Grna' is a rare grape variety. It is recommended for making dry table wines, fortified wines and raisins. The grapes are also consumed fresh by the local population.

There is no reliable information about the origin of 'Arna-Grna'. This variety has been cultivated over 200 years in the vineyards of Nakhchivan together with other grapes, mainly with the cultivar 'Ag Aldara'. At present, it occupies 30-40 % of total vineyard area of Nakhichevan.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

Many biotypes of 'Arna-grna' have been detected. One of them has hermaphrodite flower. Another second has a bunch with large berries, so it is more suitable as a table grape. Both biotypes are late ripening. No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot is green with red stripes. The first distal leaves are bronze and five lobed. The lower leaf side is covered with sparse hairs. The mature leaf is medium, pentagonal and five lobed. The lower leaf side is hairless. The lateral leaf sinuses are shallow or medium deep and triangular. The petiole sinus is open, arched, rarely narrow, with a sharp bottom. The teeth are convex: the teeth towards the end of the main veins are larger, elongated and pointed. The petiole is pink and shorter than the main vein. The flower is female.

The bunch is large, conical, shouldered and of medium density.

The berry is rounded and greenish-yellow. The skin is thick and firm. The flesh is juicy and crispy. The taste is ordinary and astringent.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second half of August

Time of ripening: first half of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Bunch weight: 252 g

Bud fertility: 0.8

Yield per plant: 4-5 kg

Climate and cultivation requirements

'Arna - Grna' is characterized by a long vegetative period and a good cane maturation. It is suitable for cultivation on the plain.

Resistance to diseases and unfavorable weather

'Arna - Grna' has a relative resistance to *Plasmopara viticola* and *Erysiphe necator*. Its resistance to Gray Mold (*Botrytis cinerea*) is high. It is drought-resistant.

Juice characteristics

Sugar: 19.0-22.0 %

Total acidity: 3.3 g·L⁻¹

Wine and grape characteristics

This variety 'Arna - Grna' is used for making dry table wines or strong wines with 17 % of alcohol content, 70 g·L⁻¹ sugar and 5 g·L⁻¹ of total acidity. The wines are characterized by rich and harmonious fruity flavor.



Askeri B.

Synonyms

'Eskeri' (Turkmenistan), 'Nazeli' (Armenia)

Meaning of the name

Asker is one of the most common masculine first names in Azerbaijanian.

Historical notes and cultural importance

The table grape variety 'Askeri' is included in the 'List of Standard Varieties' recommended for cultivation in Azerbaijan. Its distribution is sufficient.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No clones have been detected so far.

Essential ampelographic characteristics (ALIYEV and NAJAFOFF 1973)

The tip of the young shoot is covered with weak hairs. The first and the second leaves are shiny, yellow, tinted with gold. The lower side of the leaves are covered with hairs, which disappear from the third leaf.

The mature leaf is medium size, circular and five-lobed. The upper leaf side is shiny, smooth and green-colored. The edges of the leaf blade are folded towards the middle of the vein, giving the leaf a funnel-like shape. The upper leaf sinuses are deep, overlapped with oval lumen and sharp base. The petiole sinus is open, arched with a sharp base. The teeth at the ends of the lobes are stretched. The lateral teeth are triangular with rectilinear or slightly stretched sides. The lower leaf side is hairless. The peduncle is longer, sometimes shorter than the central vein.

The flower is hermaphrodite.

The bunch is medium size or large, conical or widely conical and loose.

The berry is medium size, greenish-yellow, covered with thin bloom. The skin is thin and not firm. The flesh is juicy, melting, and moderately sweet, sometimes with a weak herbaceous flavor. The berry has very soft and small seeds.

Phenology

Time of bud burst: first half of April

Time of blooming: the first half of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: medium

Bud fertility coefficient (cluster per winter bud): 1.2

Shoot fertility coefficient (cluster per shoot): 1.4

Bunch size: 12-24 x 6-11 cm

Bunch weight: 130 g

Yield per vine: 3.2 kg

Yield: 14 t·ha⁻¹

Climate and cultivation requirements

"Fan like" and low-trunk training systems with many fruity spurs and long cane pruning are recommended for 'Askeri'. The variety is sensitive to water stress, thus it needs irrigation. It is suitable for cultivation on the plain and pre-mountainous areas of Azerbaijan.

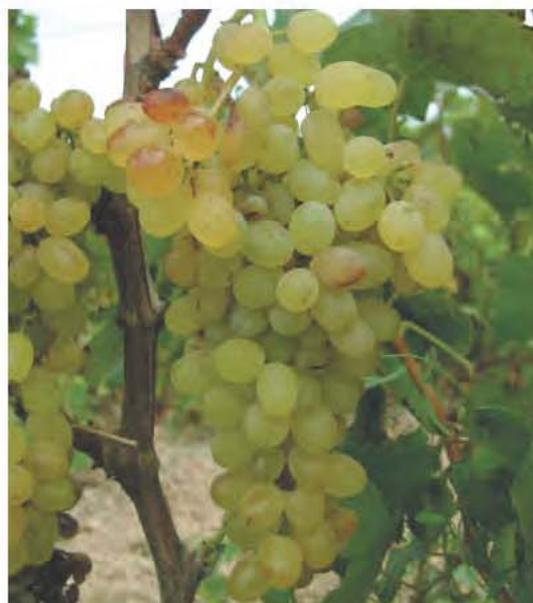
Resistance to diseases and unfavorable weather

'Askeri's resistance to *Plasmopara viticola* and *Erysiphe necator* is poor.

Juice characteristics

Sugar: 22.9 %

Total acidity: 3.1 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 9.0/10.

The variety is suitable for drying. According to raisin quality, 'Askeri' is comparable to the 'Ag Kishmish'. 'Askeri' raisins contain 82.7 % dry matter and 17.95 % sugar. The raisins' drying rate is 28.5 %.

'Askeri' grapes are also used for fresh consumption. It has large berries, thin skin, beautiful coloration and harmonious taste, it is sweet and balanced.

Bayanshira B.

Synonyms

'Bayanshirey', 'Ag Shirey', 'Ag Uzum'

Meaning of the name

The name derives from Bayan, a village in the Dashkesan district.

Historical notes and cultural importance

'Bayanshira' is a native variety from the Dashkesan district.

The variety is the leading, high yielding and most widespread white wine grape variety in Azerbaijan. It is included in the 'List of Standard Varieties', recommended for cultivation in Azerbaijan and in Middle Asia.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

'Bayanshira' has a variation showing berry shot, well-developed stamens and non-developed pistils.

Essential ampelographic characteristics (MEHDIEV 1973)

The tip of the young shoot is light bronze. Hairiness is from weak-cobweb to dense-felt. The first, the second and sometimes the third leaf are light bronze. The shoot axis is edged with loose cobwebby hairs; the back side of the first to the third internodes is light bronze changing to greenish-pink below.

The mature leaf is large, circular and five-lobed. The leaf blade is plain, sometimes creased or funnel-shaped. The upper leaf sinuses are medium, closed with elliptic lumen and pointed base. The lower leaf sinuses are similar. The petiole sinus is open, lyre-shaped with a pointed base, sometimes arched or closed, elliptical, overlapped. The teeth at the ends of the lobes may be triangular with pointed tip or serriform with convex sides and a pointed tip. The lower leaf side is hairless. The veins are covered with weak bristles.

The flower is hermaphrodite.

The bunch is medium size or large, cylindrical-conic, dense or medium dense.

The berry is medium size or large, rounded and greenish-yellow. In case of over ripening, brown-colored spots appear on the skin. The skin is covered with bloom. The taste is ordinary.

Phenology

Time of bud burst: second half of April

Time of blooming: the third ten days of May

Time of veraison: first half of August

Time of ripening: second half of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 1.05

Shoot fertility coefficient (cluster per shoot): 1.36

Bunch size: 13-20 x 7-12 cm

Bunch weight: 230-360 g

Yield per vine: 9.0-13.5 kg

Yield: 20-30 t·ha⁻¹

Climate and cultivation requirements

'Bayanshira' is well responsive in good growing conditions. Proper vineyard management, high vine vigor, high bud fertility and large bunches are the key to the high productivity of this variety. A high number of fruiting shoots is required to increase yield when the vines are in good nutritional status.

Resistance to diseases and unfavorable weather

Resistance to *Plasmopara viticola* and *Erysiphe necator* is medium. Cold-hardiness is medium. Drought-resistance is good: high yield capacity in non-irrigated vineyards was reported for this variety.



Juice characteristics

Sugar: 16.5-21.4 %

Total acidity: 3.8-6.9 g·L⁻¹

Wine and grape characteristics

'Bayanshira' grapes are used in the production of sparkling and table wines, brandies and juices. A limited quantity is also used for fresh consumption, and the grapes can be stored for 3-4 months.

Bendi B.

Synonyms

Unknown

Meaning of the name

Knot; hard (the bunch's peduncle is very firmly fixed to the shoot, thus the name)

Historical notes and cultural importance

The variety is rarely spread in the vineyards of Nakhchyvan.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No biotypes and clones have been described so far.

Essential ampelographic characteristics (ALIYEV 1973)

The tip of the young shoot is light bronze and it is covered with weak cobwebby hairs.

The mature leaf is medium size, circular and five-lobed. Rarely leaves may be slightly stretched in width. The leaf surface is reticular-wrinkled. The leaf blade is smooth. The upper leaf sinuses are medium deep, rarely deep, overlapped with oval or triangular lumen. The lower leaf sinuses are shallow, open, U-shaped and hardly visible. The petiole sinus is open, lyre-shaped with a pointed base. The teeth at the ends of the lobes are cupola-shaped, seldom triangular with convex sides and pointed tip. The lateral teeth are high, cupola-shaped and wide-based. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is medium size or large, conical or cylindrical, winged, dense or very dense.

The berry is large, oval, symmetric, wider in the middle, greenish-yellow. At full ripening the berries acquire a pink tint on the sun side. The skin is thick, light yellow with weak bloom. The flesh is meaty, juicy and sweet. The berries carry two or three seeds.

Phenology

Time of bud burst: second ten-day of April

Time of blooming: first half of June

Time of veraison: first half of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility coefficient (cluster per winter bud): 0.8-1.0

Shoot fertility coefficient (cluster per shoot): 1.42

Bunch size: 11-20.5 x 7-13.0 cm

Bunch weight: 240-336 g

Yield per vine: 2.2-2.5 kg

Yield: 15-28 t·ha⁻¹

Climate and cultivation requirements

'Bendi' belongs to Nakhchyvan's high-yield grape varieties. In order to increase yield, it is recommended to intensify bud load, to remove non-fertile shoots and to regulate the vegetative growth by canopy management operations.

Resistance to diseases and unfavorable weather

Susceptibility towards *Plasmopara viticola* and *Erysiphe necator* is lower than that of other varieties of the region. It is more resistant to drought and frost.

Juice characteristics

Sugar: 17.0-21.9 %

Total acidity: 4.0-6.0 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 7.9/10.

'Bendi' is suitable for fresh consumption and for raisin production. This variety is resistant to transport and it keeps on the vines until the autumnal frosts. It is suitable for winter storage, and in proper conditions it keeps until April. This variety has beautiful bunches and berries.

Boyakhany N.

Synonyms

Unknown

Meaning of the name

Paint, henna

Historical notes and cultural importance

There is no exact information about the origin of 'Boyakhany'. This is a rarely spread grapevine variety. It should be propagated for better evaluation.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

No clones of the variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are yellow-green and hairless.

The mature leaf is medium or large, almost rounded and five lobed. The lateral leaf sinuses are deep or medium deep, closed, narrow elliptical. The petiole sinus is open, deep and vaulted. The teeth are triangular-serriform, in the end of the lobes they are triangular with a curved tip. The petiole is longer than the main vein.

The flower is hermaphrodite.

The bunch is large, cylindrical-conical, winged and dense.

The berry is medium, rounded and black. The skin is medium-thick. The flesh is juicy. The taste is harmonious. The juice is colored.

Phenology

Time of bud burst: second ten days of April

Time of blooming: second ten days of May

Time of veraison: first ten days of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Yield per plant: 3.0-4.0 kg

Bunch weight: 375 g

Bud fertility: 0.9

Climate and cultivation requirements

The 'fan like' training system with several spurs is recommended for this variety, better in irrigated conditions.

Resistance to diseases and unfavorable weather

'Boyakhany' shows medium resistance to fungal diseases.

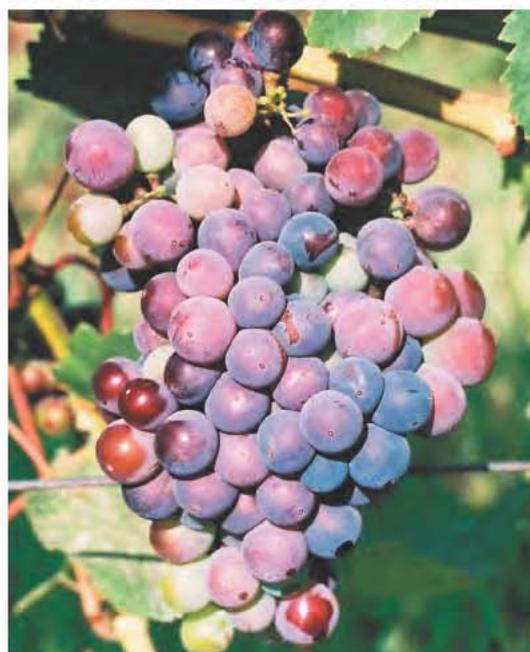
Juice characteristics

Sugar: 22.2%

Total acidity: 4.5 g·L⁻¹

Wine and grape characteristics

'Boyakhany' is mostly used for making assembled red table wines, in blend with other grapes.



Cherez N.

Synonyms

Unknown

Meaning of the name

Blend of dried fruits.

Historical notes and cultural importance

'Cherez' is a local variety of Azerbaijan.

It is a high-quality prospective table grape variety.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of the variety have been described yet.

Essential ampelographic characteristics

The tip of the young shoot and the following distal leaves are green with narrow pink edge and tuft.

The mature leaf is medium, rounded and five lobed. The leaf blade is involute. The lateral leaf sinuses are medium-deep and narrow elliptical. The petiole sinus is lyre-shaped. The teeth are cupola-shaped; in the end of the lobes they are triangular with convex sides. The petiole is colored and as long as the main vein or a little shorter.

The flower is hermaphrodite

The bunch is large, cylindrical, medium-dense or sparse.

The berry is large, oval and black. The skin is medium-firm. The flesh is pulpy and juicy.

Phenology

Time of bud burst: first ten days of April

Time of blooming: third ten days of June

Time of veraison: second ten days of August

Time of ripening: end of August - beginning of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Yield per plant: 10.0-13.0 kg

Bunch weight: 460 g

Bud fertility: 1.28

Climate and cultivation requirements

'Cherez' is mostly productive with the "fan like" training system on vertical trellises, with several spurs and irrigation.

Resistance to diseases and unfavorable weather

Plasmopara viticola and *Erysiphe necator* resistance is relatively high. The variety is not susceptible to Gray Mold (*Botrytis cinerea*). Cold-hardiness is poor.

Juice characteristics

Sugar: 23.0 -24.0 %

Total acidity: 5.0-7.5 g·L⁻¹

Wine and grape characteristics

'Cherez' is a local table grape variety.



Dana Burnu B.

Synonyms

Unknown

Meaning of the name

Cow nose.

Historical notes and cultural importance

'Dana Burnu' is rarely spread, but it is recognized as prospective for distribution in all areas of the Garabagh-Mil and Gyanja-Gazakh regions of Azerbaijan.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspiica* Negr.

No biotypes and clones of the variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot is light-green and hairless. The lower side of the first and second distal leaves is hairless, tinted with light red.

The mature leaf is large, circular, slightly five-lobed, sometimes whole. The leaf blade is bent. The upper leaf side is smooth and blistering. The upper leaf sinuses are shallow, open, chinked or U-shaped. The lower leaf sinuses are very shallow or absent. The petiole sinus is open, deep and lyre-shaped. The teeth at the ends of the lobes are triangular with a pointed tip. The lateral teeth are serriform, triangular, small and large. All veins on the lower leaf side are covered with short bristle hairs.

The flower is hermaphrodite.

The bunch is medium size or large, conical, dense, sometimes loose.

The berry is large, reverse oval, light green, tinted with light amber on the sun side. The skin is covered with dense bloom. On the skin there are small grey spots. Thickness of the skin is medium. The flesh is colorless, succulent, of neutral taste.

Phenology

Time of bud burst: second ten days of April

Time of blooming: third ten days of May

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 0.86

Shoot fertility coefficient (cluster per shoot): 1.50

Bunch size: 16-22 x 10-15 cm

Bunch weight: 286.8 g

Yield per vine: 4.6-6.8 kg

Yield per shoot: 10.2-15.1 t·ha⁻¹

Climate and cultivation requirements

'Dana Burnu' prefers light brown and brown soils. It gives higher yield with irrigation. It demands long pruning (12-14 buds). 'Dana Burnu' is very sensitive to water deficit and it needs irrigation. It is suitable for cultivation on the plain and pre-mountainous areas of Azerbaijan.

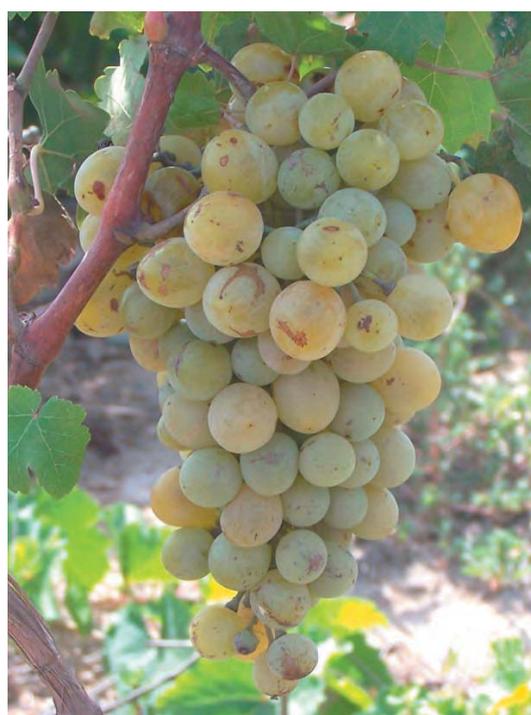
Resistance to diseases and unfavorable weather

The variety is susceptible to *Plasmopara viticola* and relatively susceptible to *Erysiphe necator* and Gray Mold (*Botrytis cinerea*). Drought-resistance and frost-hardiness is very poor.

Juice characteristics

Sugar: 17.0-21.0 %

Total acidity: 7.2-5.8 g·L⁻¹



Wine and grape characteristics

'Dana Burnu' is used for making light white table wines and, locally, for fresh consumption. The table wines are moderately alcoholic and have a sufficiently high acidity. The grapes are used for making dessert wines, grape juices and locally for the production of a very concentrated boiled juice called Bekmez or Doshab.

Deve Gyozu B.

Synonyms

Unknown

Meaning of the name

Camel's eye.

Historical notes and cultural importance

There is no reliable information about the origin of the variety 'Deve Gyozu'. It is spread in the old vineyards as a high-trunk vine growing over trees. The variety is rarely spread. The grape is used locally for fresh consumption.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot is green with red stripes. The first distal leaves are green tinted with yellow.

The mature leaf is medium size, rounded, three to five lobed. The lower leaf surface is covered with hairs. The lateral leaf sinuses are medium, hardly visible or V-shaped. The petiole sinus is vaulted and deep, sometimes wide with round bottom. The teeth are serriform with convex sides, in end of the lobes they are triangular with convex sides and sharp tip. The petiole is shorter than the main vein and light green.

The flower is hermaphrodite.

The bunch is small, conical and sometimes formless.

The berry is large, oval and greenish-yellow.

Phenology

Time of bud burst: second ten days of April

Time of blooming: end of May

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Yield per plant: 4.5-5.1 kg

Bunch weight: 374-386 g

Bud fertility: 0.8

Climate and cultivation requirements

'Deve Gyozu' grape is characterized by a medium vegetative period and good cane maturation. It is suitable for cultivation in plain areas.

Resistance to diseases and unfavorable weather

The variety has medium resistance to fungal diseases and frost and it shows high resistance to drought.

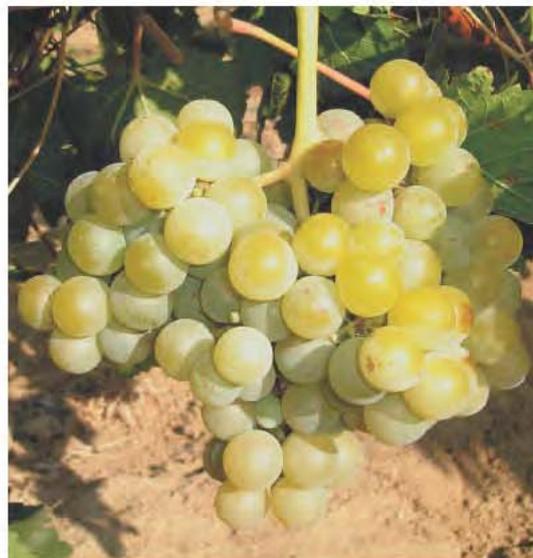
Juice characteristics

Sugar: 16.0 %

Total acidity: 6.2 g·L⁻¹

Wine and grape characteristics

'Deve Gyozu' is mostly used fresh. It is suitable for making a boiled concentrated grape juice Bekmes (Doshab) and common grape juice.



Et Marandi R.

Synonyms

Unknown

Meaning of the name

Pulpy Marandi.

Historical notes and cultural importance

'Et Marandi' is a local grape variety. It is original of the Agdam region in Azerbaijan.

The variety is rarely spread in the old vineyards of the Agdam and Gyanja regions in separate plots or as single vines.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No biotypes and clones have been described so far.

Essential ampelographic characteristics (ATAKISHIYEV 1966)

The tip of the young shoot is light green and it is covered with weak hairs. The first and the second distal leaves have a reddish shade and they are covered with felt hairs on both sides.

The mature leaf is medium-large, circular, five-lobed, light green. The leaf blade is smooth. The upper leaf sinuses are shallow, open, U-shaped, rarely overlapped with a narrow elliptic lumen. The lower leaf sinuses are slightly expressed, lyre-shape with almost parallel sides and a sharp base. The petiole sinus is open, squared with pointed base. The teeth at the end of the lobes are triangular with slightly convex sides. The lateral teeth are triangular with slightly convex sides and a pointed tip. The lower leaf side is hairless.

The flower is female.

The bunch is large, cylindrical-conic and medium dense.

The berry is large, rounded and pink. The skin is firm, covered with a medium dense bloom, easy to peel off. The flesh is juicy and meaty. The juice is colorless and medium sweet. The taste is pleasant.

Phenology

Time of bud burst: second ten days of April

Time of blooming: third ten days of May

Time of veraison: first half of August

Time of ripening: first half of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: high

Bud fertility coefficient (cluster per winter bud): 0.70

Shoot fertility coefficient (cluster per shoot): 1.23

Bunch size: 18-23 x 10-12 cm

Bunch weight: 220-290 g

Yield per vine: 3.2-3.6 kg

Yield: 7-8 t·ha⁻¹

Climate and cultivation requirements

'Et Marandi' belongs to the medium-late ripening varieties. On fertile soils and in irrigated conditions the variety grows vigorously. It gives high-quality grape when it is cultivated on chestnut soils.

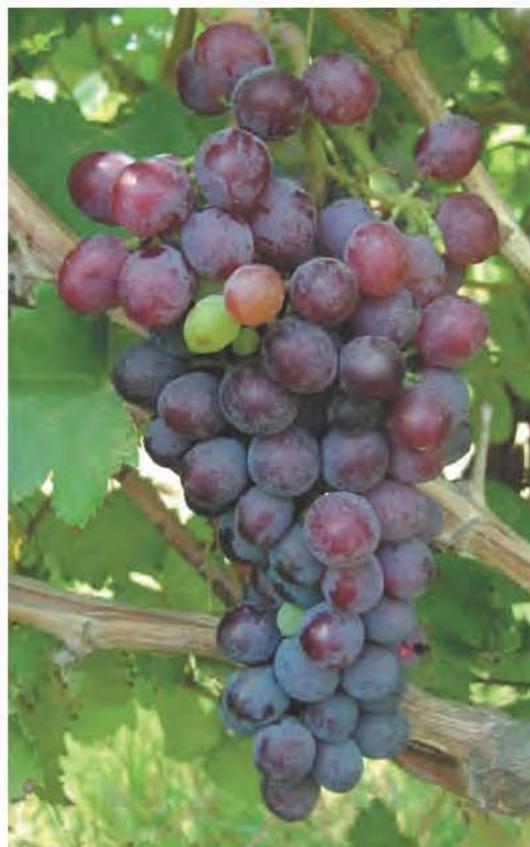
Resistance to diseases and unfavorable weather

The variety has low susceptibility to *Plasmopara viticola* and *Erysiphe necator*. It is not damaged by European grapevine moth (*Lobesia botrana*). Drought-resistance is comparatively high.

Juice characteristics

Sugar: 16.1-22.0 %

Total acidity: 3.8-5.7 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 8.6/10.

'Et Marandi' grapes are mostly used for fresh consumption. Some grapes are transported into other districts. The grapes have a wonderful appearance, large beautiful bunches and pink-colored large berries with pleasant taste. The firmness of the grape's skin allows long-term storage. Harvest is usually late.

Fatmayi B.

Synonyms

Unknown

Meaning of the name

Fatmayi is a village situated in the Absheron district.

Historical notes and cultural importance

'Fatmayi' is spread as single vines in the old vineyards of the village of Fatmayi in the Absheron district.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No clones from this variety are described.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are green with a bronze tint and hairless.

The mature leaf is medium, rounded and five lobed. The lateral leaf sinuses are medium-deep, closed, with an oval lumen. The petiole sinus is open and lyre-shaped. The lateral teeth and the teeth on end of the lobes are triangular, with a wide base and a cupola-shaped tip. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium, cylindrical and dense.

The berry is medium, rounded and white with a golden tint. The skin is thick. The flesh is pulpy and juicy. The taste is ordinary.

Phenology

Time of bud burst: second ten days of April

Time of blooming: end of May

Time of veraison: middle of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 4.0-5.0 kg

Bunch weight: 180 g

Bud fertility: 0.9

Climate and cultivation requirements

'Fatmayi' is characterized by a medium vegetative period and good cane maturation. It is more productive with the 'fan like' training system with several spurs.

Resistance to diseases and unfavorable weather

The variety has medium resistance to *Plasmopara viticola*, *Erysiphe necator* and Gray Mold (*Botrytis cinerea*).

Juice characteristics

Sugar: 18.0-19.0 %

Total acidity: 5.0-5.5 g·L⁻¹

Wine and grape characteristics

'Fatmayi' is a local table grape variety.



Gara Khazani N.

Synonyms

Unknown

Meaning of the name

Khazani black.

Historical notes and cultural importance

'Gara Khazani' is a local rare variety of the Nakhchivan region.

Taxonomy and intra-variety variability

Vitis orientalis subproles *antasiatica* Negr.

No clones of 'Gara Khazani' have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are grayish-green with weak hairs.

The mature leaf is large, rounded, five to seven lobed. The lateral leaf sinuses are medium deep. The petiole sinus is lyre-shaped. There are sparse bristles along the main veins on the lower leaf surface.

The flower is hermaphrodite.

The bunch is large, conical and sparse.

The berry is large and elongated with black color. The flesh is very soft and melting.

Phenology

Time of bud burst: first ten days of April

Time of blooming: middle of May

Time of veraison: second ten days of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3.0-4.0 kg

Bunch weight: 180-200 g

Bud fertility: 0.8

Climate and cultivation requirements

'Gara Khazani' has good cane maturation. The variety produces the best results with 45-50 buds per vine. It grows well on chestnut soils.

Resistance to diseases and unfavorable weather

This variety has medium resistance to *Plasmopara viticola* and considerable resistance to *Erysiphe necator*.

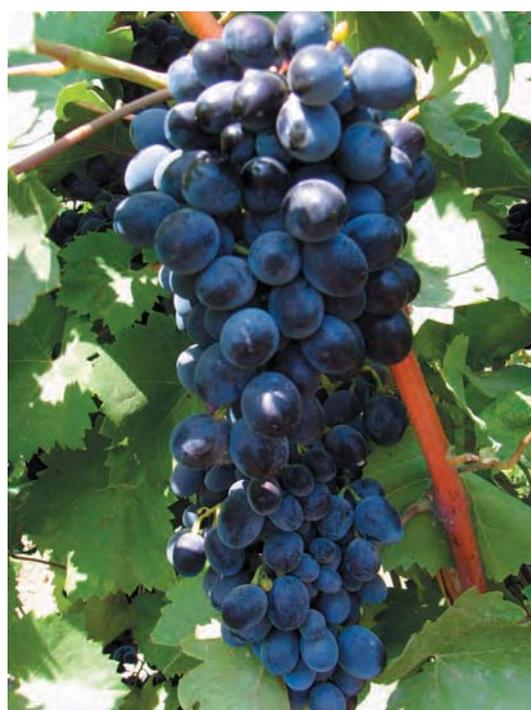
Juice characteristics

Sugar: 19.0-20.0 %

Total acidity: 3.0-4.5 g·L⁻¹

Wine and grape characteristics

'Gara Khazani' is a table grape variety suitable for fresh consumption.



Gara Kishmish N.

Synonyms

'Kishmish Sio', 'Shuvargany', 'Shubirxany' (Middle Asia), 'Kishmish Chernyi' (Russia), 'Black Monucca' (USA)

Meaning of the name

Black raisin.

Historical notes and cultural importance

'Gara Kishmish' is one of the main table grape varieties of Nakhchivan. The variety is included in the "List of Standard Varieties" recommended for cultivation in Azerbaijan. 'Gara Kishmish' is the most valuable high-quality table grape variety for both fresh consumption and raisin production.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot is light green and covered with weak cobwebby hairs, diminishing from the tip to the base of the shoot. The distal leaves are light green with reddish-bronze edges. Cobwebby hairs cover the lower side of the leaves.

The mature leaf is medium size, circular and three lobed. The leaf blade is funnel-shaped, undulated or creased. The upper leaf side is dark green and the lower side is green and not glossy. The upper and lower leaf sinuses are sharp and stretched. The petiole sinus is open and narrow elliptic. The teeth at the ends of the lobes are well expressed, rectilinear or serriform with convex sides and a pointed tip. The lateral teeth are upright or serriform with convex sides and a pointed tip. The leaf is hairless.

The flower is hermaphrodite.

The bunch is large, cylindrical or conical, sometimes winged, loose and seldom dense.

The berry is medium size, oval with rounded tip and flattened base, black with a thick bloom giving the berries a blue tint. The skin is thin, easy to cut. The juice is colorless, high in sugar and without aroma. The berry is seedless.

Phenology

Time of bud burst: second half of April

Time of blooming: first ten days of July

Time of veraison: third ten days of July

Time of ripening: third ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility coefficient (cluster per winter bud): 0.40

Shoot fertility coefficient (cluster per shoot): 0.96

Bunch size: 20 x 10 cm

Bunch weight: 160-250 g

Yield per vine: 2.8-4.0 kg

Yield: 7.5-10.7 t·ha⁻¹

Climate and cultivation requirements

The variety demands long pruning, expanse "fan like" or cordon training system and high bud load. Although the variety is relatively drought resistant, in case of irrigation it grows better and gives richer crop. 'Gara Kishmish' prefers stony-shelly soils.

Resistance to diseases and unfavorable weather

'Gara Kishmish' is relatively drought-resistant. The variety is resistant to fungal diseases but is very sensitive to European grapevine moth (*Lobesia botrana*).



Juice characteristics

Sugar: 20.5-24.0 %

Total acidity: 4.5-5.1 g·L⁻¹

Wine and grape characteristics

'Gara Kishmish' is an early-ripening table grape variety. It is mainly used for fresh consumption. It is also used for raisin production. The variety is resistant to transport, but it is not suitable for storage.

Gara Kyurdashy N.

Synonyms

Unknown

Meaning of the name

Kyurdashy black.

Historical notes and cultural importance

'Gara Kyurdashy' is a local variety of Nakhchivan. The oldest plantings of 'Gara Kyurdashy' date back to end of the 19th century.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are covered with felt hairs, which disappear on the subsequent leaves.

The mature leaf is medium, almost rounded, slightly stretched in width and five lobed. The lateral leaf sinuses are deep with oval or triangular lumen. The petiole sinus is open, lyre-shaped with a plain base. The teeth are serriform and convex; the teeth at the end of the lobes are triangular with a sharp tip. The lower leaf surface is covered with weak cobwebby hairs. The petiole is red, shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium, conical and dense.

The berry is large, oval and dark blue. The skin is medium thick and firm.

The flesh is pulpy and juicy. The taste is sweet and pleasant. The juice is colorless.

Phenology

Time of bud burst: second ten days of April

Time of blooming: beginning of June

Time of veraison: middle of July

Time of ripening: middle of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 3.2-4.3 kg

Bunch weight: 174 g

Bud fertility: 0.9

Climate and cultivation requirements

'Gara Kyurdashy' is most productive when the vines are grown on a bilateral 'fan like' training system with 45-50 buds per vine. Three to five irrigation treatments per season are recommended.

Resistance to diseases and unfavorable weather

The variety has medium resistance to *Plasmopara viticola* and *Erysiphe necator*.

Juice characteristics

Sugar: 27.0 %

Total acidity: 4.2 g·L⁻¹

Wine and grape characteristics

'Gara Kyurdashy' is an interesting table grape variety with excellent sensorial characteristics, beautiful appearance, transport resistance and storage ability. It is used for fresh consumption.



Gara Shany N.

Synonyms

'Cazbinka Chornaya' (in Astrakhan and Volgograd regions of Russia)

Meaning of the name

Shany = suitable for the King (Shah). Gara = Black.

Historical notes and cultural importance

'Gara Shany' is a native variety of the Absheron peninsula. This variety is widespread in the neighbor districts of Absheron like Shebran, Divichi, Khachmaz, Gusar and Shamakhy, as well as in almost all the other districts of Azerbaijan.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

'Gara Shany' has two biotypes differentiated by the larger bunches and a higher productivity.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are slightly colored in pink and covered with dense hairs. The upper surfaces of young leaves are greenish-yellow and smooth. The lower side of the leaves is medium haired.

The mature leaf is large or medium, five lobed and round-shaped. The lower leaf surface is covered with dense felt hairs. The lateral leaf sinuses are medium deep or shallow, V-shaped. The petiole sinus is lyre-shaped. The teeth are triangular with a sharp tip; the teeth on the ends of the lobes are large, triangular.

The flower is hermaphrodite.

The bunch is various sized, conical or cylindrical-conical, winged, sparse or medium-dense.

The berry is round, dark brown with a violet tint. The flesh is juicy and flavored. The juice is colored. The taste is pleasant with a harmonious combination of sugar and acidity.

Phenology

Time of bud burst: first half of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: end of August

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Yield per plant: 2.4 kg

Bunch weight: 121 g

Bud fertility: 0.8

Climate and cultivation requirements

'Gara Shany' is characterized by good cane maturation. It is recommended for cultivation within the Absheron peninsula, on the weakly developed grey and sandy soils. In these conditions yield is medium, but the grape has excellent sensorial qualities. The variety maintains its sensorial characteristics also on irrigated fertile brown soils. Normally the bud load is 50 buds per vine or 2-3 fruity shoots with 10-12 buds per vine.

Resistance to diseases and unfavorable weather

The variety is relatively resistant towards *Plasmopara viticola* and *Erysiphe necator*, and it is susceptible to Gray Mold (*Botrytis cinerea* Pers. ex. Fr.). It is frost and drought resistant.

Juice characteristics

Sugar: 20.0-21.5%

Total acidity: 4.5 g·L⁻¹



Wine and grape characteristics

'Gara Shany' is a high quality table grape variety having excellent sensorial characteristics. It is used for fresh consumption.

Goyun Gyozu B.

Synonyms

Unknown

Meaning of the name

Sheep's eye

Historical notes and cultural importance

There is no exact information about the origin of the variety. 'Goyun Gyozu' is an interesting double usage grapevine. It is used both for fresh consumption and for winemaking.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspic* Negr.

No clones have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are light green and covered with cobwebby hairs.

The mature leaf is rounded and five lobed. The lateral leaf sinuses are deep or medium-deep, V-shaped or lyre-shaped. The petiole sinus is open, with a wide base. The teeth are triangular, on one side concave, on one side convex; the teeth on the end of lobes are larger and with a sharp tip. The lower leaf surface is covered with hairs. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is medium, conical and medium dense.

The berry is elongated and greenish-yellow. The skin is thin, but firm. The flesh is pulpy and juicy.

Phenology

Time of bud burst: first ten days of April

Time of blooming: third ten days of May

Time of veraison: middle of June

Time of ripening: end of August – beginning of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: strong

Yield per plant: 4-5 kg

Bunch weight: 180-200 g

Bud fertility: 0.7

Climate and cultivation requirements

'Goyun Gyozu' is more productive growing on a 'fan like' training system with several spurs.

Resistance to diseases and unfavorable weather

Plasmopara viticola and *Erysiphe necator* resistance is medium. Cold-hardiness is poor.

Juice characteristics

Sugar: 20.0-21.0 %

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

The variety 'Goyun Gyozu' is used for good ordinary table wine making.



Gyavangir B.

Synonyms

Unknown

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Gyavangir' is a local variety selected within the Absheron peninsula. It is a rarely spread variety, grown in separate plots or as single vines together with other varieties in the old vineyards of Absheron.

The variety is recommended for distribution in all areas of Absheron and the Samur-Shabran region of Azerbaijan.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr. (SALIMOV and SALAYEVA 2007).

No biotypes and clones of the variety have been described so far.

Essential ampelographic characteristics (SALIMOV and SALAYEVA 2007)

The tip of the young shoot is light green. The distal leaves are green tinted with light bronze.

The mature leaf is medium size or large, circular, deeply three, five, rarely seven lobed. The upper leaf side is goffering, dark green, the lower side is light green. The upper leaf sinuses are medium deep, open, triangular or V-shaped. The lower leaf sinuses are shallow, open, V-shaped or lyre-shaped with parallel sides. The petiole sinus is very overlapped. The lateral teeth are triangular with convex sides or narrow-triangular. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is medium size or large, conical, cylindrical-conic or cylindrical; dense or very dense.

The berry is medium size or large, round, light green or yellow-green with dark brown or black spots. It is covered with moderate bloom. The skin is thick and firm. The flesh is juicy or very juicy. The taste is ordinary and slightly sourish.

Phenology

Time of bud burst: first and second ten days of April

Time of blooming: end of May

Time of veraison: first and second ten days of August

Time of ripening: second and third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: vigorous

Bud fertility coefficient (cluster per winter bud): 1.14

Shoot fertility coefficient (cluster per shoot): 1.62

Bunch size: 15-20 x 10-14 cm

Bunch weight: 386 g

Yield per vine: 8.4 kg

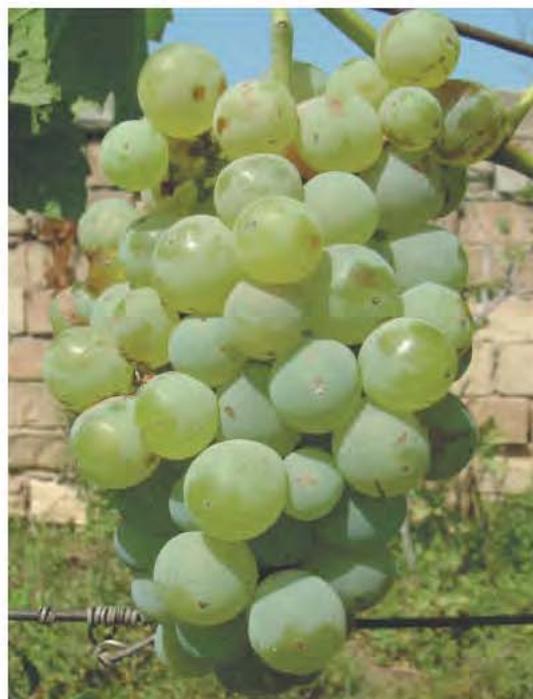
Yield: 18.6 t·ha⁻¹

Climate and cultivation requirements

'Gyavangir' is a late ripening cultivar with good cane maturation ability. Long pruning and the multi-branched "fan like" training system on trellis are recommended for this variety. The normal bud loading is 60-72 buds per vine under irrigation; 10-14 buds per fruity cane are recommended under non-irrigation conditions. The Absheron peninsula, as well as other areas of Azerbaijan with weak grey and sandy soils, is suitable for the cultivation of 'Gyavangir'.

Resistance to diseases and unfavorable weather

The variety shows medium susceptibility to *Erysiphe necator* and Gray



Mold (*Botrytis cinerea*). Resistance to European grapevine moth (*Lobesia botrana*) is high. Drought-resistance is high. Cold-hardiness is poor.

Juice characteristics

Sugar: 17.2 %

Total acidity: 6.02 g·L⁻¹

Wine and grape characteristics

Fresh grape sensorial grade is 8.3-8.8/10.

'Gyavangir' is mainly used for fresh consumption. It is also suitable for making a very concentrated boiled juice called Bekmez (Doshab) and common grape juice.

Gyrmyzy Marandi Rg.

Synonyms

Unknown

Meaning of the name

Marandi red (Marandi is the name of a village in the Kurdamir district).

Historical notes and cultural importance

'Gyrmyzy Marandi' is a native variety of the Shamakhy district of Azerbaijan.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are light green and covered with weak cobwebby hair.

The mature leaf is large, rounded and five lobed. The lower leaf surface is hairless. The lateral leaf sinuses are medium deep or shallow and elliptic. The petiole sinus is open, vaulted, with a rounded or plain base. The teeth are triangular or serriform, in the ends of lobes they are triangular with a sharp, seldom elongated, tip. The petiole is as long as the main vein, or a little bit longer.

The flower is hermaphrodite.

The bunch is large, wide conic, winged and dense.

The berry is large, oval, dark red, nearly black. The skin is thick. The flesh is semi-juicy and crispy. The juice is colorless. The taste is ordinary and pleasant.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: third ten days of July

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Yield per plant: 3.8 kg

Bunch weight: 258 g

Bud fertility: 0.8

Climate and cultivation requirements

The "fan like" training system with several spurs is recommended for 'Gyrmyzy Marandi'.

Resistance to diseases and unfavorable weather

Resistance to *Plasmopara viticola*, *Erysiphe necator* and Gray Mold (*Botrytis cinerea*) is medium.

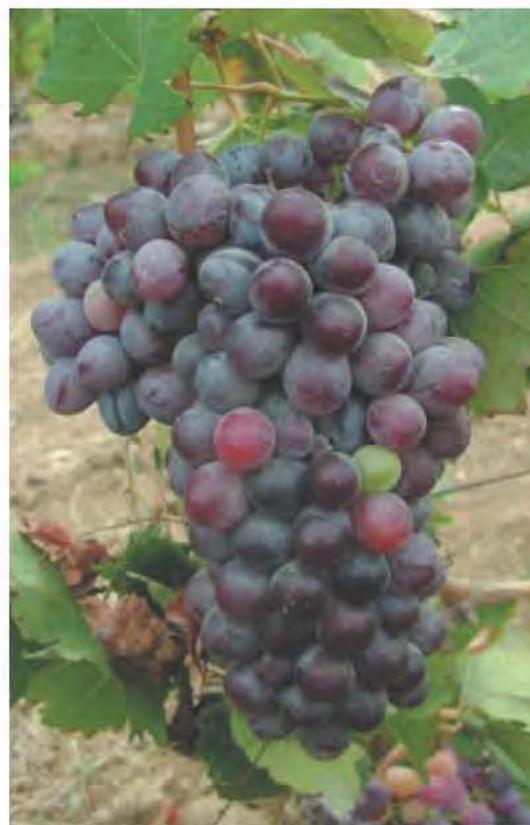
Juice characteristics

Sugar: 18.3 -18.8%

Total acidity: 6.4-7.5 g·L⁻¹

Wine and grape characteristics

'Gyrmyzy Marandi' is a late table grape variety. It is used for fresh consumption. It is transported to several cities of Azerbaijan. The grapes have a pleasant and harmonious taste and a wonderful appearance.



Haji Abbas N.

Synonyms

Unknown

Meaning of the name

The variety takes the name of its first grower: Haji Abbas.

Historical notes and cultural importance

There is no exact information about the origin of the variety 'Haji Abbas'. This is a local grape variety normally used for fresh consumption.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are yellow-green and covered with weak cobwebby hairs.

The mature leaf is pentagonal and five lobed. The lateral leaf sinuses are medium-deep and triangular. The petiole sinus is open. The teeth are triangular, on one side rectilinear, on one side convex; the teeth on the ends of lobes are large, with a sharp tip. The petiole is shorter than the main vein in length. The lower leaf side is covered with hairs.

The flower is hermaphrodite.

The bunch is medium or large, conical and medium-dense.

The berry is medium, rounded and dark-red or black. The skin is medium-thick. The flesh is juicy. The taste is ordinary.

Phenology

Time of bud burst: first ten days of April

Time of blooming: beginning of May

Time of veraison: end of June

Time of ripening: middle of August

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: strong

Yield per plant: 3.0-4.0 kg

Bunch weight: 225 g

Bud fertility: 0.9

Climate and cultivation requirements

The "fan like" training system and a long cane pruning give the best results.

Resistance to diseases and unfavorable weather

The variety is medium resistant to *Plasmopara viticola* and *Erysiphe necator*, relatively resistant to Gray Mold (*Botrytis cinerea*) and cold hardiness is poor.

Juice characteristics

Sugar: 18.0-20.0 %

Total acidity: 4.0-5.0 g·L⁻¹

Wine and grape characteristics

'Haji Abbas' is used as a fresh fruit. It is suitable for winter storage and long distance transport.



Iri Salkhym B.

Synonyms

Unknown

Meaning of the name

Big bunched.

Historical notes and cultural importance

'Iri Salkhym' is a local grape variety from the Absheron peninsula. It was discovered during the exploration of local varieties in the vineyards around the village of Mardakyan in the Absheron district in 1947.

'Iri Salkhym' is a local variety, interesting for the Absheron peninsula and for the areas of the Kyur-Araz lowlands.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two or three leaves are light green and covered with sparse cobwebby hairs.

The mature leaf is medium size, rounded and five lobed. The upper leaf surface is green and glossy. The lower leaf surface is light green and hairless. The lateral leaf sinuses are open, lyre-shaped or V-shaped, sometimes chinked. The petiole sinus is open and arched. The teeth are triangular or serriform; the teeth in the ends of lobes are triangular with a sharp tip. The petiole is shorter than the main vein in length.

The flower is hermaphrodite.

The bunch is large, conical and medium dense.

The berry is elongated and white. The skin is thick and firm. The flesh is pulpy and juicy. The taste is harmonious.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3.2 kg

Bunch weight: 322 g

Bud fertility: 0.8

Climate and cultivation requirements

This variety prefers fertile soils with sufficient moisture. Cordon training with short spurs improves yield.

Resistance to diseases and unfavorable weather

Susceptibility towards *Plasmopara viticola*, *Erysiphe necator* and Gray Mold (*Botrytis cinerea*) is low. Drought resistance and cold-hardiness is medium.

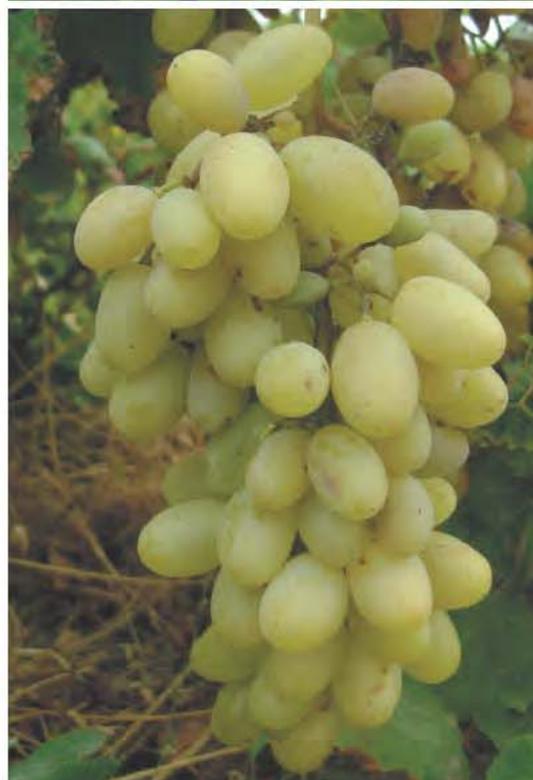
Juice characteristics

Sugar: 19.0-21.0 %

Total acidity: 4.0-7.0 g·L⁻¹

Wine and grape characteristics

'Iri Salkhym' has a local importance. It is suitable for fresh consumption.



Karga Dili N.

Synonyms

Unknown

Meaning of the name

Crow's tongue.

Historical notes and cultural importance

There is no reliable information about the origin of 'Karga Dili'. The variety is spread in the vineyards of the Absheron peninsula as well as in many other regions of Azerbaijan.

This variety has only local importance. It is used as a fresh fruit.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are light green and covered with weak hairs.

The mature leaf is large, rounded, three or five lobed. The leaf blade is funnel shaped. The lateral leaf sinuses are shallow, sometimes medium deep, chinked or elliptic. The petiole sinus is closed, elliptic, sometimes with a tooth in the base. The lateral teeth are cupola-shaped with a wide base. The teeth at the end of the lobes are triangular with a rounded top. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is medium or large, conical and sparse.

The berry is large, oval and black with a violet tint. The skin is thin but firm. The flesh is pulpy and juicy. The juice is colorless. The taste is ordinary.

Phenology

Time of bud burst: second ten days of April

Time of blooming: beginning of June

Time of veraison: end of July

Time of ripening: third ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3-4 kg

Bunch weight: 160-180 g

Bud fertility: 0.7

Climate and cultivation requirements

'Karga Dili' has a medium vegetative period and full cane maturation. The 'fan like' training system with several spurs is recommended for this variety.

Resistance to diseases and unfavorable weather

Resistance towards *Erysiphe necator* is high; resistance towards *Plasmopara viticola* and Gray Mold (*Botrytis cinerea*) is medium.

Juice characteristics

Sugar: 18.0-21.0 %

Total acidity: 5.5-6.0 g·L⁻¹

Wine and grape characteristics

'Karga Dili' has a local importance and it is used for fresh consumption.



Kerimgendi B.

Synonyms

'Shakar izum'

Meaning of the name

Kerim's sugar (Kerim is a masculine first name).

Historical notes and cultural importance

Judging by the age of the oldest plantings, the appearance of 'Kerimgendi' could date back to the last two decades of the 19th century.

This variety has a local importance and it is used as fresh fruit as well as for making wine.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspic*a Negr.

No clones have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the young leaves are green tinted with bronze and covered with weak hairs.

The mature leaf is medium, rounded and five lobed. The lateral leaf sinuses are medium, open and lyre-shaped. The petiole sinus is open and vaulted. The teeth are serriform, with slightly convex sides; in the end of the lobes they are large triangular. The lower leaf surface is covered with weak hairs. The petiole is pink and shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium, conical, winged and dense.

The berry is medium, oval and greenish-yellow. The skin is thick. The flesh is juicy and sweet.

Phenology

Time of bud burst: first half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 3.0-5.0 kg

Bunch weight: 130 g

Bud fertility: 0.6-0.7

Climate and cultivation requirements

The best results are obtained with the bilateral 'fan like' training system.

Resistance to diseases and unfavorable weather

'Kerimgendi' is relatively resistant to fungal diseases.

Juice characteristics

Sugar: 20.0 %

Total acidity: 3.9 g·L⁻¹

Wine and grape characteristics

'Kerimgendi' has a local importance. It is suitable for fresh consumption and for drying. This variety can be used for winemaking in blend with other varieties.



Khyndogny N.

Synonyms
'Gara Shira'

Meaning of the name

With a dense black berry.

Historical notes and cultural importance

'Khyndogny' is sufficiently widespread. It is suitable for fresh consumption and for wine making. The variety is included in the 'List of Standard Varieties' recommended for cultivation in Azerbaijan.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspiica* Negr.
No clones have been described so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, covered with weak cobwebby hairs. The first and the second leaves are green with a light bronze tint. The other leaves are green with a golden tint. The surface of leaves is shiny. The edges of leaves are hanging down (typical character).

The mature leaf is medium size, circular, medium or deeply five-lobed. The leaf blade is smooth or slightly blistered. The edges of the lobes are involute. The upper leaf sinuses are medium deep or deep, open, lyre-shape with parallel sides and rounded or pointed base; or closed with oval or triangular lumen and a rounded base. The lower leaf sinuses are medium deep, open, lyre-shaped with parallel sides and a rounded or pointed base, sometimes closed. The teeth at the ends of the lobes are triangular with rounded, seldom sharp tip. The lateral teeth are narrow triangular or serriform with convex sides. The lower leaf side is hairless. The veins are covered with loose erect hairs.

The flower is hermaphrodite.

The bunch is large, conical, branched or winged and very dense.

The berry is medium size or large, rounded, black, dark blue or violet. The skin is not so firm, elastic, covered with thick bloom. The flesh is juicy. The taste is very sweet and slightly astringent.

Phenology

Time of bud burst: first half of April

Time of blooming: end of May

Time of veraison: end of July

Time of ripening: second ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 1.01

Shoot fertility coefficient (cluster per shoot): 1.36

Bunch size: 20-23 x 12-15 cm

Bunch weight: 180-350 g

Yield per vine: 2.0-3.0 kg

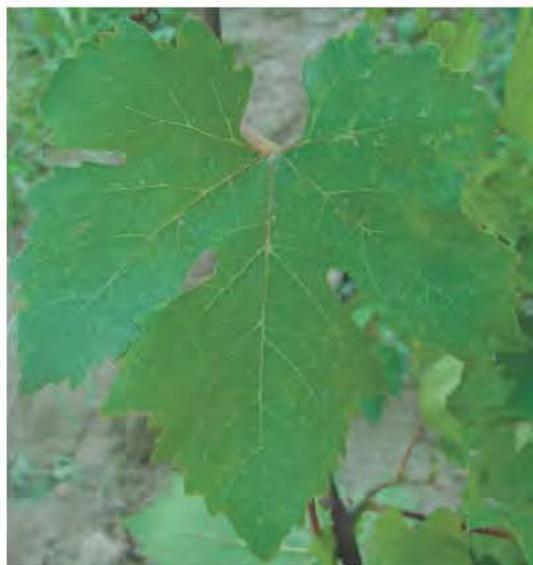
Yield: 4.4-6.7 t·ha⁻¹

Climate and cultivation requirements

'Khyndogny' is relatively resistant to drought. Under non-irrigated conditions, berries have smaller size and a higher sugar content compared to irrigated vineyards. Long cane pruning and the multi-branched "fan like" training system are recommended for this variety.

Resistance to diseases and unfavorable weather

This variety has medium resistance to *Plasmopara viticola* and *Erysiphe necator*. It is more sensitive to frost compared to other local varieties.



Juice characteristics

Sugar: 19.0-23.0 %

Total acidity: 6.0-7.0 g·L⁻¹

Wine and grape characteristics

'Khyndogny' is used for making well-colored, high-quality, pleasantly fresh red table wines with 10-15 % of alcohol. To obtain normally colored and smoother wines only some part of the skins are used during fermentation.

Khyrcha Kishmish B.

Synonyms

Unknown

Meaning of the name

Kishmish = raisin.

Historical notes and cultural importance

'Khyrcha Kishmish' is a native variety, rarely spread as single vines in the Gyanja-Gazakh region.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No clones have been described so far.

Essential ampelographic characteristics (ATAKISHIYEV and ISKENDEROV 1973)

The tip of the young shoot is green.

The mature leaf is medium size, circular and five lobed. The leaf blade is dark green, sufficiently thick and smooth. The petiole sinus is open and oval. The teeth are medium, triangular with convex sides and blunt tip. The lower leaf side is covered with very weak bristle hairs.

The flower is hermaphrodite.

The bunch is medium size and cylindrical-conical.

The berry is large, rounded and greenish-yellow. The flesh is succulent and melting.

Phenology

Time of bud burst: second half of April

Time of blooming: third ten days of May

Time of veraison: third ten days of July

Time of ripening: second ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility coefficient (cluster per winter bud): 1.40-1.50

Bunch size: 18-25 x 6-8 cm

Bunch weight: 150 g

Yield per vine: 5.4-8.1 kg

Yield: 12-18 t·ha⁻¹

Climate and cultivation requirements

The variety reacts positively to organic fertilizers. In the Gyanja region, 12-18 t·ha⁻¹ of grapes are produced with 18-24 buds per vine. With the Cherdak (Khyiyabani) training system the yield is 20-25 t·ha⁻¹.

Resistance to diseases and unfavorable weather

'Khyrcha Kishmish' has medium resistance to *Plasmopara viticola* and *Erysiphe necator*.

Juice characteristics

Sugar: 16.0-16.5 %

Total acidity: 5.2 g·L⁻¹

Wine and grape characteristics

'Khyrcha Kishmish' is an early-ripening table grape variety. It is mostly used for fresh consumption locally. Resistance to transport is not high. It is an interesting high-yielding variety.



Kyok Kishmish B.

Synonyms

Unknown

Meaning of the name

Fat, thick raisins.

Historical notes and cultural importance

'Kyok Kishmish' is suitable for fresh consumption and for raisin production.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

Clones of this variety have not been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are yellowish-green with cobwebby hair.

The mature leaf is medium, rounded, three to five lobed. The petiole sinus is open and oval. The teeth are triangular, convex on both sides and with a blunt tip; on the end of the lobes, they are a little bit larger. The lower leaf surface is covered with weak bristle hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is large, conical, sometimes winged and dense.

The berry is rounded and greenish-yellow. The skin is thin. The flesh is juicy and melting.

Phenology

Time of bud burst: first ten days of April

Time of blooming: middle of May

Time of veraison: first ten days of July

Time of ripening: second ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3-4 kg

Bunch weight: 200 g

Bud fertility: 0.9

Climate and cultivation requirements

The "fan like" training system with several spurs is recommended to achieve high yield with 'Kyok Kishmish'.

Resistance to diseases and unfavorable weather

The variety has medium resistance to fungal diseases. Frost-resistance is poor.

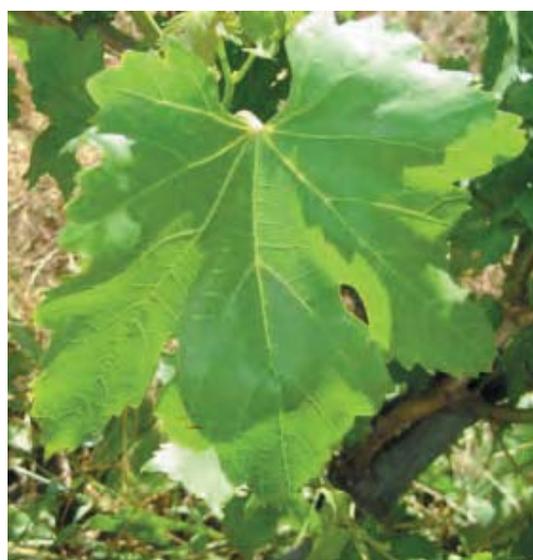
Juice characteristics

Sugar: 22.0-23.0%

Total acidity: 5-8 g·L⁻¹

Wine and grape characteristics

'Kyok Kishmish' is a seedless grape variety suitable both for fresh consumption and drying.



Madrasa N.

Synonyms

'Gara Shirey', 'Gara Shira', 'Shireyi'

Meaning of the name

Madrasa is a village in the Shamakhy district of Azerbaijan.

Historical notes and cultural importance

'Madrasa' has been cultivated in the Shamakhy region for a long time, possibly since the development of viticulture in this area.

'Madrasa' is a rather common variety, suitable for fresh consumption and winemaking.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

'Madrasa' has two variations. The first variation suffers from heavy fruitlet drop and has smaller bunches. The second variation is almost unproductive.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are covered with felt hair. The leaves are light orange and green along the main veins and on the upper side of the blade.

The mature leaf is large, rounded, five sometimes nine lobed. The lateral leaf sinuses are medium-deep or rather deep and lyre-shaped, with parallel sides and a sharp base. The petiole sinus is open and arched. The teeth are triangular, rectilinear on both sides, seldom convex on both sides; in the end of the lobes they are larger, triangular, rectilinear on both sides and with sharp tips. The lower leaf surface is hairless.

The flower is hermaphrodite.

The bunch is medium, conical and sparse.

The berry is round or slightly oval, black. The skin is medium thick. The flesh is juicy and melting. The taste is pleasant and sweet, with a weak aroma. The juice is slightly colored.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Yield per plant: 1.9-2.1 kg

Bunch weight: 153-311 g

Bud fertility: 0.8-1.4

Climate and cultivation requirements

'Madrasa' has full cane maturation (around 90-95 %). Two training systems are recommended for 'Madrasa'. The first is the "fan like" system on trellis with 4/6 fruity spurs; the second is the 1.5-2.0 m high trunk system, with five wires and six canes. Long cane pruning (10-12 buds) is recommended due to the local basal fertility.

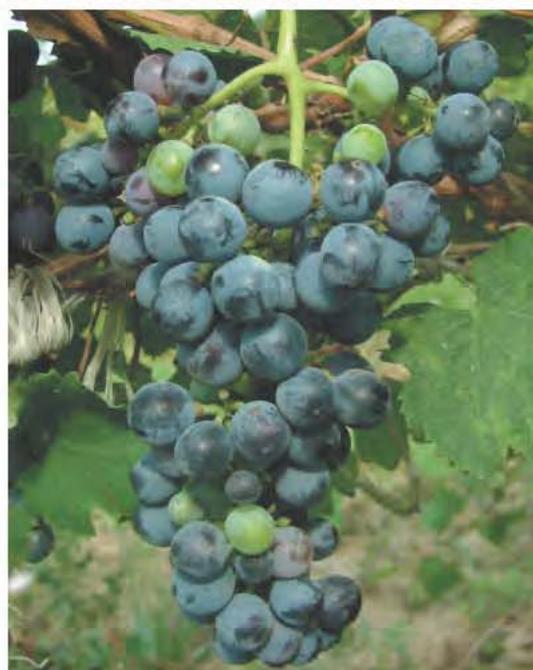
Resistance to diseases and unfavorable weather

The variety has a low susceptibility to *Plasmopara viticola* and *Erysiphe necator*, and almost none to Gray Mold (*Botrytis cinerea*). 'Madrasa' well tolerates winter frosts: it suffers only if temperature drops down to -16/-18 °C. The variety is drought-resistant.

Juice characteristics

Sugar: 20.0-25.0%

Total acidity: 5.0-7.0 g·L⁻¹



Wine and grape characteristics

'Madrasa' is used for making high quality table and "Kagor" style dessert wines as well as natural grape juice.

Marandi Rg.

Synonyms

'Shamakhy Marandisy', 'Gazari Rozovy'

Meaning of the name

Marandi is the name of a populated area in Azerbaijan.

Historical notes and cultural importance

'Marandi' is mainly spread in the Shamakhy district. It is also spread in many other regions of Azerbaijan, mixed together with other varieties.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot is green and covered with weak hairs. The first distal leaves are green with a copper tint.

The mature leaf is large, rounded and five lobed. The lower leaf side is hairless. The lateral leaf sinuses are medium deep and elliptic. The petiole sinus is vaulted. The teeth are of medium size, triangular-serriform with convex sides; on the ends of the lobes they are large, triangular, with sharp tip. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is large, conical, branched at the base and dense.

The berry is large, oval and dark red. The skin is thick. The flesh is crisp.

The juice is colorless. The taste is ordinary and pleasant.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 4.2 kg

Bunch weight: 300-500 g

Bud fertility: 0.7

Climate and cultivation requirements

'Marandi' requires long cane pruning, high bud load and a wide canopy. It grows well in fertile dark chestnut soils.

Resistance to diseases and unfavorable weather

'Marandi' has low susceptibility towards *Plasmopara viticola* and almost none towards *Erysiphe necator*. It is medium resistant to Gray Mold (*Botrytis cinerea*). The variety is quite resistant to frost.

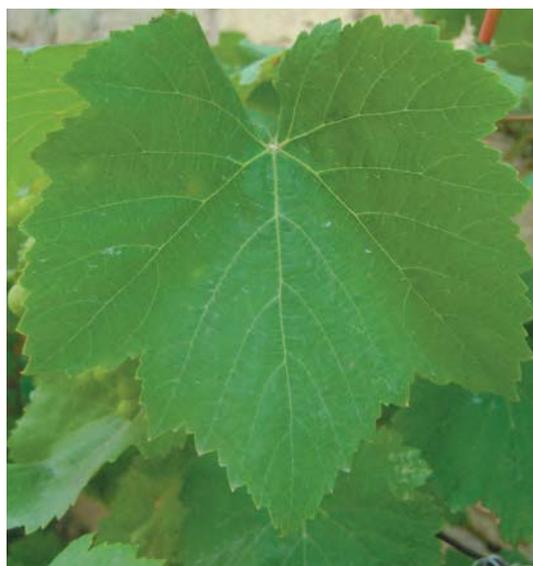
Juice characteristics

Sugar: 19.2%

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

'Marandi' is considered to be the best table grape variety of Azerbaijan. It is interesting to grow both in farms and in the home garden. It is used also as an ornamental plant along the streets in towns.



Meleyi N.

Synonyms

'Movuz', 'Urdisi', 'Milay Chernyi', 'Milakhi', 'Urza Sev', 'Areni Chernyi'

Meaning of the name

Angelic

Historical notes and cultural importance

'Meleyi' is one of the main wine grape varieties of the Nakhchyvan region. 'Meleyi' is very prospective, therefore its cultivation is recommended in Nakhchyvan and in some other regions of Azerbaijan. It should be included in the "List of Standard Varieties" of Azerbaijan.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

Biotypes and clones of this variety are currently unknown.

Essential ampelographic characteristics (ALIYEV and MAMEDOVA 1973)

The tip of the young shoot and the first distal leaves are covered with weak cobwebby hairs.

The mature leaf is medium size, slightly stretched in width and five-lobed. The leaf blade is very bent. The upper leaf sinuses are deep, seldom medium-deep, overlapped with oval or triangular lumen and a pointed base. The lower leaf sinuses are shallow, open, chinked or V-shaped. The petiole sinus is open, arched, deep with a pointed base. The teeth at the end of the lobes are cupola-shaped, seldom triangular with a wide base. The lateral teeth are high, cupola-shaped with a wider base, seldom triangular with convex sides and a pointed tip. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is small or medium, conical or cylindrical-conical, winged, dense and rarely loose.

The berry is medium size or large, oval, dark blue or black. The skin is thick, rough, covered with bloom. The flesh is meaty and juicy. The juice is colorless.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: third ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: medium

Bud fertility coefficient (cluster per winter bud): 0.91

Shoot fertility coefficient (cluster per shoot): 1.05

Bunch size: 10-21 x 9-15 cm

Bunch weight: 280-290 g

Yield per vine: 6.8-8.1 kg

Yield: 15-18 t ha⁻¹

Climate and cultivation requirements

'Meleyi' is a medium-time ripening variety. Cane maturation reaches up to 85-95 % at leaf fall.

Resistance to diseases and unfavorable weather

Susceptibility to *Plasmopara viticola* and *Erysiphe necator* is medium.

Juice characteristics

Sugar: 19.0-21.0 %

Total acidity: 5.4-6.2 g·L⁻¹



Wine and grape characteristics

'Meleyi' is one of the most valuable wine grape varieties of Azerbaijan. The red sparkling wine made from this variety deserves a special attention. The table wines have 11.0-11.9 % alcohol. The sensorial grade of the wines is 7.2-7.6 out of 8.

The fortified sweet wine fermented with grape pomace contains 17.5 % alcohol, 10.8 % sugar and 3 g·L⁻¹ total acidity. It reaches sensorial grade 7.0/8. The wine fermented without grape pomace contains 19.0 % alcohol, 10.4 % sugar and 3.8 g·L⁻¹ total acidity. It was estimated grade 7.1/8.

In Nakhchyvan, this variety is mostly used for making dry and sweet wines. 'Meleyi' makes a fresh, soft wine, with a wonderful bouquet and a good color.

It is also used as a table grape: fresh grape sensorial grade is 8.6/10.

Nabi Uzum B.

Synonyms

Unknown

Meaning of the name

The variety takes the name from its first grower: Nabi.

Historical notes and cultural importance

'Nabi Uzum' is a Nakhchivan local variety.

'Nabi Uzum' is recommended for cultivation in the regions of Nakhchivan and in the Kyur-Araz lowlands as high quality table and raisin grape.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are yellow with a pink tint.

The mature leaf is medium or large, rounded, three or five lobed. The lower leaf surface is hairless. The lateral leaf sinuses are small, not deep and V-shaped. The petiole sinus is open and lyre-shaped. The petiole is as long as the main vein or shorter.

The flower is hermaphrodite.

The bunch is medium, conical and medium dense.

The berry is medium or large, prolonged or ovate and white. The skin is medium thick and very firm. The flesh is pulpy and crispy. The taste is pleasant and harmonious. The berry carries 2-3 seeds.

Phenology

Time of bud burst: first half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 2.5-3.0 kg

Bunch weight: 250-315 g

Bud fertility: 0.8

Climate and cultivation requirements

'Nabi Uzum' is a vigorous vine that requires a large canopy and an adequate bud load to give good results.

Resistance to diseases and unfavorable weather

'Nabi Uzum' is sufficiently resistant towards *Erysiphe necator* and *Plasmopara viticola* and low susceptible to Gray Mold (*Botrytis cinerea*).

Juice characteristics

Sugar: 19.5 - 20.5 %

Total acidity: 5.0-8.0 g·L⁻¹

Wine and grape characteristics

The variety is mostly used for drying and for fresh consumption.



Nakhchivan Chehrayi Kishmishi R.

Synonyms

'Gyrmyzy Kishmish' (in Azerbaijan), 'Carmir Kishmish' (in Armenia).

Meaning of the name

Nakhchivan's Pink raisin.

Historical notes and cultural importance

The origin of 'Nakhchevan Chehrayi Kishmishi' is uncertain. The grapes are mostly used for fresh consumption, but also for raisin production.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of the variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are light green with a yellow tint and weak cobwebby hairs.

The mature leaf is medium, rounded, five and three lobed. The lateral leaf sinuses are medium-deep, closed or open. The petiole sinus is narrow elliptical. The teeth are serriform, slightly convex on both sides; in end of the lobes they are triangular with a stretched tip. The lower leaf surface is hairless. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is large, cylindrical, winged and dense.

The berry is medium, rounded or oval and pink, red at full ripening. The flesh is pulpy and juicy. The berry is seedless.

Phenology

Time of bud burst: first half of April

Time of blooming: end of May

Time of veraison: end of June

Time of ripening: middle-end of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: strong

Yield per plant: 8.0-12.0 kg

Bunch weight: 180-200 g

Bud fertility: 0.6-0.7

Climate and cultivation requirements

The "fan like" training system with several spurs, a low trunk (50-70 cm) and a relatively long cane pruning are recommended for 'Nakhchevan Chehrayi Kishmishi'. The variety is sensitive to water deficit and it needs irrigation.

Resistance to diseases and unfavorable weather

The variety has high resistance towards *Plasmopara viticola* and *Erysiphe necator*, but it is susceptible towards Gray Mold (*Botrytis cinerea*). Frost resistance is low.

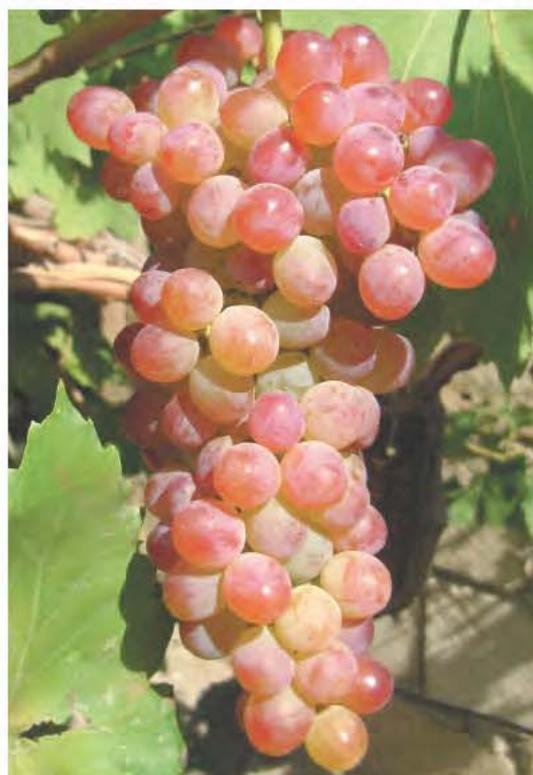
Juice characteristics

Sugar: 24.5%

Total acidity: 5.4 g·L⁻¹

Wine and grape characteristics

'Nakhchevan Chehrayi Kishmishi' is a seedless grape variety suitable for both fresh consumption and drying.



Salyany B.

Synonyms

'Ag pishras'

Meaning of the name

Salyan is the name of a district.

Historical notes and cultural importance

'Salyany' is a local grape variety widely spread in the Salyan district. It also occurs in the Absheron peninsula.

'Salyany' is an interesting very early ripening table grape variety.

Taxonomy and intra-variety variability

Vitis orientalis subproles *antasiatica* Negr.

No clones of the variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are light green tinted with pink.

The mature leaf is medium, rounded or kidney-shaped and five lobed. The lower leaf surface is hairless. The leaf blade is wavy and slightly involute. The lateral leaf sinuses are medium deep, lyre-shaped or chinked. The petiole sinus is open and lyre-shaped. The lateral teeth are serriform, convex on both sides and with a pointed tip; on the end of the lobes they are triangular, convex on both sides and pointed. The petiole is longer than the main vein and it is light raspberry-pink.

The flower is hermaphrodite

The bunch is medium or small, conical, dense or medium dense.

The berry is medium or small, rounded, white in color with a greenish-yellow tint. The skin is very thin but firm. The flesh is juicy and slightly crispy. The taste is harmonious.

Phenology

Time of bud burst: middle of April

Time of blooming: beginning of June

Time of veraison: middle of July

Time of ripening: beginning of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: weak

Yield per plant: 4.0-5.0 kg

Bunch weight: 150-180 g

Bud fertility: 0.8

Climate and cultivation requirements

'Salyany' has a long vegetative period and good cane maturation. This variety grows well on chestnut soils. The "fan like" training system with several spurs is recommended for this variety.

Resistance to diseases and unfavorable weather

This variety shows a medium resistance to diseases and pests.

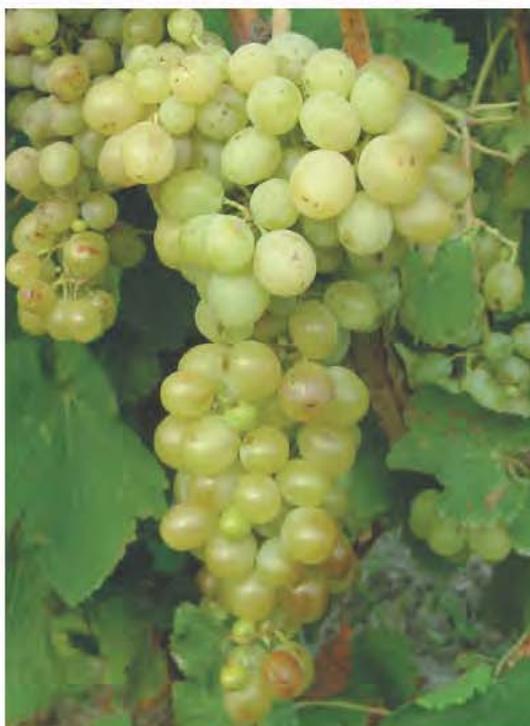
Juice characteristics

Sugar: 20.0 %

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

The 'Salyany' table grape variety has a local importance.



Sarmayi B.

Synonyms

Unknown

Meaning of the name

No hypotheses have been provided.

Historical notes and cultural importance

'Sarmayi' is an uncommon variety, it is rarely spread in the vineyards of the Ismailly district of Azerbaijan.

It is recommended for making desert wines and for local fresh consumption.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are green with a copper tint.

The mature leaf is medium, sometimes large, rounded or oval-elongated, three or five lobed. The lateral leaf sinuses are medium deep. The petiole sinus is open and vaulted. The lower leaf surface is covered with cobwebby hairs.

The bunch is medium, cylindrical-conical, medium dense or sparse.

The berry is medium, round or slightly oval and greenish-white. The flesh is pulpy and juicy, slightly crisp.

Phenology

Time of bud burst: first half of April

Time of blooming: middle of June

Time of veraison: second half of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 3.0-4.0 kg

Bunch weight: 230 g

Bud fertility: 0.8

Climate and cultivation requirements

'Sarmayi' is characterized by good cane maturation. It is suitable for cultivation in plain areas.

Resistance to diseases and unfavorable weather

The variety has medium resistance to fungal diseases and frost.

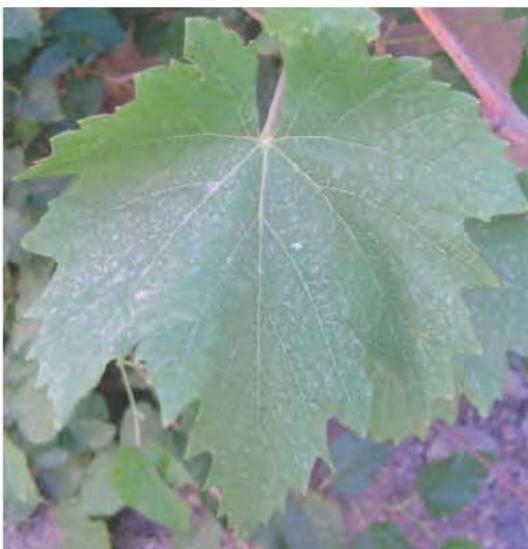
Juice characteristics

Sugar: 26.6 %

Total acidity: 4.5 g·L⁻¹

Wine and grape characteristics

'Sarmayi' grapes are used in dessert winemaking.



Sarygilya B.

Synonyms

Unknown

Meaning of the name

With yellow berries.

Historical notes and cultural importance

'Sarygilya' is an uncommon native variety, mostly found in the Absheron peninsula.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

Three variations of 'Sarygilya' are officially described. Each has a different ripening time: early ripening, middle ripening and late ripening.

Essential ampelographic characteristics (ALLAHVERDIYEV 1973)

The tip of the young shoot and the first two leaves are light grey with wine-red hems on the edges and haired. The third and the fourth leaf are light green on the upper side and grayish-green on the lower side.

The mature leaf is medium size, circular and medium five-lobed. The leaf blade is slightly undulated with involute edges. The upper leaf side is blistering. The upper leaf sinuses are medium, open, lyre-shape with narrow mouth and pointed, rarely with one tooth in the base. The lower leaf sinuses are shallow, open, U-shaped, seldom lyre-shape with parallel sides and a rounded base. The petiole sinus is open and lyre-shape, or closed with elliptical lumen and a pointed base. The teeth at the end of the lobes are triangular with slightly convex sides and a pointed tip. The lateral teeth have different size, and they are wide triangular or serriform with a pointed tip. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is medium size, wide conical, sometimes branched and medium-dense.

The berry is medium size, rounded and light yellow. The skin is thin, firm, covered with loose bloom. The flesh is pulpy, juicy and melting. The taste is pleasant with a harmonious combination of sugar and acidity.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 0.76

Shoot fertility coefficient (cluster per shoot): 1.38

Bunch weight: 160-180 g

Yield per vine: 2.8-3.2 kg

Yield: 5-7 t·ha⁻¹

Climate and cultivation requirements

'Sarygilya' shows vigorous growth even in the infertile grey and sandy soils of the Absheron peninsula. The multi-branched 'fan like' training system is the most used in the Peninsula. With a double-side training system and long cane pruning (15-16 buds) the number of undeveloped buds is rather high.

Resistance to diseases and unfavorable weather

Resistance to *Plasmopara viticola* and *Erysiphe necator* is high. This variety is quite drought-resistant.



Juice characteristics

Sugar: 21.8-27.9 %

Total acidity: 3.9-7.3 g·L⁻¹

Wine and grape characteristics

Sensorial grade of the fresh grape is 7.0-9.0/10.

'Sarygilya' is one of the best table grape varieties of the Absheron peninsula.

The grape is consumed fresh. Transport and storage resistance are poor.

Shafeyi B.

Synonyms

'Ambari'

Meaning of the name

Curative and useful for health

Historical notes and cultural importance

'Shafeyi' is a local variety from Nakhchivan. It was discovered in the Ordubad region of Nakhchivan in the 60^s-70^s of the 19th century.

It is a local variety used for fresh consumption.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot is hairless. The first distal leaves are yellow-gold.

The mature leaf is rounded, seldom kidney-shaped and five lobed. The lateral leaf sinuses are medium deep, sometimes deep, lyre-shaped with a pointed base. The petiole sinus is narrow elliptic. The lateral teeth are high and cupola-shaped; the teeth on the end of the lobes are triangular, convex on both sides and with a sharp tip. The lower leaf surface is hairless.

The flower is female.

The bunch is large, branched, conical or with an indefinite shape and sparse.

The berry is from large to small, elongated, concave on one side, convex on the other, and greenish-white. At full ripening berries are pink. The skin is thick and elastic. The flesh is pulpy, semi-juicy and crispy. The taste is pleasant. The juice is colorless.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September – first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 6.0-8.0 kg

Bunch weight: 200 g

Bud fertility: 0.8

Climate and cultivation requirements

High bud load is recommended to obtain high yields from 'Shafeyi', therefore this variety needs long cane pruning. Fruit drop is common in case of bad pollination.

Resistance to diseases and unfavorable weather

This variety has medium resistance to *Plasmopara viticola* and *Erysiphe necator* and high resistance to Gray Mold (*Botrytis cinerea*).

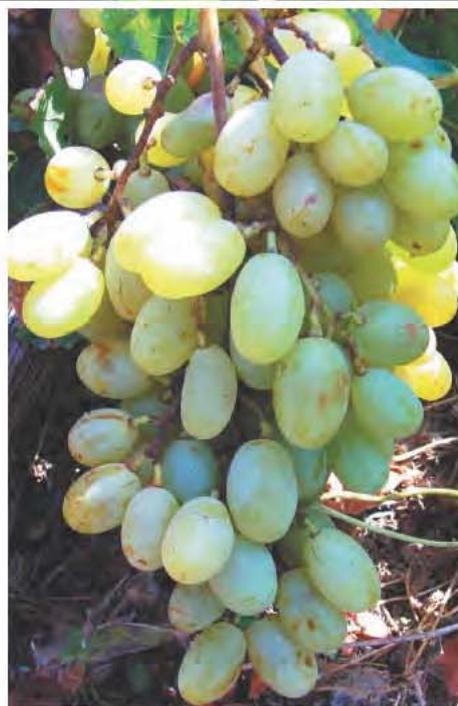
Juice characteristics

Sugar: 20.0-22.0 %

Total acidity: 5.5-6.0 g·L⁻¹

Wine and grape characteristics

'Shafeyi' is a high quality table grape with excellent sensorial characteristics and beautiful appearance.



Shekerbari B.

Synonyms

'Shakarbura'

Meaning of the name

As sweet as a Shakarbura ('Shakarbura' is the national cake of Azerbaijan).

Historical notes and cultural importance

'Shekerbari' occurs in many areas of the country.

This is a locally important table grape variety.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are green and covered with cobwebby hairs

The mature leaf is medium, rounded and five lobed. The lateral leaf sinuses are deep, with oval lumen. The petiole sinus is open and lyre-shaped. The teeth are serriform with a cupola tip; the teeth on end of the lobes are cupola-shaped. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium, conical, sparse or medium-dense.

The berry is medium, rounded with light amber. The skin is thin, but firm.

The flesh is juicy. The taste is sweet.

Phenology

Time of bud burst: second ten days of April

Time of blooming: second ten days of June

Time of veraison: third ten days of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: medium

Yield per plant: 3-4 kg

Bunch weight: 150-200 g

Bud fertility: 0.8

Climate and cultivation requirements

The vegetative period of 'Shekerbari' is medium and the variety has good cane maturation. Depending on the pollination conditions, yield varies from 3.5 to 20.0 t/ha.

Resistance to diseases and unfavorable weather

The variety is sensitive to fungal diseases

Juice characteristics

Sugar: 15.0-21.0%

Total acidity: 6.0-7.0 g·L⁻¹

Wine and grape characteristics

'Shekerbari' is used for fresh consumption. It is suitable for winter storage also. The grapes have a sweet taste and a pleasant flavor.



Shireyi B.

Synonyms

Unknown

Meaning of the name

Juicy

Historical notes and cultural importance

'Shireyi' is one of the main grape varieties of the Absheron peninsula.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

Clones and biotypes of the variety have not been described so far.

Essential ampelographic characteristics (ALLAHVERDIYEV 1973)

The tip of the young shoot is white-green. The first young leaves are shiny and green. The tip of the shoot and the young leaves are hairless.

The mature leaf is medium size or large, circular, deeply seven to nine lobed. The petiole sinus is overlapped. The teeth at the end of the lobes are large, triangular with a wide base and slightly convex sides. The lateral teeth are triangular and serriform. The lower leaf side is covered with dense felt hairs.

The flower is hermaphrodite.

The bunch is medium size, wide conical, branched at the base, often winged – rarely the wing is the same size of the bunch, medium dense or loose.

The berry is large, rounded or slightly oval, light green and at full ripening it becomes light yellow. The skin is thin or medium thin, elastic and covered with a loose layer of bloom. The flesh is juicy. The taste is harmonious.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: third ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility coefficient (cluster per winter bud): 1.15

Shoot fertility coefficient (cluster per shoot): 1.64

Bunch size: 10-18 x 6-8 cm

Bunch weight: 140-150 g

Yield per vine: 3.2-5.2 kg

Yield: 10.5-14.0 t ha⁻¹

Climate and cultivation requirements

'Shireyi' is vigorous and it needs an expanse training system like the multi-branched "fan like" system or the cordon. Tipping and topping before flowering sufficiently reduce fruit drop and berry shot. Even when growing on the non irrigated, infertile grey and sandy soils of the Absheron peninsula, 'Shireyi' gives a good yield. On the fertile gray soil of the Mil lowlands, 'Shireyi' shows vigorous growth and high yielding capacity.

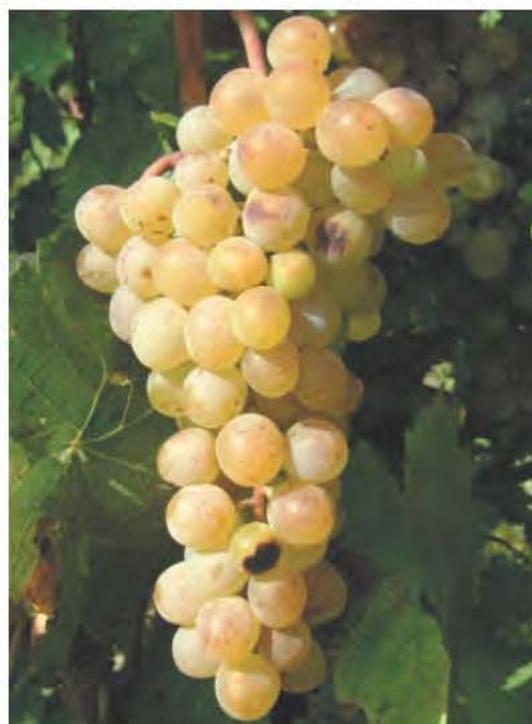
Resistance to diseases and unfavorable weather

'Shireyi' is strongly damaged by *Erysiphe necator*. Fruit drop is weak, berry shot is minor.

Juice characteristics

Sugar: 20.0-24.0 %

Total acidity: 5.5-8.5 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 8.2/10.

Local people use 'Shireyi' mostly to make a very concentrated boiled juice called Bekmez (Doshab). The grapes may also be successfully used to make white table and dessert wines.

Shirvanshahy N.

Synonyms

Unknown

Meaning of the name

King of Shirvan (Shirvan is a region in Azerbaijan).

Historical notes and cultural importance

'Shirvanshahy' is the best native wine grapevine variety of Azerbaijan. The variety has similarity with the wild grapevines growing in the pre-mountain areas and in the lowlands of Shirvan. This is an evidence of the local origin of the 'Shirvanshahy' variety.

The variety is recommended in the lowlands of Shirvan and in the districts of the Mil zone of Azerbaijan to make 'Kagor' style dessert wines.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspicum* Negr.

There are no described clones of this variety.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are covered with dense cobwebby hairs. Coloring of distal leaves changes from ashy-grey to yellow-green. The lower sides of the leaves are covered with weak hairs.

The mature leaf is medium size, rounded or elongated, three or five lobed. The lateral leaf sinuses are medium deep, closed or open and V-shaped. The petiole sinus is lyre-shaped. The lateral teeth are serriform or triangular with slightly convex sides. The petiole is shorter than the main vein in length, pink-violet in color.

The flower is hermaphrodite.

The bunch is medium size, sometimes large, conical, winged and sparse.

The berry is round or oval, black and with bloom. The skin is a little slimy. The taste is pleasant.

Phenology

Time of bud burst: second half of April

Time of blooming: end of May

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: medium

Yield per plant: 3.0-4.0 kg

Bunch weight: 163-171 g

Bud fertility: 0.8

Climate and cultivation requirements

Cane maturation is almost complete (70-80 %) when 'Shirvanshahy' is trained over mulberry or fruit trees (Khiyaban). However, "fan like" training with several spurs is the most suitable system for this variety.

Resistance to diseases and unfavorable weather

This variety has high resistance to fungal diseases.

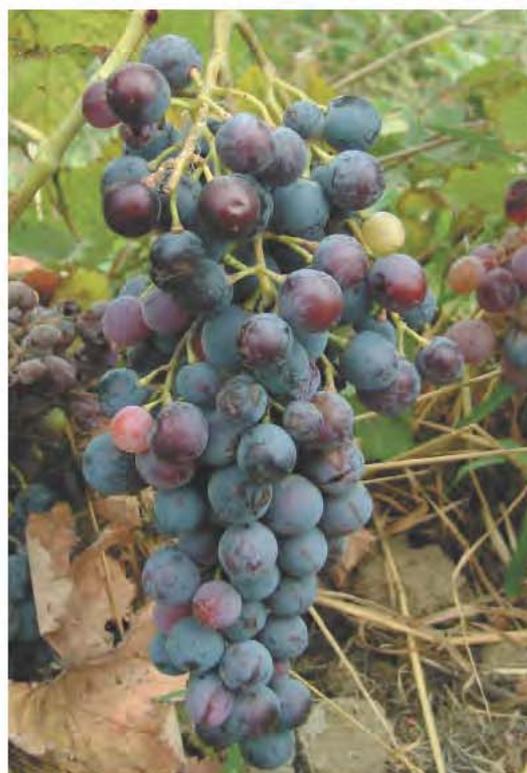
Juice characteristics

Sugar: 26.0-28.0 %

Total acidity: 8,3-7.5 g·L⁻¹

Wine and grape characteristics

A red Kagor style dessert wine named Kyurdamir is made from 'Shirvanshahy' grapes. This extractive wine contains 16.0 % alcohol, 23.0 % sugar and 5.0-6.0 g·L⁻¹ total acidity; it has a soft specific taste with a pleasant, astringent and delicate varietal bouquet.



Surmeiyi N.

Synonyms

'Fizuli gara kechimemesi'

Meaning of the name

Antimony.

Historical notes and cultural importance

'Surmeiyi' is a native table grape variety from the Garabagh region. Nowadays, the variety is rarely spread in single vines within the Alykhanly, Shukurbeili, Ahmedbeili villages of the Fizuli region of Azerbaijan.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No biotypes and clones of the variety have been described so far.

Essential ampelographic characteristics (AMANOV *et al.* 2006)

The tip of the young shoot is dark red. The distal leaves are copper and shiny. The shoot and the lower leaf side are hairless.

The mature leaf is medium size, circular or oval, three or five lobed. The leaf blade is smooth and dark green. The upper leaf sinuses are closed or open, medium deep and narrow-elliptic. The lower leaf sinuses are open and shallow. The petiole sinus is open with a lyre-shaped or arched base. The teeth at the end of the lobes are large, high, cupola-shaped with convex sides. The lateral teeth are large and cupola-shaped. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is medium size or large, conical or winged and medium dense.

The berry is large or very large, elongated, symmetrical, dark violet or black. The skin is thick, firm, covered with dense bloom. The flesh is meaty, crispy, juicy and sweet.

Phenology

Time of bud burst: first half of April

Time of blooming: end of May

Time of veraison: first ten days of August

Time of ripening: end of August

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: strong

Bud fertility coefficient (cluster per winter bud): 1.17

Inflorescences per shoot: 1.46

Bunch size: 16-26 x 11-15 cm

Bunch weight: 200-220 g

Yield per vine: 9.0-10.2 kg

Yield: 20-22 t·ha⁻¹

Climate and cultivation requirements

Long pruning (10-14 buds) and the multi-branched "fan like" training system with trellis are recommended to obtain a high and constant yield with 'Surmeiyi'. The variety needs irrigation.

Resistance to diseases and unfavorable weather

The variety has medium susceptibility to *Plasmopara viticola* and *Erysiphe necator*.

Juice characteristics

Sugar: 16.0 %

Total acidity: 5.0 g·L⁻¹



Wine and grape characteristics

Fresh grape sensorial grade is 8.9/10.

'Surmeiyi' is a late-ripening, high-yield table grape variety. Ripe grapes stay on the vines until November. The grapes are mainly used locally for fresh consumption. The variety may also be used for making high-quality common grape juice and a very concentrated boiled grape juice called Bekmez (Doshab).

Tabrizi B.

Synonyms

'Gyanja sufre uzumu', 'Shah uzumu' (in Azerbaijan); 'Tabrizeni', 'Gandzaki', 'GanjuAskeri' (in Armenia), 'Ganjuri', 'Tavrizuli', 'Shirazuli Tita' (in Georgia), 'Gyandjinski Bely', 'Kirovabadskii stolovyi', 'Shahski' (in Russia)

Meaning of the name

Apparently, great quantities of this grape used to be exported from Azerbaijan over to Tabriz, a city in Iran. Hence, the name 'Tabrizi'.

Historical notes and cultural importance

'Tabrizi' is supposed to be original of the surroundings of the city of Gyanja.

'Tabrizi' is one of the best table grape varieties in Azerbaijan. It has a beautiful appearance and pleasant, harmonious taste.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

'Tabrizi' mainly has oval berries. However, there are several biotypes with elongated, rounded and soft berries. There are three variations of 'Tabrizi' called A, B and C. Variation 'A' is clearly different from the other variations, according to storage ability, transport resistance and many other features. However, no Tabrizi clones have been described so far.

Essential ampelographic characteristics

The tip of the young shoot, the first, the second and sometimes the third leaf are covered with sparse cobwebby hairs. Coloring of leaves is orange. The young shoot is light green.

The mature leaf is medium, slightly elongated and five lobed. The lower leaf surface is hairless. The lateral leaf sinuses are medium dense with elliptic lumen. The petiole sinus is open, arched, seldom squared or lyre-shaped, with one or two teeth in base. The teeth are triangular, cupola-shaped and serriform, both sides are convex; the teeth on the end of the lobes are triangular, convex on both sides and with a sharp tip. The petiole is reddish-pink and it is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium, conical and dense.

The berry is medium and large, oval and golden. The skin is firm and elastic.

The flesh is juicy. The taste is ordinary and harmonious.

Phenology

Time of bud burst: first half of April

Time of blooming: third ten days of June

Time of veraison: end of July - beginning of August

Time of ripening: first ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 7.0-8.0 kg

Bunch weight: 210-245 g

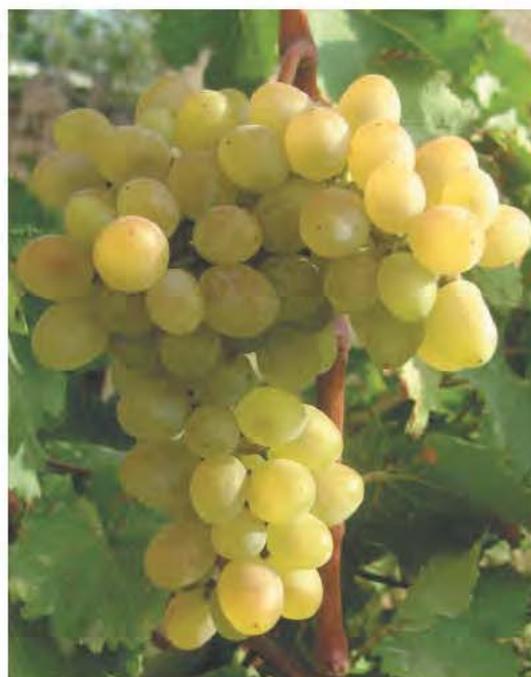
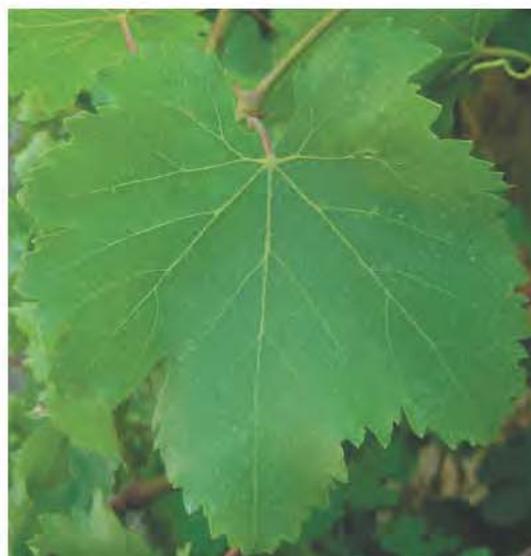
Bud fertility: 0.15-0.31

Climate and cultivation requirements

'Tabrizi' requires high bud load and long pruning (12-14 buds per cane). The cordon training system greatly increases this variety's yield capacity. The highest grape quality is obtained on well-warmed soils.

Resistance to diseases and unfavorable weather

'Tabrizi's' susceptibility is lower to *Plasmopara viticola*, and higher to *Erysiphe necator*. It is susceptible to Gray Mold (*Botrytis cinerea*). This variety is sensitive to low temperature and drought.



Juice characteristics

Sugar: 16.7-19.6 %

Total acidity: 4.3-5.9 g·L⁻¹

Wine and grape characteristics

'Tabrizi' is very suitable for long distance transport and for winter storage.

It is a high quality table grape with excellent sensorial characteristics and beautiful appearance.

Yagubi Rg.

Synonyms

Unknown

Meaning of the name

This variety takes the name of its first grower: Yagub.

Historical notes and cultural importance

There is no reliable information about the origin of 'Yagubi'.

This variety has a local importance and it is suitable for both fresh consumption and winemaking.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are greenish-white, with weak cobwebby hairs.

The mature leaf is medium, rounded and five lobed. The lateral leaf sinuses are closed with an oval lumen. The petiole sinus is open and lyre-shaped. The teeth are serriform; the teeth of the lobes are narrow triangular with an elongated tip. The lower leaf side is hairless. The petiole is light green and shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium, cylindrical-conical and medium dense.

The berry is medium, oval and dark red. The skin is medium firm. The flesh is juicy. The taste is harmonious and pleasant.

Phenology

Time of bud burst: first ten days of April

Time of blooming: end of May

Time of veraison: end of July

Time of ripening: first ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per plant: 2.0-3.0 kg

Bunch weight: 155 g

Bud fertility: 0.9

Climate and cultivation requirements

The length of the vegetative period of 'Yagubi' is medium. Cane maturation is good. 'Yagubi' is suitable for cultivation in plain areas.

Resistance to diseases and unfavorable weather

The variety shows a medium resistance to fungal diseases.

Juice characteristics

Sugar: 24.0-25.0%

Total acidity: 5.0-5.6 g·L⁻¹

Wine and grape characteristics

'Yagubi' is used for making high quality table wines with pleasant taste and aroma.



Zeynebi B.

Synonyms

Unknown

Meaning of the name

Zeyneb is a feminine first name.

Historical notes and cultural importance

'Zeynebi' is a native variety of the Agdam district. It was selected from the wild grapevine.

This is a rare table grape variety suitable for fresh consumption.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

No clones of this variety have been described so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with medium dense felt hairs and bronze hem. The first distal leaves are covered with cobwebby hairs and have a bronze tint.

The mature leaf is medium, rounded and five lobed. The lower leaf surface is hairless. The lateral teeth are small and serriform; the teeth on the end of the lobes are large with a pointed tip.

The flower is hermaphrodite.

The bunch is large, conical and sparse.

The berry is large, oval and greenish-yellow. The skin is thick. The flesh is pulpy and semi-juicy. The taste is ordinary. The juice is colorless.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: strong

Yield per plant: 15.0 kg

Bunch weight: 208 g

Bud fertility: 0.5-0.7

Climate and cultivation requirements

This variety requires long cane pruning (12-15 buds). Tipping before flowering has a positive effect. 'Zeynebi' grows well on irrigated chestnut soils.

Resistance to diseases and unfavorable weather

This variety is low-susceptible to *Erysiphe necator* and to *Plasmopara viticola* and it is almost not susceptible to Gray Mold (*Botrytis cinerea*). 'Zeynebi' is drought resistant.

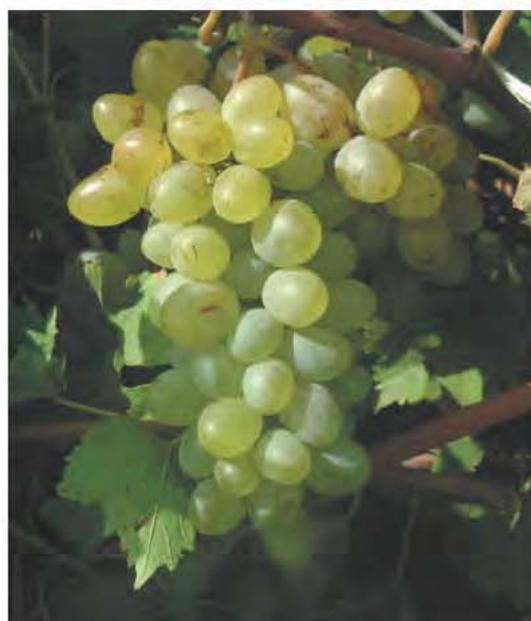
Juice characteristics

Sugar: 15.0-17.0%

Total acidity: 6.0-7.0 g·L⁻¹

Wine and grape characteristics

'Zeynebi' has a local importance. It is used for fresh consumption and it is suitable for transport.



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Table

Some general transliterations and translations from Azerbaijani to English

| Transliteration | Translation |
|-----------------|----------------------------------|
| Ag | White |
| Chehrayi | Pink |
| Gyrmyzy | Red |
| Gara | Black |
| Yashil | Green |
| Sari | Yellow |
| Sherab | Wine |
| Surma | Coloured, Stainer |
| Uzum | Grape |
| Tenek | Vine |
| Gyozu | Eye |
| Khiyabani | Pergola |
| Kishmish | Raisin |
| Absheron | Absheron peninsula in Azerbaijan |
| Iri | Large |
| Shira | Juice |

Viticulture and winemaking in Georgia

N. CHKHARTISHVILI, D. MAGHRADZE

Institute of Horticulture, Viticulture and Oenology, Tbilisi, Georgia

Introduction

Georgia is a country of 69,700 km², located in the Southern Caucasus between 41°07'-43°35' latitude and 40°05'-46°44' longitude. It borders on Russia to the north and northeast, on Azerbaijan to the east and southeast, on Armenia and Turkey to the south and on the Black Sea to the west.

With the exception of the fertile plain of the Kolkheti Lowland, Georgia is largely mountainous and more than one third is covered by forest or brushwood. The remarkable variety of landscapes ranges from the subtropical Black Sea shores to the snowy Caucasian crest line. To the north there are the high Caucasian mountains, to the south we find the Trialeti Mountains. The Likhi Mountains, from north to south, split the Country in two (Eastern and Western Georgia). The main rivers are Mtkvari Kura, Alazani, Rioni and Enguri.

The soils where the main commercial vineyards grow are cinnamonic, meadow cinnamonic, grey cinnamonic (chestnut), raw humus calcareous black, meadow black forest, cinnamonic forest and alluvial soils with their sub-types. Cinnamonic soils guarantee the best winemaking: this is where famous wines like Tsinandali, Vazisubani, Akhasheni, Gurjaani, Manavi and Kardanakhi originate from. Other soils with good winemaking features are raw humus calcareous (mainly limestone and carbonate rocks - in Racha-Lechkhumi), brown forest, red soils, yellow soils, alluvial, meadow alluvial and porzols are spread in the main viticultural regions in Western Georgia.

Western Georgia has a humid subtropical, maritime climate, while Eastern Georgia has a very wide range of climates: at different altitudes, during the same season, climate varies from humid subtropical to alpine; on the peaks, snow and ice are present all year round.

The Caucasian barrier to the north protects Georgia from cold air intrusions and the Black Sea is a source of warm air and humidity. Annual rainfall spans from 1,000-2,800 mm in the West to 300-800 mm in the East. Average annual temperature is 11-12 °C. The average temperature in July for Eastern Georgia is 24-25 °C at 450 m a.s.l. and 22-23 °C in Western Georgia at the same altitude. The sum of active temperature (base 0 °C) in the viticultural regions of the country is 3200-4500 GDD.

History of viticulture and winemaking

The 7th millennium BC is considered to be the age of the first human settings in Georgia. Palaeobotanical and archaeological data from this period are evident on the sites of "Shulaveri" belonging to the "Shulaveri-Shomu tepe" culture period (6000-4000 BC). Among these remains, grapevine seeds are very important, as they are the nearest sign of



Fig. 1: Clay jar 'Dergi' (Khramis didi gora, VI-V mil. BC.) with relief image of a grape bunch belonging to the Shulaveri-Shomu tepe culture (VI-IV mill. BC). This is one of the oldest archaeological evidences of winemaking on the territory of Georgia.

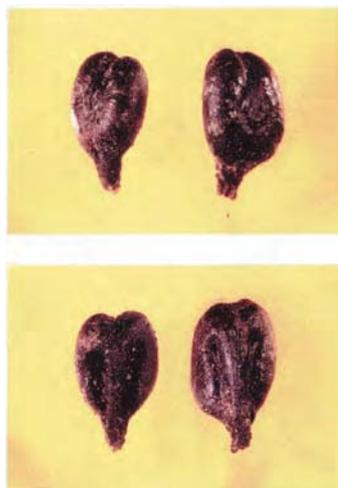


Fig. 2: Seeds of grape from Dangeuli gora, VI-V mil. BC, having characteristics of cultivated grapevines. This, together with pottery artifacts, is an evidence of grapevine cultivation (RUSISHVILI 2007).

cultivation of *V. vinifera* L. ssp. *sativa* D.C. Other findings from the same site are: 'Dergi' (a wine vessel with the relief of a grape bunch), fragments of other vessels with relief representations of grapes and statues of the Goddesses of Fertility (CHILASHVILI 2004; KIGURADZE 2000). MCGOVERN (2003b) reports about wine residues found in a "Shulaveri" jar.

From this period up to recent time, archaeology and palaeobotanic data have demonstrated constant viticulture and winemaking activity in the country (JAVAKHISHVILI 1934, JAPARIDZE and JAVAKHISHVILI 1971, KIGURADZE 2000, MCGOVERN 2003 a, CHILASHVILI 2004). Grape seeds and pollen artifacts confirm data (RUSISHVILI 1990 and 2010, COSTANTINI *et. al* 2005-2006).

After the age dominated by the "Shulaveri culture", the "Mtkvari (Kura)-Araks culture" (4000-2000 BC) spread in Southern Caucasus, with a further development of livestock breeding, progress of copper metallurgy, improvement of farming and living standards: the site of Badaani shows signs of cultivation of common wheat (*Triticum aestivum* L. em Thell), Persian wheat (*Triticum carthlicum* Nev., called 'Dika' in Georgian) and multi-rowed barley; together with signs of grapevine cultivation (JAPARIDZE and JAVAKHISHVILI 1971, RUSHISHVILI 1990 and 2010).

The "Trialeti culture", named after the Trialeti region, spread in the first part of the 2nd millennium BC and reached its peak in 1500 BC in Eastern Georgia (TRIALETI 2010). In the 'National Treasures of Georgia' (1999), MCGOVERN underlines 'The importance of viticulture in Georgia to have intensified in later periods, finding new forms of cultural expression. For example, impressive and unique artifacts characterize the so-called Trialeti culture of the earlier second millennium BC. Large burial mounds (Kurgans) as Trialeti itself, west of modern Tbilisi, and other sites of the period have yielded marvelously ornate gold and silver goblets, often depicting drinking scenes or ceremonies. Grapevine cuttings were even encased in silver, accentuating the intricate nodal pattern of the plants. The later specimens, with their nearly 4000-year-old wood still intact, are on display, together with several Trialeti goblets, in the treasure room of the Georgian State Museum'.

In Western Georgia, a unique culture known as Colchian developed between 1300 and 700 BC. In Greek mythology, Colchis was the home of Aeëtes and Medea and the destination of the Argonauts. When Jason and the Argonauts arrived in Colchis, among the many wonders they found, there were shadow grapevines and wine flowing fountains near Aeëtes' palace (APOLLONIUS RHODIUS, III c. BC). According to Herodotus (V cent. BC) and Strabon (I cent. BC), winemaking prospered in Georgia: the "fizzing and sweet, as honey, wine of Colchis" are frequently mentioned in their works. History and Myth are confirmed by findings of grapevine seeds from Ergeta (Zugdidi district, VII-VI cc. BC) and Gienos (Ochamchire district, VII-VI cc. BC) belonging to *V. vinifera* ssp. *sativa* and to *V. vinifera* ssp. *sylvestris* (RUSISHVILI 2010).

During the Christian age, viticulture and winemaking held a leading position. St. Nino, native from Cappadocia and related to St. George, came to Iberia (Kartli) from Jerusalem to preach Christianity in the country. She arrived to the capital of Georgia, Mtskheta, with a cross of grapevine canes. The "Grapevine Cross", also known as the "Georgian Cross" or "Saint Nino's Cross", is a major symbol of the Georgian Orthodox Church, dating back to the 4th century (337), when Christianity became the official religion of the kingdom of Iberia and later of the Kingdom of Egrisi (previously called Colchis) in Western Georgia. From this period we have: 'Marani' (wine cellars) with 'Kvevri' (big or small clay jars for fermentation and storage) and 'Satsnakheli' (stone presses), viticultural tools, fossil grapevine seeds, signs of irrigation systems and terraces for the cultivation of grapevine, which became also a main Church ornament. All these findings, together with the historical references, indicate that viticulture and winemaking were leading fields of agriculture also during the Middle Ages (SHARDEN 1711) and up to the 19th century, when they underwent important challenges.

In 1801 Georgia was integrated in the Russian Empire and a new wide market for Georgian wine was opened. Construction of new wineries (or reconstruction of old ones) started, and this gave a new impulse to the winemaking sector.

The 20th century was characterized by a significant change in the political and economical life, which affected also the winemaking sector. The planted area and the correspondent wine production changed several times throughout the century. This is clearly demonstrated in Tab. 1, representing the vineyard area in different years, on the basis of various sources (KETSKHOVELI *et al.* 1960, CHUBINIDZE 1967, ANONYMOUS 2004, MOA 2006).

The situation in the 21st century changed again: between 2004 and 2006, new vineyards were planted and the value of grapes rose. The Russian embargo on Georgia though led this process to a crisis, with a consequent drop of the products and of the price of grapes (FAO 2009).

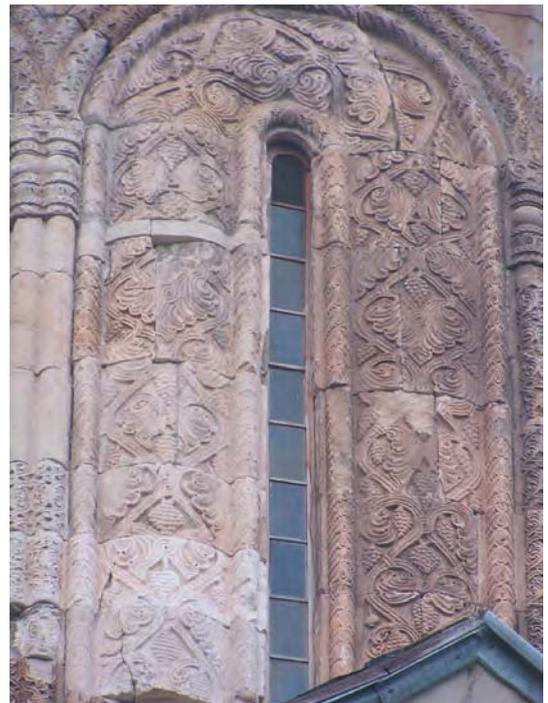


Fig. 3: Relief imagine of grapevine bunch and leaves in a Christian church of Nikortsminda (XI c.).

Viticulture in terms of figures

The climate is favourable to viticulture in wide areas of Georgia but most of the vineyards are located up to 700-800 m a.s.l.

The Georgian Law "About Vine and Wine" (1998) recommends 37 wine and 13 table grape cultivars with white and coloured berries (Tab. 2). Of the wine grapes, 31 are local and only 6 are foreign. Of the 13 table cultivar, 4 are autochthonous, 5 are from local breeding and 4 are allochthonous.

Table 1

Area of vineyards in Georgia in 19th-21st centuries

| 1875 | 1900 | 1913 | 1921 | 1940 | 1953 | 1976 | 1990 | 2000 | 2004 |
|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|
| 71,200 | 50,258 | 49,549 | 37,400 | 60,000 | 78,333 | 134,300 | 115,539 | 60,614 | 37,419 |

Table 2

Grapevine varieties recommended for cultivation in Georgia

| Colour | Wine Grape | Table Grape |
|----------|---|--|
| White | Avasirkhva, Chinuri, Goruli Mtsvane, Kapistoni, Kisi, Khikhvi, Krakhuna, Mtsvane Kakhuri, Mtsvane Kakhuri-Clone 12, Rkatsiteli, Rkatsiteli - Clone 48, Tsitska, Tsoolikouri, Tsulukidzis Tetra Aligoté, Chardonnay, Pinot Blanc | Gorula Kartuli Saadreo, Kolkhuri, Muskaturi Rkatsiteli, Sakhalkho Tetri, Tbilisuri Karabuornu, Khalili, Chasselas Blanc, Tabrizi (sin. Ganjuri <i>in Georgia</i>) |
| Coloured | Aladasturi, Alexandrouli, Asuretuli Shavi, Chkhaveri, Dzelshavi, Katchitchi, Mujuretuli, Ojaleshi, Orbeluri Ojaleshi, Otskhanuri Sapere, Saperavi, Saperavi - Clone 359, Saperavi Budeshurisebri, Shavkapito, Tavkveri, Usakhelouri Cabernet Sauvignon, Malbec, Merlot, Pinot Noir | Budeshuri Tsiteli, Tskhenis Dzudzu, Tskhenis Dzudzu from Abkhazia Muscat of Alexandria |

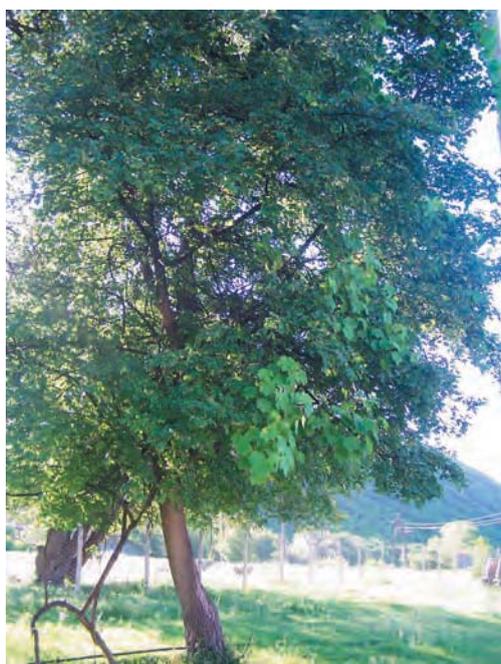


Fig. 4: Cultivation of grapevine on a high tree is one of the ancient training systems for this plant, derived directly from a wild grapevine in the beginning of grapevine domestication. This method still exists in Georgia.



Fig. 5: An ancient vineyard.



Fig. 6: The main viticultural region of Georgia is Kakheti with large and modern vineyards.



Fig. 7: Small family vineyards are common in the province of Imereti in West Georgia.

There are 12 recommended Phylloxera resistant rootstocks: Kober 5BB, 420A, 41B, SO4, 101-14, 3309 Couderec, 3306 Couderec, Rupestris du Lot, Teleki 8B, No14 (Rkatsiteli X Riparia Gloire), No19 (Kharistvala Shavi X 420A) and No32 (Rkatsiteli X 420A) obtained from local breeding programs.

According to the census in 2004, the total vineyard surface was 37,419 ha, planted with various proportion in the historical - geographical provinces of Georgia: the leader region is Kakheti with 54.9 %; followed by Imereti (22.9 %), Kartli (11.1 %), Racha-Lechkhumi (3.6 %), Samegrelo (2.6 %), Guria (0.7 %), Adjara (0.1 %), Abkhazeti.

Autochthonous Georgian varieties cover 95 % of the vineyards and they can yield quality wines, highly rated by tasting panels over the world. The top cultivars are 'Rkatsiteli B.' (19,741 ha), 'Tsolikouri B.' (6,161 ha), 'Saperavi N.' (3,704 ha), 'Tsitska B.' (2,839 ha), 'Chinuri B.' (859 ha), 'Dzelshavi N.' (685 ha). 'Rkatsiteli B.', 'Saperavi N.' and 'Chinuri B.' are cultivated in Eastern Georgia while 'Tsolikouri B.' and 'Tsitska B.' are cultivated in the West. Only 16,3 % of the grapes are black, while the rest is white. Table grapes' supply is based on import. The two best-known varieties of Georgia are native: 'Rkatsiteli B.' and 'Saperavi N.' They are wide spread in the Caucasus, East Europe and Middle Asia. In 1985, 'Rkatsiteli' was the leader cultivar of the former Soviet Union (40 %) and according to GALET (1990), with 280,000 ha, it was among the leading varieties in the world. Saperavi, with 10,000 ha, held the 86th position in the same period.

Between 1981 and 1990, grape production in Georgia was over 700,000 tons per year, yielding 28-30 million decalitres of wine: this meant 18-20% of all agricultural production (CHKHARTISHVILI and DARCHAISHVILI 1980). Such numbers dropped as a consequence of the reduction of the vineyard surface in the last 20 years. If we consider the 1986-1990 period, there were 84,259-115,539 ha of vineyards and a production of 629,500 t of grapes. In 2000, the amount of grapes was esteemed to be of around 210 000 t (with 60,614 ha of vineyards) while in 2007 it decreased to 93,000 tons (GEORGIAN AGRICULTURE 2004, FAO 2009). The main reasons of this reduction are connected to the difficult economical period together with the loss of the Russian market – the major market for Georgian wines.

Winemaking in terms of figures

There were three wine categories available in Georgia: "Table wine", "Region wine" and the top "Qualitative wine PSR", produced in the Georgian appellations of origin (MOA 2006):

- Red: Mukuzani, Napareuli, Teliani, Kindzmarauli, Akhasheni, Kvareli, Kotekhi, Khvanchkara;
- White: Tsinandali, Napareuli, Gurjaani, Vazisubani, Kardenakhi, Tibaani, Manavi, Atenuri, Svir, Tvishi, Kotekhi, Kakheti (DEKANOSIDZE and MIRVELASHVILI 2010).

Various styles of wine are produced in Georgia, but the leading style is high quality dry table wine, both white and red. White wine holds a leading position for internal consumption, while dry red and especially naturally semi-sweet wine is mainly sold on foreign markets. Until 2006, the main market for Georgian wine was Russia, followed by Ukraine, Kazakhstan, Baltic States, Byelorussia, USA, UK, Japan, Israel, Poland, Asia, Scandinavian countries and others (MOA 2006). In 2008, export reached 33 countries.

The annual production is about 1 million hl; 90 % of it is exported while the rest is sold on the local market (FAO 2009). Yearly average consumption is 30 liters per capita (ANONYMOUS 2006): light wines hold 93 % of this share, followed by sparkling (5 %) and dessert (2 %) wine.



Fig. 8: Fermentation of a white wine in "Kvevri".



Fig. 9: Vashlijvari collection of Georgian native varieties was established in the framework of Bioversity International project on grapevine by the Institute of Horticulture, Viticulture and Oenology.

Even if professional winemaking is a well-developed sector, homemade wine in rural environments is still a deep-rooted tradition: in 1990, 30 % of the wine was homemade. Traditionally, grapes are foot pressed in woody "Satsnakheli" or in small mechanical presses, the must ferments in "Kvevri" jars, barrels or metal casks. "Kvevri" or demijohns are used for storage.

Sparkling winemaking began in the second half of the 19th century. In the 1930s, a large sparkling wine factory - recently named "Bagrationi 1886" - was built in Tbilisi.

For a long time, pomace brandy production was unavailable, but now some leading wineries like "Telavi Wine Cellar", "Kindzmarauli Marani", "Teliani Valley", "Shumi" and others have started to distil it.

Maintenance of grapevine collections

Grapevine collections in Georgia started in 1890, when STAROSELSKII established the first one in the Testing Station of Sakara (LOMINEISHVILI and GAPRINDASHVILI 1990). In the 1930s, the first studies were carried out and many local varieties were preserved in the Telavi Collection. Several collections were established between the 1940s and the 1980s: Sakara (220 varieties), Gudauta (321), Mukhrani (155), Zugdidi (48), Keda (42), Skra (32), Galavani (22) and others. In 1967-68, the State Agrarian University planted a collection in Dighomi, with 3000 accessions from all over the world, 420 of which were Georgian local varieties. By the end of the 1990s, local varieties were protected in Dighomi, Mukhrani, Telavi, Gudauta and other collections in Georgia, Moldova, Ukraine, Azerbaijan and Russia, but soon economical difficulties came along.

During the 2003-2005 period, Georgia was able to establish a new field collection of native varieties in Vashlijvari, in the framework of the international project "Conservation and sustainable use of grapevine genetic resources in the Caucasus and northern Black Sea region", organized by the International Plant Genetic Resources Institute (IPGRI, Rome) and recently named "Bioversity International" (TUROK 2007, CHKHARTISHVILI 2008, TROSHIN *et al.* 2008, MAGHRADZE *et al.* 2009 b). Georgian autochthonous varieties from the old Dighomi, Mukhrani, Telavi and Chisinau (Moldova) collections were gathered here.

On these bases, the Institute of Horticulture, Viticulture and Oenology was able to establish three other field collections in Telavi (573 accessions), Skra (440) and Vachevi (312) in 2008. Three new collections were set up by "Kindzmarauli" winery (400 accessions), "Shumi" winery (149) and Saguramo "Centre for Grapevine and Fruit Tree Planting Material Propagation" (425 accessions). Two new collections were established in Italy by the University of Milan.

Despite these efforts, viticulture in Georgia is still threatened by genetic erosion: only few local varieties are still cultivated while many indigenous breeds have not been included in the collections or are present only in a single collection with few individuals. Moreover, many varieties available in international collections are not present in the national ones.

Germplasm of native varieties

The "Ampelography of Georgia" (KETSKHOVELI *et al.* 1960) lists more than 525 autochthonous varieties which have been bred in the following areas thanks to the uninterrupted millennial Georgian winemaking tradition: Kakheti (80 varieties), Kartli (72), Imereti (75), Racha-Lechkhumi (50), Samegrelo (60), Guria (59), Adjara (52), Abkhazeti (58), Meskheti (25).

Most Georgian varieties have been described since 1846 (KOLENATI 1846). Other relevant ampelographies are: "Grapevine varieties of the Caucasus - Shorapani and Kutaisi uyezds of Kutaisi Gubernia" by V. A. STAROSELSKII 1893, "Ampelography" by S. CHOLOKASHVILI (1939), "Grapevine varieties of Adjara, Guria and Samegrelo" by M. RAMISHVILI (1946), "Grapevine varieties of Kaketi" by D. TABIDZE (1954), "Ampelography of the Soviet Union" in ten volumes (1946-1970) with a description of 414 Georgian native varieties; "Ampelography of Georgia" (1960); "A study of grapevine varieties of Kartli" by R. KIKACHEISHVILI (1963), "Determiner of grapevine varieties distributed in Georgia" by N. TSERTSVADZE (1987), "La vite e l'uomo" by DEL ZAN *et al.* (2004, 2009) and others.

According to the inventory made in the framework of Bioversity International's project, there were 875 accessions of native varieties in 5 collections in Georgia. Now, thanks to the establishment of new public and private collections, there are 2664 accessions (about 350 varieties).

Investigations are ongoing thanks to international projects like "Conservation and sustainable use grapevine genetic resources in the Caucasus and northern Black sea region" of Bioversity International, the "ECO-NET" project of the French Minister of Foreign Affairs, "Agricultural research-extension and training" of the World Bank, "GrapeGen06 - management and conservation of grapevine genetic resources" of the EU together with the University of Milan (Italy) and INRA-Montpellier (France).

The main research guidelines are: pollen and stoma parameters and characteristics, aspect of pollination and fruit set (VASHAKIDZE 2006, CHKHARTISHVILI *et al.* 2006); characterizations of varieties by modern ampelographic methods and use of OIV and IPGRI descriptors; classification of colored varieties by antocyanin analyses based on HPLC technique

(ROSSONI *et al.* 2007); phenological timing, according to Baggiolini's scale (COOMBE 1995) and technological ripening profiling; molecular characterisation of cultivated varieties and wild forms based on 20 SSR markers for description and characterisation of Georgian grapevine gene pool and for comparison of this data to other germplasm of the World (MAGHRADZE 2009 a).

Wild grapevine

Wild Grapevine *Vitis vinifera* ssp. *sylvestris* Gmel., the supposed wild ancestor of the cultivated grapevine *Vitis vinifera* ssp. *sativa* D.C., is a typical representative of the Caucasian and Georgian flora. It grows sporadically in woods, forests, lowlands and rivers' banks up to 1,200 m a.s.l. (RAMISHVILI 1988). The history of the wild grapevine in Georgia should be separated in two periods: I) since the earliest time until the second part of 19th century; II) since the 1860s until today, when Oidium, Mildew and Phylloxera, together with industrial and urban expansion, destroyed spontaneous development of wild grapevine populations.

The first researcher who started investigations of the wild grapevine of Georgia was F. A. KOLLENATI (1846), followed by F. RUPRECHT (1869), N. SREDINSKII (1874), A. DE CANDOL (1883), I. PLANSCHEN (1887), V. LIPSKII (1885), S. TIMOFEEV (1892), G. RADDE (1901), D. SOSNOVSKII (1925, 1946), N. VAVILOV (1931), R. ERGESIAN (1946), R. BURKACH-ABRAMOVICH (1953), M. RAMISHVILI (1943, 1948, 1968), L. PRUIDZE (1966), E. CHAMAGUA (1968), R. RAMISHVILI (1988, 2001) and others (RAMISHVILI 1988).

R. RAMISHVILI investigated wildy growing grapevines of Georgia in the second half of the 20th century (1956-1988). He collected about 400 genotypes in a field collection. On the basis of the results, he wrote the book "Wildly Growing Grapevine of the Trans-Caucasus" (1988). According to R. RAMISHVILI, there are three types of wildy growing grapevines in Georgia: 1. real *V. vinifera* ssp. *sylvestris* Gmel.; 2. feral varieties *V. vinifera* ssp. *sativa* D.C.; and 3. intermediate forms between these two types, named as *V. vinifera* ssp. *silvesatis* Ram. On these bases, we have a map of the spreading of wild grapevine in 8 main concentration centres.

The institute of Horticulture, Viticulture and Oenology (IHVO) could renovate investigation, description and inventory of wild grapevines in the framework of the above mentioned projects (CHKHARTISHVILI *et al.* 2005, MAGHRADZE *et al.* 2006). Fifty populations of wild grapevine with 180 plants were described; size of population varied from 1 to 20 plants, with an average quantity of 3.8 plants per site. According to the number of plants of the populations, they were classified as "Very bad" (64 %) or 'Bad' (24 %) and only 12 % - as "Regular".

Thanks to the Geographic Information System (GPS), it has been possible to describe the plants in their location. Harmonized ampelographic descriptors of OIV (1983, 2007), IPGRI (1997) and GENRES 081 descriptors were used for ampelographic, agronomic and cytological characterization of vine organs. Antocyanin analysis was made by HPLC technique. In 2008, a joint research with Spain (University of Sevilla) was organised for investigating the sanitary status of 10 wild grapevine *in-situ* populations, describing plant associations to wild vines. Twenty-two genotypes of wild vine together with 139 autochthonous varieties were characterized by 20 SSR markers, demonstrating that wild accessions are well distinguished from the cultivated compartments. Forty-six selected exemplars of wild grapevine and 7 genotypes of vine collected by R. Ramishvili were propagated at the University of Milan for collection, while just several forms are in *ex-situ* preservation in Telavi grapevine collection and Tbilisi Botanical Garden.

Despite being so widespread in the past, *V. vinifera* ssp. *sylvestris* is now included in the "Red Book of Georgia" (1982) for *in-situ* preservation. Only few populations are available in the reserve areas of Georgia and the activities for preservation of *V. vinifera* ssp. *sylvestris* in other areas are not sufficient.

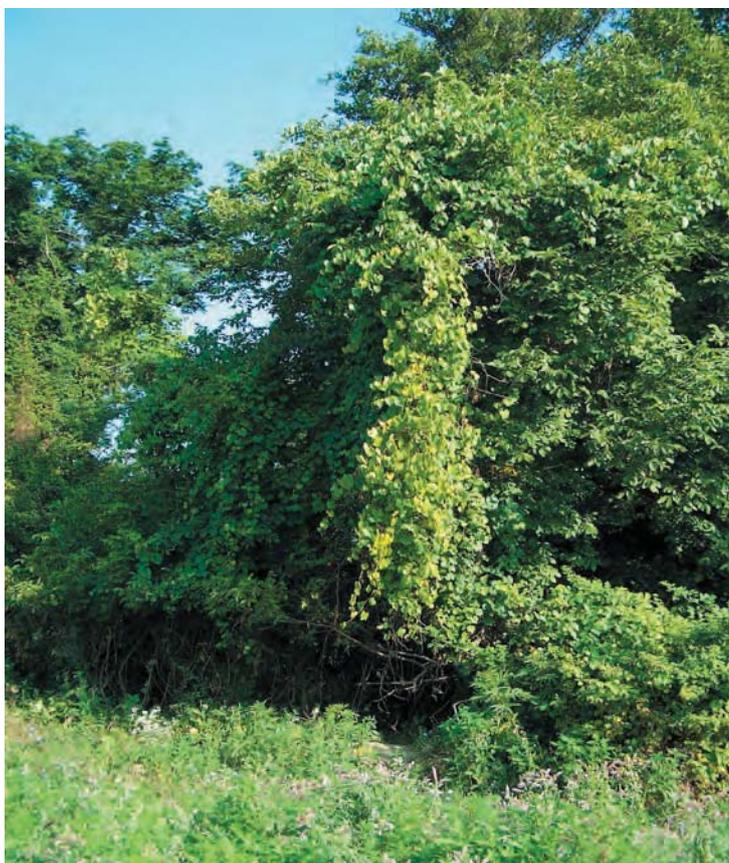


Fig. 10: Wild grapevine *V. vinifera* ssp. *sylvestris* Gmel. is a typical representative of Georgian flora. It grows mainly in river gorges. It has undergone scientific evaluation since 1846 (KOLLENATI 1846).

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Georgia: native varieties of grapevine

N. TSERTSVADZE

Institute of Horticulture, Viticulture and Oenology, Tbilisi, Georgia

Authors of the photos: D. MAGHRADZE, I. MDINARADZE and R. CHIPASHVILI, Institute of Horticulture, Viticulture and Oenology, Tbilisi, Georgia

English translation: V. GURASASHVILI and T. VAKHTANGADZE, Institute of Horticulture, Viticulture and Oenology, Tbilisi, Georgia

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|---------------------------|---------------------------------|
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| 2. Alexandrouli N. | 26. Ojaleshi N. |
| 3. Asuretuli Shavi N. | 27. Okhtoura N. |
| 4. Budeshuri Tetri B. | 28. Otskhanuri Sapere N. |
| 5. Budeshuri Tsiteli Rg. | 29. Paneshi N. |
| 6. Buera B. | 30. Partala Shavi N. |
| 7. Chinuri B. | 31. Rkatsiteli B. |
| 8. Chitistvala Bodhuri B. | 32. Rkatsiteli Vardisperi R. |
| 9. Dzelshavi N. | 33. Saperavi N. |
| 10. Ghrubela Kartlis G. | 34. Saperavi Atenis N. |
| 11. Ghvinis Tsiteli Rg. | 35. Saperavi Budeshuriseburi N. |
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| 15. Ikaltos Tsiteli N. | 39. Sirgula B. |
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| 17. Jineshi R. | 41. Tavkveri N. |
| 18. Khikhvi B. | 42. Tavkveri Saperaviseburi N. |
| 19. Krakhuna B. | 43. Tehvitoluri B. |
| 20. Kumsi Tetri B. | 44. Tsirkvalis Tetri B. |
| 21. Kundza B. | 45. Tsitska B. |
| 22. Mgaloblishvili N. | 46. Tskhvedianis Tetra B. |
| 23. Mkhargrdzeli B. | 47. Tsolikouri B. |
| 24. Mtevandidi N. | 48. Tsulukidzis Tetra B. |

Notes: N-Noir (black), B-Blanc (white), Rg-Rouge (red), G-Gris (gray), R-Rose (pink).

Aladasturi N.

Synonyms

Unknown.

Meaning of the name

Distributed in the village of Aladast.

Historical notes and cultural importance

Before the arrival of the American fungal diseases and of *Phylloxera*, 'Aladasturi' was wide spread within the Guria province, especially in the village of Amaghleba (Chokhatauri district) and in Lower Imereti. 'Aladasturi' was grown on a high training system. 'Aladasturi' is included in the official list of grapevine varieties recommended for cultivation in Western Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are covered with white hairs.

The mature leaf is large, pentagonal, five lobed or almost entire. The upper leaf sinuses are open, lyre-shaped. The petiole sinus is lyre-shaped. The teeth are straight on both sides and sharp on the end. The lower leaf side is covered with felt hairs. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is medium size and large, cylindrical or cylindrical-conical and medium dense.

The berry is medium size, ovate or oblong, rounded at the end and dark blue. The skin is thick. The flesh is firm.

Phenology

Time of bud burst: middle of April

Time of blooming: beginning of June

Time of veraison: third ten days of August

Time of ripening: third ten days of October

Vegetative and yielding characteristics

Bud fertility: 1.3

Bunch weight: 200 g

Yield per vine: 2.0 kg

Yield: 8.0-9.5 t·ha⁻¹

Climate and cultivation requirements

'Aladasturi' is a high yield variety. It is generally trained in the double side Georgian free training system with two fruity canes. It prefers well-aired soils, low hill-slopes, and soils with a sufficient lime content.

Resistance to diseases and unfavorable weather

The variety has low resistance to *Erysiphe necator* and sufficient resistance to *Plasmopara viticola*.

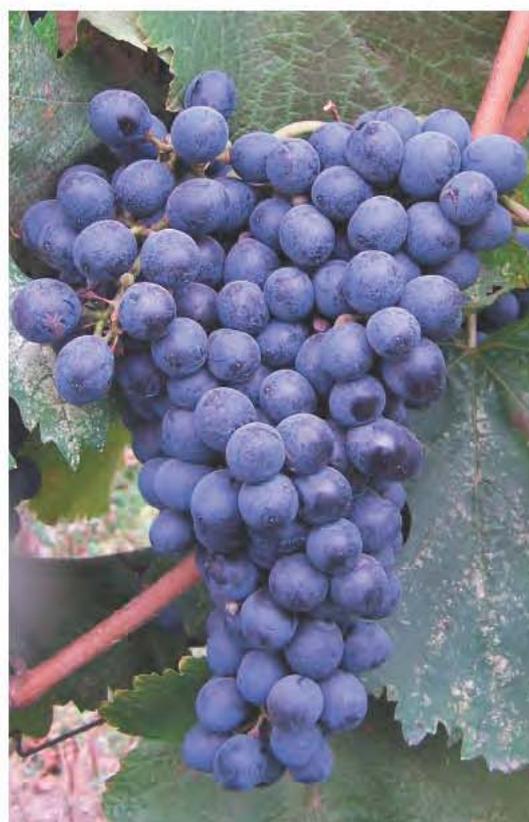
Juice characteristics

Sugar: 19.0 %

Total acidity: 8.5 g·L⁻¹

Wine and grape characteristics

'Aladasturi' table wine is light, harmonious, with 10 % alcohol. The grape is good for fresh consumption and it can be stored for a long time.



Alexandrouli N.

Synonyms

'Alexandreuli'.

Meaning of the name

Vine of Alexander.

Historical notes and cultural importance

'Alexandrouli' has been cultivated for a long time in the Ambrolauri, Oni and Tsageri districts of the Ratche-Lechkhumi province of Western Georgia. It is particularly well known for the production of Khvantchkara and other original semisweet dessert wines. 'Alexandrouli' grapes grown in the higher zones of the Ambrolauri and Tsageri districts produce high quality table wines. 'Alexandrouli' is included in the official list of grapevine varieties recommended for cultivation in Western Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. subproles *tomentosae* Tserts.
No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with dense felt hairs on both sides; hairiness diminishes on the upper surface of the following leaves and stays felt on the lower leaf surface.

The mature leaf is medium, rounded, triangular, five lobed or sometimes entire. The upper leaf sinuses are medium and chinked. The lower leaf sinuses are V-shaped and chinked. The teeth are triangular with sharp tips. The lower leaf side is covered with dense cobwebby hairs.

The flower is hermaphrodite.

The bunch is medium size or large, conical, seldom shouldered and winged, medium dense or seldom loose.

The berry is medium size, rounded, dark blue. The flesh is juicy, slightly crispy, colorless.

Phenology

Time of bud burst: first and second ten days of April

Time of blooming: first ten days of June

Time of veraison: first half of August

Time of ripening: first half of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Shoot fertility (cluster per shoot): 1.5-1.78

Bunch weight: 90-100 g

Yield: 4.0-6.0 t·ha⁻¹

Climate and cultivation requirements

'Alexandrouli' is not a high yielding variety. The normal training system is the one-side Guyot with one fruity cane. The variety grows up to 800 m above sea level.

Resistance to diseases and unfavorable weather

Susceptibility towards *Plasmopara viticola* is high and low towards *Erysiphe necator*.

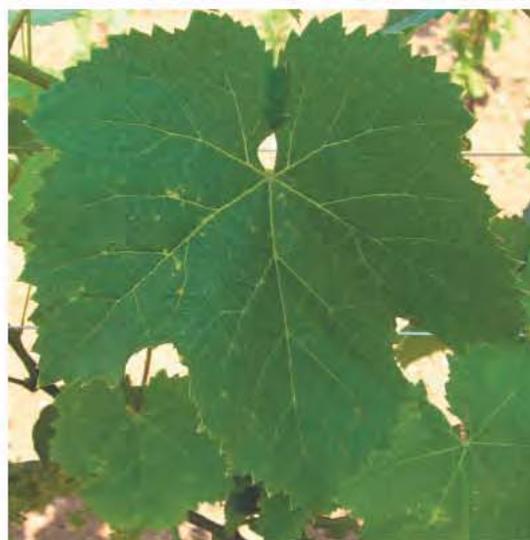
Juice characteristics

Sugar: 22.0-27.0 %

Total acidity: 5.0-7.0 g·L⁻¹

Wine and grape characteristics

'Alexandrouli' grapes harvested with 21-22 % sugar and 8.0 g·L⁻¹ total acidity are ideal for table wine production. 23 % sugar is recommended for the production of Khvantchkara semi-sweet wine.



Asuretuli Shavi N.

Synonyms

'Asuretuli', 'Shaltraube', 'Shal', 'Shalshvarts'.

Meaning of the name

Asureti's black (Asureti is the name of a village in Eastern Georgia)

Historical notes and cultural importance

'Asuretuli Shavi' is an old Georgian variety, selected during the 19th century from a wild mother plant growing near the village of Asureti in the Tetrtskharo district.

The variety is included in the official list of grapevine varieties recommended for cultivation in the Low Kartli region in Eastern Georgia.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two leaves are covered with dense cobwebby hairs.

The mature leaf is medium size or large, rounded, three seldom five lobed, medium dissected. The upper leaf sinuses are closed, deep and elliptical. The lower leaf sinuses are V-shaped. The petiole sinus is lyre-shaped and rarely chinked. The teeth are triangular and both sides are convex. The lower leaf side is covered with sparse cobwebby hairs. The petiole is shorter than the main vein.

The flower is female.

The bunch is large and cylindrical-conical in case of artificial pollination. It is often polymorphic shaped, winged and dense or very dense in case of normal pollination.

The berry is medium size, rounded and dark blue. The skin is easy to peel off. The flesh is colorless.

Phenology

Time of bud burst: second ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Vigor of shoot growth: vigorous

Shoot fertility (cluster per shoot): 1.15

Fruiting shoots: 78.0 %

Bunch weight: 200-600 g (according to pollination conditions)

Yield: 15.0-25.0 t·ha⁻¹ (in case of artificial pollination)

Climate and cultivation requirements

'Asuretuli Shavi' has female flowers and the yield depends on the cross pollination level: when it is good, the variety gives high yield. The variety grows well in any type of soil. It needs medium pruning with 8-10 buds per fruity cane.

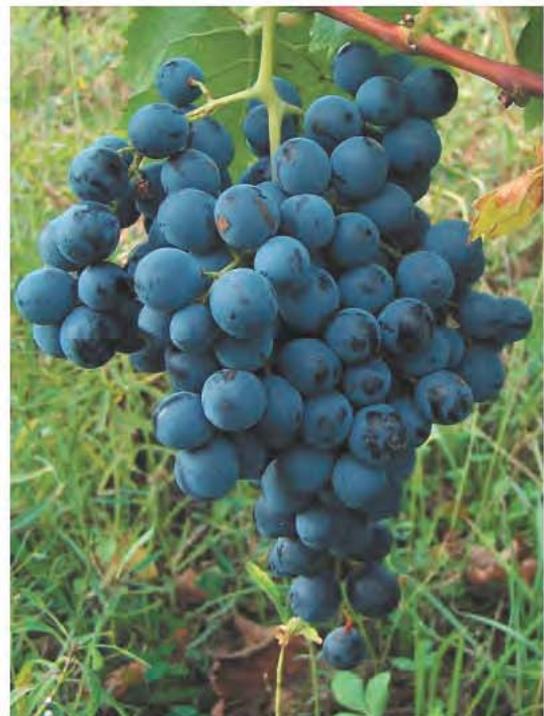
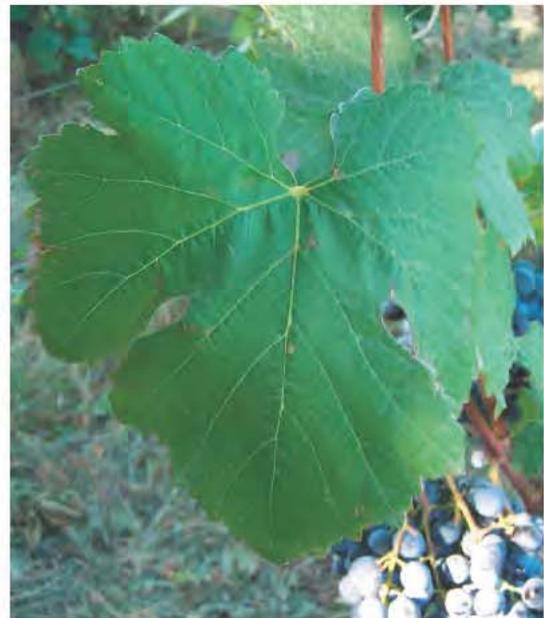
Resistance to diseases and unfavorable weather

Susceptibility towards fungal diseases is low. 'Asuretuli Shavi' is damaged by the European grapevine moth (*Lobesia botrana*) due to the high density of its bunches. This variety is resistant to frost and relatively resistant to drought.

Juice characteristics

Sugar: 18.0-22.0 %

Total acidity: 5.0-9.0 g·L⁻¹



Wine and grape characteristics

'Asuretuli Shavi' wines have sufficient good quality and can age for several years. 'Asuretuli Shavi' wines are also involved in the production of brandy. The grapes are also used for making juice or for fresh consumption.

Budeshuri Tetri B.

Synonyms

Unknown.

Meaning of the name

Budeshuri = With prolonged berries, Tetri = White.

Historical notes and cultural importance

'Budeshuri Tetri' is an old Georgian variety. It is mainly found in Eastern Georgia, where it was widely spread before the fungal diseases and *Phylloxera* invasion.

Nowadays, only single vines of this variety are found within the vineyards of the Kartli region. 'Budeshuri Tetri' is also grown sporadically in Central Asia, Ukraine and Northern Caucasus.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two lower distal leaves are covered with cobwebby hairs.

The mature leaf is large, cordate, sometimes rounded and five lobed. The upper leaf sinuses are medium and closed. The lower leaf sinuses are small and closed. The petiole sinus is U-shaped. The teeth are triangular and convex on both sides. The lower surface of the leaf blade is covered with weak felt hairs. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is medium size or large, conical, medium dense or loose.

The berry is medium size or large, ovate, sometimes prolonged and greenish-yellow. The skin is thin. The flesh is juicy with very pleasant harmonious taste.

Phenology

Time of bud burst: beginning of April

Time of blooming: beginning of June

Time of veraison: middle of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bunch weight: 150-200 g

Yield: high or medium

Climate and cultivation requirements

The double Guyot training system is recommended for 'Budeshuri Tetri'.

Vigor and yield depend on soil fertility.

Resistance to diseases and unfavorable weather

'Budeshuri Tetri' is very susceptible towards *Erysiphe necator* and Grey Mold (*Botrytis cinerea*) and it is relatively resistant to *Plasmopara viticola*, frost and drought.

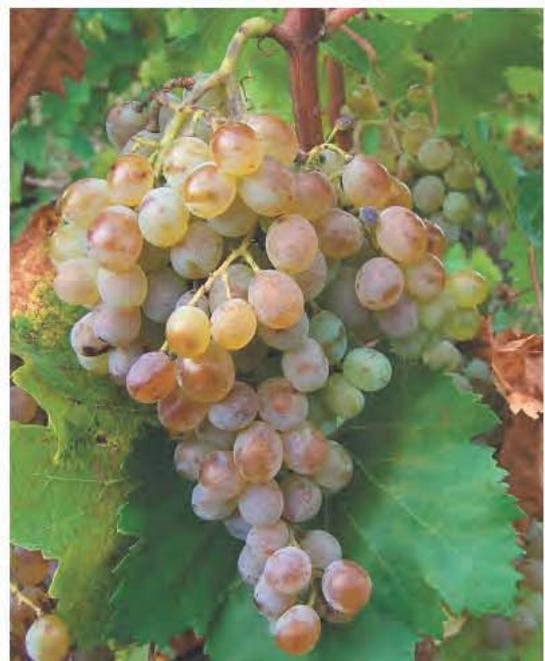
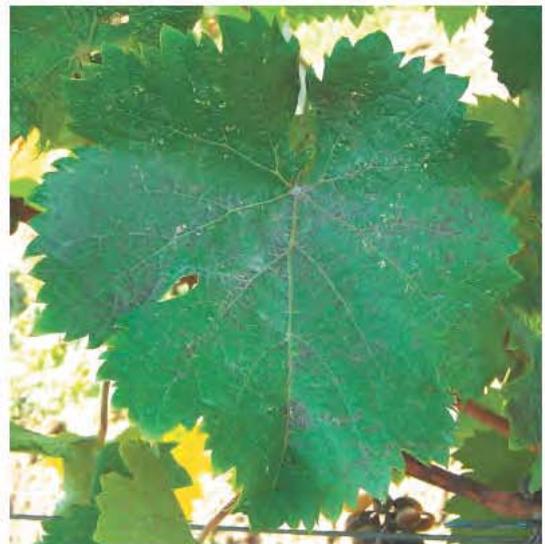
Juice characteristics

Sugar: 16.0-19.0 %

Total acidity: 5.3-6.6 g·L⁻¹

Wine and grape characteristics

'Budeshuri Tetri' is an early-medium ripening variety and it is highly resistant to transport. The wine was traditionally used in blend together with other varieties to make the Atenuri sparkling wine.



Budeshuri Tsiteli Rg.

Synonyms

'Tsiteli Budeshuri', 'Shavi Budeshuri', 'Tamareuli'.

Meaning of the name

Budeshuri = With prolonged berries. Tsiteli = Red.

Historical notes and cultural importance

In the past, 'Budeshuri Tsiteli' was spread in Western Georgia, nowadays it is spread in Eastern Georgia and particularly in Kakheti.

'Budeshuri Tsiteli' is included in the official list of table grape varieties recommended for cultivation in Eastern Georgia, however these days it is not a widespread variety.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is white due to the felt hairs and it is tinged with pink.

The mature leaf is large, rounded or slightly oval, and medium three to five lobed. The upper leaf sinuses are medium size, elliptical and lyre-shaped. The lower leaf sinuses are V-shaped, seldom chinked or lyre-shaped. The petiole sinus is chinked with a rounded bottom or lyre-shaped. The teeth are either straight on both sides or convex on one side and straight on the other. The lower leaf side is covered with sparse cobwebby hairs. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is medium size or large, conical, sometimes winged, loose or medium dense.

The berry is medium size, seldom large, oval or sometimes oblong, dark pink, when over-ripe it is almost black. The skin is thin and coarse, it is hard to peel off. The flesh is firm. The juice is colorless, flavored, tasty and harmonious.

Phenology

Time of bud burst: beginning of the second ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

Fruiting shoots: 75.0 %

Bunch weight: 180-200 g

Yield: 7.0 t·ha⁻¹

Climate and cultivation requirements

'Budeshuri Tsiteli' has a medium long vegetative period and good cane maturation. It gives the highest yields on rich carbonate, alluvial and forest soils.

Resistance to diseases and unfavorable weather

Resistance to *Plasmopara viticola* and *Erysiphe necator* is medium. Susceptibility towards the European grapevine moth (*Lobesia botrana*) is low. 'Budeshuri Tsiteli' shows medium resistance to frost and drought.

Juice characteristics

Sugar: 17.0-18.0 %

Total acidity: 4.5-6.5 g·L⁻¹

Wine and grape characteristics

'Budeshuri Tsiteli' grapes are used for fresh consumption on the local market. It is prospective for cultivation around urban areas.



Buera B.

Synonyms

'Buero, Buero Vazi', 'Sachurchkhle', 'Bezhanauri', 'Bua Kurdzeni', 'Gavazuri', 'Sari Sachakh'.

Meaning of the name

Foggy like, chubby.

Historical notes and cultural importance

As many other varieties in Georgia, 'Buera' is original of the Alazani river basin. Before the invasion of the American fungal diseases and of *Phylloxera*, the variety was widely spread in the Kakheti and Bolnisi districts of Southern Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first three distal leaves are sparsely haired, grey-green with rose edges.

The mature leaf is medium size, rounded, sometimes ovate, slightly three to five lobed. The upper sinuses are small, chinked or lyre-shaped. The lower sinuses are small and V-shaped. The petiole sinus is lyre-shape or chinked with a pointed bottom. The teeth are triangular and convex on both sides, sometimes arched. The lower leaf side is hairless. The petiole is equal or shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size or large, conical, medium dense or dense.

The berry is medium or quite large, rounded or ovate and greenish-yellow.

The skin is thin and medium firm. The flesh is medium firm, tender with pleasant taste and a slight acidity.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first part of June

Time of veraison: middle of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Shoot fertility (cluster per shoot): 1.3-1.5

Bunch weight: 250 g

Yield per vine: 3.6 kg

Climate and cultivation requirements

'Buera' is a variety with a medium long vegetative period and good maturity of wood. It requires a plant density of 3333 vines per hectare, medium pruning and 32 buds per vine.

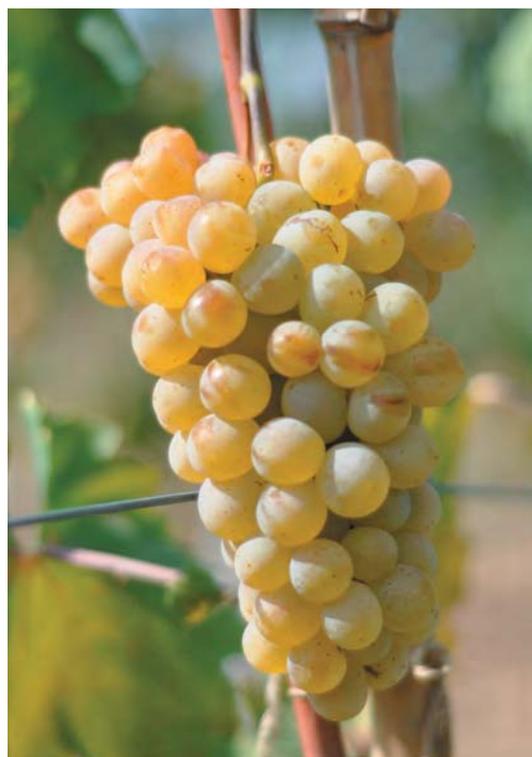
Resistance to diseases and unfavorable climate conditions

'Buera' has medium resistance to *Plasmopara viticola*, the berries are more affected than the leaves. Susceptibility towards *Erysiphe necator* is high. 'Buera' is susceptible towards the European grapevine moth (*Lobesia botrana*), Spider mites (*Tetranychidae*) and Leafhoppers (*Jassidae*). 'Buera' is one of the less frost-resistant varieties of the Kakheti region. It is comparatively resistant to drought.

Juice characteristics

Sugar: 17.7-18.8 %

Total acidity: 7.9-6.3 g·L⁻¹



Grape and Wine and grape characteristics

'Buera' is used for making table wines, for fresh consumption and for making grape juice. The wine is ordinary, light green, soft in taste and with low extract. The variety has a local importance. The variety is cultivated in the Lower Kartli district to make homemade light table wines. It is sometimes used in blend with other varieties to improve the flavor of the wine, particularly if it is too hard. 'Buera' is used for distillation and for the production of spirits and brandy.

Chinuri B.

Synonyms

'Kaspuri Tetri', 'Kaspuri', 'Atenuri', 'Roketula', 'Sapharula'.

Meaning of the name

"The best".

According to I. JAVAKHISHVILI (1934), the name Chimuri comes from the word Chini, which in old Georgian means "reddish-green". However, according to the Georgian's tradition, the word Chinuri comes from Chinebuli, which means "the best". Thus, the variety was named after its good characteristics: excellent bunch look, color and flavor. 'Chinuri' grapes make the ancient and well-known high quality 'Atenuri' wine.

Historical notes and cultural importance

According to I. JAVAKHISHVILI's (1934) semantic investigation, 'Chinuri' is an ancient Georgian grapevine variety.

'Chinuri' is included in the official list of grapevine varieties, recommended for cultivation in Eastern Georgia. It is widely spread in the Inner Kartli region.

Taxonomy and intra-variety variability

Proles *orientalis*. subproles *caspiica* Negr.

It originated in the Eastern part of Georgia.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with sparse cobwebby hairs. The first two distal leaves have rare hairs and the third leaf is covered with very sparse hairs.

The mature leaf is rounded, five or seldom three lobed or entire. The upper and the lower leaf sinuses are not deep. The petiole sinus is arched or rarely lyre-shaped. The teeth are erect, straight and with slightly convex sides. The lower surface of the leaf blade is almost hairless, it has short hairs only along the main veins. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is large, cylindrical-conical or cylindrical, often winged, medium dense, seldom dense or loose.

The berry is medium size, rounded-ovate and greenish-yellow. The flesh is juicy. The skin is easy to peel off.

Phenology

Time of bud burst: middle of April

Time of blooming: middle of June

Time of veraison: middle of August

Time of ripening: first part of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

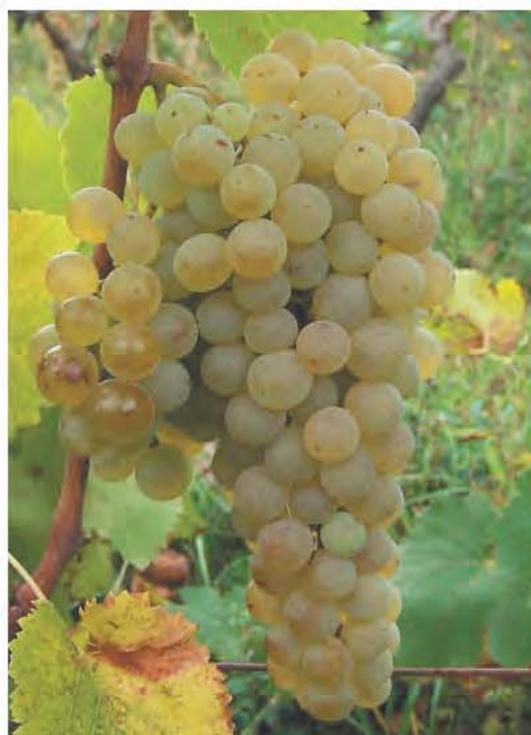
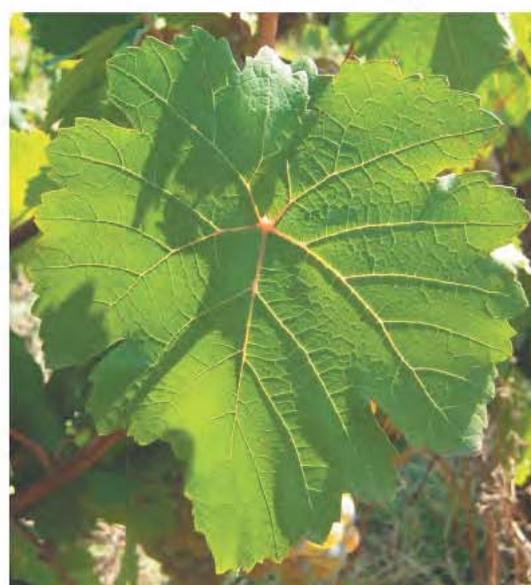
Bunch weight: 200-240 g

Yield: higher than medium

Climate and cultivation requirements

The double Georgian free training system with two fruity canes is recommended for 'Chinuri'. Topping before flowering increases yield by 6-7 %.

'Chinuri' is a medium-late ripening variety. The period from bud burst to ripening ranges between 183 and 191 days on average. Harvest takes place from the 15th of October to the end of the month. More than 80 % of the canes are mature at harvest, and they are all fully mature by leaf fall. The variety grows well on steep slopes as well as on the plains, in alluvial and rich stony soils.



Resistance to the diseases and unfavorable weather

Susceptibility towards fungal diseases and chlorosis is low. Frost resistance is low compared to other local varieties. Drought depression is not reported.

Juice characteristics

Sugar: 18.0-21.0 %

Total acidity: 5.0-10.0 g·L⁻¹

Wine and grape characteristics

'Chinuri' is used for making high quality, green-amber, pleasant, soft, light and harmonious table wines. 'Chinuri' sparkling wines have the same quality of those made from Pinot noir, Tsitska or other varieties. Therefore, 'Chinuri' is perspective for making natural sparkling wines.

Chitistvala Bodburi B.

Synonyms

Unknown.

Meaning of the name

Chitistvala = Bird's eye. Bodburi = from Bodbe (Bodbe is the name of a village in Eastern Georgia).

Historical notes and cultural importance

'Chitistvala Bodburi' is a native local variety of the Kakheti province, where it is spread as a minor variety in multi-varietal vineyards.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The mature leaf is medium size, rounded, medium or deeply five lobed. Secondary lobes are well formed. The upper leaf sinuses are medium and deep, sometimes with a tooth on the bottom. The petiole sinus is lyre-shaped or chinked with a flat bottom, very often closed with rounded or elliptic lumen. The teeth on the end of the lobes are narrow triangular and convex on both sides. The lower leaf blade is covered with very dense felt hairs. The length of the petiole is equal to the main vein.

The flower is hermaphrodite.

The bunch is medium size, narrow-conical or cylindrical and dense. The peduncle is long.

The berry is small, rounded. The skin is thin and difficult to peel off. The flesh is juicy with pleasant taste and slightly astringent.

Phenology

Time of bud burst: second part of April

Time of blooming: beginning of June

Time of veraison: first part of August

Time of ripening: first ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility: 0.75

Bunch weight: 150-200 g

Yield per vine: 2.0 kg

Climate and cultivation requirements

'Chitistvala Bodburi' is an early-medium ripening and medium yield wine grape variety.

Resistance to diseases and unfavorable weather

Susceptibility to *Plasmopara viticola* and *Erysiphe necator* is low.

Damaging by other diseases or insects was not reported.

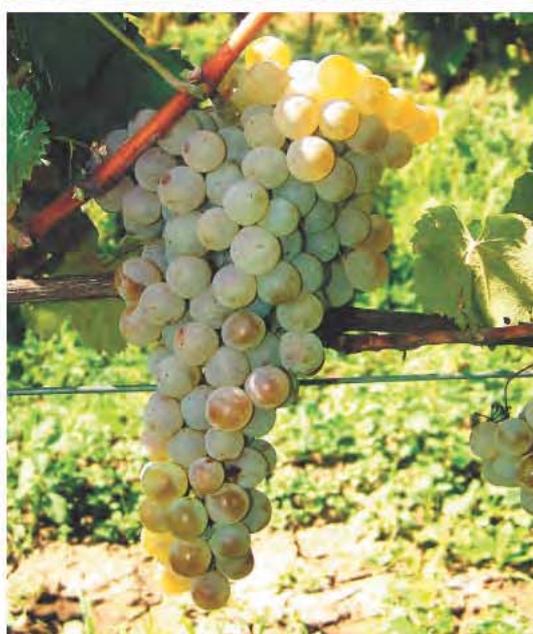
Juice characteristics

Sugar: 18.0-21.2 %

Total acidity: 6.8-8.5 g·L⁻¹

Wine and grape characteristics

The variety is used for the production of dry table wines through European and Kakhetian winemaking methods. The wine is of medium quality, but in good vintages quality is slightly higher. It is perspective for cultivation in the South-East of Georgia, particularly in blend with 'Rkatsiteli'.



Dzelshavi N.

Synonyms

'Dzveli Obchuri', 'Dzvelshavi'.

Meaning of the name

Old black, black tree.

Dzveli Obchuri = Old black from the village of Obcha.

Historical notes and cultural importance

'Dzelshavi' is an ancient Georgian grapevine variety. The origins of this variety and of its cultivation are unknown.

'Dzelshavi' is spread in the Imereti and Ratcha-Lechkhumi provinces. It is included in the official list of grapevine varieties recommended for cultivation on the territory of Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the two first distal leaves are covered with dense and white-grey felt hairs edged with pink.

The mature leaf is large, rounded and almost oval, rather deeply five lobed. The upper leaf sinuses are elliptic, seldom lyre-shaped. The lower leaf sinuses are chinked and V-shaped. The teeth are triangular with sharp tips. The lower leaf blade is covered with medium felt hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is large, wide conical, winged, medium dense or dense.

The berry is medium size, rounded and dark red. The skin is thin. The flesh is juicy.

Phenology

Time of bud burst: second part of April

Time of blooming: end of May - beginning of June

Time of veraison: end of August - beginning of September

Time of ripening: end of September - beginning of October

Vegetative and yielding characteristics

Vigor of shoot growth: high

Shoot fertility (cluster per shoot): 1.4-1.5

Fruiting shoots: 82.0-95.0 %

Bunch weight: 144-190 g

Yield: 8-13.5 t·ha⁻¹

Climate and cultivation requirements

'Dzelshavi's berries are sensitive to grape mold during rainy autumns.

Resistance to diseases and unfavorable climate conditions

The variety has good resistance towards fungal diseases.

Juice characteristics

Sugar: 20.0-22.0 %

Total acidity: 8.0-10.0 g·L⁻¹

Wine and grape characteristics

'Dzelshavi' is used for making ordinary table wines. The wine is light red, with fresh taste and low extract. To improve wine quality, 'Dzelshavi' is very often blended before fermentation with 'Otskhanuri Sapere' and 'Mgaloblishvili' or with other red wine varieties. The blend has an intense color, good bouquet and higher extracts.



Ghrubela Kartlis G.

Synonyms

Unknown.

Meaning of the name

Ghrubela = Cloudy. Kartlis = From Kartli (Kartli is the name of a province in Eastern Georgia)

Historical notes and cultural importance

'Ghrubela Kartlis' is found only in Georgia and it is similar to ancient autochthonous varieties in some morphological traits.

The variety is spread as single vines within the old vineyards of the Kartli region in Eastern Georgia.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspic*a Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are covered with dense white hairs.

The mature leaf is medium size and large, oblong, seldom rounded, medium three lobed. The upper leaf sinuses are chinked. The petiole sinus is arched. The teeth are straight, triangular with rounded or pointed tops. The lower leaf blade is hairless. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size or large, conical, seldom cylindrical-conical, winged, medium dense, sometimes loose.

The berry is medium size or large, ovate, grey-green to violet. The skin is thin, easy to peel off. The flesh is juicy and colorless.

Phenology

Time of bud burst: first or second ten days of April

Time of blooming: first ten days of June

Time of veraison: second half of August

Time of ripening: end of September

Vegetative and yielding characteristics

Vigor of shoot growth: medium and high

Buds fertility: 1.2

Shoot fertility (cluster per shoot): 1.2

Fruiting shoots: 70.0-74.0 %

Bunch weight: 270-275 g

Yield: high (9.5-12.0 t·ha⁻¹)

Climate and cultivation requirements

'Ghrubela Kartlis' has good cane maturation.

Resistance to diseases and unfavorable weather

The variety is very susceptible to *Erysiphe necator* and less susceptible to *Plasmopara viticola*.

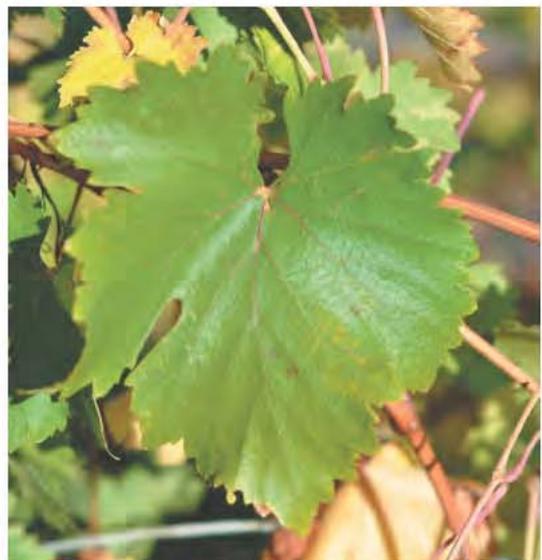
Juice characteristics

Sugar: 17.0 %

Total acidity: 5.0 g·L⁻¹

Wine and grape characteristics

'Ghrubela Kartlis' is used in blend to make ordinary table wines.



Ghvinis Tsiteli Rg.

Synonyms

Unknown.

Meaning of the name

Variety with red berries.

Historical notes and cultural importance

'Ghvinis Tsiteli' is a native Georgian variety from Eastern Georgia and it is rarely found in the Kakheti province.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserets. No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The mature leaf is medium size, oval or cordate, and medium three, seldom five lobed. The upper leaf sinuses are open, V-shaped. The lower leaf sinuses are small and V-shaped. The petiole sinus is elliptic, seldom lyre-shaped or sometimes chinked. The teeth have pointed ends and both sides are slightly convex. The lower leaf blade is rarely covered with medium dense cobwebby hairs. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is medium size, wide conical, winged, sometimes cylindrical-conical, dense or medium dense.

The berry is medium size, rounded and dark pink. The skin is thin. The flesh is juicy and colorless.

Phenology

Time of bud burst: middle of April

Time of blooming: beginning of June

Time of veraison: end of August

Time of ripening: third ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility: 0.9

Bunch weight: 120-130 g

Yield per vine: 2.0-2.5 kg

Yield: 8.0 t·ha⁻¹

Climate and cultivation requirements

'Ghvinis Tsiteli' is a variety with a long vegetative period. Autumn cane maturation is good. It is suitable for cultivation in the Kakheti province.

Resistance to diseases and unfavorable weather

Resistance towards fungal diseases is medium.

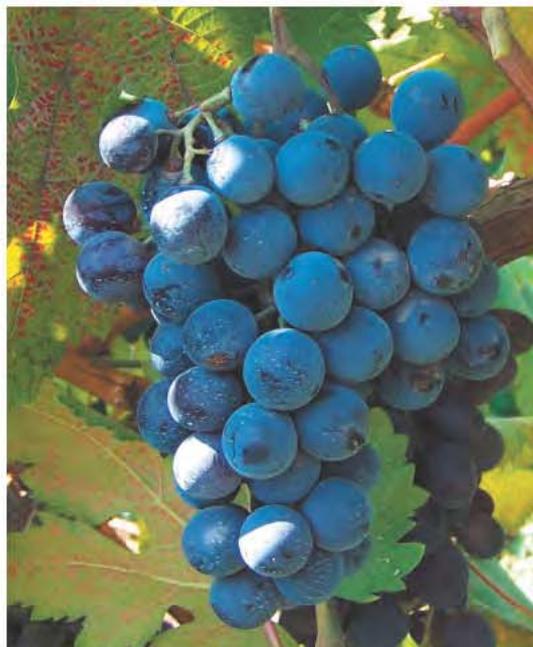
Juice characteristics

Sugar: 18.0 %

Total acidity: 9.0 g·L⁻¹

Wine and grape characteristics

'Ghvinis Tsiteli' is used to make medium quality table wines. It is suitable for the production of brandy.



Gorula B.

Synonyms

'Gldanula', 'Suphris Gorula', 'Mrgvali Kurdzeni'.

Meaning of the name

Distributed in Gori (Gori is the name of a town and district in Eastern Georgia).

Historical notes and cultural importance

'Gorula' is an ancient variety of the Kartli province of Eastern Georgia, where the variety is currently mainly spread. 'Gorula' is included in the official list of grapevine varieties, recommended for cultivation in Georgia.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with cobwebby hairs and edged with light rose.

The mature leaf is large, seldom medium, rounded, sometimes ovate or cordate, five and three lobed. The upper leaf sinuses are medium or deep and lyre-shaped. The lower leaf sinuses are V-shaped, closed and overlapped. The petiole sinus is lyre-shaped or arched. The teeth are triangular, convex on both sides and with a sharp tip. The lower leaf side is hairless. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, cylindrical, seldom cylindrical-conical and dense, sometimes loose.

The berry is large, ovate, sometimes rounded and greenish-yellow.

Phenology

Time of bud burst: first ten days of April

Time of blooming: first ten days of June

Time of veraison: third ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Vigor of shoot growth: high

Bunch weight: 215-220 g, some bunches can be 400-500 g

Yield: 10.0-12.0 t·ha⁻¹

Shoot fertility (cluster per shoot): 1.3

Fruiting shoots: 65.5 %

Climate and cultivation requirements

'Gorula' grows well on humus-carbonate and clay soils.

Resistance to diseases and unfavorable weather

The variety has high susceptibility towards *Plasmopara viticola* and high resistance to *Erysiphe necator*. Resistance towards frost is medium and resistance towards drought is sufficient. The ripening level is lower during rainy autumns and the berries are more easily damaged by gray mold (*Botrytis cinerea*). The grape has good transport resistance and storage ability.

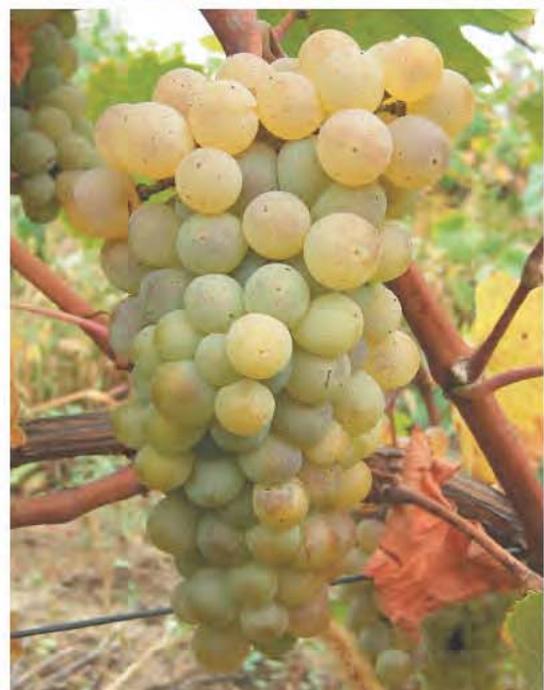
Juice characteristics

Sugar: 17.0-18.0 %

Total acidity: 5.0-7.0 g·L⁻¹

Grape and Wine and grape characteristics

'Gorula' is a table grape variety. It has a beautiful bunch, large berries, high transport resistance and storage ability. Sometimes the grapes are used in blend with other varieties to make dry table wine.



Goruli Mtsvane B.

Synonyms

'Mtsvane', 'Tetrapotola', 'Lurji Mtsvane', 'Jishiani', 'Qvishkhuri', 'Tbiluri', 'Suramuli'.

Meaning of the name

Green from Gori (Gori is the name of the town and district in Eastern Georgia where the variety probably had origin).

Mtsvane = Green. *Tetrapotola* = Having a white leaf.

Historical notes and cultural importance

According to S. CHOLOKASHVILI (1938), 'Goruli Mtsvane' belongs to the group of ancient Georgian grapevine varieties for its morphological and biological characteristics.

'Goruli Mtsvane' is spread only in Central Georgia - Kartli and Imereti. This variety is included in the official list of grapevine varieties, recommended for cultivation in the whole territory of Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.

The variety 'Goruli Mtsvane' has several biotypes. A high-yield biotype is 'Mukha Mtsvane'. Many low-yield biotypes have a high degree of flower and berry drop. Some of these variations are: 'Goruli Mtsvane Avrekhi', 'Mtsvane Avrekhi', 'Udzisho' and some others. Because of this variability, it is necessary to carefully choose the plant material for multiplication.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are covered with dense felt hairs. On the following leaves, hair density is gradually reduced. The mature leaf is large, rounded or pentagonal, three or five lobed, deeply dissected (with secondary dissection). The upper leaf sinuses are deep, elliptical and lyre-shaped. The lower leaf sinuses are V-shaped. The petiole sinus is sagittate, arched and elliptic. The teeth are sharp with straight and convex sides. The lower side of leaf is covered with felt hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical, medium dense or seldom dense.

The berry is medium size, rounded and yellowish-green. The flesh is juicy.

Phenology

Time of bud burst: second-third ten days of April

Time of blooming: end of May-first half of June

Time of veraison: third ten days of August

Time of ripening: middle-end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

Yield: medium

Climate and cultivation requirements

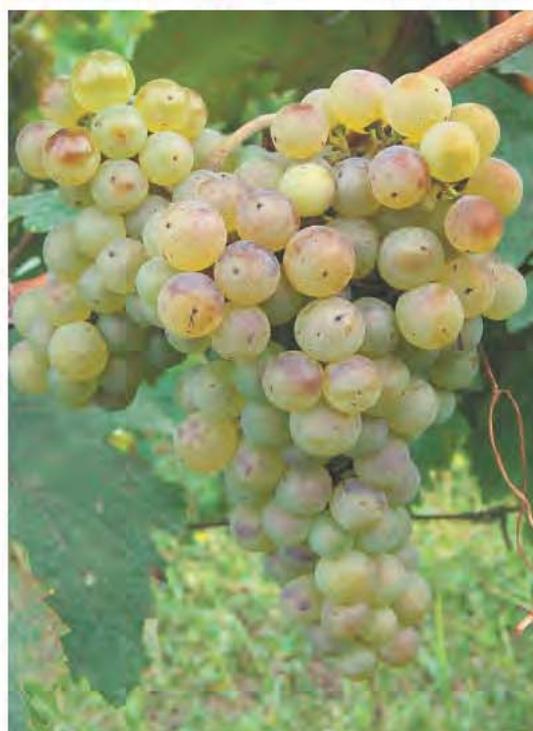
'Goruli Mtsvane' on the double Guyot training system with two canes gives high yield.

The vegetative period is medium. Cane maturation is good. Ripening takes longer during rainy autumns and in these conditions sugar content is lower.

This variety is mainly planted in Kartli, in the Ateni valley, in the lowlands of the river Mtkvari on diluvial and diluvial-alluvial soils.

Resistance to diseases and unfavorable weather

Resistance to *Plasmopara viticola* is high, resistance to *Erysiphe necator* and frost is medium (temperatures are not dangerous until down to -15/-16 °C).



Juice characteristics

Sugar: 18.0-21.0 %

Total acidity: 6.0-9.0 g·L⁻¹

Wine and grape characteristics

'Goruli Mtsvane' is used for making high quality table and sparkling wines. The table wine is yellowish. It is sufficiently full and fresh. The sparkling wine has high quality, chaff-flower color and harmonious taste.

Grdzelmtevana B.

Synonyms

Unknown.

Meaning of the name

With a long bunch.

Historical notes and cultural importance

'Grdzelmtevana' is an old Georgian variety.

It is not widely distributed in Georgia now.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with dense felt hairs.

The mature leaf is medium size, rounded, seldom cordate, five lobed, medium or deeply dissected. The upper and the lower leaf sinuses are rather deep, lyre-shaped. The petiole sinus is lyre-shaped with a sharp bottom. The teeth are sharp, triangular. The lower leaf side is covered with medium dense cobwebby and some bristle hairs. The petiole is equal or shorter than the medium vein.

The flower is hermaphrodite.

The bunch is long, conical or conical-cylindrical, winged, loose or medium dense.

The berry is medium size, round or round ovate and green-yellow. The skin is thin. The flesh is juicy and tender.

Phenology

Time of bud burst: first ten days of April

Time of blooming: first ten days of June

Time of veraison: middle of August

Time of ripening: the second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility: 0.8

Bunch weight: 300-320 g

Yield: medium

Climate and cultivation requirements

'Grdzelmtevana' has a medium vegetative period and good woody maturation. It grows well on the forest type and humus-carbonate soils on the slopes. The best planting layout is 2.5 x 1.5 m with long pruning.

Resistance to diseases and unfavorable weather

'Grdzelmtevana' is comparatively resistant to the main fungal diseases and rather resistant to drought and frost.

Juice characteristics

Sugar: 19.0-22.5 %

Total acidity: 5.5-6.2 g·L⁻¹

Wine and grape characteristics

'Grdzelmtevana' is used for making European-style table and dessert wines. It is also consumed fresh. The wines made from this variety have soft, harmonious, velvet and varietal taste. The quality is comparable to the best 'Rkatsiteli'. The dessert wines are particularly good.



Ikalto Tsiteli N.

Synonyms

'Shavi Kurdzeni', 'Chitistvala Shavi'.

Meaning of the name

Red from Ikalto (Ikalto is the name of a village in Eastern Georgia)

Historical notes and cultural importance

'Ikalto Tsiteli' is spread in little plots or as single vines among other old varieties in Kakheti, mostly in the village of Ruispiri of the Telavi district.

Taxonomy and intra-variety variability

Proles *pontica* subproles. *georgica* Negr. provar. *tomentosae* Tserts.
No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The mature leaf is large, round, sometimes cordate, three to five lobed or rarely entire. The upper leaf sinuses are small or medium, closed or with narrow elliptic or oval lumen, sometimes open. The lower leaf sinuses are serriform, open V-shaped or rarely slightly V-shaped. The petiole sinus is U-shaped or sometimes lyre-shaped. The teeth are triangular and both sides are convex. The lower leaf surface is covered with strong felt hairs. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is small or medium, conical, winged and medium dense.

The berry is medium size, round and dark-blue. The skin is thin and firm.

The flesh is juicy and slightly crispy.

Phenology

Time of bud burst: first or second ten days of April

Time of bloom: first ten days of June

Time of veraison: middle August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Fruiting shoots: 80.0 %

Shoot fertility (cluster per shoot): 1.4-1.5

Bunch weight: 180-220 g

Yield: high (8-10 t·ha⁻¹)

Climate and cultivation requirements

No information is available.

Resistance to diseases and unfavorable climate conditions

The variety has good resistance towards *Erysiphe necator* and low susceptibility to *Plasmopara viticola*.

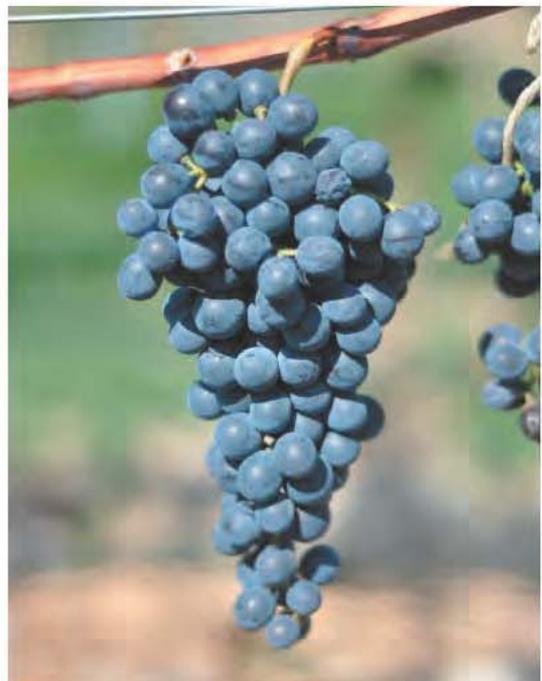
Juice characteristics

Sugar: 18.4-21.3 %

Total acidity: 5.7-7.7 g·L⁻¹

Wine and grape characteristics

'Ikalto Tsiteli' is suitable for dry table wine production. The wine made has only medium quality. For this reason it is recommended to use in blend with 'Saperavi'.



Jani Bakhvis N.

Synonyms

'Jani'.

Meaning of the name

Jani from Bakhvi (Bakhvi is the name of a village in Western Georgia). Jani = strong, powerful.

Historical notes and cultural importance

'Jani Bakhvis' is an autochthonous variety from Western Georgia. Before the arrival of *Phylloxera* and of the American fungal diseases in Georgia, this variety was widespread all over the Guria province on the Black Sea coast. 'Jani Bakhvis' was used to make high quality red table wine. Often, the grapes were left on the plants during the whole winter before harvesting. 'Jani Bakhvis' is recognized as the best wine among all the other local red table wines. In the past, the people of the Guria and Samegrelo provinces used to organize competitions between the wines made from 'Jani' (Guria) and 'Ojaleshi' (Samegrelo). 'Jani Bakhvis' vineyards were virtually destroyed after the invasion of the fungal diseases. At the beginning of 20th century, farmers started planting grafted 'Jani Bakhvis' vines, using a low training system to rebuild their vineyards.

Nowadays, 'Jani Bakhvis' is a rare variety.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserts.
No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two leaves are covered with felt hairs with rose leaf edges.

The mature leaf is medium size or large, rounded or slight ovate and almost entire. The petiole sinus is arched. The teeth are triangular, both sides are convex with sharp tips. The lower leaf side is covered with felt hairs. The length of the petiole is almost equal to the main vein.

The flower is hermaphrodite.

The bunch is little or medium, conical, winged, loose or sometimes medium dense.

The berry is medium size and small, round and dark blue. The skin is very thick. The flesh is firm and crispy.

Phenology

Time of bud burst: beginning of April

Time of blooming: beginning of June

Time of veraison: third ten days of August

Time of ripening: November

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Fruiting shoots: 69-75 %

Shoot fertility (cluster per shoot): 1.2-1.6

Bunch weight: 70 g

Yield: low 2.2-3.5 t·ha⁻¹ (one of the lowest among Georgian varieties)

Climate and cultivation requirements

No information is available.

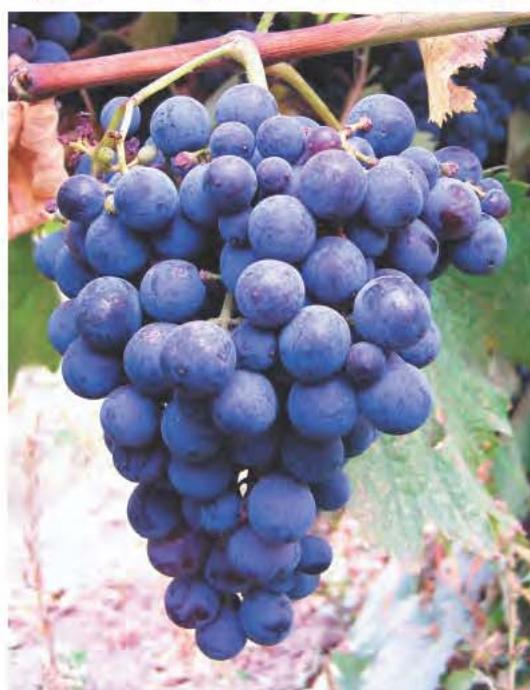
Resistance to diseases and unfavorable weather

Resistance towards *Plasmopara viticola* is low and resistance towards *Erysiphe necator* is sufficient.

Juice characteristics

Sugar: 20.9-23.4 %

Total acidity: 6.0-9.0 g·L⁻¹



Wine and grape characteristics

'Jani Bakhvis's makes high quality red table wines. The wines are harmonious and have normal alcohol content. During aging, the wine acquires a pleasant taste and aroma. 'Jani Bakhvis' is also used as a table grape due to its transport resistance and storage ability.

These qualities make 'Jani Bakhvis' one of the best local varieties.

Jineshi Rg.

Synonyms

Unknown.

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Jineshi' is spread in the district of Khulo, in the Adjara region, in single vines on the high pergola straining system.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserts.
No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is greenish-rose and it is covered with dense white down.

The mature leaf is ovate, slightly three lobed. The upper leaf sinuses are small, open and V-shaped. The petiole sinus is arched or rarely V-shaped. The lower leaf side is covered with sparse cobwebby-felt hairs. The petiole is equal or shorter than the main vein.

The flower is female.

The bunch is medium size, cylindrical, seldom cylindrical-conical, loose or sometimes medium dense.

The berry is medium size, ovate and red or dark rose. The flesh is very juicy.

Phenology

Time of bud burst: first ten days of April

Time of blooming: middle of June

Time of veraison: end of August or beginning of September

Time of ripening: third ten days of October

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Fruiting shoots: 71.0-73.0 %

Shoot fertility (cluster per shoot): 1.2-1.3

Bunch weight: 95 g

Yield: enough high (7.5-8.0 t·ha⁻¹)

Climate and cultivation requirements

The variety is suitable for cultivation in all the winemaking regions of Adjara.

Resistance to diseases and unfavorable weather

Resistance towards the main fungal diseases is low, especially towards *Plasmopara viticola*.

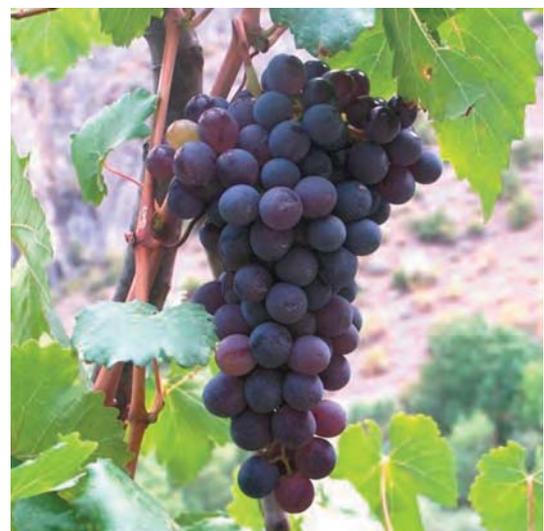
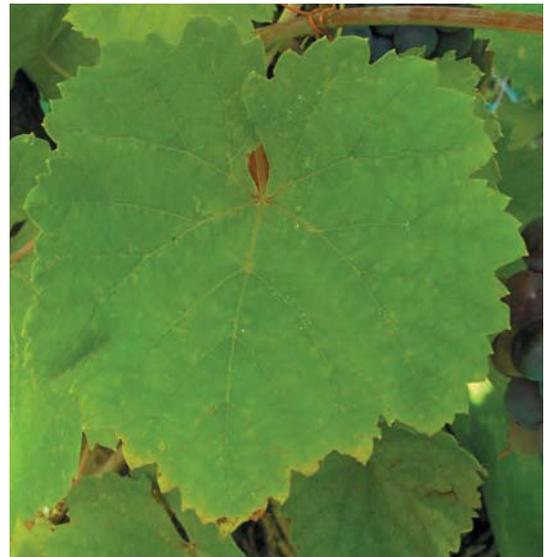
Juice characteristics

Sugar: 18.0-19.0 %

Total acidity: 9.0-11.0 g·L⁻¹

Wine and grape characteristics

'Jineshi' is a table grape variety. The grapes have a pleasant appearance, harmonious taste and good transport resistance. The variety is recommended for winter storage and for the production of Bekmez (boiled and concentrated grape juice).



Khikhvi B.

Synonyms

'Jananura' (Telavi, a district of the Kakheti province).

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Khikhvi' is original of Eastern Georgia, where it is widespread. This variety is included in the official list of grapevine varieties, recommended for cultivation in the Kartli and Kakheti provinces of Eastern Georgia. Being an early ripening variety, 'Khikhvi' is recommended for the mountain regions of Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. *tomentosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two leaves are covered with felt hairs; other following leaves are weakly hairy.

The mature leaf is large, circular, three-lobed or almost entire. The upper leaf sinuses are small, lyre-shaped or shallow. The lower leaf sinuses are also small. The petiole sinus is open, V-shaped or lyre-shaped. The teeth are triangular and convex on both sides. The lower leaf side is covered with felt hairs.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical and conical, winged, loose or sometimes medium dense.

The berry is medium size, seldom ovate, dark greenish-yellow. The skin is thin. The flesh is juicy with pleasant and typical varietal taste.

Phenology

Time of bud burst: first half of April

Time of blooming: end of May to beginning of June

Time of Veraison: first ten days of August

Time of ripening: September.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous or medium

Bud fertility: 0.6-0.7

Fruiting shoots: 81.0-86.0 %

Bunch weight: 80-100 g

Yield per vine: 1.6-1.4 kg

Climate and cultivation requirements

'Khikhvi's vegetative period is shorter than medium and its cane maturation is good. The double Guyot with two fruity canes is the main training system.

Resistance to diseases and unfavorable weather

The variety has low susceptibility to *Plasmopara viticola* and it is very sensitive to *Erysiphe necator*. 'Khikhvi' has low susceptibility to Spider Mites (*Tetranychlidae*).

Juice characteristics

Sugar: 19.0-24.0 %. Sugar can reach 30 % in good climate conditions.

Total acidity: 4.0-8.0 g·L⁻¹

Wine and grape characteristics

'Khikhvi' dry table wines have an original and typical bouquet, and a fresh, full, soft and harmonious taste. This cultivar is also suitable for making a natural semi-sweet wine from grapes with 24-26 % sugar. High quality 'Tokay' style dessert wines are made from late-harvest 'Khikhvi' grapes with at least 30 % sugar.



Krakhuna B.

Synonyms

Unknown.

Meaning of the name

Crispy

Historical notes and cultural importance

According to I. JAVAKHISHVILI (1934), 'Krakhuna' is one of the oldest Georgian grapevine varieties. V. A. STAROSEL'SKII (1893) pointed out that the variety was introduced from Kakheti into the village of Sviri (Zestaphoni district) and then it spread in Western Georgia. However, nowadays 'Krakhuna' is not found in Kakheti, while it is widely spread in Imereti.

In 1940, in the Tkibuli and Zestaphoni districts there were 102 ha of 'Krakhuna'. It is included in the official list of varieties recommended for cultivation in Western Georgia.

Taxonomy and intra-variety variability

Proles pontica subproles *georgica* Negr. provar *tomentosae* Tsert.

'Krakhuna' has some selected clones.

Essential ampelographic characteristics

The tip of the young shoot and the first two leaves are covered with dense felt hairs and they have rose edges. The lower side of the following leaves is also covered with dense felt hairs, which gradually diminish.

The mature leaf is large, three or five lobed or entire. The upper leaf sinuses are lyre-shaped or V-shaped, seldom elliptical. The lower leaf sinuses are small and open. The petiole sinus is V-shaped. The teeth are triangular, both sides are convex. The lower leaf side is covered with felt hairs. The petiole is shorter or as long as the main vein.

The flower is hermaphrodite.

The bunch is medium size, conical, winged and dense.

The berry is medium size, round-ovate and yellow-green. The flesh is very juicy, firm, crispy with a weak aroma.

Phenology

Time of bud burst: middle of April

Time of blooming: beginning of June

Time of Veraison: middle of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bunch weight: 100-186 g

Yield: 8-10 t·ha⁻¹ (on alluvial and rich humus soils, with a planting distance of 1.5 x 1.5 m, using Guyot with one fruity cane)

Climate and cultivation requirements

'Krakhuna' requires no particular training system, however, in Western Georgia the variety is normally trained through double Guyot with two fruity canes.

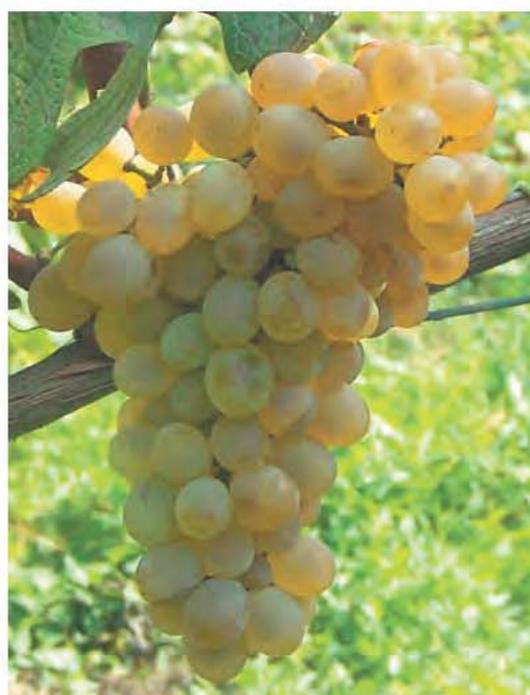
Resistance to diseases and unfavorable weather

Krakhuna is less resistant towards *Plasmopara viticola* and more resistant towards *Erysiphe necator* (in some places) than other local varieties. It is highly frost resistant. Negative influence of drought has not been reported.

Juice characteristics

Sugar: 19.0-24.0 %

Total acidity: 5.0-7.0 g·L⁻¹



Wine and grape characteristics

'Krakhuna' makes high quality table and Madeira style wines.

'Krakhuna' wines are more full-bodied and rough compared to 'Tsitska' and 'Tsolikouri' wines.

In some vintages, 'Krakhuna' wines made through European technology have high sensorial value. Blends of 'Krakhuna', 'Tsitska' and 'Tsolikouri' have a very positive character, typical of the white Imeretian wines.

Kumsi Tetri B.

Synonyms

Unknown.

Meaning of the name

Dense white.

Historical notes and cultural importance

'Kumsi Tetri' is a very rare variety, seldom found as single vines within the old vineyards of Kakheti.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserets.
No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two or three leaves are covered with felt hairs. The lower part is violet-white with light rose edges.

The mature leaf is medium size, round, medium or deeply five lobed. The upper leaf sinus is deep, elliptical and lyre-shaped. The lower sinus is medium, chinked or seldom wedge-shaped. The petiole sinus is lyre-shaped, arched, seldom elliptic or shaft. The teeth are triangular with a sharp tip and plain sides. The lower leaf side is covered with felt hairs. The length of the petiole is equal to the main vein.

The flower is hermaphrodite.

The bunch is medium size, conical or cylindrical-conical, seldom winged, dense, seldom medium to very dense.

The berry is medium size, light yellow, rounded or seldom oblong. The flesh is medium firm.

Phenology

Time of bud burst: second part of April

Time of blooming: first ten days of June

Time of veraison: middle of August

Time of ripening: the second ten days of September

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Fruiting shoots: 81.0-86.0 %

Shoot fertility (cluster per shoot): 1.1-1.4

Yield: 6.0-8.0 t·ha⁻¹

Bunch weight: 156-200 g

Climate and cultivation requirements

Grown on a trellis with one fruity cane, with 2.15 m² per plant, on the humus-carbonate soils of Kakheti, 'Kumsi Tetri' yields 6.0-8.0 t·ha⁻¹.

Resistance to diseases and unfavorable weather

'Kumsi Tetri' has medium resistance towards *Erysiphe necator* and low susceptibility towards *Plasmopara viticola*.

Juice characteristics

Sugar: 17.6-19.4 %

Total acidity: 6.0-7.1 g·L⁻¹

Wine and grape characteristics

'Kumsi Tetri' is used in blend with 'Rkatsiteli', 'Mtsvane Kakhuri' and 'Kikhvi'. 'Kumsi Tetri' mono-varietal wine has medium quality. 'Kumsi Tetri' is a medium quality, high yield variety with relative resistance towards fungal diseases. Thus, this variety is recommended to use in blend to soften some Kakhetian wines or to make brandy.



Kundza B.

Synonyms

'Kumsi', 'Mtsvane'.

Meaning of the name

Very dense.

Historical notes and cultural importance

'Kundza' is one of the oldest varieties from Western Georgia.

Imereti is the only province where there are 'Kundza' mono varietal vineyards.

Taxonomy and intra-variety variability

Proles pontica subproles *georgica* Negr. provar *tomentosa* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two leaves are white, with pink edges and covered with dense felt hairs.

The mature leaf is large, rounded, sometimes ovate, almost whole. The petiole sinus is lyre-shaped and shifty. The teeth are wide, triangular with sharp tips. The lower leaf side is covered with felt hairs. The petiole is as long as the main vein or shorter.

The flower is hermaphrodite.

The bunch is medium size, conical, winged and very dense.

The berry is large and round-ovate. The skin is rather thick. The flesh is medium, slightly viscous and juicy.

Phenology

Time of bud burst: beginning of the second ten days of April

Time of blooming: third ten days of May

Time of veraison: middle of August

Time of ripening: end of September-beginning of October

Vegetative and yielding characteristics

Vigor of shoot growth: medium; higher than medium on alluvial soils

Shoot fertility (cluster per shoot): 1.7-1.9

Fruiting shoots: 81.0-86.0 %

Bunch weight: 150-175 g

Yield: medium (5.0 t·ha⁻¹ on the carbonate, slight podsol clay and clayey soils of the hills of Central Imereti); higher than medium (7.5-10.0 t·ha⁻¹ on alluvial soils)

Climate and cultivation requirements

In Lower Imereti and Abkhazeti, 'Kundza' yields more using the double Guyot training system with two fruity canes. In the alluvial fertile soils of Abkhazeti, favorable to the cultivation of 'Kundza', the plants are grown with four fruity canes.

Resistance to diseases and unfavorable weather

'Kundza' has low susceptibility towards fungal diseases. It is more resistant to winter frosts than 'Tsolikouri'.

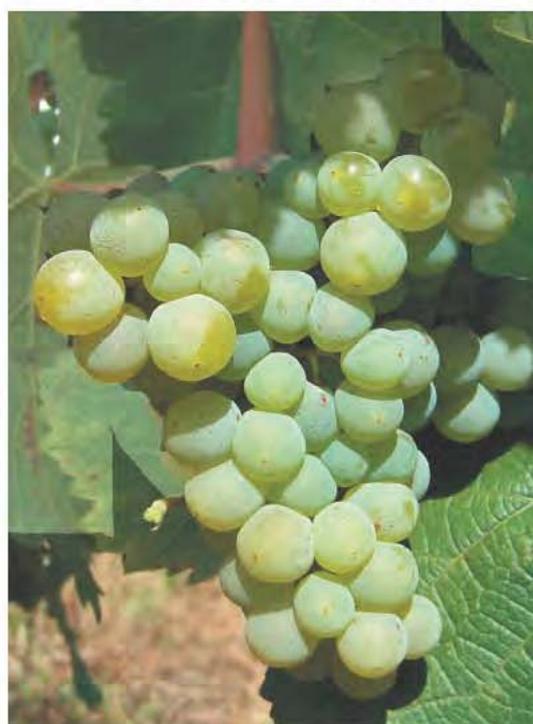
Juice characteristics

Sugar: 21.0 %

Total acidity: 6.0-12.0 g·L⁻¹

Wine and grape characteristics

'Kundza' is suitable for making ordinary white table wines. Long aging does not improve the taste and bouquet of the wine. For this reason, it is better to drink it within 2-3 years. This variety gives the best quality on the hills of Central Imereti.



Mgaloblishvili N.

Synonyms

Unknown.

Meaning of the name

Mgaloblishvili is a Georgian surname. Probably it is the name of the person who first grew this variety.

Historical notes and cultural importance

'Mgaloblishvili' is a local variety from the Imereti province of Western Georgia; its origin is unknown. In Western Georgia there are 'Mgaloblishvili' mono-varietal vineyards.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.
No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two or three leaves are covered with felt hairs on both sides.

The mature leaf is large, rounded and three lobed. The upper petiole sinuses are chinked, U-shaped and elliptical. The lower leaf sinuses are V-shaped. The petiole sinus is lyre-shaped, seldom elliptical. The teeth are triangular and convex on both sides. The lower leaf side is covered with felt hairs. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical or seldom cylindrical and dense or very dense.

The berry is medium size, round and dark red. The flesh is juicy.

Phenology

Time of bud burst: beginning of the first ten days of April

Time of blooming: end of May–beginning of June

Time of veraison: middle of August

Time of ripening: beginning of the second ten days of October

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Yield: medium (6.0-7.5 t·ha⁻¹)

Climate and cultivation requirements

The double Guyot training system with two fruity canes and 18 to 24 buds per plant is recommended for 'Mgaloblishvili'. Optional planting layouts are 2.0 x 1.5 m and 1.5 x 1.5 m.

Resistance to diseases and unfavorable climate conditions

This variety has low resistance towards *Plasmopara viticola* and sufficient resistance towards *Erysiphe necator*. It is less frost and drought resistant compared to 'Tsitska', 'Tsolikouri' and 'Krakhuna'. The bunches are more affected by gray mold (*Botrytis cinerea*) during rainy years, especially in the lowlands.

Juice characteristics

Sugar: 21.0-25.8 %

Total acidity: 7.2-8.7 g·L⁻¹

Wine and grape characteristics

'Mgaloblishvili' is generally blended with other varieties, usually 'Otskhanuri Sapere' (30 %). A 100 % 'Mgaloblishvili' wine is simple, light in color, and not very high in quality, thus it is recommended for the production of brandy.



Mkhargrdzeli B.

Synonyms

'Mkhargdzeli Tetri'.

Meaning of the name

Shouldered; variety with long, shouldered bunches.

Historical notes and cultural importance

'Mkhargrdzeli' is original of the Kakheti region in Eastern Georgia.

It is spread in all districts of Kakheti as single vines in old vineyards and farmers' yards. The popularity of this variety all over Kakheti could be due to its long and good-looking bunches.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are white, with slight, rose edges and covered with felt hairs.

The mature leaf is medium, circular and five lobed. The upper and lower leaf sinuses are deep. The petiole sinus is lyre-shaped and arched. The teeth are triangular, both sides are convex with sharp or arched tips. The lower leaf side is covered with dense felt hairs mixed with medium dense cobwebby hairs. The petiole is shorter than the main vein.

The flower is female.

The bunch is medium size or large, conical, often winged or shouldered and loose.

The berry is medium size, round or seldom oval and green-yellow. The skin is thin and not firm. The flesh is medium firm.

Phenology

Time of bud burst: second part of April

Time of blooming: beginning of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility: 0.6-0.8

Bunch weight: 150-200 g

Yield per vine: 2 kg

Climate and cultivation requirements

'Mkhargrdzeli' is a medium ripening variety with good wood maturation. It is suitable for cultivation all over the Kakheti province. Yield depends on the planting spacing and on the climate conditions during flowering. 'Mkhargrdzeli' is better on humus-carbonate soils.

Resistance to diseases and unfavorable climate conditions

'Mkhargrdzeli's resistance towards the main fungal diseases is medium, it is relatively resistant towards gray mold (*Botrytis cinerea*) during rainy autumn and it is frost and drought resistant.

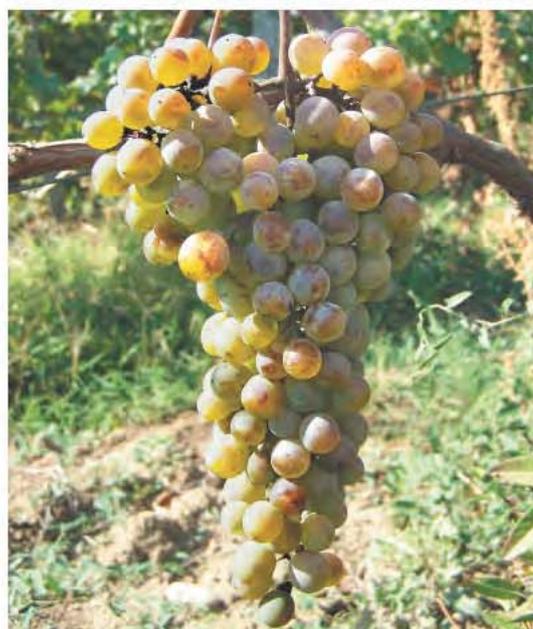
Juice characteristics

Sugar: 18.0-21.0 %, rarely 23.0 %

Total acidity: 6.0-7.0 g·L⁻¹

Wine and grape characteristics

'Mkhargrdzeli' is a double usage grape variety: it is used both for making dry table wines and for fresh consumption, even if its transport resistance is not satisfactory.



Mtevandidi N.

Synonyms

Akido.

Meaning of the name

Big bunch.

Historical notes and cultural importance

'Mtevandidi' was widespread in the Guria province, before the invasion of the fungal diseases and of *Phylloxera*. Most of the 'Mtevandidi' vineyards were reduced as a result of their attack. Only few vines survived. Nowadays 'Mtevandidi' is a rare variety in Georgia, however, it is currently being newly propagated.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. *araneosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is white and covered with dense felt hairs.

The mature leaf is large, round, slightly three lobed. The upper leaf sinuses are chinked and V-shaped. The petiole sinus is arched. The teeth are serriform, triangular, with sharp tips. The lower leaf side is covered with weak cobwebby hairs. The petiole is as long as the main vein.

The flower is hermaphrodite.

The bunch is medium size, wide-conical, winged, loose or sometimes of medium density.

The berry is medium size, ovate and dark-blue. The skin is thick. The flesh is juicy and pulpy.

Phenology

Time of bud burst: first ten days of April

Time of blooming: end of May

Time of veraison: end of August

Time of ripening: second ten days of October

Vegetative and yielding characteristics

Shoot fertility (cluster per shoot): 1.46

Fruiting shoots: 73.7%

Bunch weight: 114 g

Yield per vine: 50.0 kg (from pergola) and 2.0 kg (from low trained vines)

Yield: irregular (1.7-4.8 t·ha⁻¹)

Climate and cultivation requirements

The best 'Mtevandidi' grapes are grown on the south and south-east slopes of the Guria province, on those soils which have enough humus. In the lowlands fertile soils the yield is higher, but the wine quality is poorer.

Resistance to diseases and unfavorable climate conditions

'Mtevandidi' is relatively low resistant towards the fungal diseases, especially towards *Erysiphe necator*. In some years it suffers from black mold (*Aspergillus niger*) and Vine mealybug (*Planococcus ficus*). It is relatively frost resistant.

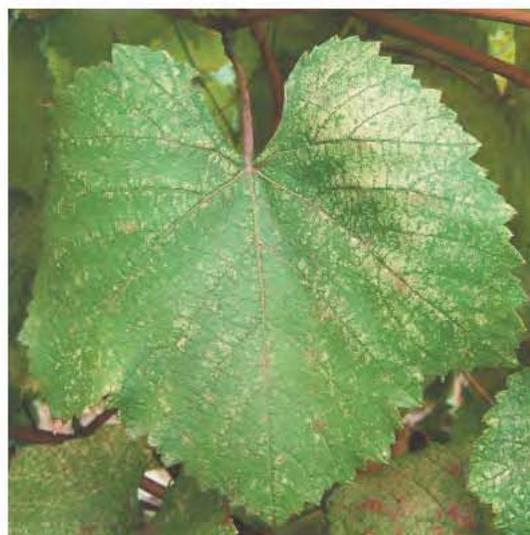
Juice characteristics

Sugar: 18.8-20.1 %

Total acidity: 9.9-11.0 g·L⁻¹

Wine and grape characteristics

'Mtevandidi' is used for making ordinary red table wines and in blend with 'Jani'. 100 % 'Mtevandidi' wines are rather strong. Through long ageing, the wine acquires a delicate bouquet and taste. In the 19th century, I. MARR used to make a wine from a blend of 'Mtevandidi' and 'Jani' called Mari Ghvino, this wine was also exported outside Georgia.



Mujuretuli N.

Synonyms

Unknown.

Meaning of the name

From Mujureti¹⁾

Historical notes and cultural importance

'Mujuretuli' is distributed in the Racha-Lechkhumi province (in the Ambrolauri and Tsageri districts) in Western Georgia. This variety is normally planted in the same vineyards together with 'Alexandrouli'; mono varietal 'Mujuretuli' vineyards are rare. 'Mujuretuli' is included in the official list of grapevine varieties, recommended for cultivation in Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are covered with felt hairs on both sides. The third leaf is covered with sparse cobwebby hairs.

The mature leaf is from medium size to large, sometimes slightly wide, three, sometimes five lobed or entire. The upper leaf sinuses are medium, sometimes small or not expressed, chinked or without lumen. The lower leaf sinuses are not pronounced or V-shaped. The petiole sinus is arched or lyre-shaped. The teeth are triangular and both sides are convex. The lower leaf side is covered with dense cobwebby hairs. The petiole sinus is shorter or equal to the main vein.

The flower is hermaphrodite.

The bunch is medium size, conical, winged, medium dense or often loose.

The berry is medium size, ovate, opposite oval and dark blue. The flesh is firm, slightly juicy and colorless.

Phenology

Time of bud burst: middle of April

Time of blooming: first ten days of June

Time of veraison: first half of August

Time of ripening: first part of October

Vegetative and yielding characteristics

Vigor of shoot growth: medium or high

Shoot fertility (cluster per shoot): 1.5-1.6

Yield: 4.5-6.5 t/ha

Bunch weight: 98-120 g

Climate and cultivation requirements

No information is available.

Resistance to diseases and unfavorable climate conditions

'Mujuretuli' is strongly susceptible towards *Plasmopara viticola*, sensitive towards *Erysiphe necator* and sufficiently resistant towards frost and drought.

Juice characteristics

Sugar: 20.0-27.0 %

Total acidity: 5.0-7.0 g·L⁻¹

Wine and grape characteristics

The well known Georgian natural semi-sweet wine Khvanchkara is made by blending 'Mujuretuli' and 'Alexandrouli' grapes. 'Mujuretuli' is harvested when it reaches 23.0 % sugar and 5.0-6.0 g·L⁻¹ total acidity.



The highest quality wines are produced in the micro-zone of Tola-Khvanchkara. These wines are dark ruby, particularly pleasant, with a harmonious velvet taste. The average chemical composition of the wine is: 11.0-12.0 % alcohol, 3.0-6.0 % sugar and 6.0-7.2 g·L⁻¹ total acidity.

¹⁾ According to recent research, 'Mujuretuli' and 'Alexandrouli' are two distinct varieties with a monophyletic origin from the same seedling. Probably 'Mujuretuli' was originated in the Racha province from 'Alexandrouli' as a sport variation (MAGHRADZE *et al.* 2009: Georgian native grapevine cultivars 'Alexandrouli', 'Dzveli Alexandrouli' and 'Mujuretuli': Description, genetic relationship and hypotheses about their origin. J. Am. Pomolog. Soc. **63**, 181-191).

Ojaleshi N.

Synonyms

'Svanuri', 'Shonuri'.

Meaning of the name

Vine on a tree, high vine.

Historical notes and cultural importance

'Ojaleshi' is one of the oldest Georgian grapevine varieties. Many ancient authors like HERODOTUS (480 BC), STRABON (24), A. LAMBERT (1654), J. SHARDEN (1672), VAKHUSHTI BAGRATIONI (1745), DIUBUA DE MONTEREY (1840) and others reported about the great viticulture of Samegrelo in the past. 'Ojaleshi' used to be the most widely spread variety in Samegrelo up to the invasion of *Erysiphe necator*, *Plasmopara viticola* and *Phylloxera*. It was grown over persimmon or alder trees, with a free training system called 'Maghlari'.

'Ojaleshi' grapes grown in the mountain regions of Samegrelo produce high quality wines.

'Ojaleshi' is included in the official list of grapevine varieties recommended for cultivation in Western Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two or three distal leaves are covered on both sides with violet–white dense felt hairs. Hair density gradually becomes sparse on the following leaves.

The mature leaf is medium size, rounded and almost entire. The petiole sinus is shaft-shaped. The teeth are triangular, convex on both sides and with sharp tips. The lower leaf side is covered with felt hairs.

The flower is hermaphrodite.

The bunch is small, short-conical, sometimes winged and medium dense.

The berry is medium size, rounded and dark-blue. The skin is thick. The flesh is firm and tender.

Phenology

Time of bud burst: first half of April

Time of blooming: end of May - beginning of June

Time of veraison: beginning of August

Time of ripening: end of October

Vegetative and yielding characteristics

Vigor of shoot growth: medium or high with 'Maghlari' (high tree training system)

Shoot fertility coefficient (cluster per shoot): 0.8-1.6

Bunch weight: 98-120 g

Yield per vine: 30 kg ('Maghlari') or less (low training system)

Yield: 4.5-5.7 t·ha⁻¹

Climate and cultivation requirements

Up to end of 19th century 'Ojaleshi' was grown over trees with the Maghlari training system. Afterwards, during the rehabilitation of this variety, a low training system was used. However, since 1930-32 the single or double training system with one or two fruity canes was adopted.

Resistance to diseases and unfavorable weather

The variety is very sensitive towards the fungal diseases, especially towards *Erysiphe necator*. The influence of winter and spring frosts is minimal in Samegrelo's environment.



Juice characteristics

Sugar: 24.0-26.0 %

Total acidity: 7.0-11.0 g·L⁻¹

Wine and grape characteristics

'Ojaleshi' makes high quality red table wines, with intense color, high extract, satisfactory harmonious, fresh, pleasant taste and varietal aroma. During aging the wines improve and acquire the typical bouquet and taste of a high quality dry table wine.

Okhtoura N.

Synonyms

'Didi Adanasuri'.

Meaning of the name

From Okhtoura, the name of a village.

Historical notes and cultural importance

'Okhtoura' is an ancient grapevine variety from Western Georgia. Most of it is found as single vines within the vineyards of Imereti, especially in the Tkibuli district.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts. No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The mature leaf is medium size, round and five lobed. The upper leaf sinuses are deep, lyre-shaped or seldom elliptic. The lower leaf sinus is lyre-shaped and V-shaped. The petiole sinus is elliptic. The teeth are triangular with sharp tips, seldom triangular and convex on one side. The lower leaf side is covered with felt hairs. The petiole is as long as the main vein or shorter. The flower is hermaphrodite.

The bunch is medium size, cylindrical, rarely cylindrical-conical and dense.

The berry is medium size, almost rounded (rounded-oval) and dark red. The skin is rough. The flesh is juicy.

Phenology

Time of bud burst: second ten days of April

Time of blooming: third ten days of May

Time of veraison: beginning of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Shoot fertility (cluster per shoot): 1.6-1.8

Fruiting shoots: 78.0 %

Bunch weight: 100-125 g

Yield: medium (6.0-7.0 t·ha⁻¹)

Climate and cultivation requirements

'Okhtoura' achieves the highest quality during dry autumns. The vegetative period lasts 160-162 days from bud burst to ripening. 'Okhtoura' does not require any particular growing condition.

Resistance to diseases and unfavorable weather

'Okhtoura's resistance towards the main fungal diseases is medium.

Juice characteristics

Sugar: 17.0 %

Total acidity: 5.5-6.0 g·L⁻¹

Wine and grape characteristics

'Okhtoura' is used for the production of rosé table wines. The wines are light and with low extract.

The best 'Okhtoura' wines are made from late-harvest grapes with more than 17.0 % sugar and grown during a dry autumn.



Otskhanuri Sapere N.

Synonyms

'Sapere Otskhanuri'.

Meaning of the name

Otskhana's colorful. The name of the variety is linked to a village in Western Georgia called Otskhana (JAVAKHISHVILI 1934).

Historical notes and cultural importance

'Otskhanuri Sapere' is one of the oldest Georgian grapevine varieties. The variety is spread only in Western Georgia, particularly in Imereti. In 1939, 'Otskhanuri Sapere' was included in the official list of grapevine varieties recommended for cultivation in Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosa* Tserets.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first four-five distal leaves are covered with dense felt hairs.

The mature leaf is medium size and large, three sometimes five lobed. The upper leaf sinuses are deep and arched. The petiole sinus is arched as well. The teeth are triangular with sharp tips. The petiole is shorter than the main vein. The flower is hermaphrodite. The bunch is medium size, cylindrical-conical or seldom cylindrical and dense. The berry is small or medium, rounded and dark-blue. The flesh is juicy.

Phenology

Time of bud burst: second part of April

Time of blooming: end of May-beginning of June

Time of veraison: second part of August-beginning of September

Time of ripening: first part of October

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Yield: 7.0 t·ha⁻¹ (with 1.5 x 1.5 m planting layout and Guyot training system)

8.0 t·ha⁻¹ (with 1.5 x 1.5 m planting layout and "Olikhnari" training system with 40-50 buds per vine)

Climate and cultivation requirements

Plants growing on a double sided training system with two fruity canes, long pruning and 16-25 buds per plant yield more than those growing on the Olikhnari training system with short pruning. Tipping increases yield by 20 %.

Resistance to diseases and unfavorable weather

'Otskhanuri Sapere' is medium resistant towards fungal diseases. The grapes can stay for a long time on the vines. The variety is resistant towards gray mold (*Botrytis cinerea* Pers. ex Fr.) even in a rainy autumn.

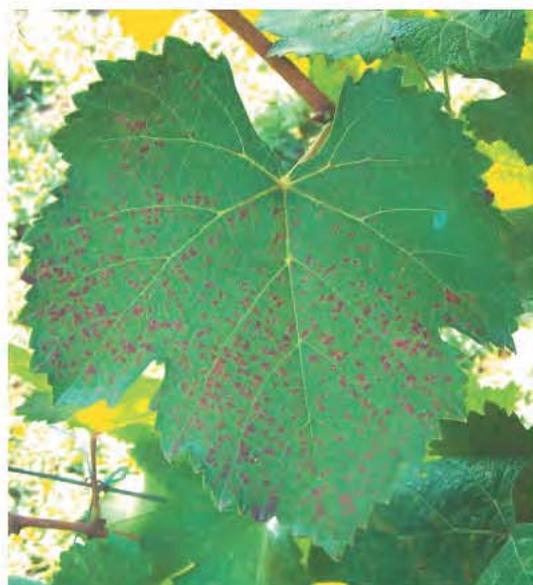
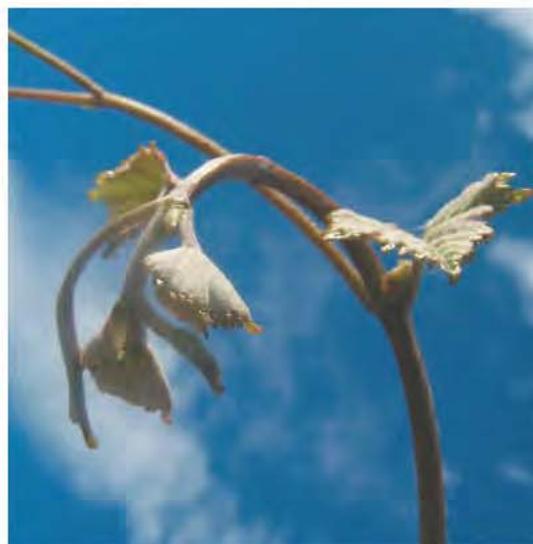
Juice characteristics

Sugar: 18.0-23.0 %

Total acidity: 7.0-12.0 g·L⁻¹

Wine and grape characteristics

'Otskhanuri Sapere' wines from Central Imereti have an intense red color, a pleasant bouquet, and a fresh, soft, satisfactory and harmonious taste. 'Otskhanuri Sapere' wines can age up to 30-40 years and they reach their best after 10 or 15 years. The grapes achieve high sugar content and high total acidity during ripening.



Paneshi N.

Synonyms

Unknown.

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

As a very productive variety, 'Paneshi' was widely spread on the hills of Samegrelo and it was trained on high Maghlari. Almost all the plants of this variety were destroyed after the invasion of *Phylloxera* and of fungal diseases. However, several plants survived in Upper Samegrelo.

'Paneshi' is a rare variety in Georgia now.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal laves are covered with white and dense felt hairs.

The mature leaf is medium size, slightly cordate, three or rarely five lobed. The upper leaf sinuses are elliptical. The petiole sinus is elliptical as well. The teeth are triangular, convex on both sides and with a sharp tip. The lower leaf side is covered with felt hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is small or medium, conical, sometimes shouldered and medium dense.

The berry is medium size, oblong-ovate and almost black. The skin is thick. The flesh is juicy.

Phenology

Time of bud burst: beginning of April

Starting of blooming: first ten days of June

Time of veraison: end of August

Time of ripening: second week of October

Vegetative and yielding characteristics

Shoot fertility (cluster per shoot): 1.8

Fruiting shoots: 77.0-78.0 %

Bunch weight: 190 g

Yield: 6.5-7.0 t·ha⁻¹ (depending on the training system)

Yield per vine: 2.3-4.0 kg (using the local Georgian training system)

Climate and cultivation requirements

'Paneshi' is suitable for the humid climate of the Black Sea coast in Western Georgia.

Resistance to diseases and unfavorable weather

The variety is very susceptible towards fungal diseases. It is highly resistant towards winter and spring frosts.

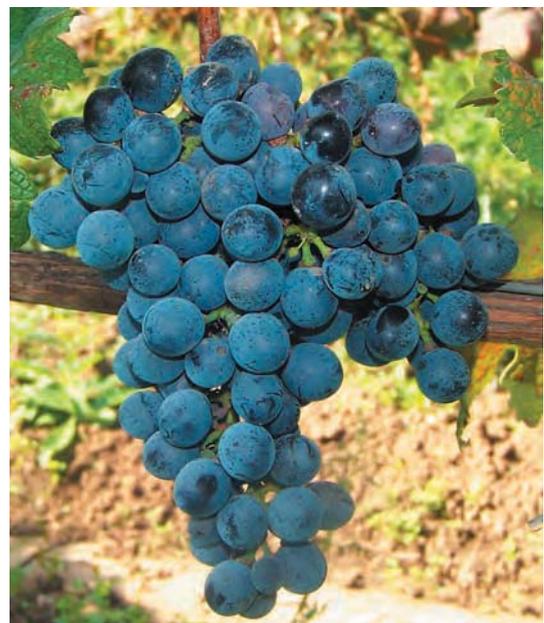
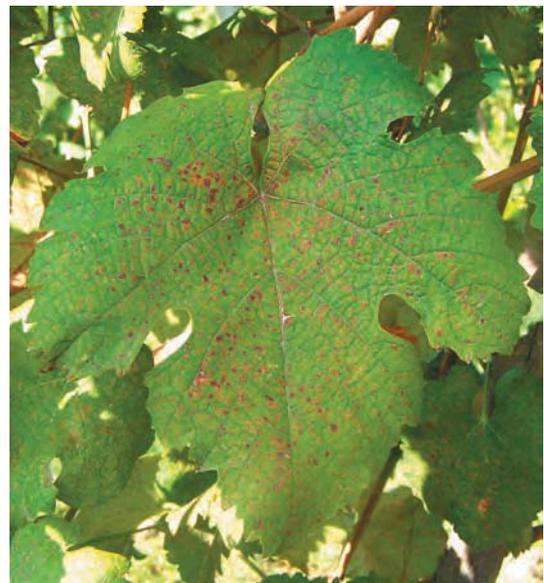
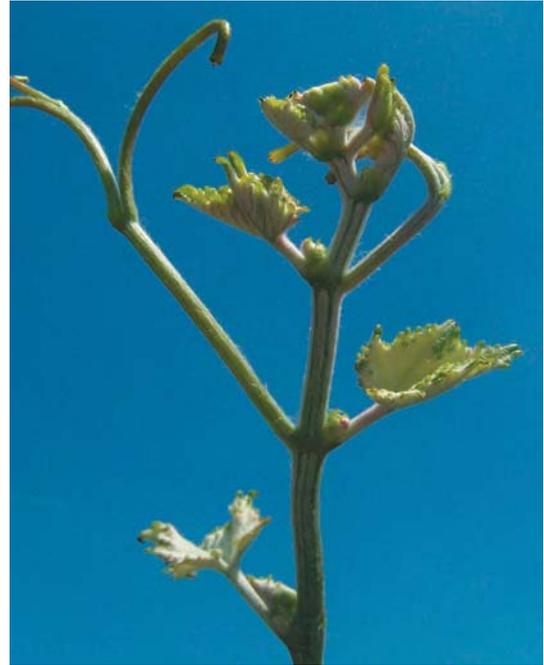
Characteristics of must

Sugar: 17.0 %

Total acidity: 9.8 g·L⁻¹

Wine and grape characteristics

'Paneshi' is used for table winemaking. The wine is sufficiently alcoholic, harmonious, fresh and with a pleasant flavor. It keeps throughout winter. The best 'Paneshi' wines are made in the Samegrelo's highlands. The variety is also suitable for fresh consumption and storage.



Partala Shavi N.

Synonyms

Unknown.

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Partala Shavi' is spread only in the old vineyards around Tbilisi and in the Mtskheta and Kaspi districts of Kartli (Eastern Georgia).

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the following distal leaves are hairless.

The mature leaf is cordate or rounded, five lobed and medium dissected.

The upper leaf sinuses are medium, seldom deep, lyre-shaped and elliptic.

The petiole sinus is lyre-shaped and arched. The teeth are triangular with sharp or rounded tips. The lower surface of the leaf blade is hairless. The

petiole sinus is shorter than the main vein.

The flower is hermaphrodite.

The bunch is large, cylindrical-conical, winged, dense or sometimes loose.

The berry is medium size, rounded and black with a dark-red tint. The flesh is juicy with pleasant taste.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Vigor of shoot growth: medium or higher in some micro regions

Shoot fertility (cluster per shoot): 1.4

Fruiting shoots: 96.0-97.0 %

Bunch weight: 180 - 240 g

Yield: medium (8.0-9.0 t·ha⁻¹) on the single sided Guyot training system; higher than medium (10.0-12.0 t·ha⁻¹) on the "Kheivani" (Pergola) training system

Climate and cultivation requirements

Cane maturation is almost complete.

Resistance to diseases and unfavorable climate conditions

Susceptibility towards the main fungal diseases is low.

Juice characteristics

Sugar: 18.0-22.0 %

Total acidity: 4.5-7.0 g·L⁻¹

Wine and grape characteristics

Mono-varietal 'Partala Shavi' vineyards do not exist. Thus, it is always used in blend with other varieties. The wines are medium bodied and harmonious.



Rkatsiteli B.

Synonyms

'Dedali Rkatsiteli', 'Mamali Rkatsiteli', 'Kukura', 'Kakura' (Georgia), 'Topoliok', 'Gruzinski', 'Koroliok' (Russia), 'Khangluri', 'Asangluri', 'Rkatsiteli Gialo'.

Meaning of the name

With red canes.

Historical notes and cultural importance

According to the linguistic and philological analysis conducted by I. JAVAKHISHVILI (1934) on the word Rkatsiteli, the cultivar dates back to the V-VI century AD. 'Rkatsiteli' belongs to the local cultural group of varieties of the Alazani river basin.

'Rkatsiteli' is a very popular variety. It was the most widespread variety of the former Soviet Union. It was also grown in Bulgaria and Romania. 'Rkatsiteli' is the main Georgian cultivar, thus it is included in the official list of grapevine varieties recommended for cultivation in the whole country. 'Rkatsiteli' is also included in the standard list of grapevine cultivars of Armenia, Uzbekistan, Tajikistan, Ukraine, Northern Caucasus and Moldova.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserts. Several 'Rkatsiteli' biotypes with many different properties have been selected. The most interesting are the high-yield clones N° 48 and N° 320 as well as the sport (bud variation) 'Vardisperi (pink) Rkatsiteli'.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are grey-white, with light-rose edges and covered with medium dense cobwebby hairs.

The mature leaf is medium size or large, three or five lobed, sometimes almost entire. The upper and lower leaf sinuses are medium and small, arched or lyre-shaped. The petiole sinus is lyre-shaped or arched. Teeth are large and both sides are convex. The lower leaf side is covered with felt hairs. The petiole is equal to the main vein.

The flower is hermaphrodite.

The bunch is medium size and large, cylindrical-conical, rarely cylindrical, winged and medium dense.

The berry is medium, rounded-ovate and golden-yellow. The skin is medium firm. The flesh is colorless, juicy and with a neutral taste.

Phenology

Time of bud burst: middle of April

Time of blooming: middle of June

Time of veraison: first ten days of August

Time of ripening: end of September

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: medium

Bud fertility: 0.7

Bunch weight: 104-204 g

Yield per vine: 2 kg

Climate and cultivation requirements

'Rkatsiteli' has a medium vegetative period and good wood maturation. It grows well on the plain regions, particularly in Kakheti (Eastern Georgia), where it yields very high quality. The variety is less suitable for humid climate conditions.

The best results with 'Rkatsiteli' are achieved having: 3,300 vines/ha planting density, 2.0 x 1.5 m planting layout, the four cane "fan like" training system, 8-10 buds per cane and 35-40 buds per vine.



Resistance to diseases and unfavorable climate conditions

'Rkatsiteli' shows medium resistance towards *Plasmopara viticola*. In the very humid areas of Western Georgia it suffers from *Plasmopara viticola* more than other local varieties. 'Rkatsiteli' has also little resistance to *Erysiphe necator*, it is susceptible towards Spider Mites (*Tetranychidae*), it is relatively resistant towards *Phylloxera* and it has good resistance towards winter frosts (-22-24 °C) and drought.

Juice characteristics

Sugar: 20.0-25.0 %

Total acidity: 5.0-9.0 g·L⁻¹

Wine and grape characteristics

'Rkatsiteli' makes high quality Kakheti dry table wines. The best table wines are in blend with 'Mtsvane Kakhuri'.

The wines made through the European technologies are straw-golden, fresh, with varietal bouquet and harmonious taste. The traditionally made wines have the color of strong tea, they are fruity, varietal, full bodied with low acidity and moderate tannins, 13.0-14.0 % alcohol and 4.0-5.0 g·L⁻¹ total acidity.

Rkatsiteli is successfully used for preparing high quality dessert and fortified wines, brandy and grape juice. The grapes can also be used as a table grape.

Rkatsiteli Vardisperi R.

Synonyms

'Vardisperi Rkatsiteli', 'Pink Rkatsiteli'.

Meaning of the name

Pink Rkatsiteli (Rkatsiteli with pink berries).

Historical notes and cultural importance

'Rkatsiteli Vardisperi' is a 'Rkatsiteli' clone selected by V. LOLADZE in 1948.

The variety is spread in the Gurjaani, Telavi, Lagodekhi and Akhmeta districts of Kakheti.

Taxonomy and intra-variety variability

Proles *pontica* subpoles *georgica* Negr. provar *araneosae* Tserts.

No phenotypic variations have been revealed so far.

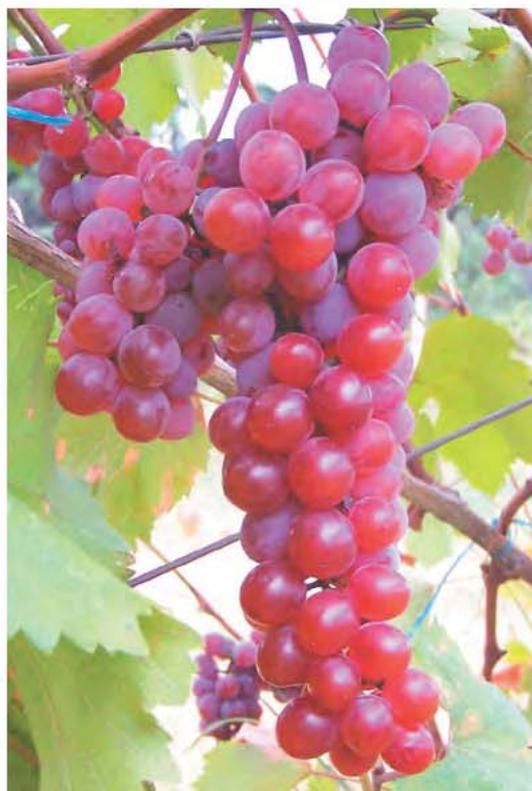
Distinction characters from 'Rkatsiteli B'.

The autumnal coloration of the leaves is wine-red.

The berry is pink.

Wine and grape characteristics

'Rkatsiteli Vardisperi' makes high quality dry and dessert table wines. The grapes are also consumed fresh.



Saperavi N.

Synonyms

Unknown.

Meaning of the name

Colorful (the name is due to the great amount of pigments in the berry).

Historical notes and cultural importance

'Saperavi' is an old Georgian variety. The variety was well known in Central Georgia in the beginning of the 17th century. 'Saperavi' was probably original of Colchis (Western Georgia) and then it spread to Eastern Georgia.

'Saperavi's juice is colored. For this reason, 'Saperavi' is used to color wines from white grapes or to improve the color of red wines.

'Saperavi' is one of the main grapevine cultivars of Georgia. It is included in the official list of grapevine varieties, recommended for cultivation in the country. This Georgian variety was successfully introduced in Azerbaijan, Armenia, Moldova, Ukraine, Russia and in Central Asia.

Taxonomy and intra-variety variability

Proles pontica subproles *georgica* Negr. provar *tomentosae* Tserets.

Several variation of Saperavi are known:

Saperavi Budeshuriseburi

Saperavi Didtanakvaviliani (with large inflorescence)

Saperavi Mskhvilmartsva (with large berries)

Saperavi Martsvamtsveni (drooped)

Saperavi Moklemtevana (with short bunch)

Saperavi - Clone No 359 (high yield)

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are covered with felt hairs.

The mature leaf is large, rounded, seldom cordate, three, sometimes five lobed. The upper leaf sinuses are medium and small, lyre-shaped and elliptical. The petiole sinus is lyre-shaped, arched and elliptic. The teeth are triangular, both sides are convex. The lower leaf side is covered with dense felt hairs. The petiole length is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size or large, branched and variable in shape, loose and medium dense.

The berry is medium size or large, ovate and dark-blue. The skin is thin. The flesh is juicy and tender. The juice is sticky and rose.

Phenology

Time of bud burst: middle of April

Time of blooming: beginning of June

Time of veraison: middle of August

Time of ripening: end of September-first part of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium or strong

Fruiting shoots: 60.0-94.0 %

Bunch weight: 190-250 g

Yield: more than high

Climate and cultivation requirements

'Saperavi' is a medium-time ripening variety. The best training system for 'Saperavi' is the double Guyot with two fruity canes and 18-20 buds per plant and the recommended planting area is 3.0 m² per vine. However, over the hillsides, the best results are achieved using the single Guyot training system with one fruity cane and with 2.0 m² per vine planting area.



Resistance to diseases and unfavorable weather

'Saperavi' is medium resistant towards the main fungal diseases. It is a little more susceptible towards the Vine mealybug (*Planococcus ficus* Sign.) compared to other varieties, however it is more resistant towards the European grapevine moth (*Lobesia botrana*)

'Saperavi' is more frost resistant than most Western European varieties, but not as resistant as 'Rkatsiteli' and 'Mtsvane Kakhuri'.

Juice characteristics

Sugar: 20.0-24.0 %

Total acidity: 5.0-9.0 g·L⁻¹

Wine and grape characteristics

'Saperavi' Kakhetian-style dry table wines have deep color, pleasant aroma, full and strong taste. Aged wines are soft, with a strong varietal bouquet.

This variety is used also for making semi-sweet and dessert wines. The 'Saperavi' Kagor style wine is the most interesting.

Saperavi Atenis N.

Synonyms

Unknown.

Meaning of the name

Colored from Ateni (Ateni is the place of origin of this variety. It refers to both a village and a narrow valley in Eastern Georgia).

Historical notes and cultural importance

'Saperavi Atenis' is suitable for the central regions of Kartli in Eastern Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosea* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The mature leaf is large, rounded and slightly three lobed. The upper leaf sinuses are small, open and V-shaped. The lower leaf sinuses are small and closed. The petiole sinus is elliptic, seldom lyre-shaped. The teeth are triangular with wide bottoms. The lower leaf side is covered with medium hairs.

The flower is hermaphrodite.

The bunch is small and conical.

The berry is ovate and black. The flesh is pulpy and juicy. The juice is colorless.

Phenology

Time of bud burst: beginning of April

Time of blooming: beginning of June

Time of veraison: middle of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bunch weight: 107 g

Yield per vine: 1.8 kg

Yield: medium (6.0 t·ha⁻¹)

Climate and cultivation requirements

Cane maturation is good. The variety is suitable for cultivation in Kartli.

Resistance to diseases and unfavorable weather

'Saperavi Atenis' is medium resistant towards *Plasmopara viticola* and *Erysiphe necator*. It is slightly susceptible toward the Common Red Spider (*Tetranychus telarius* L.).

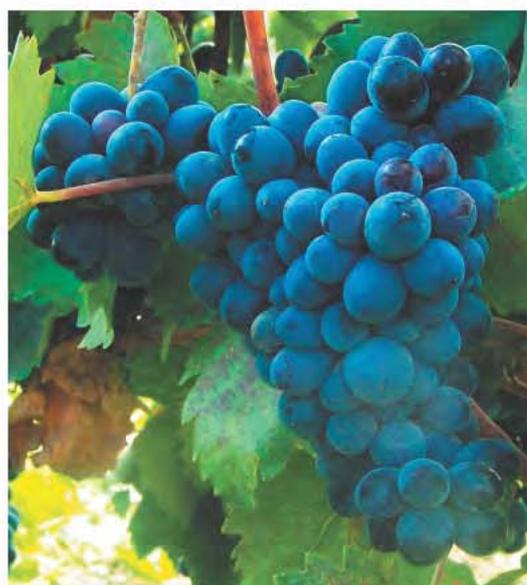
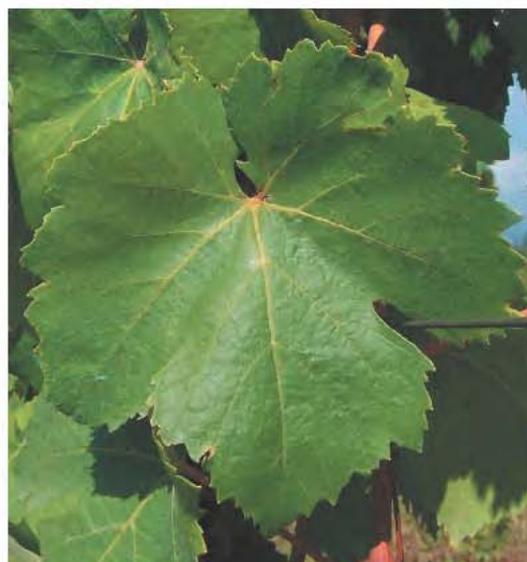
Juice characteristics

Sugar: 18.0 %

Total acidity: 11.6 g·L⁻¹

Wine and grape characteristics

The wine is lightly colored and not full bodied.



Saperavi

Budeshuriseburi N.

Synonyms:

'Budeshuri', 'Grdzelmartsvala Saperavi'.

Meaning of the name

'Saperavi' similar to 'Budeshuri' (this particular 'Saperavi' has prolonged berries like 'Budeshuri's).

Historical notes and cultural importance

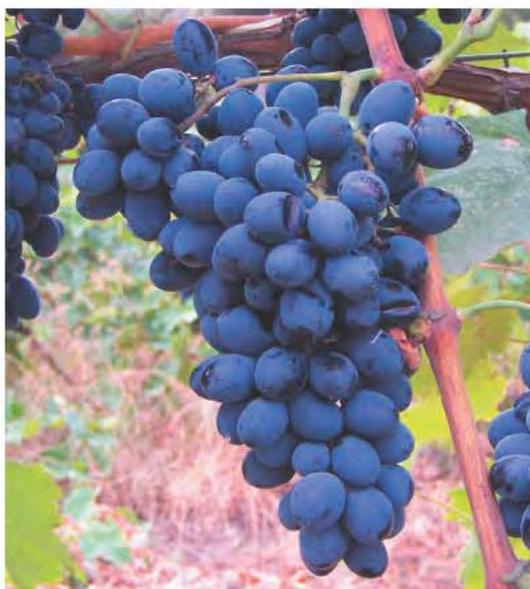
This variety is a 'Saperavi' mutant.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.
No phenotypic variations have been revealed so far.

Distinction characters from variety 'Saperavi'

Elongated berries; time of ripening; higher quality.



Sapena B.

Synonyms

'Dedat kurdzeni', 'Dedali kurdzeni'.

Meaning of the name

Grape with berries all on one layer.

Historical notes and cultural importance

'Sapena' seems to be more related to 'Kakhuri Mtsvane' among other white grapevine varieties of Kakheti. It is spread in multi varietal vineyards of Kakheti.

'Sapena' should be given more attention for improving quality and yield. It is suitable in blend and for producing varietal wines.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserets.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two-three distal leaves are white, with pink edges and covered with felt hairs.

The mature leaf is rounded, sometimes ovate, five or seldom three lobed, strongly or medium dissected. The upper leaf sinuses are medium in size and deep, often with an oval and triangular lumen. The petiole sinus is often lyre-shaped and limited by the veins, but sometimes it is arched. The teeth are triangular with sharp tips and both sides are convex. The lower leaf side is covered with felt hairs. The petiole is shorter than the main vein.

The flower is female.

The bunch is medium size, wide conical, shouldered, rarely cylindrical, medium dense.

The berry is medium size, rounded and greenish-yellow with a pink shade. The skin is thin. The flesh is medium firm, tender, with a typical varietal flavor.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: middle of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Fruiting shoots: 90.0-92.0 %

Yield per vine: 1.6 kg

Bunch weight: 150-180 g

Climate and cultivation requirements

'Sapena' is a medium-late ripening wine grape variety. The vegetative period is medium. Cane maturation is good. The variety is suitable for cultivation in Kakheti. Medium pruning and 35-40 buds per vine are recommended. 'Sapena' mono-varietal vineyards need a pollinator variety.

Resistance to diseases and unfavorable climate conditions

Resistance towards *Plasmopara viticola* is medium. Resistance towards *Erysiphe necator* is low. Susceptibility towards other fungal diseases or insects is not reported. Resistance to frost and drought is satisfactory.

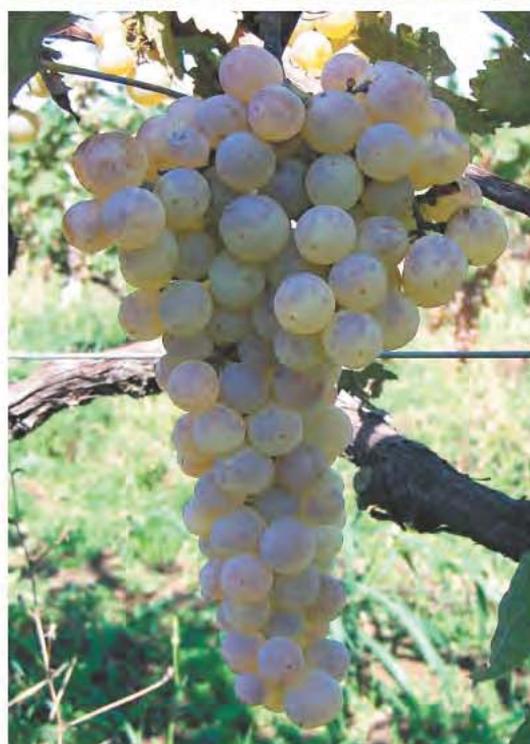
Juice characteristics

Sugar: 20.3 %

Total acidity: 5.0-7.0 g·L⁻¹

Wine and grape characteristics

'Sapena' wine is soft, medium bodied with harmonious taste and varietal aroma. The wine sensorial grade was evaluated as 7.1/10 for several years. 'Sapena' was used successfully also for making alcohol-free drinks.



Satsuravi N.

Synonyms

Unknown.

Meaning of the name

Juicy grape.

Historical notes and cultural importance

'Satsuravi' is original of the Adjara province in Western Georgia. The variety is spread as single vines in the Tao, Furno, Vaio villages of the Khulo and Keda districts in Adjara.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts. No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are covered with dense felt hairs; on the following leaves hairs get sparse.

The mature leaf is medium size or large, cordate, slightly or deeply five lobed. The upper leaf sinuses are deep, elliptic, lyre-shaped and arched. The lower leaf sinuses are V-shaped and chinked. The petiole sinus is arched, sometimes lyre-shaped. The teeth are triangular with sharp tips. The lower leaf side is covered with felt hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size or large, cylindrical-conical or cylindrical with two, sometimes three wings, dense or medium dense.

The berry is medium size, ovate-rounded and dark red. The flesh is very juicy.

Phenology

Time of bud burst: beginning of April

Time of blooming: beginning of June

Time of veraison: middle of August

Time of ripening: second ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Shoot fertility (clusters per shoot): 1.4

Fruiting shoots: 77.0-79.0 %

Bunch weight: 288 g

Yield: high (10.0-14.0 t·ha⁻¹ on alluvial soils with 400 plants/ha and the Guyot training system)

Yield per vine: 4.0-6.0 kg (in a vineyard with short pruned canes)

Climate and cultivation requirements

It is recommended to grow 'Satsuravi' on aerated and well-exposed slopes. The plant should be at least 70 cm high.

Resistance to diseases and unfavorable weather

'Satsuravi' is less susceptible towards fungal diseases than other local varieties from the region. The variety has resistance to winter and spring frosts.

Juice characteristics

Sugar: 17.0 %

Total acidity: 10.0 g·L⁻¹

Wine and grape characteristics

'Satsuravi' is used for making common dry table wines. The wine is light red or rosé with a weak and harmonious aroma. 'Satsuravi' is also good to make grape juice.



Shavkapito N.

Synonyms

'Shavi Kapito', 'Lurjpotola'.

Meaning of the name

Vine with a black cane.

Historical notes and cultural importance

'Sahvkapito' originated in Kartli, Eastern Georgia. The variety is included in the official list of grapevine varieties, recommended for cultivation in Georgia. It is one of the basic wine varieties in the Samachablo region.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar. *tomentosae* Tserts. No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is almost white, with light pink edges and covered with dense cobwebby hairs.

The mature leaf is medium size, rounded, three to five lobed. The upper leaf sinus is open, deep and lyre-shaped with a pointed bottom. The lower leaf sinuses are medium, chinked and V-shaped. The petiole sinus is lyre-shaped, seldom arched, seldom elliptic. The teeth are convex on both sides with roundish tops. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, conical or cylindrical-conical, winged, medium dense or dense.

The berry is medium size, rounded and dark blue. The flesh is juicy. The juice is colorless.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Shoot fertility (cluster per shoot): 0.96-1.7

Fruiting shoots: 90.0-98.0 %

Bunch weight: 160-180 g (250 g per large ones)

Yield: medium or higher than medium

Climate and cultivation requirements

'Sahvkapito' is a medium time ripening grape variety.

Resistance to diseases and unfavorable climate conditions

'Sahvkapito' is medium resistant towards *Erysiphe necator* and *Plasmopara viticola*.

Juice characteristics

Sugar: 16.0-20.0 %

Total acidity: 4.5-9.5 g·L⁻¹

Wine and grape characteristics

'Sahvkapito' wines are fresh and with a weak bouquet. The grapes grown over the slopes give softer wines than those grown on the plain. The grapes grown on skeletal soils give pleasant, soft, very light and rather fresh wines with 11.0 % alcohol and 7.0 g·L⁻¹ total acidity. Good quality wines are made in pre-mountain and mountain regions.



Sirgula B.

Synonyms

Unknown.

Meaning of the name

Vine bearing alternately.

Historical notes and cultural importance

'Sirgula' is a variety from Eastern Georgia. It is spread as single vines in the gardens of Kakheti.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are covered with cobwebby hairs. The edge of the leaves is light wine-red.

The mature leaf is rounded or cordate, medium or deeply five lobed. The upper leaf sinuses are medium, lyre-shaped and elliptic. The lower leaf sinuses are lyre-shaped. The petiole sinus is lyre-shaped, seldom shaft-shaped and elliptic. The lower leaf side is covered with dense bristly hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical or cylindrical, winged or sometimes shouldered, medium dense, seldom very dense.

The berry is medium size, oval or seldom rounded and light yellow. The skin is difficult to peel off. The flesh is firm, slightly crispy.

Phenology

Time of bud burst: second or third ten days of April

Time of blooming: second ten days of June

Time of veraison: middle of August

Time of ripening: end of September

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Shoot fertility (cluster per shoot): 1.3-1.5

Fruiting shoots: 69.4-92.4 %

Yield: medium (6.3 t·ha⁻¹ with double Guyot, 3 m² of planting area, without irrigation and on brown not carbonate clay soils)

Bunch weight: 120-150 g

Climate and cultivation requirements

The main cultivation method for 'Sirgula' is the double sided Guyot with 8-10 buds per cane. The planting layout must take into account the high vigor of this variety.

Resistance to diseases and unfavorable climate conditions

'Sirgula' is medium resistant towards *Plasmopara viticola* and it is more sensitive to *Erysiphe necator*. In Kakheti, 'Sirgula' is considered relatively frost resistant.

Juice characteristics

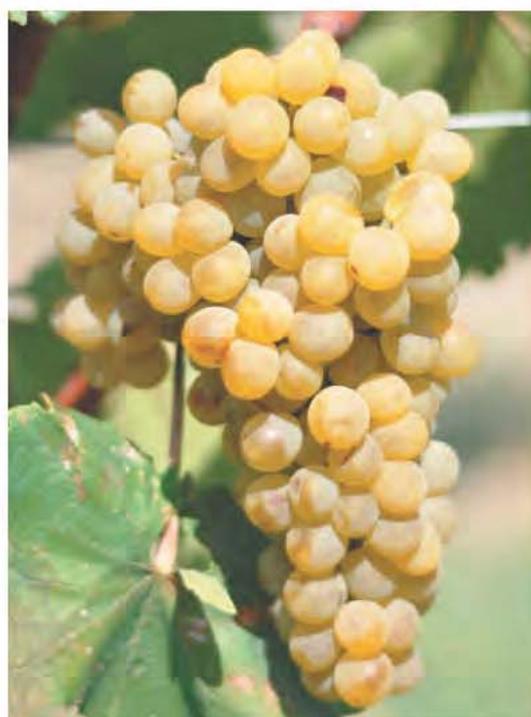
Sugar: 17.8-20.2 %

Total acidity: 4.5-6.5 g·L⁻¹

Grape and Wine and grape characteristics

'Sirgula' is mainly used as a table grape. Its beautiful bunches and oval berries are very attractive.

The wine is not of high quality. Blending with other varieties gives dry table wines with a relatively good alcoholic level.



Skhilatubani N.

Synonyms

'Skhilitaubani', 'Skhilitobani', 'Tckhilitobani', 'Chkhilitobani'.

Meaning of the name

Skhilatubani is a toponym.

Historical notes and cultural importance

'Skhilatubani' is an old Georgian variety from the Guria province in Western Georgia.

The variety is found mixed with other varieties in Guria's vineyards.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics:

The tip of the young shoot is covered with colorless dense hairs.

The mature leaf is medium size, rounded or very cordate, three lobed or seldom entire. The upper leaf sinuses are small and V-shaped. The petiole sinus is lyre-shaped. The lower leaf side is covered with dense felt hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, cylindrical or cylindrical-conical and very dense.

The berry is medium size, rounded and dark-blue. The flesh is very juicy.

Phenology

Time of bud burst: first ten days of April

Time of blooming: third ten days of May

Time of veraison: end of August

Time of ripening: second week of October

Vegetative and yielding characteristics

Vigour of growth: medium or stronger than medium

Shoot fertility (cluster per shoot): 2.0 - 2.2

Fruiting shoots: 79.0 - 83.0 %

Bunch weight: 60 - 150 g

Yield per vine: 1.9 - 2.5 kg

Yield: high (8.0-9.0 t·ha⁻¹ on alluvial soils, using the Georgian free training system and a 1.5 x 1.5 m planting layout)

Climate and cultivation requirements

'Skhilatubani' is a very late ripening variety. Cane maturation is good.

Resistance to diseases and unfavorable climate conditions

'Skhilatubani' is highly sensitive to *Erysiphe necator*. It is frost and drought resistant.

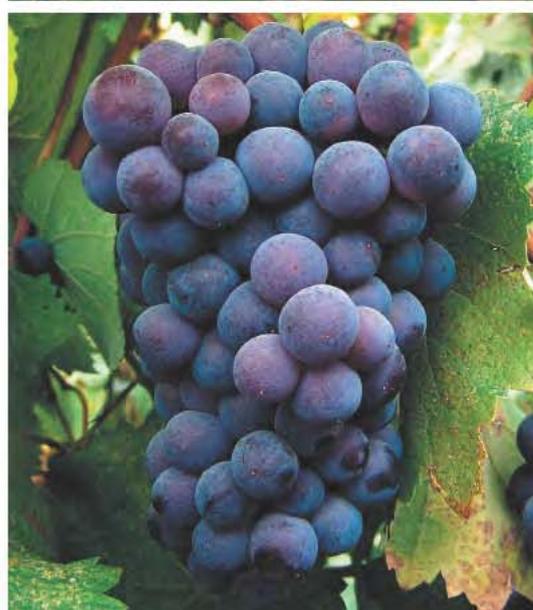
Juice characteristics

Sugar: 19.5 %

Total acidity: 8.8 g·L⁻¹

Wine and grape characteristics

'Skhilatubani' makes good quality mono-varietal table wines. The wines are harmonious, light and with a normal alcohol content.



Tavkveri N.

Synonyms

Unknown.

Meaning of the name

Flatten (variety with flat berries).

Historical notes and cultural importance

'Tavkveri' is one of the main Georgian cultivars. It is included in the official list of grapevine varieties, recommended for cultivation in Georgia. This variety is also grown in Azerbaijan, where it was introduced from Georgia in 1852-1854 and now it is included in the official list of varieties, recommend for cultivation in the country for producing table wines and brandy. In Tajikistan and Turkmenistan 'Tavkveri' is used to make dessert wines.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspiica* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot, the first and the second distal leaves are covered with cobwebby down.

The mature leaf is large, cordate, deeply five lobed. The upper leaf sinuses are elliptic. The lower leaf sinuses are chinked and lyre-shaped. The petiole sinus is lyre-shaped and arched. The teeth are triangular, both sides are straight or one side is straight and the other side is convex. The lower leaf side is hairless. The petiole is as long as the main vein.

The flower is female.

The bunch is medium size or large, conical, winged and very dense in case of good pollination.

The berry is medium size or large, rounded and dark blue. The flesh is juicy.

Phenology

Time of bud burst: end of March, middle of April

Time of blooming: end of May, beginning of June

Time of veraison: end of July, middle of August

Time of ripening: end of August, second ten days of September

Vegetative and yielding characteristics

Vigor of shoot growth: strong

Shoot fertility (cluster per shoot): 1.22

Fruiting shoots: 79.0-87.0 %

Bunch weight: 160-230 g

Yield: very high (20.0-30.0 t·ha⁻¹ according to pollination)

Climate and cultivation requirements

'Tavkveri' is a medium time ripening variety. The recommended planting layout is 1.5 x 2.0 m. The best training system is the double sided Guyot with two fruity canes and 20-25 buds per vine or, in some vineyards, 35-40 buds per vine. This variety needs 4-6 irrigations per season. Tipping before flowering has a positive effect on 'Tavkveri', increasing yield up to 25 %.

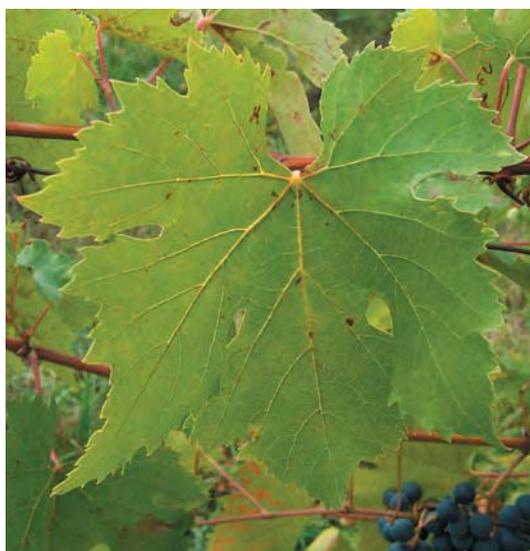
Resistance to diseases and unfavorable weather

'Tavkveri' has high susceptibility towards *Plasmopara viticola*. Resistance towards *Erysiphe necator* is medium. The variety is strongly susceptible towards the European grapevine moth (*Lobesia botrana*), Spider mites (*Tetranychidae*) and gray mold (*Botrytis cinerea*), the latter in a rainy autumn particularly. Resistance to frost is high and resistance towards drought is medium.

Juice characteristics

Sugar: 14.0-20.0 %

Total acidity: 5.0-8.0 g·L⁻¹



Wine and grape characteristics

'Tavkveri' is used for making high quality table, strong, dessert, as well as red Porto style and Kagor style wines. 'Tavkveri' is also good for the production of grape-juice.

Red table wines have 9.0-11.0 % alcohol, 5.0-8.0 g·L⁻¹ total acidity, 23.0-25.0 extract.

Dessert red wines have 16.0-17.0 % alcohol, 5.0-8.0 g·L⁻¹ total acidity, 23.0-25.0 extracts, 3.0-5.0 % residual sugar.

Tavkveri

Saperaviseburi N.

Synonyms

Unknown.

Meaning of the name

Tavkveri similar to Saperavi.

Historical notes and cultural importance

'Tavkveri Saperaviseburi' is original of the Gurjaani district in Kakheti.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are grey, with slight wine-pink colored edges, and covered with sparse cobwebby down.

The mature leaf is rounded and three or five lobed. The upper leaf sinuses are small and medium, elliptic-shaped. The lower leaf sinuses are small, V-shaped or rarely chinked. The petiole sinus is lyre-shaped, seldom shaft-shaped. The teeth are triangular, both sides are convex with sharp or cupola-shaped tops. The lower leaf side is weakly hairy.

The flower is hermaphrodite.

The bunch is large, cylindrical-conical or narrow-conical, often shouldered, seldom winged and dense.

The berry is medium size, oval, rarely rounded and slightly prolonged, dark-blue. The skin is firm and difficult to peel off. The flesh is medium firm and tender. The juice is light pink.

Phenology

Time of bud burst: third ten days of April

Time of blooming: the first ten days of June

Time of veraison: middle of August

Time of ripening: end of September

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Shoot fertility (cluster per shoot): 1.25

Fruiting shoots: 81.0 %

Bunch weight: 160-200 g

Yield: medium (5.5-6.0 t·ha⁻¹)

Climate and cultivation requirements

Cane maturation is good.

Resistance to diseases and unfavorable weather

Susceptibility towards the main fungal diseases and insects is medium.

Juice characteristics

Sugar: 16.3-21.0 %

Total acidity: 5.6-8.0 %

Grape and Wine and grape characteristics

'Tavkveri Saperaviseburi' is used locally as a table grape. Bunches are long, loose and decorative. The berries are good-looking, sufficiently large, oval, dark blue, with a pleasant taste. 'Tavkveri Saperaviseburi' is used rarely to make dry table wine in blend with other local varieties. A 100 % 'Tavkveri Saperaviseburi' wine has medium quality, dark pink, with medium extract and a sufficiently pleasant taste.



Tchiviluri B.

Synonyms

'Tchivilauri', 'Tchivilori'.

Meaning of the name

Variety from the village of Tchvitleti.

Historical notes and cultural importance

'Tchiviluri' is a high yield variety. Thus, it was widely spread in Samegrelo (Western Georgia), on the plains particularly, where it was grown over trees following the Maghlari training system.

Many 'Tchiviluri' vineyards were destroyed in the 19th century by *Phylloxera*, however several tree-grown plants survived in the hills of Samegrelo.

Nowadays, 'Tchiviluri' is rarely spread in Samegrelo.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* provar *tomentosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with white felt hairs and the edges are pink.

The mature leaf is medium size, rounded or slightly cordate and slightly three or five lobed. The upper leaf sinuses are weakly developed or V-shaped. The petiole sinus is shaft-shaped, sometimes lyre-shaped. The teeth are triangular, convex on both sides and with sharp tips. The lower surface of the leaf blade is covered with dense felt hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is small, cylindrical, sometimes cylindrical-conical, dense and medium dense, or rarely medium dense.

The berry is medium size, rounded, dark amber. The skin is rather thin. The flesh is firm and juicy and with a good flavor.

Phenology

Time of bud burst: first ten days of April

Time of blooming: end of May

Time of veraison: third ten days of August

Time of ripening: end of October

Vegetative and yielding characteristics

Vigor of shoot growth: higher than medium

a) In low vineyards:

Fruiting shoots: 76.0 %

Shoot fertility (cluster per shoot): 1.4

Bunch weight: 100 g

Yield per vine: 2.5-3.0 kg

Yield: 7.0-7.5 t·ha⁻¹

b) In high 'Maghlari':

Yield per vine: 30 kg

Yield: 6.0-6.5 t·ha⁻¹

Resistance to diseases and unfavorable weather

'Tchiviluri' is weakly resistant towards the main fungal diseases, especially towards *Plasmopara viticola*.

Climate and cultivation requirements

The variety prefers the warm slopes facing south.

Juice characteristics

Sugar: 20.0-21.8 %

Total acidity: 8.1-8.9 %



Wine and grape characteristics

'Tchvitoluri' is used for high quality white table wine production. The wines have a sufficiently high alcohol content (11.0 %) and a harmonious and pleasant taste.

'Tchvitoluri' is a high yield and high quality variety, therefore it should be encouraged in the pre-mountainous regions of Samegrelo.

Tsitkvalis Tetri B.

Synonyms

'Kartula'.

Meaning of the name

White from the village of Tsirkvali.

Historical notes and cultural importance

'Tsitkvalis Tetri' is very rarely spread in the Zemo (Upper) Imereti region of Western Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserets.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The mature leaf is medium size, round and slightly three-lobed. The upper leaf sinuses are small or medium, V-shaped or lyre-shape. The lower leaf sinuses are small and V-shaped. The petiole sinus is lyre-shaped. The teeth are triangular with sharp tips. The lower leaf side is covered with dense felt hairs. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, conical and medium dense.

The berry is medium size, rounded and yellowish-green. The flesh is juicy.

The taste is sweet and pleasant.

Phenology

Time of bud burst: beginning of April

Time of blooming: beginning of June

Time of veraison: middle of August

Time of ripening: second ten days of October

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Bunch weight: 150 g

Yield per bunch: 2.0 kg

Yield: high (8.8 t·ha⁻¹)

Climate and cultivation requirements

'Tsitkvalis Tetri's vegetative period is medium. Cane maturity is good. It is suitable for cultivation in the Sachkhere, Kharagauli, Oni and Tsageri districts of Upper Imereti and in the Ratcha-Lechkhumi province.

Resistance to diseases and unfavorable weather

'Tsitkvalis Tetri' is not very susceptible to *Plasmopara viticola* and *Erysiphe necator*.

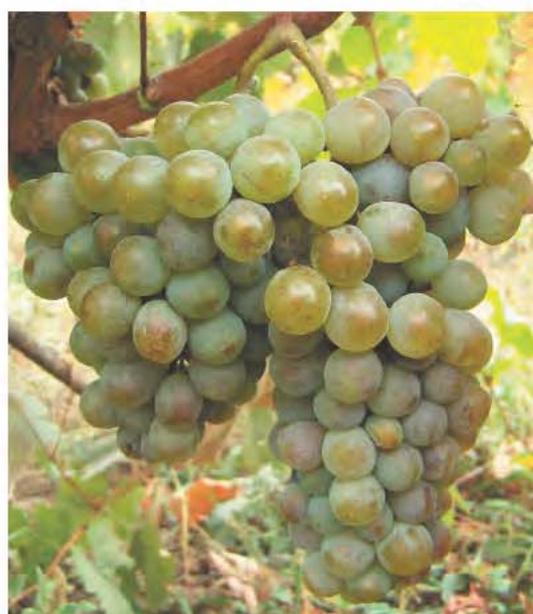
Juice characteristics

Sugar: 20.0-21.0 %

Total acidity: 8.0-9.0 g·L⁻¹

Wine and grape characteristics

'Tsitkvalis Tetri' is used for making table wines. The wine is delicate and harmonious.



Tsitska B.

Synonyms

'Shanti', 'Mamali Tsitska'.

Meaning of the name

Variety with small grapes or variety from the village of Tsitske or Tsitskiuri (JAVAKHISHVILI 1934).

Historical notes and cultural importance

'Tsitska' is one of the best and most widespread cultivars in Upper and Central Imereti. It is included in the official list of grapevine varieties, recommended for cultivation in Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.
No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first five leaves are covered with dense felt hairs.

The mature leaf is medium size, rounded or sometimes cordate, three or five lobed. The upper leaf sinuses are medium and open. The lower sinuses are small and closed, sometimes open. The petiole sinus is U-shaped. The teeth are sharp and convex on both sides. The lower surface of the leaf blade is covered with felt hairs.

The flower is hermaphrodite.

The bunch is medium size, conical or cylindrical-conical, dense, very dense or sometimes medium dense.

The berry is medium size, rounded-ovate and green-yellow. The skin is thick. The flesh is juicy with a sweet-sour taste.

Phenology

Time of bud burst: beginning of April

Time of blooming: end of May, beginning of June

Time of veraison: middle of August

Time of ripening: beginning of October

Vegetative and yielding characteristics

Habit of shoot grows: semi-erect

Vigor of shoot growth: medium

Yield: high (8.0-10.0 t·ha⁻¹)

Climate and cultivation requirements

The recommended planting layout is 1.5 x 1.5 m with 32-40 buds per vine.

Resistance to diseases and unfavorable weather

'Tsitska' has low resistance towards *Oidium* and *Plasmopara viticola*.

Juice characteristics

Sugar: 16.0-25.0 %

Total acidity: 7.0-12.0 g·L⁻¹

Wine and grape characteristics

Dry 'Tsitska' table wines are dark amber, energetic and fresh. Grapes with 19.0-21.0 % sugar content and 7.0-9.0 g·L⁻¹ total acidity make the best wine.



Tskhvedianis Tetra B.

Synonyms

Unknown.

Meaning of the name

Tskhvediani's White (Tskhevdiani is a Georgian surname, probably of the first person who distributed this variety).

Historical notes and cultural importance

'Tskhvedianis Tetra' is spread in limited areas of Ratcha-Lechkhumi.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *araneosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the shoot are covered with sparse hairs.

The mature leaf is large, cordate or almost rounded, slightly three or five lobed. The upper leaf sinuses are medium, lyre-shaped and elliptic. The lower leaf sinuses are weak and chinked. The petiole sinus is lyre-shaped and arched. The teeth are triangular with sharp tips. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, conical or cylindrical, rarely winged and medium dense.

The berry is medium size, round or round-oval, green with a yellow tint.

The skin is thin, not firm. The flesh is juicy.

Phenology

Time of bud burst: end of first ten days of April

Time of blooming: third ten days of May

Time of veraison: beginning of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Vigor of shoot growth: high

Shoot fertility (cluster per shoot): 1.6-1.7

Bunch weight: 150-185 g

Yield: high (10.6-13.3 t·ha⁻¹)

Climate and cultivation requirements

'Tskhvedianis Tetra's vegetative period is medium. Cane maturation is good. 3300 vines per hectare plant density and 35-40 buds per vine are recommended.

Resistance to diseases and unfavorable climate conditions

'Tskhvedianis Tetra' is highly susceptible towards *Erysiphe necator* and *Plasmopara viticola*, especially in the inflorescences. Resistance to frost and drought is medium.

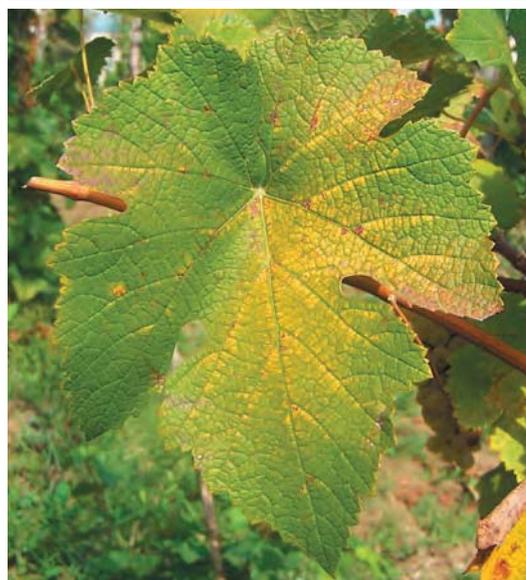
Juice characteristics

Sugar: 20.0-23.0 %

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

'Tskhvedianis Tetra' is used for making dry table wines and grape juice. The wine is of medium quality, light and soft.



Tsolikouri B.

Synonyms

'Tsolikauri', 'Obchuri Tsolikouri', 'Melkos Tsolikauri', 'Kakhidzis Tsolikauri', 'Kobakhidsis Tsolikauri'.

Meaning of the name

Tsoli means Wife, thus Tsolikouri means "Brought, distributed by a wife".

Historical notes and cultural importance

'Tsolikouri' was selected by Melko (Melko is a Georgian first name) in the village of Obtcha.

'Tsolikouri' is able to produce high quality wines and is resistant to the main fungal diseases. It is widely spread in whole Western Georgia. It is included in the official list of grapevine varieties, recommended for cultivation in Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.

Tsolikouri has several clones:

Tsolikauri Mskhviltsala (with large berry)

Tsolikauri not yielding

Essential ampelographic characteristics

The tip of the young shoot and the first five leaves are covered with dense felt hairs and have pink edges.

The mature leaf is medium size, rounded, three lobed, sometimes entire. The upper leaf sinuses are medium and closed. The petiole sinus is U-shaped. The teeth are triangular and both sides are convex. The lower surface of the leaf blade is covered with felt hairs. The petiole is equal to the main vein. The flower is hermaphrodite.

The bunch is medium size, wide conical, sometimes winged and medium dense.

The berry is medium size, rounded and yellow-greenish. The skin is thick. The flesh is juicy.

Phenology

Time of bud burst: beginning of April

Time of blooming: end of May, beginning of June

Time of veraison: middle of August

Time of ripening: middle of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Shoot fertility (cluster per shoot): 1.7

Bunch weight: 120 g

Yield: high (8.0-10.0 t·ha⁻¹)

Climate and cultivation requirements

The double Guyot training system and 8-10 buds per fruiting cane are recommended.

Resistance to diseases and unfavorable weather

'Tsolikouri' is relatively resistant towards the main fungal diseases. Resistance to frost is low.

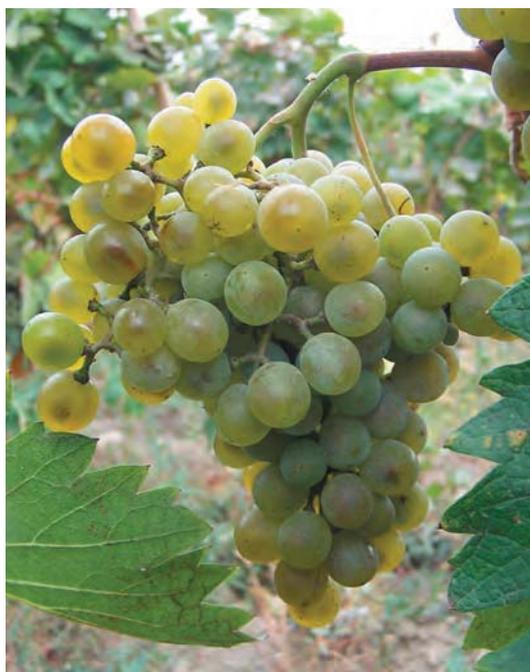
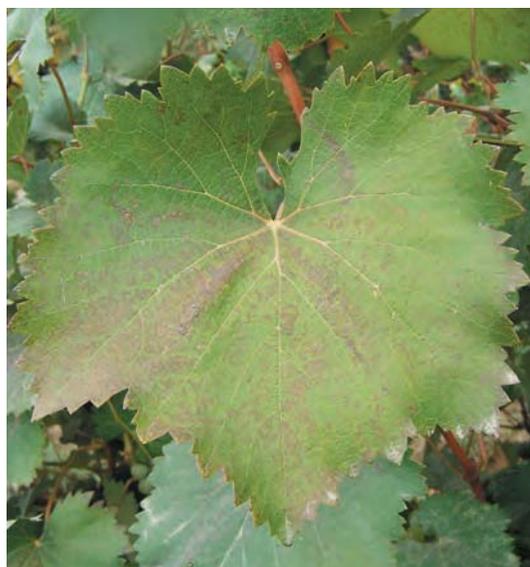
Juice characteristics

Sugar: 17.0-25.0 %

Total acidity: 6.0-10.0 g·L⁻¹

Wine and grape characteristics

'Tsolikouri' table wines are energetic, fresh and light yellow. During aging in oak barrels, the wines acquire a soft bouquet.



Tsulukidzis Tetra B.

Synonyms

'Ratchuli Tetra', 'Albilio Krimski', 'Albilio Castellano'.

Meaning of the name

Tsulukidze's White (Tsulukidze is a Georgian surname, probably of the person who first distributed this variety).

Historical notes and cultural importance

'Tsulukidzis Tetra' was assimilated to the 'Albilio' variety in Nikitski botanical garden (Yalta), however many ampelographic traits are different from those of the real 'Albilio'.

'Albilio' was introduced in 1933 in the Telavi grapevine collection. There, the ampelographer D. TABIDZE defined it as similar to 'Tsulukidzis Tetra', a widespread native Georgian variety. Later, N. TSERTSVADZE, within his research work aimed at classifying Georgian native varieties following A. NEGRUL's classification, confirmed the similarity among 'Albilio', 'Krimski' and 'Tsulukidzis Tetra' using a statistical method. In N. TSERTSVADZE's work, 'Tsulukidzis Tetra' was classified in the same group along with 'Rkatsiteli' and five other Georgian local varieties on the basis of their morphological traits. Later, this classification was confirmed also by the cytologist L. VASHAKIDZE.

'Tsulukidzis Tetra' is spread in the district of the Ratcha-Lechkhumi province. It is included in the official list of grapevine varieties, recommended for cultivation in Georgia.

Taxonomy and intra-variety variability

Proles *pontica* subproles *georgica* Negr. provar *tomentosae* Tserts.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are covered on both sides with felt dense hairs. The edges of the leaves are reddish.

The mature leaf is large, three to five lobed. The upper leaf sinuses are medium and lyre-shaped. The lower leaf sinuses are very small. The petiole sinus is lyre-shaped or chinked. The teeth are triangular, both sides are convex. The lower leaf side is covered with sparse cobwebby hairs. The petiole is equal to the main vein.

The flower is hermaphrodite.

The bunch is medium size, conical or cylindrical-conical, sometimes winged or medium dense.

The berry is small and medium, rounded or slightly ovate and yellow-green. The skin is hard to peel off the flesh. The flesh is juicy.

Phenology

Time of bud burst: first or second ten days of April

Time of blooming: first ten days of June

Time of veraison: middle of August

Time of ripening: middle September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bunch weight: 110-140 g

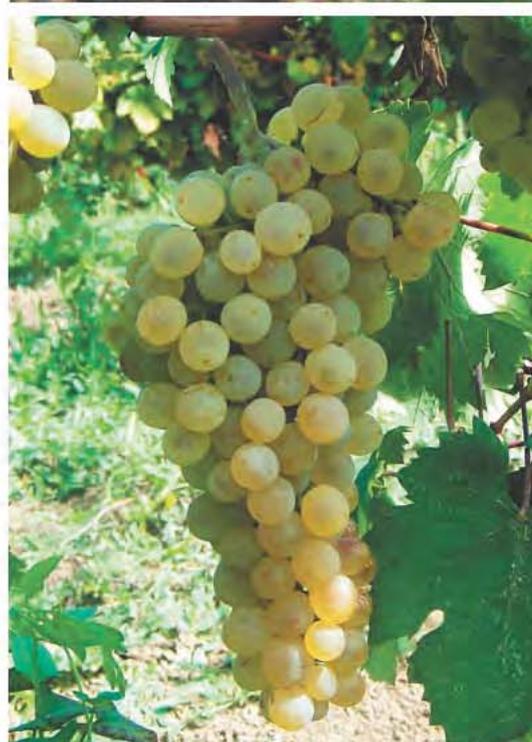
Yield: high (10.0-15.0 t·ha⁻¹)

Climate and cultivation requirements

Double Guyot with two fruity canes is used for 'Tsulukidzis Tetra'

Resistance to diseases and unfavorable weather

'Tsulukidzis Tetra' has good resistance towards *Plasmopara viticola* and *Erysiphe necator*, but low resistance towards grey mold (*Botrytis cinerea*), especially in a rainy autumn.



Juice characteristics

Sugar: 19.0-26.0 %

Total acidity: 5.0-8.0 g·L⁻¹

Wine and grape characteristics

The variety is used for making high quality dry table and semi-sweet wines in the Ambrolauri and Oni districts in Georgia and high quality dessert wines in Crimea, Uzbekistan and Kazakhstan.

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Table 1

Some general transliterations and translations from Georgian to English

| Transliteration | Translation |
|------------------|------------------------------|
| Tetri | White |
| Vardisperi | Pink |
| Tsiteli | Red |
| Shavi | Black |
| Mtsvane | Green |
| Kviteli | Yellow |
| Ghvino | Wine |
| Sapere, Saparavi | Coloured, Stainer |
| Kurdzeni | Grape |
| Vazi | Vine |
| Maghlari | High training system on tree |
| Kheivani | Pergola |

Viticulture and winemaking in Moldova

G. SAVIN

National Institute for Viticulture and Oenology, Chisinau. Moldova

Moldova (Republic of Moldova) is situated in the southeast part of Europe between 45-49° latitude and 27-30° longitude (Fig. 1). Total area of the country is 33,670 km². The relief is generally plain undulating, average altitude above sea level is 147 m, the slopes occupy about 57 % of the territory of the country. The period with a positive temperature is about 260-270 days in the northern part and 280-290 days in the southern part of Moldova. The annual precipitation is 380-550 mm and the major part (75-80 %) falls during the summer. Annual duration of solar radiation is 2,060-2,330 hours and the maximum length of a summer day is 14-16 hours. The sum of active temperatures above 10 °C ranges from 2,750 to 3,400 °C. The average air temperature of the warmest month (July) ranges between 19 and 22 °C, but in some summers it can increase up to +38 and even +41 °C. The average temperature of the coldest month (January) ranges between -3 and -5 °C, while the absolute minimal temperature can fall down to -30 or -35 °C.

The annual rainfall on the territory of Moldova may be in some year not sufficient for viticulture. This deficit periodically (sometimes for a few consecutive years) provokes prolonged summer and winter droughts.

As regard conditions for viticulture, the territory of Moldova is situated in a frost risk area, mainly during the winter period. Even if the average temperatures in the cold period are not so low, winter is characterized by significant fluctuations, from positive to negative values or vice-versa over short periods (sometimes over a day). Also, there is a risk of early autumn and late spring frosts.

In spite of Moldova's northern location and continental climate, the specific agroclimate conditions allowed successful harvests since the oldest times and viticulture and winemaking have a rich and significant history here. Presence of *Vitis* species in Moldova dates back to ancient times. The imprint of a grapevine leaf was discovered near the village of Naslavcea, in the northern part of the country, and it was dated to the Superior Miocene geological epoch (about 6-25 million years ago). For its morphological characteristics, the leaf belongs to *V. teutonica*. No imprints from the following geological periods have been discovered; hence the exact time of the beginning of grapevine cultivation in the territory is not precisely known. Archeological excavations though, denoted that the population of this area already knew grapevine in the Late Stone - Early Bronze ages. The fossil of grapevine's seed, discovered on the remains of brown ware near the location of Varvareuca, corresponds to this period. According to its morphological characteristics, this seed does not belong to wild grapevines, but to cultivated ones.

Another seed fossil from the same archeological period was found near the location of Rusestii Noi. As opposed to the previous archeological findings, it belongs to a wild grapevine, but with some different characteristics compared to *Vitis vinifera* ssp. *sylvestris* - it is likely to be an intermediate wild form that has nowadays disappeared. Probably, these samples were the basis from which local grapevine varieties originated. The level of development of viticulture in this area in the following periods is not known, but in the "Geography" of the famous Greek geographer Strabo we have statements about the presence of widespread and developed viticulture in the state of Dacia (including the present territory of Moldova) in the middle of the 1st century BC. This denotes the presence of a rather old and independent origin of viticulture and winemaking in this territory. The developments of all aspects of viticulture and winemaking, including grape assortment, applied technologies etc. was influenced by contacts with other countries that had advanced viticulture and winemaking skills, like Greece, Roman Empire, Oriental countries etc. (PELYACH 1970).

Based on local and imported grapevine genetic resources, the prolonged period of formation of autochthonous grapevines led to the establishment of those varieties which constituted the base of viticulture and winemaking for the following 2 millennia - until the invasion of *Phylloxera* and fungal diseases at the end of the 19th century. During this long period, viticulture in Moldova saw periods of ascension and decline, depending on social, political and natural events. However, in the period of ascension of viticulture in feudal Moldova, several wines became famous outside the country as well.

Invasion of *Phylloxera* caused great damages to viticulture in terms of cultivated area and cultivar composition. Especially the old indigenous varieties were damaged and some of them definitively disappeared. At the beginning of the 20th century, European varieties were introduced in cultivation and demonstrated good adaptation to the local conditions. The number of old autochthonous varieties permanently decreased in the list of recommended varieties. At the same time, new cultivars were created as a result of successful breeding programs started in the 1960s, and they were recommended for cultivation.

At the same time, the cultivated area within the country was mainly covered by imported varieties (up to 80 %). Wine varieties are currently under cultivation in the most important vineyards and the same trend is foreseen for the future. The highest level of development of this sector was achieved in the early 1980s. Actually, the main purposes for development of viticulture and winemaking for the national economy are determined by the "National Program for the restoration and development of viticulture and winemaking in the Republic of Moldova in the period of 2002-2020".

The most widespread wine grape cultivars in Moldova are the international European varieties 'Cabernet Sauvignon', 'Merlot', 'Aligoté', 'Sauvignon', 'Traminer Rosé', Pinot's group, 'Riesling' and 'Rkatsiteli'. The surface of vineyards cultivated with old and new indigenous varieties is still low - like the small areas of 'Rara Neagra' ('Babeasca Neagra'), 'Feteasca Alba' and 'Feteasca Neagra'.

The main cultivated table grape varieties are 'Chasselas Blanc', 'Muscat of Hamburg', 'Regina Viilor' (syn. 'Koroleva Vinogradnikov'), 'Alepo' (syn. 'Karabournu'), 'Cardinal', 'Perla di Csaba', the indigenous cultivar 'Coarnă Neagră' and the newly bred cultivar 'Moldova'. According to the prospective plan, the area of newly created varieties will be increased up to 80 % among the table grapes.

The seedless grapevine varieties are a new component of the local grapevine assortment in Moldova. As a result of the breeding program, initiated in the seventies of the 20th century, seedless varieties like 'Kishmish Moldavski' and 'Kishmish Luchistyi' were created and recommended for cultivation in 1988 and 1992 respectively. Recently, 3 new seedless varieties with relative resistance to winter conditions - 'Apiren Alb', 'Apiren Roz' and 'Apiren Negru de Grozesti' have also been recommended for cultivation.

T a b l e

Area and yielding of vineyards in Moldova

| Years | Area of vineyards, thousand ha | Average yield per ha, tons | Harvest, thousand tons | |
|-------------|-----------------------------------|----------------------------------|------------------------|---------------------------|
| | | | Total | Among it - table grape |
| 1951-1960* | 184 | - | 338.8 | - |
| 1961- 1970* | 207 | - | 828.1 | - |
| 1971-1980* | 224 | 6.03 | 1123.8 | 56.2 |
| 1981-1990* | 202 | 6.40 | 1219.6 | 64.1 |
| 1991-1995* | 198 | 4.73 | 809.6 | 86.7 |
| 1996-2000** | 177 | 3.32 | 515.9 | 73.5 |
| 2001 | 155 | 3.35 | 505.0 | 26.7 |
| 2002 | 152 | 4.33 | 641.2 | 32.4 |
| 2003 | 149 | 4.74 | 677.2 | 30.7 |
| 2004 | 146 | 4.95 | 685.6 | 33.6 |
| 2005 | 148 | 3.62 | 518.6 | 21.8 |
| 2006 | 150 | 3.19 | 466.1 | 8.3 |
| 2007 | 150 | 4.10 | 598.0 | 13.6 |
| 2008 | 150 | 4.44 | 635.5 | 14.4 |
| 2009 | 149 | 4.84 | 685.1 | 13.6 |

*) The annual average harvest for the period.

***) Since 1994 the information does not include the Transnistria region.

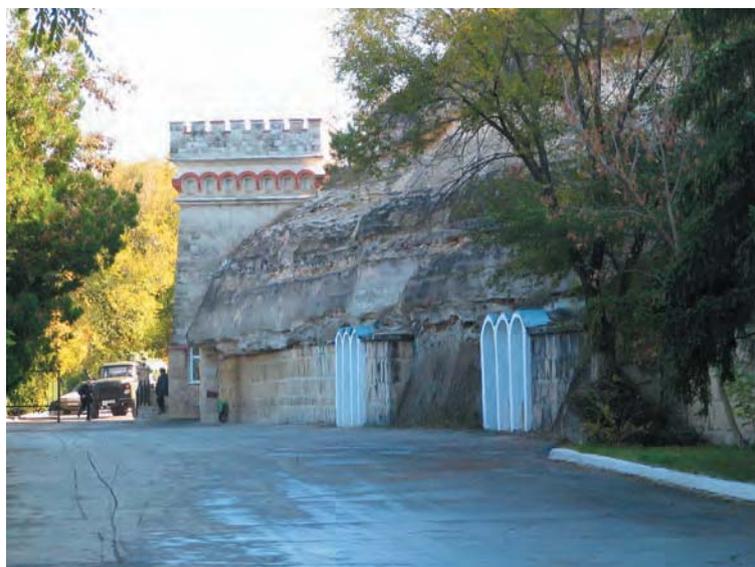


Fig. 1: Entrance to the cave-winery "Cricova".

The winemaking industry of Moldova became famous thanks to different products like quality wines of controlled origin such as 'Negru de Purcari', 'Rosu de Purcari' and 'Romanesti'; pellicular wines (wines produced with pellicular maceration) like 'Vin de Ialoveni'; aromatized 'Buket Moldavii'; sparkling wine 'Cricova' and brandy 'Belyi Aist'.

The history of collection and preservation of grapevine genetic resources includes the establishment of a number of ampelographic collections since the beginning of the 19th century. The first field collection was established in 1832 near the locality of Cetatea Alba (Akkerman, now Belgorod-Dnestrovskii). Among the 330 varieties included in this collection, 85 were old indigenous varieties. In 1849, the collection of Basarabia's Viticulture and Winemaking School in Chisinau was created, on the basis of cultivars received from Crimea. In 1910, after the invasion of *Phylloxera*, in order to promote the cultivation of high-quality European wine grapes and to change the management of viticulture by introducing grafted culture, the Experimental and Demonstration Station near Chisinau (locality of Costiujeni) was created, with a field collection. This station is the predecessor of the current National Institute for Viticulture and Oenology. All further important collections were established at this Institute. The great collection was established in 1956 and was regenerated in 1981. The so-called "Old Collection" contained about 2,750 genotypes from more than 57 sources in 1976. The "New Collection", established in 1981 on the basis of the previous collection, was completed with new genetic resources, selected according to criteria like earliness, resistance, seedlessness, big berry size and others. In 1997, a presentation was done and the grapevine genetic resources of the collection included 2,800 genotypes from 60 locations worldwide. In the collection there are about 40 old autochthonous and more than 70 newly created cultivars and forms from Moldova.

The wild grapevine is an important genetic resource and it can still be found in the country. The first scientific investigations concerning this plant were carried out at the beginning of the 20th century, by PACHESKI (1912, 1914) and POP (1931) (YANUSHEVICH and PELYAKH 1971). One of the last scientific expeditions and wide evaluations of the wild grapevine resources of Moldova was carried out in the period of 1961-1969 (YANUCHEVICH and PELYAKH 1971). During these expeditions it was recognized that all variations of wild grapevine grow in the country: *V. vinifera* ssp. *sylvestris* var. *typica* Negr., *V. vinifera* ssp. *sylvestris* var. *aberrans* Negr. and *V. vinifera* ssp. *sylvestris* var. *balcanica* Negr. and intermediary forms were discovered too.

During the last 6 years, estimations of new niches of wild grapevine populations started in some areas of land flooding near the river Prut (SAVIN and CORNEA 2008). The material was collected in order to complete the *ex situ* collection, which also contains the wild grapevine accessions from the mountains Kapet-Dag, Turkmenistan, collected during the expedition with the participation of Dr. V. Nosulchak from the Kara-Kala Station of the Vavilov Institute of Plant Industry (VIR) in 1986.



Fig. 2: The National Institute of Vine and Wine is a leader research institution in the country, working for the investigation of various aspects of viticulture and winemaking since 1910. It is also the holder of grapevine collections.



Fig. 3: A grapevine collection of the institute with a wide number of accessions including varieties from project partner countries.

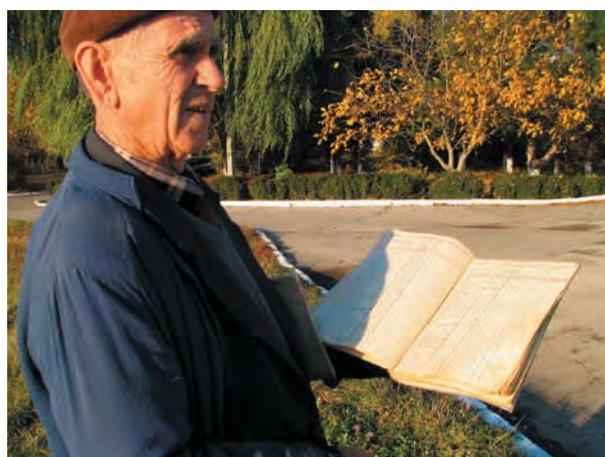


Fig. 4: All accessions in the collection have their "address" indicated in the main register of the collection.

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Moldova: native^{*)} varieties of grapevine

G. SAVIN

National Institute for Viticulture and Oenology, Chisinau, Moldova

Authors of the photos and English translation: V. CORNEA, National Institute for Viticulture and Oenology, Chisinau, Moldova

1. Băbească Neagră N
2. Cabasma B.
3. Ciorcuța Roză Rg.
4. Coarnă Albă B.
5. Coarnă Neagră N.
6. Coarnă Roșie Rg.
7. Copceac N.
8. Fetească Neagră N.
9. Galabura B.
10. Galbenă de Ardeal B.
11. Galbena de Odobești B.
12. Gordin B.
13. Gordin Gurguiat B.
14. Gordin Verde B.
15. Țâța Caprei B.
16. Turba Plotnaya Belaya B.
17. Turba Rikhlaya Belaya B
18. Zghihară B.

Notes: N-Noir (black), B-Blanc (white), Rg-Rouge (red), G-Gris (gray), R-Rose (pink)

^{*)} Republic of Moldova represents a part of the wider historical region of Moldova which comprised the present-day Republic of Moldova and Romania's north-eastern region. In this historical geographical background has to be interpreted the meaning of native varieties (editor's note).

Băbească Neagră N.

Synonyms

'Rară Neagră', 'Crăcană, Crăcanată', 'Căldărușa', 'Rășchirată', 'Râmțurată', 'Neagra Rară', 'Poma Rara Neagră', 'Serecția', 'Serecsia', 'Serecția Ciomaia', 'Serecsia Ciomaia', 'Ciomii Redchii', 'Rastriopa', 'Copuiac', 'Stropatâi', 'Rastopârca', 'Țotlear', 'Sasser', 'Rexavo grozdî'.

Meaning of the name and synonyms

Literarily, Babă = old woman, Băbească = belonging to a destined/an old woman. Negru = black.

However, the word Băbească can be used also to specify ancient (antique, old aged) things. So, the other meaning of the name can be "Black from the ancient (time)", Ancient (antique, old) Black, referring to the ancient origin of the variety.

'Căldărușa' = (Little) Bucket. 'Rară Neagră' = Rare (loose) black. 'Neagra Rară' = Black rare (loose). 'Poama Rara Neagră' = Black rare (loose) grape, Black rare (loose) bunch. 'Crăcană, Crăcanată', 'Crăcanat', 'Rășchirată', 'Râmțurat' = Ramified, branched, divaricated, forked, furcated. 'Ciomii Redchii' = Black rare (loose) (in Russian). 'Rastriopa' = Disheveled, uncombed (in Russian).

Historical notes and cultural importance

'Băbeasca Neagră' is an old native variety, but the origin remains unknown. According to COSTANTINESCU *et al.* (1959), the first record about this variety dates back to the 14th century. In Moldova this variety is mostly known under the names 'Rară Neagră' or 'Serecsia'.

'Băbeasca Neagră' is included in the Register of Plant Varieties of the Republic of Moldova, admitted for commercial use. However, the variety is not widespread in the country nowadays.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

'Băbeasca Neagră' is cultivated since antiquity. Thus, there are many variations and clones, but they are not selected or registered. The form with oblate, blue-black berries is the most valuable (COSTANTINESCU *et al.* 1959).

Essential ampelographic characteristics

The tip of the young shoot is fully open with sparse flaky pubescence, green with brown-red shade.

The young leaves are three or five lobed. The upper leaf side is green-reddish with brown shade. The first distal leaves are covered by weak flaky pubescence, especially on the lower leaf surface.

The mature leaf is medium in size, circular and five lobed. The leaf profile is V-shaped with revolute margins or undulate. The petiole sinus is wide open and V-shaped in the base. The upper leaf sinuses are open, medium deep with a tooth on the base, which represents a typical character for the variety. The lower leaf surface between the main veins is hairless. Sparse bristle hairs are presented on the main veins of the lower leaf side. The leaf is dark green. The teeth are in a pattern of large and small ones, triangular, a mixture between both sides straight and both sides convex.

The flower is hermaphrodite.

The bunch is medium size-large, with one-three wings, loose or medium dense.

The berry is round or slightly flattened (oblate), blue-black or violet. The flesh is juicy, with neutral taste. The seeds are well developed.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: end of September - beginning of October



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 200-230 g

Yield per vine: 3.5 kg

Climate and cultivation requirements

The length of the vegetative period for the variety is 180-195 days.

Resistance to diseases and unfavorable weather

'Băbeasca Neagră' is susceptible towards drought and fungal diseases:

Plasmopara viticola, *Erysiphe necator* and grey mold (*Botrytis cinerea*).

It is frost resistant.

Juice characteristics

Sugar: 18.8-24.5 %

Total acidity: 9.3-14.0 g·L⁻¹

Wine and grape characteristics

'Băbeasca Neagră' is used for making ordinary red wines. It is used in blend with 'Cabernet Sauvignon' and 'Saperavi' to make the famous Moldovan high quality red wine Negru de Purcari.

Cabasma B.

Synonyms

'Cabasmă Albă', 'Cabasma Belaia', 'Poamă Bătută Albă'.

Meaning of the name

Thick-skinned (PELYAH 1970).

'Cabasma Belaia' = 'Cabasma white' (in Russian).

'Poamă Bătută Albă' = White compact grape.

Historical notes and cultural importance

'Cabasma' is an old native variety whose origin remains unknown. The first records attest the presence of this variety near Cetatea Albă (now Belgorod Dnestrovshii, Ukraine) and near the village Shabo.

Nowadays this variety is conserved only in the ampelographic collection of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles pontica subproles *balcanica* Negr. (COSTANTINESCU *et al.* 1962).

Intra-variety variability is not reported.

Essential ampelographic characteristics

The tip of the young shoot is green with slightly violet margins, covered by medium dense cobwebby hairs.

The young leaves are entire, pentagonal with slightly distinguished three lobes. The upper leaf side of the first two leaves is white-green, the following leaves are green with brown spots. Cobwebby hairs between veins are medium-sparse on the upper leaf surface and dense on the lower surface.

The mature leaf is large, rounded and entire with slightly distinguished lobes. The leaf profile is undulate and in some cases V-shaped. The petiole sinus is slightly or half open with a sharp base. The upper leaf sinuses are very shallow and slightly distinguishable. The upper leaf side is smooth and hairless. The cobwebby hairs between the main veins on the lower leaf side are rare or medium-sparse. The leaf is green. The teeth are triangular, medium, forming a pattern of large and small ones, with a mixture: sometimes both sides are rectilinear; sometimes both sides are convex.

The flower is hermaphrodite.

The bunch is medium size, narrow conical and medium dense.

The berry is small, round, green-yellow with well-developed seeds. The flesh is juicy, with neutral taste.

Phenology

Time of bud burst: first ten days of May

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 290 g

Yield per vine: 5.0 kg

Climate and cultivation requirements

'Cabasma's vegetative period is 180-195 days.

Resistance to diseases and unfavorable weather

The variety is susceptible to fungal diseases and unfavorable environmental conditions.

Juice characteristics

Sugar: 18.0-23.0 %

Total acidity: 5.5-11.2 g·L⁻¹

Wine and grape characteristics

'Cabasma' is used for making ordinary white wine.



Ciorcuța Roză Rg.

Synonyms

'Ciorcuța Rozovă', 'Dedova Boroda'.

Meaning of the name

'Ciorcuța' seems to be a diminutive for Ciorchine = Cluster; Bunch.

'Ciorcuța Rozovă' = Rose-colored (pink) cluster. 'Dedova Boroda' = Beard of old man (in Russian).

Historical notes and cultural importance

'Ciorcuța Roză' is an old native variety whose origin is unknown.

The variety is presented only in the ampelographic collections of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *pontica* Negr. (ANONYMOUS 1966).

No clonal variation is selected or registered.

Essential ampelographic characteristics

The tip of the young shoot is open, green with medium or sparse pubescence.

The young leaves are circular, five lobed and green. The hairs on the upper leaf surface are very sparse or sparse and medium on the lower surface.

The mature leaf is medium size, circular and five lobed. The leaf profile is undulate with revolute edges. The petiole sinus is wide open, U-shaped in the base. The upper leaf sinuses are open and medium deep. The cobwebby hairs between the main veins on the lower side are medium dense. The leaf blade is green. The teeth form a pattern of large and small ones and with straight (both side rectilinear) sides.

The flower is hermaphrodite.

The bunch is medium size-large, conical or cylindrical-conical, often winged, medium loose, sometimes very loose.

The berry is round or elliptic and red-violet. The seeds are well developed.

The flesh is soft with neutral flavor.

Phenology

Time of bud burst: beginning of May

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: second ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 240 g

Yield per vine: 2.8 kg

Climate and cultivation requirements

The vegetative period is 180-195 days.

Resistance to diseases and unfavorable weather

'Ciorcuța roză' is susceptible to drought and to fungal diseases.

Juice characteristics

Sugar: 15.0-22.0 %

Total acidity: 6.0-11.5 g·L⁻¹

Wine and grape characteristics

'Ciorcuța Roză' is used for making ordinary red wines.



Coarnă Albă B.

Synonyms

'Coarnă', 'Poamă Coarnă Albă', 'Cornorata', 'Țicheni', 'Copăceanca', 'Caraburnu', 'Puhleakovski', 'Koarna Belaia', 'Majorka Belaia', 'Cornichon Blanc', 'Doigts de Douzelle', 'Pis de Chevre Blanc', 'Corniola Bianca', 'Pizzutello Bianco', 'Dattola', 'Tetta di Vacca', 'Corniciola', 'Bisutella', 'Zirnjava Bela', 'Zelodovna', 'Goble Szolofeher', 'Kozea Titi', 'Eicheltraube Weisse', 'Anguur Rimisi Blanc', 'Fourchou', 'Finger Grape'.

Meaning of the name

Corn means Horn or/and Cornel (Cornelian cherry). 'Coarnă' means something having the shape of a cornel or of a horn. So the name 'Coarna Albă' means White cornel or White horned.

'Poamă Coarnă Albă' = White horn grape. 'Cornorata' = Horn.

Historical notes and cultural importance

'Coarna Albă' is supposed to have originated in Turkey or from some other oriental country (ANONYMOUS 1959) and it has been introduced in Moldova since ancient time. Nowadays it is considered a native variety because it is very well adapted to the local conditions and also because it was cultivated in Moldova for a very long time.

In the Republic of Moldova, the variety is currently present only in the ampelographic collection.

Taxonomy and intra-variety variability

Proles pontica subproles *georgica* Negr. (COSTANTINESCU *et al.* 1959).

'Coarna Albă' was cultivated since antiquity, thus there are many variations and clones in its population but they were not selected.

Essential ampelographic characteristics

The tip of the young shoot is green-yellow with slightly red-violet margins, open and covered with dense hairs.

The young leaves are circular, five-lobed, green-yellow with slightly bronze spots. The cobwebby hairs between the veins on the upper leaf side are medium or sparse and decreasing on the following leaves. The hairs on the lower leaf side are very dense.

The mature leaf is medium size or large, circular and five lobed. The leaf profile is undulate. Anthocyanin coloration of the main veins on the upper leaf surface is very weak. The petiole sinus has slightly overlapped lobes, forming a round (circular) sinus, which is a typical character for the variety. The upper leaf sinuses are closed with slight overlapped lobes forming a triangular or oval lumen. The upper leaf surface is hairless. The cobwebby hairs between the main veins on the lower side are sparse and bristle hairs on the main veins are very weak or absent. The teeth are medium, triangular, both sides are rectilinear, often big and small ones are alternated.

The flower is female.

The bunch is medium size or large, prolonged, cylindrical-conical and loose.

The berry is ovate (elliptic) and green-white. The seeds are well developed. The flesh is firm, pulpy with a neutral flavor.

Phenology

Time of bud burst: end of April

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: first ten days of October

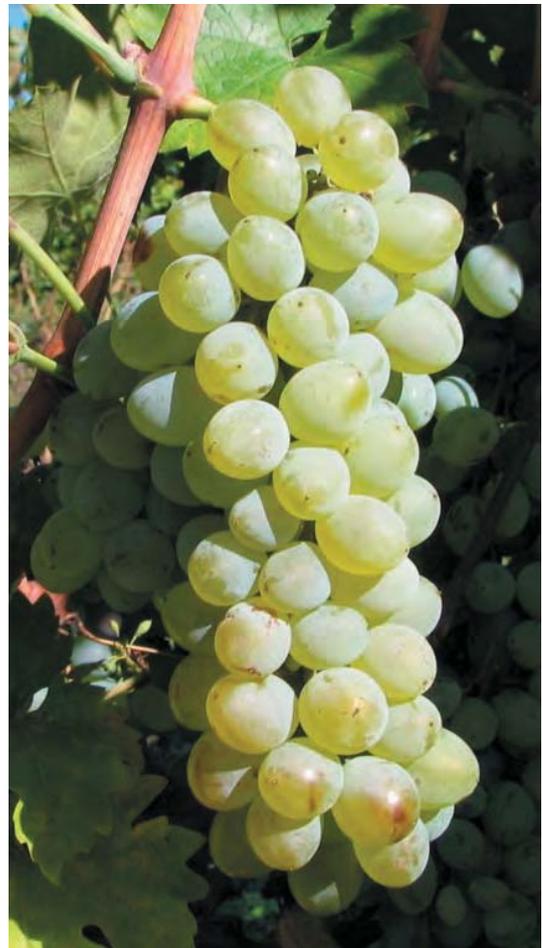
Vegetative and yielding characteristics

Habit of shoot growth: semi-drooping

Vigor of shoot growth: high

Bunch weight: 310 g

Yield per vine: 3.2 kg



Climate and cultivation requirements

The vegetative period is 180-210 days.

Resistance to diseases and unfavorable weather

'Coarna Albă' is relatively resistant towards frost and drought. It is highly susceptible to *Erysiphe necator* and *Plasmopara viticola*.

Juice characteristics

Sugar: 15.9-22.5 %

Total acidity: 5.5-9.0 g·L⁻¹

Wine and grape characteristics

'Coarna Albă' is a table grape and it is used mainly for fresh consumption or for long-term winter storage.

Coarnă Neagră N.

Synonyms

'Asma', 'Negru de Crimeea', 'Moldavskii', 'Ciornyi Krymskii', 'Cerna razachia', 'Kara Asma', 'Sultanka', 'Tyрно Greiko'.

Meaning of the name

Black cornel or Black horn.

Historical notes and cultural importance

'Coarna Neagră's origin is supposed to be oriental. It was introduced in Moldova in ancient times, it is very well adapted to the local conditions and, thus, it is considered as a native variety. In Bulgaria it is considered to be very closely related to 'Razachia' (COSTANTINESCU *et al.* 1959).

'Coarna Neagră' is included in the Register of Plant Varieties of the Republic of Moldova, admitted for commercial use, however, this variety is very limited in the country now.

It should be mentioned that 'Coarna Neagră' is, among all the old local table grape varieties, one of the few still cultivated in the country.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

In 'Coarna Neagră's population there are many vegetative variations, however, they were not selected or registered. 'Coarna Neagră' and 'Asma de Crimeea' are well-known biotypes. In 'Coarna Neagră's population there are biotypes with black or dark-red berries. Furthermore, a new line with black berries and hermaphrodite flower was selected (COSTANTINESCU *et al.* 1959).

Essential ampelographic characteristics

The tip of the young shoot is green, open with sparse cobwebby hairs.

The young leaves are pentagonal, three or five lobed and green. The hairs on the upper and lower surfaces are very sparse as well as between the main veins and on the main veins.

The mature leaf is medium size or large, pentagonal, three lobed, but also entire or five lobed. The leaf profile is undulate. The leaf is smooth on both surfaces. Anthocyanin coloration of the main veins on the upper leaf surface is very weak. The upper leaf sinuses are open, U-shaped or slightly overlapped, forming an elliptical or oval lumen. The petiole sinus is slightly open with a sharp base, often with a tooth. The teeth are convex on both sides and medium deep.

The flower is female with reflected stamens.

The bunch is medium size, cylindrical or cylindrical-conical and medium dense.

The berry is oblong-ovate and dark-red. The seeds are well developed. The flesh is pulpy with neutral taste.

Phenology

Time of bud burst: end of April

Time of blooming: second ten days of June

Time of veraison: third ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 200 - 300 g

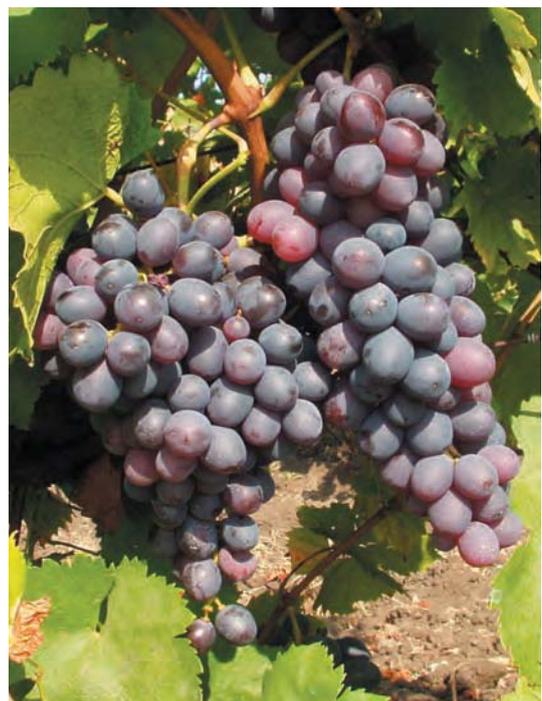
Yield per vine: 2.0 - 3.2 kg

Climate and cultivation requirements

The vegetative period is 180-210 days.

Resistance to diseases and unfavorable weather

'Coarna Neagră' is relatively resistant towards frost and grey mold (*Botrytis cinerea*).



Juice characteristics

Sugar: 16.0-21.0 %

Total acidity: 5.5-10.5 g·L⁻¹

Wine and grape characteristics

'Coarna Neagră' is a unique old table grape variety, grown in both commercial vineyards and home gardens. The grapes are used for fresh consumption or for long-term storage.

Coarnă Roșie Rg.

Synonyms

'Coarnă Roză', 'Korna Krasnaya', 'Korna Rozovaya', 'Țâța Caprei Roșie', 'Pis de chevre', 'Pis de Chevre Rouge', 'Geisdutte Rote', 'Veilchenblaue Geisdutte'.

Meaning of the name

Red cornel or Red horn.

'Coarnă Roză' = Pink cornel or Pinked horn. 'Țâța Caprei Roșie' = Goat's red nipple

Historical notes and cultural importance

'Coarna Roșie's origin is supposed to be oriental (COSTANTINESCU *et al.* 1962), but due to its presence in many local vineyards since ancient times, it is considered to be a native variety.

The variety is present only in the ampelographic collections of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspica* Negr. (COSTANTINESCU *et al.* 1962).

No clones were selected from 'Coarna Roșie's population.

Essential ampelographic characteristics

The tip of the young shoot is open, green with a reddish hue.

The young leaves are pentagonal with five or seven distinguishable lobes, green with bronze spots.

The mature leaf is medium size or large, circular and five or seven lobed. The leaf profile is undulate. The main veins' coloration intensity is very weak or medium up to the first ramification. The upper leaf sinuses are closed by slight overlapped lobes, forming an ovate or triangular lumen. The lower leaf sinuses are open or slightly overlapped, ovate. The petiole sinus is half or slightly open, U-shaped in the base, limited by the veins which represents a typical character of the variety. The leaf is hairless on both surfaces. The teeth are narrow-triangular. Sometimes both sides have rectilinear teeth and sometimes both sides have convex teeth.

The flower is female with reflected stamens.

The bunch is medium size or large, cylindrical or cylindrical-conical, dense or very dense.

The berry is oblong or prolonged-elliptic. The skin is red. The seeds are well developed. The flesh is firm without any particular flavor.

Phenology

Time of bud burst: first ten days of May

Time of blooming: second ten days of June

Time of veraison: third ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect, horizontal

Vigor of shoot growth: medium

Bunch weight: 320 g

Yield per vine: 3.0 kg

Climate and cultivation requirements

The vegetative period is 180-200 days.

Resistance to diseases and unfavorable weather

'Coarna Roșie' is relatively resistant towards frost, *Plasmopara viticola* and grey mold (*Botrytis cinerea*).

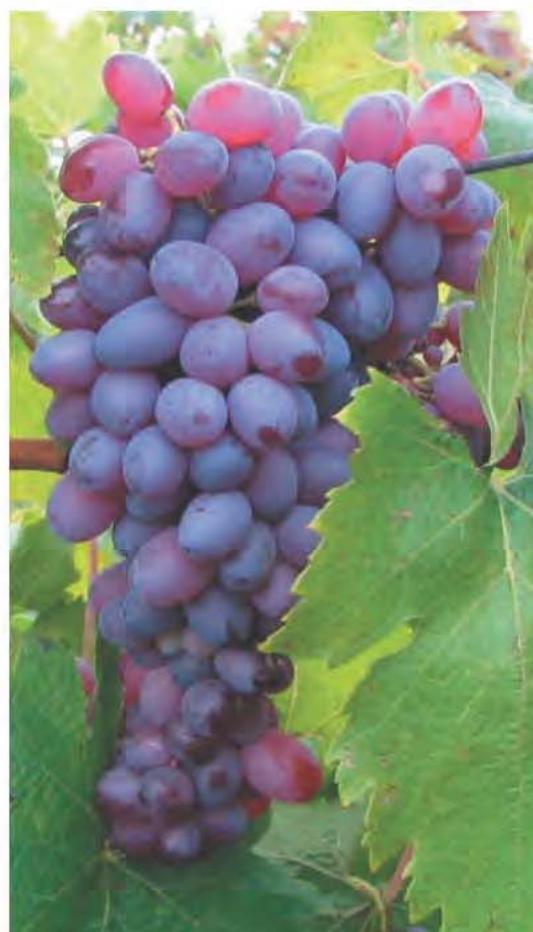
Juice characteristics

Sugar: 15.0-17.5 %

Total acidity: 4.0-11.5 g·L⁻¹

Wine and grape characteristics

'Coarna Roșie' is used for fresh consumption or for long time storage.



Copceac N.

Synonyms

'Timofeevka'.

Meaning of the name

From the name of a village in the Republic of Moldova and the name of a small river.

Historical notes and cultural importance

There is no information about the origin of *Copceac* and the time of its first cultivation. 'Copceac' is considered to be a significantly deviated variation of the cultivar 'Babească Neagră' (ANONYMOUS 1965; IVANOVA 1976).

The variety is present only in an ampelographic collection of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *orientalis* Negr. (ANONYMOUS 1965).

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green, open with sparse cobweb hairs.

The young leaves are three or five lobed, green with brown-reddish spots. Prostrate hairs are very sparse on both sides.

The mature leaf is medium size, circular, five or seven lobed. The leaf profile is V-shaped or undulated. The petiole sinus is half open, lyre-shaped and with a sharp base. The upper leaf sinuses are slightly overlapped forming an elliptic or ovate lumen. There are no cobwebby hairs between the main veins on the lower leaf side. The bristle hairs on the main veins of the lower side are medium sparse. Color of the leaf blade is green or dark green. The teeth are triangular, with both side convex or with one side convex and one side concave.

The flower is hermaphrodite.

The bunch is medium size, conical and loose.

The berry is flat (oblate) and dark-blue. The seeds are well developed. The flesh is juicy and neutral.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: beginning of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 135-200 g

Yield per vine: 3.5 kg

Climate and cultivation requirements

The vegetative period is 180-195 days.

Resistance to diseases and unfavorable weather

'Copceac' is relatively resistant towards frost and it is very susceptible to *Plasmopara viticola*.

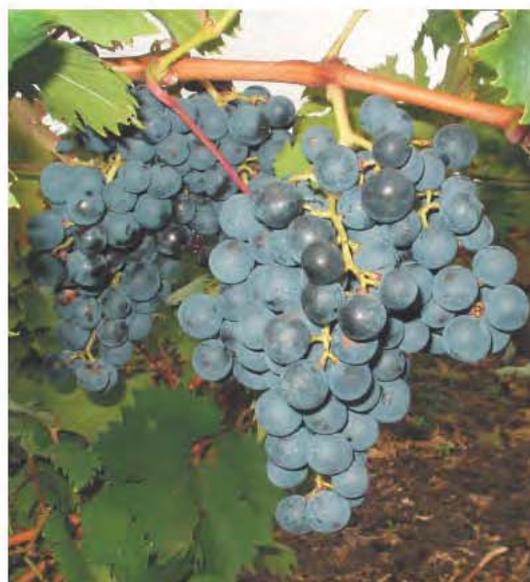
Juice characteristics

Sugar: 16.2-25.3 %

Total acidity: 5.0-11.5 g·L⁻¹

Wine and grape characteristics

'Copceac' is used for making ordinary red wines.



Fetească Neagră N.

Synonyms

'Păsărească', 'Păsărească Neagră', 'Poama Fetei Neagră', 'Poama Fetei neagră de Moldova', 'Coadă Rândunicii', 'Feteasca chernaya'.

Meaning of the name

Fată = Girl; Fetească means belonging to a girl, typical or destined for a girl); Neagră = black.

'Păsărească' = Bird's, 'Păsărească Neagră' = Bird's black. 'Poama Fetei Neagră' = Girl's black grape. 'Coadă Rândunicii' = Swallow's tail. 'Feteasca chernaya' = 'Feteasca black' (in Russian).

Historical notes and cultural importance

'Fetească neagră' is cultivated from ancient time and it is considered as a native Moldovan variety. It is supposed that this variety was selected from spontaneous *Vitis vinifera* ssp. *sylvestris* Gmel. (COSTANTINESCU *et al.* 1959).

Nowadays, the presence of 'Fetească neagră' in the Republic of Moldova is very limited.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

In the populations of 'Fetească neagră' there are diverse phenotypic variations and clones as a result of its long time cultivation, but none has been selected and registered (COSTANTINESCU *et al.* 1959).

Essential ampelographic characteristics

The tip of the young shoot is open, green-reddish with very sparse cobwebby hairs.

The young leaves are deeply five lobed, green-reddish with brown tints. The first leaves have sparse pubescence on both sides; the following leaves are smooth on the upper leaf surface and have medium dense cobwebby hairs on the lower leaf surface.

The mature leaf is medium size, circular and five lobed. The leaf profile is undulate. The petiole sinus is very wide open with a flat, sharp base (like a curly bracket), which represents a typical character for the variety. The upper leaf sinuses are open or slightly overlapped, forming an elliptic or an ovate shape. Prostrate hairs are absent or sparse between the main veins on the lower leaf side. Erect hairs are sparse or medium on the main veins on the same lower surface. The leaf blade is green-yellow.

The lateral teeth are triangular, rectilinear on both sides. The teeth on the ends of the main veins are longer.

The flower is hermaphrodite.

The bunch is medium size, cylindrical or cylindrical-conical, dense.

The berry is round and blue-black. The seeds are well developed. The flesh is juicy, the taste is neutral.

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

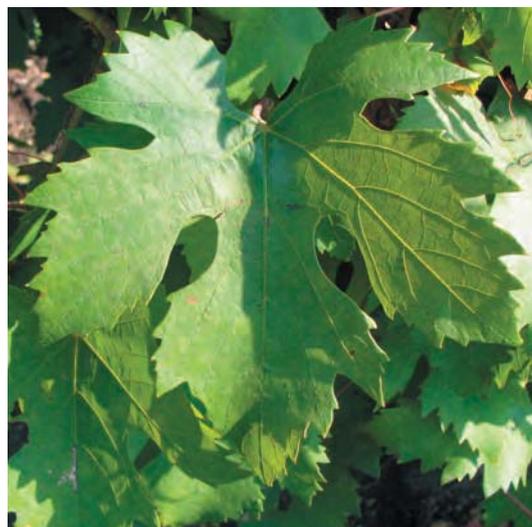
Vigor of shoot growth: high

Bunch weight: 150-190 g

Yield per vine: 2.45 kg

Climate and cultivation requirements

The vegetative period is 160-195 days.



Resistance to diseases and unfavorable weather

'Fetească neagră' shows a relative resistance towards frost, drought and *Erysiphe necator*; it is very susceptible towards *Plasmopara viticola* and grey mold (*Botrytis cinerea*).

Juice characteristics

Sugar: 18.0-28.0 %

Total acidity: 7.5-15.0 g·L⁻¹

Wine and grape characteristics

'Fetească neagră' is used for making high-quality red wines.

Galabura B.

Synonyms

'Airabulo'.

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Galabura' is considered to be an old native variety whose origin is still unknown. This variety was present in the Shabo viticultural area, near Cetatea Albă, now Belgorod Dnestrovskii, in Ukraine (ANONYMOUS 1963; KATARYAN 1962).

Now 'Galabura' is presented only in the ampelographic collection in the Republic of Moldova.

Taxonomy and intra-variety variability

Proles pontica Negr.

Information about intra-variety variability is not reported (ANONYMOUS 1963).

Essential ampelographic characteristics

The tip of the young shoot is open, green with slightly pink edges and strong dense cobwebby hairs.

The young leaves are entire, with slightly distinguished three lobes. The first leaves are green-white and the following leaves are green with brown spots. Density of cobwebby hairs is medium-sparse on the upper leaf side and dense on the lower surface.

The mature leaf is medium size or large, entire, circular with slightly distinguished lobes. The leaf profile is undulated with involute edges. The petiole sinus is lyre-shaped, half open or closed with ovate lumen. The upper leaf sinuses are open, very shallow. The lower leaf side is hairless. The cobwebby hairs on the lower leaf side are medium-sparse. The leaf blade is green. The teeth form a pattern of large and small ones, both sides straight, or one side concave and one side convex.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical, sometimes winged and medium dense.

The berry is medium size-large, round and green-yellow. The seeds are well developed. The flesh is juicy and neutral in taste.

Phenology

Time of bud burst: last ten days of April, first ten days of May

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: horizontal

Vigor of shoot growth: high

Bunch weight: 270 g

Yield per vine: 3.3 kg

Climate and cultivation requirements

The vegetative period is 180-195 days.

Resistance to diseases and unfavorable weather

'Galabura' is relatively resistant towards *Erysiphe necator*, and highly susceptible to *Plasmopara viticola* and grey mold (*Botrytis cinerea*).

Juice characteristics

Sugar: 16.5-20.0 %

Total acidity: 6.5-11.0 g·L⁻¹

Wine and grape characteristics

'Galabura' is used for making ordinary white wines and for distillation.



Galbenă de Ardeal B.

Synonyms

'Fetească Regală', 'Daneșană', 'Fetească de Daneș', 'Dunnedorfer Konigsast', 'Konigsast', 'Kiraileanka', 'Feteasca Muskatnaia', 'Feteasca Korolevskaia'.

Meaning of the name

'Galbena = yellow. 'Galbena from Ardeal (Ardeal, a region in Romania). 'Fetească Regală' = Royal (Regal). Fetească, 'Daneșană' = from the locality of Daneș. 'Fetească de Daneș' = Fetească from Daneș. 'Feteasca Muskatnaia' (in Russian) = Fetească Muscat.

Historical notes and cultural importance

'Galbenă de Ardeal' originated in the village of Daneș, Sighișoara (Romania). According to the COSTANTINESCU *et al.* (1959), it could be the result of a crossing between 'Fetească Albă' and 'Grasa de Cotnari'. Other references (ANONYMOUS 1956) suggest it could be the result of a crossing between 'Fetească Albă' and 'Muscat Ottonel'. In the Republic of Moldova, 'Galbenă de Ardeal' is mostly known under the names 'Fetească Regală' or 'Feteasca Muscatnaya'.

Galbenă de Ardeal is very limited in the country now.

Taxonomy and intra-variety variability

Proles pontica subproles *georgica* Negr.

'Galbenă de Ardeal' has two biotypes: one with longer, medium-dense or loose bunch and yellow berry; the second has a more compact and winged bunch with green-yellow berries. Both clones are valuable for commercial winemaking (COSTANTINESCU *et al.* 1959).

Essential ampelographic characteristics

The tip of the young shoot is open, white-green with slightly pink-violet edges and dense cobwebby hairs.

The young leaves are entire or with three slightly distinguishable lobes, yellow-green with slight yellow-bronze spots. The cobwebby hairs are sparse between the main veins on the upper leaf surface and they are medium or dense on the lower surface.

The mature leaf is medium size or large, circular, entire and slightly three or five lobed. The leaf profile is undulate (rolled). The petiole sinus is half open, U, V or lyre-shaped. The upper leaf side is hairless. The cobwebby hairs between the main veins are sparse on the lower leaf side. The teeth are irregular, triangular, alternating a big one and a small one, with both sides either straight or convex.

The flower is hermaphrodite.

The bunch is medium size, cylindrical or cylindrical-conical, often winged, dense or very dense.

The berry is medium size, round, yellow-green, with visible stigma remains. The seeds are well developed. The flesh is juicy and slightly aromatic.

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 180 g

Yield per vine: 5.0 kg

Climate and cultivation requirements

The vegetative period is 160-210 days.



Resistance to diseases and unfavorable weather

'Galbenă de Ardeal' is relatively resistant towards frost, *Erysiphe necator* and *Plasmopara viticola*. The variety is highly sensitive to drought.

Juice characteristics

Sugar: 13.8-26.0 %

Total acidity: 7.5-11.9 g·L⁻¹

Wine and grape characteristics

'Galbenă de Ardeal' is used for making high quality white dry and sweet wines.

Galbena de Odobești B.

Synonyms

'Galbenă', 'Galbenă de Capitanu', 'Poamă Galbenă', 'Bucium de Poamă Galbenă', 'Galbenă Grasă', 'Sars Izum', 'Orangentraube', 'Naranczolo', 'Galbina', 'Galbina batuta', 'Galbina Ourâta', 'Zhovtets', 'Zheltyi vinograd', 'Poama Galbina', 'Turba byala'.

Meaning of the name

Yellow from Odobesti (Odobesti is the name of a locality in Romania)
'Galbenă' = Yellow. 'Galbenă de Capitanu' = Captain's yellow. 'Poamă Galbenă' = Yellow grape. 'Galbenă Grasă' = Yellow plump (fat). 'Galbina Batuta' = Yellow compact.

Historical notes and cultural importance

'Galbena de Odobești' is an old native variety. Its origin remains unknown and it is cultivated since ancient times. ANONYMOUS (1959) suggests it is original of the village of Capitanu, on the Milcov River, near Odobești (Romania).

The variety is conserved only in an ampelographic collection in the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *pontica* subproles *balkanica* Negr.

In 'Galbena de Odobești's population there are the following variations: 'Galbenă Măruntă', 'Galbenă Aurie' and 'Galbenă de Capitanu' (COSTANTINESCU *et al.* 1959).

Essential ampelographic characteristics

The tip of the young shoot is white-green with a reddish margin, open and with dense cobwebby hairs.

The young leaves are entire or with three slightly distinguishable lobes. The first distal leaves are white-yellow, the following leaves are green-yellow with slightly brown spots. The cobwebby hairs are sparse on the upper leaf side and medium or dense on the lower leaf surface.

The mature leaf is medium size or large, circular, almost entire or slightly three to five lobed. The leaf profile is undulate or folded at mid vein. The petiole sinus is half open, V-shaped. The upper leaf surface is hairless. The cobwebby hairs on the lower surface are sparse. The teeth are irregular, alternating a big one and two or three small ones, with both sides either straight or convex.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical, often winged, dense or very dense.

The berry is medium and irregular in size, round and yellow-green, with tan on the sun-side. The seeds are well developed. The flesh is juicy and neutral in taste.

Phenology

Time of bud burst: first ten days of May

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

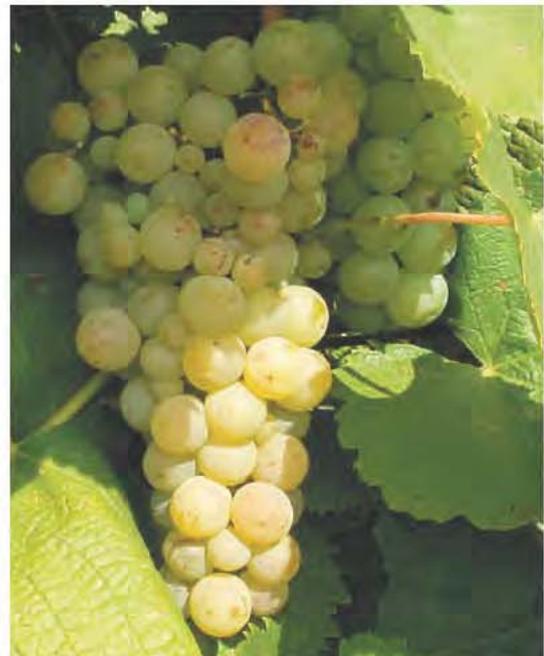
Vigor of shoot growth: high

Bunch weight: 180 g

Yield per vine: 7.0 kg

Climate and cultivation requirements

The vegetative period is 180-210 days.



Resistance to diseases and unfavorable weather

'Galbena de Odobești' is relatively resistant towards frost and *Erysiphe necator*, but it is susceptible to drought, *Plasmopara viticola* and grey mold (*Botrytis cinerea*).

Juice characteristics

Sugar: 14.0-21.0 %

Total acidity: 5.5-10.0 g·L⁻¹

Wine and grape characteristics

'Galbena de Odobești' is used for making ordinary white wines.

Gordin B.

Synonyms

'Gordin galben', 'Gordin de Dealul Mare', 'Gordin mărunț' ('Mierlița'), 'Trescun', 'Ceainac galben'.

Meaning of the name

It is supposed that 'Gordin' was introduced by the Romans and named 'Gordin' in honor of General Gordinus. Other references suggest that this variety was named after Gordian I, Gordian II and Gordian III, kings of Dacia or after Gordinus, king of Frigia (Minor Asia). 'Gordin Galben' = Yellow Gordin. 'Gordin de Dealul Mare' = Gordin from the Great Hill (COSTANTINESCU *et al.* 1959).

Historical notes and cultural importance

'Gordin' is considered to be one of the oldest native Moldovan varieties, as it is grown since ancient times. Currently, 'Gordin' is conserved only in an ampelographic collection of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles pontica subproles *balcanica* Negr. (COSTANTINESCU *et al.* 1959)

Despite the fact 'Gordin' is cultivated since ancient times, no variations and clones were selected or registered.

Essential ampelographic characteristics

The tip of the young shoot is green-white with pink-colored edges, open, with medium dense cobwebby hairs.

The young leaves are entire. The first five distal leaves are green-yellow with dense cobwebby hairs on both sides, the following leaves are green with brown spots. The hairs are sparse on the upper leaf surface; they are sparse also on the main veins and medium-dense between the main veins on the lower leaf surface.

The mature leaf is medium size, wedge-shaped and rarely circular, almost entire or slightly three lobed. The leaf profile is undulated or striate. The petiole sinus is half open, lyre-shaped and with a rounded base. The upper leaf surface is hairless. The cobwebby hairs between the main veins on the lower leaf side are medium-dense. The leaf blade is green or dark-green. The lateral teeth are small and both sides are rectilinear.

The flower is hermaphrodite.

The bunch is medium size, short-conical, often winged and dense.

The berry is round or ovate, green-yellow with visible green veins. The seeds are well developed. The flesh is juicy with neutral taste.

Phenology

Time of bud burst: first ten days of May

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: second ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect, horizontal.

Vigor of shoot growth: medium

Bunch weight: 250 g

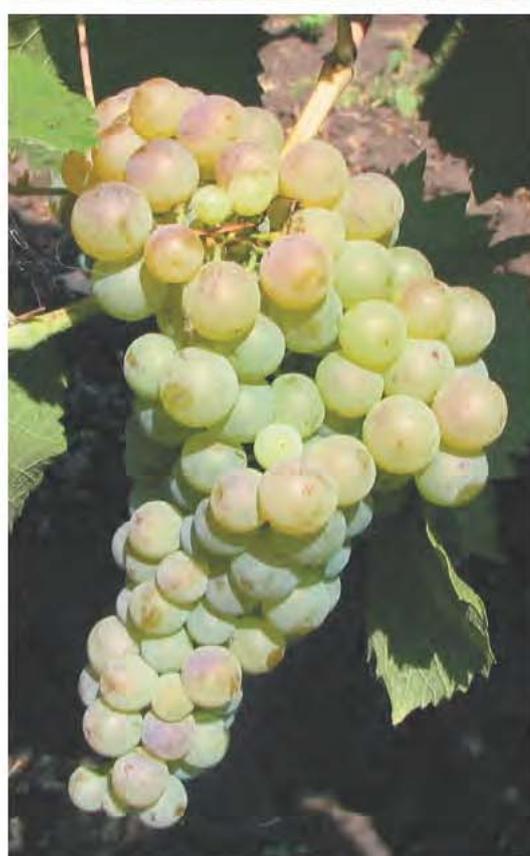
Yield per vine: 4.0 kg

Climate and cultivation requirements

The vegetative period is 180-210 days.

Resistance to diseases and unfavorable weather

'Gordin' is susceptible to diseases and unfavorable environmental conditions.



Juice characteristics

Sugar: 15.4-20.0 %

Total acidity: 8.0-10.7 g·L⁻¹

Wine and grape characteristics

'Gordin' is used for making ordinary white wines and for distillation.

Gordin Gurguiat B.

Synonyms

'Timpurie', 'Pticie'.

Meaning of the name

Gordin gurguiet = Gordin-like nipple.

Timpurie = Early. Pticie = Bird's

Historical notes and cultural importance

'Gordin Gurguiat' is currently present only in an ampelographic collection of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *proletica* subproles *balcanica* Negr. (COSTANTINESCU *et al.* 1962).

There are no references about intra-variety variability.

Essential ampelographic characteristics

The tip of the young shoot is green-white with pink-colored edges, open, with medium dense cobwebby hairs.

The young leaves are entire. The first distal leaves are green-white with dense cobwebby hairs, especially on the lower surface; the following leaves are green with red-brown spots. The hairs on the upper leaf surface are weak, on the lower surface they are sparse on the main veins and medium-dense between the main veins.

The mature leaf is medium size, circular and five lobed. The leaf profile is undulated or V-shaped. The petiole sinus is closed with slightly or strongly overlapped lobes, forming an elliptic or lyre-shaped lumen with a rounded base. The cobwebby hairs between the main veins on the lower leaf side are medium-high dense. The leaf blade is green or dark-green. The teeth are small, triangular and both sides are rectilinear.

The flower is hermaphrodite.

The bunch is medium size, truncate-conical, often winged and dense.

The berry is round or ovate, green-yellow with visible green veins. The seeds are well developed. The flesh is juicy and neutral.

Phenology

Time of bud burst: first ten days of May

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: second ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect or horizontal.

Vigor of shoot growth: medium

Yield per vine: 5.3 kg

Bunch weight: 250-300 g

Climate and cultivation requirements

The vegetative period is 180-210 days.

Resistance to diseases and unfavorable weather

'Gordin Gurguiat' is susceptible to diseases and unfavorable environmental conditions.

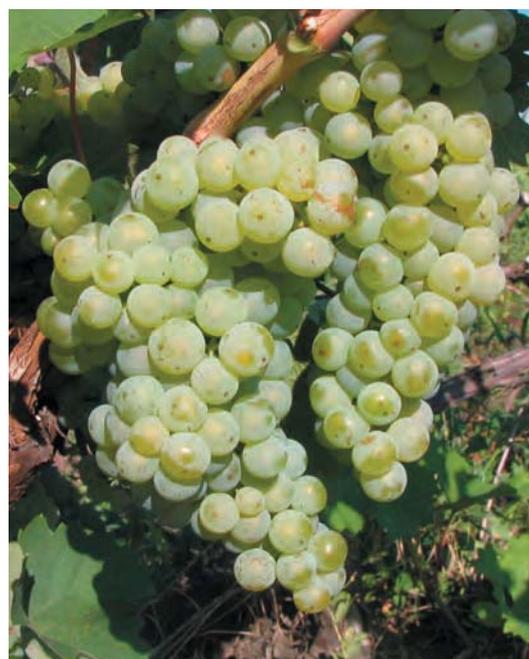
Juice characteristics

Sugar: 16.0-23.0 %

Total acidity: 5.5-12.0 g·L⁻¹

Wine and grape characteristics

'Gordin Gurguiat' is used for making ordinary white wines and for distillation.



Gordin Verde B.

Synonyms

'Ciainac verde'.

Meaning of the name

Green Gordin.

Historical notes and cultural importance

'Gordin Verde' is an old native variety. The origin of this variety is unknown and nowadays it is present only in the ampelographic collections of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *pontica* subproles *balcanica* Negr. (ANONYMOUS 1963).

There are no reports about intra-variety variability.

Essential ampelographic characteristics

The tip of the young shoot is green with violet veins, open and is covered by medium dense cobwebby hairs.

The young leaves are pentagonal with five lobes. The first three distal leaves are green-yellow with dense cobwebby hairs on both sides; the fourth and fifth leaves are green with brown spots. The hairs on the upper leaf surface are sparse; on the lower surface they are sparse on the main veins and medium-dense between the main veins.

The mature leaf is medium size, circular and five lobed. The leaf profile is undulated or V-shaped. The petiole sinus is slightly open, lyre-shaped or slightly overlapped, with an ovate lumen. The hairs between the main veins on the lower leaf side are medium-dense. The leaf blade is green. The teeth are triangular and both sides are convex.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical and dense.

The berry is round or flat (oblate) and green-yellow. The seeds are well developed. The flesh is juicy. The taste is neutral.

Phenology

Time of bud burst: first ten days of May

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: first ten days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 220-250 g

Yield per vine: 2.5 kg

Climate and cultivation requirements

The vegetative period is 180-195 days.

Resistance to diseases and unfavorable weather

'Gordin Verde' is relatively resistant to *Erysiphe necator* and *Plasmopara viticola* but it is susceptible to grey mold (*Botrytis cinerea*).

Juice characteristics

Sugar: 18.3-21.8 %

Total acidity: 7.6-9.0 g·L⁻¹

Wine and grape characteristics

'Gordin Verde' is used for making ordinary white wines.



Țâța Caprei B.

Synonyms

'Pis de chèvre blanc', 'Anapskii Kornishon', 'Kadym parmak belyi', 'Kilibarko'.

Meaning of the name

Goat's nipple.

Historical notes and cultural importance

'Țâța Caprei' is an old native variety and its origin is unknown (CONSTANTINESCU 1958, 1967).

The variety is currently presented in the ampelographic collections of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspica* Negr.

No 'Țâța Caprei' variations or clones were selected or registered.

Essential ampelographic characteristics

The tip of the young shoot is green with brown-reddish edges and open. Anthocyanin coloration of the prostrate hairs of the tip is medium. The hairs on the tip are sparse.

The young distal leaves are five or seven lobed and cooper-reddish. The cobwebby hairs are medium dense on both the lower and upper leaf surfaces.

The mature leaf is medium size, circular or slightly elongated, five or seven lobed. The sixth and seventh inferior lobes are a typical character for the variety. The leaf blade profile is undulate, sometimes V-shaped. The petiole sinus is wide or half open with a rounded base. The upper leaf sinuses are open. The lower leaf sinuses are slightly overlapped, forming an ovate lumen. The bristle hairs along the main veins of the lower leaf side are medium or dense. The leaf blade is green. The teeth form a pattern of large and small teeth, pointed and both sides are rectilinear. The teeth on the ends of the main veins are more elongated.

The flower is hermaphrodite.

The bunch is large, cylindrical-conical, winged, loose or medium dense.

The berry is oval-prolonged and green-yellow. The seeds are well developed. The flesh is pulpy and neutral.

Phenology

Time of bud burst: first ten days of May

Time of blooming: first ten days of June

Time of veraison: last ten days of August

Time of ripening: beginning of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 120-400 g

Yield per vine: 3.2 kg

Climate and cultivation requirements

The vegetative period is 175-190 days.

Resistance to diseases and unfavorable weather

'Țâța Caprei' is susceptible to frost and fungal diseases.

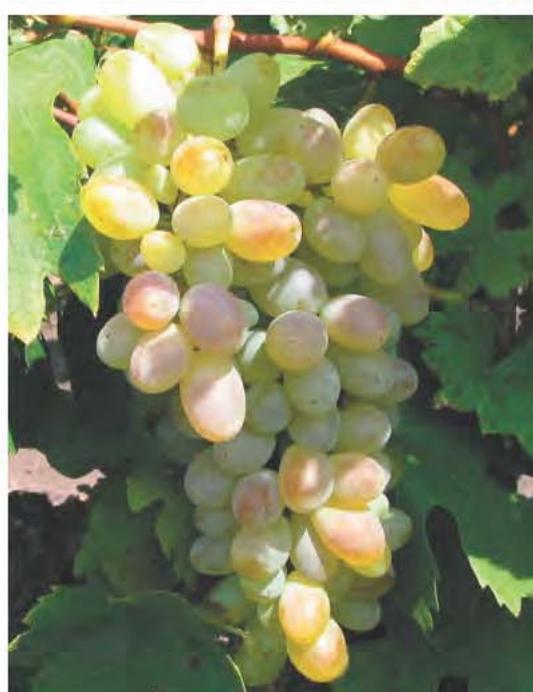
Juice characteristics

Sugar: 16.0-20.0 %

Total acidity: 6.5-10.8 g·L⁻¹

Wine and grape characteristics

'Țâța Caprei' is used as a table grape for fresh consumption.



Turba Plotnaya Belaya B.

Synonyms

'Malvoisie du Roussillon', 'Torbato', 'Kanina', 'Kuskoseda Bianca'.

Meaning of the name

Turbat = mad, furious, violent, but referring to high vigor and growth of shoots and large or very large size of some leaves. The name possibly means the luxuriant, exuberant, gross, heavy growing.

Plotnaya = dense (in Russian), Belaya = white (in Russian).

Historical notes and cultural importance

'Turba Plotnaya Belaya' is an old native variety whose origin remains unknown (ANONYMOUS 1970; IVANOVA 1976).

The variety is currently present only in the ampelographic collections of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *pontica* Negr. (ANONYMOUS 1970).

Variations and clones for 'Turba Plotnaya Belaya' have not been selected and registered.

Essential ampelographic characteristics

The tip of the young shoot is green-white with slightly pink edges and open. Anthocyanin coloration is absent or very weak. The hairs are medium or dense.

The young leaves are 3 lobed, green-bronze with brown-cherry colored spots. The cobwebby hairs on the main veins are medium, between the main veins they are medium-dense.

The mature leaf is medium size-large, circular and slightly three lobed. The leaf profile is undulate. The petiole sinus is half open or closed, forming an elliptic lumen with a U-shaped base. The upper leaf sinuses are slightly distinguishable. The cobwebby hairs on the lower leaf side are medium or dense. The leaf blade is green. The teeth form a pattern of large and small ones; in most cases both sides are rectilinear.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical, winged and medium dense. The berry is round and green-yellow. The seeds are well developed. The flesh is juicy with neutral taste.

Phenology

Time of bud burst: first ten days of May

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: beginning of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 200-400 g

Yield per vine: 4.4 kg

Climate and cultivation requirements

The vegetative period is 170-185 days.

Resistance to diseases and unfavorable weather

'Turba Plotnaya Belaya' is susceptible to frost and fungal diseases.

Juice characteristics

Sugar: 15.5-22.0 %

Total acidity: 7.8-11.5 g·L⁻¹

Wine and grape characteristics

'Turba Plotnaya Belaya' is used for making ordinary white wines.



Turba Rikhlaya Belaya B.

Synonyms

Unknown.

Meaning of the name

For 'Turba' no hypotheses have been proposed. 'Rikhlaya' = loose (in Russian). 'Belaya' = white (in Russian).

Historical notes and cultural importance

'Turba Rikhlaya Belaya' is considered a variation of 'Turba Plotnaya Belaya' with female flowers (ANONYMOUS 1970; IVANOVA 1976).

The variety is currently present only in the ampelographic collections of the Republic of Moldova.

Taxonomy and intra-variety variability

Proles *pontica* Negr. (ANONYMOUS 1970).

No variations or clones of 'Turba Rikhlaya Belaya' have been selected so far.

Essential ampelographic characteristics

The tip of the young shoot is green-white with pink edges and open anthocyanin coloration of the prostrate hairs on the tip is weak. The hairs on the tip are medium or dense.

The young leaves are three lobed, green-bronze with brown-cherry colored spots. Both the lower and upper leaf surfaces are covered with medium-dense cobwebby hairs.

The mature leaf is medium size or large, circular and slightly three lobed. The leaf profile is mainly undulate, sometimes V-shaped. The petiole sinus is mainly half open, rounded in the base. The cobwebby hairs on the lower leaf side are medium or dense. The leaf blade is green. The teeth form a pattern of large and medium size ones and small and short ones; in most cases both sides are rectilinear.

The flower is female.

The bunch is medium size, conical or cylindrical-conical, winged and medium dense.

The berry is round and green-yellow. The seeds are well developed. The flesh is juicy. The flavor is neutral.

Phenology

Time of bud burst: first ten days of May

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: beginning of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 200-350 g

Yield per vine: 4.3 kg

Climate and cultivation requirements

The vegetative period is 165-180 days.

Resistance to diseases and unfavorable weather

'Turba Rikhlaya Belaya' is susceptible to frost and fungal diseases.

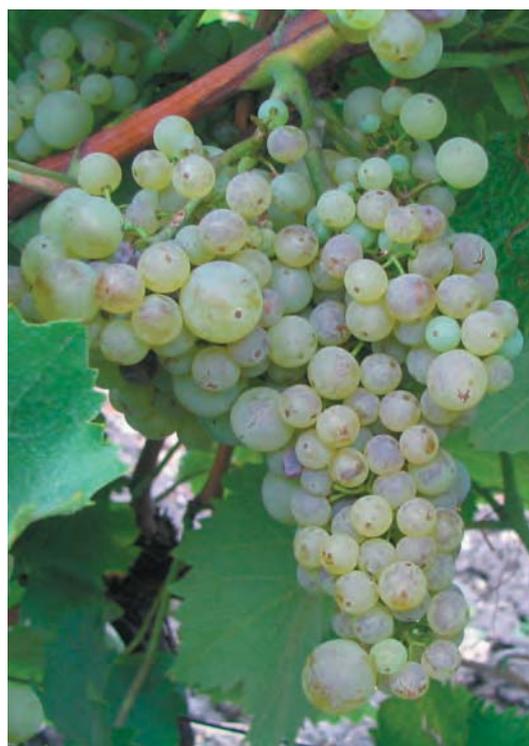
Juice characteristics

Sugar: 16.5-23.2 %

Total acidity: 8.0-14.3 g·L⁻¹

Wine and grape characteristics

'Turba Rikhlaya Belaya' is used for ordinary white wines.



Zghihară B.

Synonyms

'Sghiară', 'Durleasca', 'Zghihară Galbenă', 'Zghihară de Huși', 'Ghihară', 'Zghihară Verde Bătută', 'Poamă Zosnească Flenchișa', 'Zghihară Albă bătută', 'Bătuta', 'Sgigarda Galbenă', 'Sgigarda Verde', 'Poamă Sgigardă Verde'.

Meaning of the name

Wild (PELYAKH 1970).

Historical notes and cultural importance

'Zghihară' is an old native variety and its origin is unknown. According to COSTANTINESCU *et al.* (1960) the variety belongs to the same group as 'Galbena de Odobești' and 'Bătută Neagră'.

The variety 'Zghihară' is present only in ampelographic collections in the Republic of Moldova now.

Taxonomy and intra-variety variability

Proles *pontica* subproles *balcanica* Negr.

'Zghihară' is considered a variation of Galbena, another old native cultivar (ANONYMOUS 1960).

Essential ampelographic characteristics

The tip of the young shoot is green–white and open. Anthocyanin coloration of prostrate hairs is very weak or absent. The cobwebby hairs on the tip are medium-dense.

The young leaves are three lobed and green-white. The lower leaf surface is covered with medium dense cobwebby hairs along the main veins and with very dense cobwebby hairs between them.

The mature leaf is medium size, circular and slightly five lobed. The leaf profile is undulate, sometimes V-shaped. The petiole sinus is closed by medium or strongly overlapped lobes, forming broad ellipsoid or obovoid lumen. The upper leaf sinuses are open and hardly distinguishable.

The lower leaf side is covered with medium-dense prostrate hairs between the main veins and with sparse erect hairs along them. The leaf blade is dark green. The teeth are triangular, in a pattern of large and small ones; both sides are rectilinear.

The flower is hermaphrodite.

The bunch is medium size or large, cylindrical and very dense.

The berry is round and green-yellow. The seeds are well developed. The flesh is very juicy and has a neutral flavor.

Phenology

Time of bud burst: first ten days of May

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: beginning of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect, horizontal

Vigor of shoot growth: high

Bunch weight: 110-250 g

Yield per vine: 4.9 kg

Climate and cultivation requirements

The vegetative period is 160-190 days.

Resistance to diseases and unfavorable weather

'Zghihară' is relatively resistant towards frost, but it is susceptible towards fungal diseases: *Plasmopara viticola*, *Erysiphe necator* and grey mold (*Botrytis cinerea*).



Juice characteristics

Sugar: 13.5-23.0 %

Total acidity: 4.5-15.0 g·L⁻¹

Wine and grape characteristics

'Zghihară' is used for making ordinary white wines.

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Table 1

Some general translations from Romanian to English

| | Translation |
|---|--|
| Alb (<i>m</i>), Albă (<i>f</i>) | White |
| Roz (<i>m</i>), Roză (<i>f</i>) | Rose-colored, Pink |
| Roșu (<i>m</i>), Roșie (<i>f</i>) | Red |
| Negru (<i>m</i>), Neagră (<i>f</i>) | Black |
| Verde (<i>m,f</i>) | Green |
| Galben (<i>m</i>), Galbenă (<i>f</i>) | Yellow |
| Vie, viță de vie | Vine |
| Strugure | Grape |
| Vin | Wine |
| Poamă | Generalized name used sometimes for vine, for grape, for bunch |

m = masculine gender, *f* = feminine gender.

Viticulture and winemaking in Russia

L. P. TROSHIN

Kuban State Agrarian University, Krasnodar, Russian Federation

Introduction

Russia (the Russian Federation) stretches across a large extent to the north of the super-continent of Eurasia: with 17,075,400 km², it is the largest country in the world, covering more than one eighth of the Earth's land area; with 142 million people, it is the ninth largest country by population. Though Russia's population is among the largest, its density is low due to the country's enormous size: it is higher in the European part of Russia, near the Ural Mountains and in south-west Siberia. Most of the population (73 %) lives in urban areas. The two largest cities in Russia are Moscow (10,126,424 people) and Saint Petersburg (4,661,219). Eleven other cities have between one and two million inhabitants like Chelyabinsk, Kazan, Novosibirsk, Nizhny Novgorod, Omsk, Perm, Rostov-on-Don, Samara, Ufa, Volgograd and Yekaterinburg. Russia shares land borders with the following countries: Norway, Finland, Estonia, Latvia, Lithuania (Kaliningrad Oblast), Poland (Kaliningrad Oblast), Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, China, Mongolia and North Korea. It is also close to Alaska, Iran, Sweden, Denmark, Turkey and Japan across relatively small stretches of water (the Bering Strait, the Caspian Sea, the Baltic Sea, the Black Sea and La Pérouse Strait, respectively). Russia is well known for its developed agriculture, including field-crop cultivation, horticulture, livestock breeding, forestry and fishery.

History of viticulture and winemaking

The origin of viticulture in Russia goes back several centuries (EGOROV *et al.* 2004, SMIRNOV *et al.* 1998). In ancient times, the wild grapevine *Vitis vinifera* ssp. *sylvestris* Gmel. was already grown on the territories of the modern major viticultural areas: mainly in the sub-mountain and mountain areas of Dagestan and along the Black and Azov Seas' coasts.

During the settlement process, people from these territories also introduced a selection of plants following economic criteria: they preferred plants having a larger bunch, bigger berries, pleasant taste etc.

As a result of this selection, we now have a wide range of local vines, including valuable grapevine varieties – but local breeding was also influenced by contact with other cultures thanks to the development of travelling and sailing. This led to the meeting with people from countries along the coasts of the Black and Azov seas; on the modern territory of Krasnodar there were colonies of the Greek seafarers of the Old World, where the immigrants had brought grape cultivation: an already deep-rooted tradition in their homeland.

As a matter of fact, Greek immigrants had brought the best selected forms of grapes, together with the best equipment for the care of vines and of course vessels and tools for winemaking. A similar process happened along the cost of the river Don.

The ancient introduction of viticulture in these regions is proven by the many archaeological evidences collected in the museum of J. I. Potapenko Research Institute of Viticulture and Winemaking and in Krasnodar (Krai) and Novochechensk local museums.



Fig. 1: Archaeological materials and historical information from Russia concerning viticulture and winemaking activities, are preserved in the Taman Archaeological Museum.

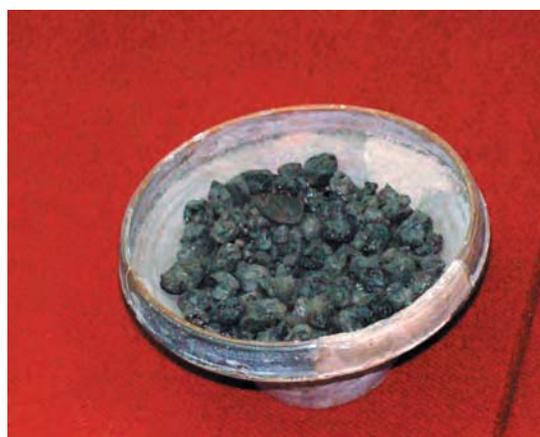


Fig. 2: Burned grape seeds in an ancient clay vase dating back to I-II cc. AD and discovered in the location (posiolok) of Batareika (Taman Archaeological Museum).

On the Taman Peninsula, a process of grapevine domestication from wild grape *Vitis vinifera* ssp. *sylvestris* Gmel. started, and Adygo-Abkhazian and other tribes - who had started to settle there definitively - took part in it.

Later, Slavs immigrants from Kuban and Don joined this process, importing canes of different forms and varieties that they planted as they settled.

In the annals, it is mentioned that the first state (Imperial) vineyards on the territory of Russia were established in Astrakhan in 1613. The annals also report that in 1706, on the site of Cossack Persianov, Tsar Peter I planted 5 plants of grapevine with his own hands. The conditions of viticulture in Astrakhan captured the interest of also the father of the Emperor Peter I, the king Alexey Mikhailovich. In his inquiry on conditions of viticulture in Astrakhan, the king's assistant "Voevoda" informs him that in the Cossack towns "there are lots of good grape bushes" and that Cossacks prepare a "grape drink, both for themselves and for selling elsewhere, even in Astrakhan".

Viticulture and winemaking in the valley of the river Don has a rich and interesting history. The importance of these activities is underlined by a Don army stamp approved by Peter I in 1704, on which an armed Cossack is represented while sitting on a wine cask.

During excavations in the territory of Rostov, concerning an earlier pre-Peter period, plenty of valuable findings were made – mainly vessels of Greek origin for drinking wine: this confirms the historical contact between Greece and Don.

Viticulture was undertaken also by Khazars on the territory of the Russian state, the beginning of which, according to the opinion of the historian L.N. Gumilev, should be attributed to the Dagestan people. The Arabian traveler of that time al-Istakhri Abu Iskhak al-Farisi (about 850-934 AD) wrote that in the gardens belonging to Khazars, about 4,000 grapevine bushes were available.

A particular place in the history of Russian viticulture belongs to Dagestan, which is now the second area of grape plantings after the Territory of Krasnodar Krai. In the sub-mountain and mountain areas of Dagestan, you can still easily find wild and feral grapevines from which plenty of valuable native varieties were selected and cultivated.

More than 99 % of Russian vineyards are concentrated in the North-Caucasian ecological-geographical region.

Climatic conditions of this viticultural region are rigid: insufficient heat and water supply, hard winters compel to cover vines during the cold season in almost half of the vineyards: in the central and northern areas of Krasnodar, in the northern part of Dagestan, in Stavropol Krai, Rostov, Chechnya and Kabardino-Balkariya. The non-covered vineyards are cultivated along the coast of the Azov and Black Seas (from the city of Temryuk up to the city of Sochi) on the Territory of Krasnodar Krai and in the southern areas of Dagestan.

Where commercial vineyards are grown, all vines are grafted because of Phylloxera.

The main grapevine cultivation areas of Northern Caucasus are known to have insufficient and unstable watering. So, in places where water sources are available, grapes are cultivated under irrigation.

The territory of Krasnodar has more favorable soil and climatic conditions; therefore it is a leading region in Russia for grapevine cultivation. The main areas of plantings (about 65 %) are concentrated in the Black Sea zone where grapevine is cultivated without plant covering during winter: these areas produce about 75 % of the total grape quantity. In the central and northern zones the cultivation of grapes is characterized by the winter covering system: more than 25 % of the vineyards of Krasnodar are covered, producing about 15 % of the total vintage.

One of the main actual problems of viticulture is to update and improve grapes assortment. A wide number of valuable varieties was created by breeders and most of these are recommended for cultivation. Breeding activities are always accompanied by the introduction of advanced cultivars from the neighbors or from distant foreign countries, and this helps the enrichment of the Russian vineyards.

Viticulture in terms of figure

The total area of vineyards in Russia is 79.500 ha. The average yield ranges from 3.84 to 6.57 t·ha⁻¹. The grape assortment contains 57 table, 62 wine and 21 universal varieties of grapevine (TROSHIN and RADCHEVSKII 2005).

Table grape production: The main table grape cultivars in the country are 'Augustine', 'Agadai', 'Cardinal', 'Chasselas Blanc', 'Chasselas Muscat' and 'Chasselas Rosa', 'Dekabr'skii', 'Early Magaracha', 'Italia', 'Karabournu', 'Lyana', 'Moldova', 'Muscat of Hamburg', 'Muscat Amber', 'Vostorg' etc. (TROSHIN and RADCHEVSKII 2005). The cultivation of table grapes covers about 15 % of the Russian vineyards. Average annual consumption of fresh grape is 2.5-2.8 kg/person.

Winemaking in terms of figure: The basic commercial wine cultivars for Russia are 'Aligoté', 'Bianka', 'Doina', 'Dunavskiy Lasur', 'Cabernet-Sauvignon', 'Krasnostop Zolotovskii', 'Levokumskii', 'Merlot', 'Müller-Thurgau', 'Onickanskii White', 'Pervenets Magaracha', 'Pinot Blanc', 'Pinot Gris', 'Pinot Noir', 'Podarok Magaracha', 'Riesling', 'Riton', 'Rkatsiteli', 'Saperavi', 'Saperavi Severnii', 'Sauvignon Blanc', 'Chardonnay', 'Silvaner', 'Traminer Rosé', 'Tsimlyanskii Chernyi', 'Tsitronii Magaracha', 'Zala Dend', 'Viorika', 'Vidvizhenets', etc. (TROSHIN and RADCHEVSKII 2005). They are used for making various styles of wine, brandy, pomace brandy and other grape-based products.

The best wines of the country are:

- Table white: Aligoté of Gelendgik, Aligoté Myskhako, Riesling Abrau, Riesling Myskhako, Riesling Sauk-Dere, Traminir of Tamany etc.;
- Table red: Star of Tamani, Cabernet of Anapa, Cabernet of Myskhako, Cabernet of Fanagorii, Krasnostop Zolotovkii, Nomernoy Reserve, Saperavi Beshtau etc.;
- Special (fortified, dessert, Madeira style, Sherry style): Alexandrite of Gelendgik, Anapa fortified, Gorgippia, Gold Coast, Caucasus, Red Cluster, Kuban fortified, Madera of Dagestan, Madera of Don, Madera of Kuban, Madera 19, Maria, Muscat Amber, Russia, Sauvignon of Gelendgik, Ulybka, Sherry Tamanskii, Black Sea fortified, Chernye glaza, Iuzhnaia noch etc.;
- Sparkling white: Ah, Abrau, Gold, Emperor, Prince Lev Golitsin, Cornet, Nadezhda, Russian Champagne, Sedoi Caspii, Soviet Champagne, Jury Dolgoruky etc.,
- Sparkling red: Velvet Season, Krasnodar sparkling, Muscat sparkling, Sapphire Dona, Tsimlanskii sparkling, etc.;
- Flavored: Mountain Flower, Black Doctor etc. (GUGUCHKINA et al. 2004; SOBOLEV 2004).

Grapevine collections

During the disaggregation of the former Soviet Union, the largest ampelographic collection in Russia with about 1,200 accessions was located at the J. I. Potapenko Research Institute of Viticulture and Winemaking, situated in the northern and most risky viticultural area of Russia (Novocherkassk, Rostov). An order of The Russian Academy of Agrarian Sciences (1995) charged the following institutions of Kuban (who are still working at the project) to establish the complete Russia ampelographic collection: Anapa Zonal Testing Station of Horticulture, Viticulture and Winemaking belonging to the North Caucasus Research Institute of Horticulture and Viticulture, the Crimsk Testing Station of the same North Caucasus Research Institute of Horticulture and Viticulture and the Kuban State Agrarian University. The total number of varieties in the collections, including local and foreign varieties, breeding and wild-growing forms, is 3,960 (NOSULCHAK et al. 2006, TROSHIN et al. 2007). In the collection there are varieties from 42 countries of the World.

In 1930, N.I. VAVILOV gave a description of the wild-growing grapes of the Caucasus. This was a basis for ampelographers to describe a separate subspecies *Vitis vinifera* ssp. *caucasica* Vav. According to VAVILOV: "in the woods there is a considerable amount of wild grapes, sometimes traceable to *Vitis sylvestris* Gmel". The natural habitat of the wild grape is extensive: wild grape is spread in the whole of the Caucasus and particularly in the south European part of the former Soviet Union, living in deciduous forests of the lower zones on fresh, damp, but not boggy soils up to 1000 m. The wild grapevine is widespread in the western part of the Southern Caucasus, in Kakheti (Georgia), in Kuban (Russia), in the lower zones of the Small Caucasus, Karabakh (Azerbaijan), Lenkorani (Azerbaijan), in the foothills of the river Aras valley (VAVILOV 1931).

Native varieties arose through naturalization of the existing wild grapevines and on the basis of traditional selection (TROSHIN 1999, TROSHIN 2007, TUROK et al. 2006). Undoubtedly, it is possible to consider in this group the following varieties: 'Agadai', 'Puhlakovskii', 'Hatmi', 'Kubanskii chernyi', 'Krasnostop Anapsky', 'Krasnostop Zolotovskii', 'Plechistik', 'Tsimlanskii black'.

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Russia: native varieties of grapevine

L. P. TROSHIN

Kuban State Agrarian University, Krasnodar, Russian Federation

English translation: A. ZVYAGIN, Kuban State Agrarian University, Krasnodar, Russian Federation

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Notes: N-Noir (black), B-Blanc (white), Rg-Rouge (red), G-Gris (grey), R-Rose (pink).

Ag Chakrak B.

Synonyms

Unknown.

Meaning of the name

White grape (in Dagestani).

Historical notes and cultural importance

'Ag Chakrak' is a native Dagestani variety. Precise information about the origin of this variety is not available. It was spread in single vines or small groups within the vineyards of the Tabasaranskii, Kasumkentskii and Kizlyarskii districts of Dagestan (ALIEV 1963).

'Ag Chakrak' is a rare, local variety. It is suitable to use in high-yield breeding programs.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspica* Negr.

No biotypes or clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is bronze and covered with very weak cobwebby hairs. The shoot is hairless, light green, sometimes with a light-bronze hue.

The mature leaf is large, round or slightly wide, deeply five lobed. The leaf profile is undulated and revolute. The leaf surface is reticular, sometimes slightly blistered. The upper leaf sinuses are deep, rarely medium, closed, almost without lumen or with a narrow elliptic lumen and a sharp base. The lower leaf sinuses are similar in shape to the upper sinuses but smaller, medium deep, open and V-shaped. The petiole sinus is open, sagittate, deep, with a sharp base, sometimes closed and frequently with one or two teeth. The teeth on ends of the lobes are triangular with slightly convex sides and a sharp top. The lateral teeth are triangular-serriform on one side, sometimes on both sides, convex and with sharp top. The lower leaf side is hairless. The petiole is usually longer than the middle vein.

The flower is female with five or six upright stamens with short filaments. The ovary is wide conical-cylindrical and thick. The stigma is well developed and disc-shaped.

The bunch is large, rarely medium, conical, shouldered, often winged, medium dense, sometimes loose. The peduncle is lignified on the base.

The berry is rather large, round or slightly oval, greenish-yellow, with a brownish hue towards full ripening. The skin is medium firm, strong, covered with thin bloom. The flesh is juicy, slightly fleshy and neutral.

There are usually 1-3 seeds per berry. They are easy to separate, large, brown with a grayish hue and pear-shaped. The chalaza is oval, convex, located in the upper side of the seed and surrounded by wrinkles. The beak is long, obtuse truncated or slightly bifurcated in the end.

The mature cane is brownish-yellow and covered with a rather dense grayish bloom. The nodes are not distinguishable from the internodes due to the similar color (ALIEV 1963).

Phenology

Time of bud burst: end of April-beginning of May

Time of blooming: second half of June

Time of veraison: second ten days of August

Time of ripening: end of September

The vegetative period is 143-146 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: very high

Bud fertility (bunches per winter bud): 0.8

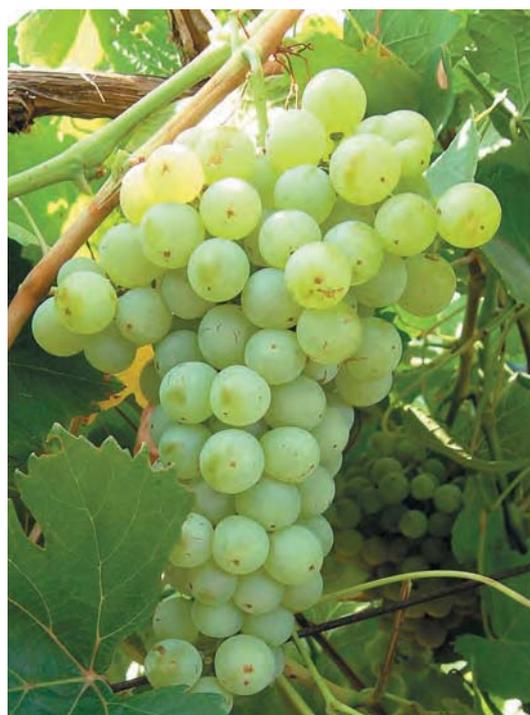
Shoot fertility (bunches per shoot): 1.3-1.5

Bunch weight: 220-270 g

Berry weight: 3.23 g

Yield per vine: 15-23 kg

Yield: high. 24.4-37.9 t·ha⁻¹ on irrigated soils in Derbent (ALIEV 1963)



Climate and cultivation requirements

'Ag Chakrak' has a long vegetative period and good cane maturation.

Resistance to diseases and unfavorable weather

Susceptibility towards *Plasmopara viticola* and *Erysiphe necator* is low.

Resistance to frosts and drought is not too high.

Juice characteristics

Sugar: 15.6-18.6 %

Total acidity: 4.0-6.5 g·L⁻¹

Wine and grape characteristics

'Ag Chakrak' makes ordinary table wine and blends. The grapes are also suitable for local fresh consumption. Resistance to transport is low. The berry's crushing load is 900 g; pedicel detachment force is 200 g (ALIEV 1963).

Ag Emchek B.

Synonyms

Unknown.

Meaning of the name

White cone (in Dagestan).

Historical notes and cultural importance

'Ag Emchek' is a rare variety. It is found in the old vineyards of Dagestan. According to A.M. ALIEV (1963), 'Ag Emchek' is a natural cross between an Eastern table variety and a variety from the Black Sea. The variety is used for local fresh consumption. It can be interesting for breeding purposes.

Taxonomy and intra-variety variability

Proles *pontica* Negr.

There are no registered clones so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with dense cobwebby hairs. The young leaves are green with a bright orange hue. The shoot axis is hairless, often green.

The mature leaf is medium size, rounded or a little elongated, deeply five lobed with secondary leaf sinuses. The upper leaf blade is slightly vascular-wrinkled, almost smooth and glossy. The middle lobe is usually elongated. The upper leaf sinuses are deep and very deep, closed, with a sharp base. The lower leaf sinuses are deep, open, rarely medium, lyre-shaped, occasionally closed with an oval or elliptic lumen. The petiole sinus is open, often arched with a sharp base, rarely closed with a wide-oval lumen. The teeth on the end of the lobes are large, triangular, with slightly convex sides, rarely with a rounded top. The lateral teeth are similar. The lower leaf side is covered with medium dense bristly-cobwebby hairs. The petiole is often shorter than the middle vein.

The flower is hermaphrodite, with six or seven stamina. The filament is shorter than the anther. The ovary is almost cylindrical, ridged, with a sharp transition in the middle. The style is short, cylindrical and rather thick. The stigma is well developed.

The bunch is very large, cylindrical-conical and loose, rarely medium dense. The peduncle is rather long, herbaceous and lignified on the base.

The berry is large, oblong, grayish-yellow, at full maturity with brownish sunburns and covered with bloom. The skin is medium thick and very firm. The flesh is juicy, slightly fleshy. The flavor is neutral. In the berry there are often three seeds.

The seed is large, brown with a gray hue and elongated. The chalaza is rounded, flat, slightly depressed in the middle, located in the high third of the seed. The beak is rather long, cylindrical, lighter in color compared to the body of the seed.

The mature cane is yellow-brown. The nodes are almost the same color of the internodes. The shoots are erect; this is a typical character for the variety (ALIEV 1963).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: first part of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

The vegetative period is 141-153 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: erect

Vigor of shoot growth: vigorous

Bud fertility (bunches per winter bud): 0.8-0.9

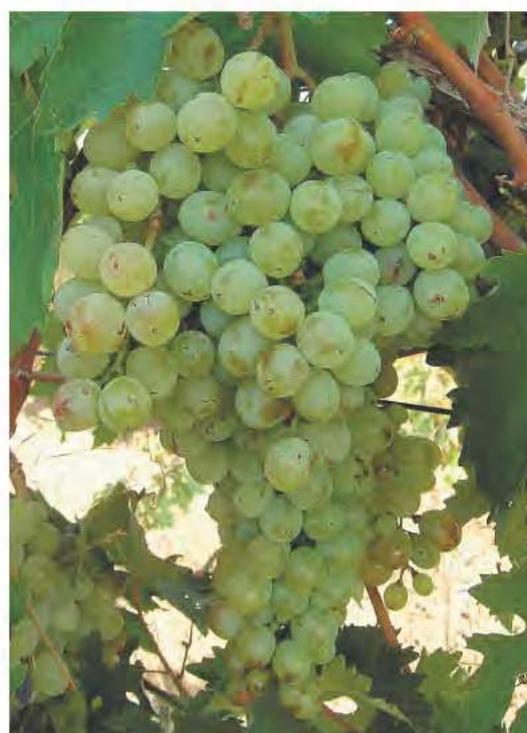
Shoot fertility (bunches per shoot): 1.1-1.3

Bunch weight: 230-290 g

Berry weight: 3.9 g

Yield per vine: 6.5-12.0 kg

Yield: 13-24 t·ha⁻¹ (with irrigation).



Climate and cultivation requirements

'Ag Emchek' shows a long vegetative period and good cane maturation, it is affected by berry shot (9-20 % of the berries) and it needs long pruning.

Resistance to diseases and unfavorable weather

The variety is susceptible to *Plasmopara viticola* and *Erysiphe necator* and shows poor resistance towards frost and drought.

Juice characteristics

Sugar: 14.0-15.6 %

Total acidity: 5.2-5.5 g·L⁻¹

Wine and grape characteristics

'Ag Emchek' is medium transport resistant. The variety has large and beautiful oblong berries, however the flavor is not very good (ALIEV 1963).

Ag Izyum B.

Synonyms

'Astrakhanskii Skorospelyi', 'Tonkokoryi', 'Katta ak Izyum' (Dagestan).

Meaning of the name

White grape.

Historical notes and cultural importance

'Ag Izyum' is a local Dagestani variety, known since the 17th century (KUKHTIN and PEITEL 1953). This variety is better known in Dagestan, however it is also spread as single vines or in small vine groups in other regions of Russia such as Astrakhan, Volgograd, Saratov, Stavropol Krai. 'Ag Izyum' is included since 1959 in the official list of varieties recommended for cultivation in Northern Caucasus established by the "Russian Federation's State Commission for Selection Achievements, Tests and Protection" (Catalogue of Varieties 2007). 'Ag Izyum' covers 17 ha in Russia (TROSHIN 2007).

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

According to KUKHTIN and PEITEL' (1953), there are two 'Ag Izyum' selected biotypes: fleshy-juicy and crispy-fresh.

A high yield clone ('Ag Izyum Urozhaiyi' - high harvesting 'Ag Izyum') is in the 'Russian Federation's State Commission for Selection Achievements, Tests and Protection' since 1986. The clone was selected by the federal state research institution "Dagestan Breeding and Testing Station for Viticulture and Horticulture" (RADZHABOV and ABARYANTS 2002). This variety is included in the official list of varieties, recommended for cultivation in the regions of North Caucasus since 2006.

Essential ampelographic description

The tip of the young shoot is green with brown and red color spots and covered with rare hairs. The first distal leaves are green with a light bronze tint. The shoot axis is bronze with a purple shade on the nodes, covered with an easily erasable, grey, waxy bloom.

The mature leaf is large, round, deeply five lobed with additional lower lobes. The blade profile is involute with uplifted edges. The upper leaf sinuses are deep or very deep, often closed with an oval or elliptic, sometimes spindle-shaped, lumen. The lower leaf sinuses are deep, open lyre-shaped with a narrow mouth and sharp base. The additional lower sinuses are open, with parallel sides and V-shaped. The petiole sinus is open, lyre-shaped and with a sharp base. The teeth on the end of the blades are large, narrow triangular with straight sides and sharp tops. The hairs covering the lower leaf side are rare and bristly. The leaves are yellow in autumn.

The flower is hermaphrodite.

The bunch is medium size (17-20 x 11-14 cm), shouldered or conical, loose or medium dense.

The berry is big (19-22 x 18-21 mm), rounded or slightly oval, pale-green (thus the name White Grape) with little brown spots, overripe berries are yellow with sunburns. The skin is medium firm. The flesh is colorless, juicy and neutral (KUKHTIN and PEITEL 1953).

Phenology

Time of bud burst: end of April

Time of blooming: first part of June

Time of veraison: first part of August

Time of ripening: first part of September

Description and characteristics of cultivation

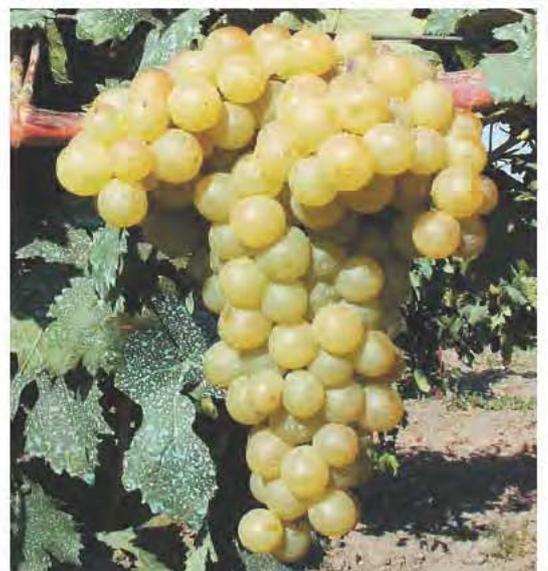
Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility (bunches per winter bud): 0.7

Shoot fertility (bunches per shoot): 1.3-1.5

Bunch weight: 250-350 g



Berry weight: 3.0-6.0 g
Yield per vine: 2.7-5.3 kg
Yield: 8-16 t·ha⁻¹

Climate and cultivation requirements

It is very susceptible to growing conditions. It is vigorous on light, warm chestnut soils and on south-facing slopes. Stable harvest and high quality are achieved through the multi-spur training system. In these conditions, grapes keep well and may even dry on the vines.

Resistance to diseases and unfavorable weather

Susceptibility to *Plasmopara viticola* is medium. Susceptibility towards *Erysiphe necator* is low. In a rainy year, the berries crack open and they are destroyed by grey mold (*Botrytis cinerea*).

'Ag Izyum' suffers from flower and berry shot. It is relatively drought and frost (-18 -20 °C) resistant. Transport resistance and storage ability are sufficient. The grapes can keep for a long time in dry weather.

Juice characteristics

Sugar: 18-22 %
Total acidity: 5.0-6.0 g·L⁻¹
Fresh grape sensorial grade: 8.2-8.8/10

Wine and grape characteristics

'Ag Izyum' is used for local fresh consumption and for short-distance transport.

Agadai B.

Synonyms

'Derbent Tsibil' (Dagestan).

Meaning of the name

Respectable uncle (in Dagestan).

Historical notes and cultural importance

'Agadai' is the most widespread local variety in Dagestan and it is extensively grown in the Southern districts. 'Agadai' was first discovered in the 1760s in Derbent. The variety soon spread across Southern Russia, Azerbaijan, Crimea and Kazakhstan (PEITEL' 1953), and it is still cultivated today (i.e. in Azerbaijan it is cultivated in the Absheron peninsula). 'Agadai' is included in the official list of varieties recommended for cultivation in North Caucasus established by the "Russian Federation's State Commission for Selection Achievements, Tests and Protection" since 1959 (Catalogue of Varieties 2007). 'Agadai' covers 1507 ha in Russia (TROSHIN 2007) and it is preserved in nine collections around the world.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr. var. *transcaucasica* Gram. et Trosch. (TROSHIN 1999, 2002, 2007).

PEITEL' (1953), described two biotypes:

a) dense bunch, almost rounded berries, not very juicy, rough flesh and strongly sour;

b) loose bunch, prolonged juicy berries, less rough flesh, almost not sour.

Three clones were also described:

1) colored leaf veins; marked brown spots on the berry, juicy, good sugar content;

2) open leaf sinuses, open petiole sinus, large teeth, dense bristly hairs on the veins; flat, round or oval berries marked with brown spots on the skin;

3) deeply lobed leaves, big rare lateral teeth; tasty, juicy and sweet berries with 2 or 3 seeds, early ripening.

However, the clones are not registered in the 'State Commission for Testing and Protection of Breeding Achievements' of the Ministry of Agriculture of Russia.

Progeny of 'Agadai' are 'Vezne', 'Gyul'baar', 'Dagestanskii', 'Dol'chatyi', 'Zhemchuzhina Derbenta', 'Iskristyi', 'Maral', 'Muscat Derbentskii', 'Muscat Peitel', 'Muscat Yuzhnodagestanskii', 'Obil'nyi', 'Primetnyi', 'Salam', 'Samur', 'Startovyi' and others varieties (TIMUSH 1966-1967).

Essential ampelographic description

The tip of the young shoot is green with reddish and orange tints, the shoot axis is green. The tips and the young leaves are hairless. Cobwebby hairs appear during leaf growth. The leaves are orange (PEITEL' 1953).

The mature leaf is large or medium, cordate, deeply five lobed. The leaf blade is wrinkled, involute, with uplifted edges. The petiole sinus is closed, with a narrow elliptic lumen or without any, rather overlapped (this is a typical character for the lower leaves); or it is open, deep lanceolate, or more often lyre-shaped. Bristly hairs cover the lower leaf side along the veins. The teeth on end of the lobes are big, narrow-triangular, with convex sides and with sharp tips. The petiole sinus is green or pink and shorter than the main vein. The leaves are lemon-yellow in autumn.

The bunch is large (15-20 x 11-13 cm), cylindrical or cylindrical-conical, loose or medium loose. The peduncle is 3-5 cm in length, herbaceous and light-green.

The berry is big (20-26 x 19-21 mm), oval, sometimes rounded or oblong, light green, with white, medium dense bloom. It has little brown spots on the sunny side and a pink hue. The skin is rough, medium thick and easy to peel off. The flesh is firm, crispy, fleshy, with 3-4 big seeds. The taste is fresh and rather astringent.

The seeds are big (6-8 x 4-5 mm), light brown, slightly oval with a rather sharp transition to short beak. The chalaza is prolonged-oval and hollow in the middle. The ventral groove is large and sinuous. The beak is short, conical, with a blunt top (LAZAREVSKII and ALIEV 1965).



Phenology

Time of bud burst: end of April

Time of blooming: second part of June

Time of veraison: middle of August

Time of ripening: end of September - first part of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous, with many side-shoots

Bud fertility (bunches per winter bud): 0.5-0.7

Shoot fertility (bunches per shoot): 1.0-1.2

Bunch weight: 250-900 g

Berry weight: 3.0-7.0 g

Yield per vine: 3.1-6.0 kg

Yield: 10-18 t·ha⁻¹

Climate and cultivation requirements

'Agadai' has a long vegetative period and satisfactory cane maturation. It is suitable for the hilly zones of South Dagestan in North Caucasus and for the South coast of Crimea. It requires 2,200-5,600 plants per hectare density, long canes with 10-12 buds, warm weather and an expanse training system. It grows well on light chestnut soils with low clay.

Resistance to diseases and unfavorable weather

Susceptibility to *Plasmopara viticola* is low and medium towards *Erysiphe necator* and grey mold (*Botrytis cinerea*). It is low-susceptible to frost (-16 °C) and high-susceptible to drought. It is susceptible to frost in late spring. Grapes are worse on clayey, swamp and salted soils.

Juice characteristics

Sugar: 12.0-15.0 %

Total acidity: 5.0-10.0 g·L⁻¹

Wine and grape characteristics

'Agadai's transport resistance is very high, it is suitable for long storage and for the production of pickles and compotes. The fresh grape's sensorial grade is 7.8-8.1 out of 10. Low sugar content, the slight astringent taste, roughness and the low juiciness make 'Agadai' a poor dessert fruit.

Alen'kii N.

Synonyms

'Pink Muscat' (wrong name used in the Semikarakorskii district of Rostov).

Meaning of the name

Scarlet.

Historical notes and cultural importance

'Alen'kii' is a rare local wine variety from Don. It is probably a natural crossing of unknown West-European varieties. The variety is spread in single vines within the old vineyards of the Semikarakorskii and Ust-Donetsk districts of Rostov (ALIEV *et al.* 1963).

Taxonomy and intra-variety variability

Proles *occidentalis* Negr.

No biotypes and clones of this variety have been selected so far.

Essential ampelographic characteristics

The tip of the young shoot is dark-green, with a dark brown tint on the following distal leaves. Very dense hairs make the leaf's lower side white. The mature leaf is medium size, circular, medium or slightly three or five lobed. The upper leaf surface is reticular-wrinkled, seldom slightly bristled. The leaf blade is slightly involute. The upper leaf sinuses are medium or small, closed, narrow or wide, elliptic with a sharp base, sometimes with a tooth in the base. The lower leaf sinuses are medium or open, lyre-shaped, V-shaped with a sharp or pointed base. The petiole sinus is open and lyre-shape, seldom arched with a sharp base. The teeth on the end of blades are large, sharp, seldom with slight convex sides. The lateral teeth are medium, triangular, serriform, with sharp ends. Hairs on the lower surface are weak, cobwebby, with short bristle. The petiole is as long as the main vein.

The flower is female.

The bunch is medium (12-14 cm in length), conic or cylindrical-conic, loose or very loose, sometimes medium dense.

The berry is small or medium (14-15 x 13-14 mm), slightly oval, black, with dense bloom. The thin skin is firm and rough. The flesh is juicy. The taste is neutral. In the berry there are 3 or 4 seeds (ALIEV *et al.* 1963).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: the first ten days of June

Time of veraison: the first ten days of August

Time of ripening: the second ten days of September

The vegetative period is 140-150 days.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of growth: medium

Bud fertility: 0.7

Bunch weight: 60-90 g

Yield per vine: 0.6-1.3 kg

Yield: 2-4 t·ha⁻¹.

Climate and cultivation requirements

'Alen'kii' is middle-late. Cane ripening is good. It is preserved in the collections of Don and Kuban. The best pollinators are 'Bulanyi', 'Krasnostop Zolotovskii' among others. Strong berry shot is not reported.

Resistance to diseases and unfavorable weather

The variety has a rather high resistance towards *Plasmopara viticola* and grey mold (*Botrytis cinerea*) and it is medium susceptible to *Erysiphe necator*. It is not drought and frost resistant.



Juice characteristics

Sugar: 18.2-27.6 %

Total acidity: 6.2-15.2 g·L⁻¹

In Novocherkassk sugar reaches 22.3 % and total acidity 10.2 g·L⁻¹ in middle September.

Wine and grape characteristics

'Alen'kii' is used for making satisfactory table and dessert wines. It is usually blended.

Alyi Terskii N.

Synonyms

'Alyi', 'Alyi Stanichnyi', 'Kara Bar', 'Mestnyi Alyi', 'Dzhadu Tsibil', 'Cheer Tsibil', 'Cheereb Tsibil' (Russia).

Meaning of the name

Scarlet from Terek (like a wine from the sandy soils of Terek).

Historical notes and cultural importance

'Alyi Terskii' is spread in some districts of Dagestan and Stavropol' Krai, where it was introduced from Kizlyar or from the nearby Cossack villages of Terek.

'Alyi Terskii' is included in the official list of varieties recommended for cultivation in North Caucasus established by the "Russian Federation's State Commission for Selection Achievements, Tests and Protection" since 1959. In Russia, 'Alyi Terskii' covers 72 ha (TROSHIN and RADCHEVSKII 2005).

Taxonomy and intra-variety variability

Proles *pontica* Negr.

It is probably a seedling of a Georgian variety (PEITEL' 1953).

Essential ampelographic characteristics

The tip of the young shoot and the first two or three distal leaves are covered on both sides with dense white hairs. Also the lower side of the fourth and fifth distal leaves are covered with dense white hairs. The leaves are golden in the middle and yellow-orange on the swellings of the upper leaf blade and on the edges. On the lower surface there are pink spots. The shoot axis is covered with hairs.

The mature leaf is large, slightly oval or rounded cordate or circular, deeply five or seven lobed, dark green. The leaf blade is undulated-folded, funnel-shaped, revolute and wrinkled. The upper leaf sinuses are deep, rarely medium, just overlapped, with an elliptic or oval lumen; the base is sharp, seldom with a tooth in the base. The lower leaf sinuses are deep, seldom medium deep, closed with wide elliptic or oval lumen and a sharp base or seldom open and lyre-shaped. The petiole sinus is closed, wide lyre-shaped with a round or flat base; sometimes bordered by veins. The lower side of the leaf blade is covered with dense cobwebby hairs, bristly along the veins. The petiole is brownish, as long as the middle vein or a little bit shorter. The flower is hermaphrodite.

The bunch is medium or large, wide conical, frequently winged or branched and loose.

The berry is medium size, rounded or slightly oval and dark blue. The skin is rather thin, firm, easy to peel off and covered with dense bloom. The flesh is juicy and not very concentrated. The juice is colorless. The berries are moderately sweet and neutral (LAZAREVSKII and ALIEV 1965).

Phenology

Time of bud burst: end of April

Time of bloom: second ten days of June

Berries ageing time: second ten days of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bunch weight: 200-265 g

Yield: 15-18 t·ha⁻¹

Bud fertility (bunches per winter bud): 0.6-0.9

Shoot fertility (bunches per shoot): 1.1-1.3

Climate and cultivation requirements

'Alyi Terskii' has a long vegetative period and good cane maturation. It is perspective for cultivation in the regions of the North Caucasus. It grows well on slightly stony-gravelly soils on the hills and on alluvial irrigated soils in the plain.



The variety is susceptible to warm weather. It requires expanse training system and long pruning, shoot vigor diminishes over 30 spurs per vine, but flower and berry shot increase.

Resistance to diseases and unfavorable weather

The variety is medium resistant to *Plasmopara viticola*, *Erysiphe necator* and European grapevine moth (*Lobesia botrana*). It is rather resistant to frost and salt.

Juice characteristics

Sugar: 17.2-19.6 %

Total acidity: 7.8-8.4 g·L⁻¹

Wine and grape characteristics

'Alyi Terskii' is used for making spirits, brandy, pomace brandy and the Chikhir table wine.

Alzub R.

Synonyms

Unknown.

Meaning of the name

Bright.

Historical notes and cultural importance

It is a native variety of Dagestan. In the past it was spread as single vines in vineyards of Tabasaranskii district (PEITEL' 1963). The variety is rarely spread. The grape is used for local fresh consumption.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

Biotypes or clones of this variety are not registered yet.

Essential ampelographic characteristics

The tip of the young shoot and the following three leaves are brownish-red, with green veins. The hairs on the lower side are very weak.

The mature leaf is medium size, rounded, deeply five lobed, with additional leaf sinuses. The blade is bent or slightly funnel-shaped. The upper leaf surface is smooth. The upper leaf sinuses are deep, open, lyre-shaped, with a narrow mouth and a sharp base. The lower leaf sinuses are medium deep, open and similar to the upper ones. The teeth on the end of the lobes are triangular, with slightly convex sides and a sharp top. The lateral teeth are similar to the previous ones. The petiole sinus is open, vaulted, narrow with a sharp base, sometimes with a tooth. The lower leaf side is hairless. The petiole is as long as the medium vein.

The flower is female.

The bunch is medium size, cylindrical and very loose.

The berry is medium size, oval and dark pink. The skin is thin and medium firm. The flesh is delicate, juicy, crispy and neutral. The juice is colorless. In the berry there are generally one or two seeds.

The chalaza is big, dark-grey, oval or rounded, slight pressed, almost flat. The beak is cylindrical, oblique and truncated on the dorsal side (PEITEL' 1963).

Phenology

Time of bud burst: middle of April

Time of blooming: first part of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September

The length of period from bud burst to ripening is 132-140 days.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility (bunches per winter bud): 0.5

Bunch weight: 140 g

Yield per vine: 3.0-3.5 kg

Yield: 6-7 t·ha⁻¹

Climate and cultivation requirements

'Alzub' has a medium vegetative period and good cane maturation.

Resistance to diseases and unfavorable weather

The variety is medium susceptible to *Plasmopara viticola*, high susceptible towards *Erysiphe necator* and low susceptible to grey mold (*Botrytis cinerea*). Frost resistance is medium and drought resistance is moderate. Fruit drop is significant (up to 14 %).

Juice characteristics

Sugar: 17.2 %

Total acidity: 4.3 g·L⁻¹

Wine and grape characteristics

The variety has medium transport resistance and not very high quality.



Asyl Kara N.

Synonyms

'Kizlyarskii Chernyi', 'Praskoveiskii Chernyi', 'Mestnyi Chernyi', 'Vengerka Chernaya', 'Kizlyari' (Russia).

Meaning of the name

Hanging, pendent, dangling, suspended - black.

Historical notes and cultural importance

'Asyl Kara' is one of the oldest varieties of North Caucasus (Stavropol' Krai, Dagestan). It is mainly spread in the Prikumskii and Priterskii districts. The variety was probably introduced from the South of Caucasus in the beginning of viticulture in the River Terek's basin (MARCHENKO and PETTEL' 1953).

The variety is cultivated in the viticultural regions of North Caucasus (Stavropol' Krai, Dagestan, Chechnya). It is included in the in the official list of varieties recommended for cultivation in North Caucasus established by the "Russian Federation's State Commission for Selection Achievements, Tests and Protection" since 1965 (Catalogue of Varieties 2007). In Russia there are 18 ha under 'Asyl Kara' (TROSHIN and RADCHEVSKII 2005).

Taxonomy and intra-variety variability

Proles pontica Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

Two variations of 'Asyl Kara' have been selected and described:

'Krasnolozka' (with little fruit): bright wine-red young shoots; red fluffy buds; dark-red petiole; more lobed and rounded leaves; denser bunch; bigger and slightly flat berries. The variation is less yielding as a result of the great number of fruitless shoots.

'Belolozka' (with many grapes and loose bunches): distinguishable light coloration of the vine; anthocyanins on the petiole and on the veins are absent; light-green and slightly dissected leaf lobes with sharp blade and closed, chinked petiole sinus; big inflorescence with many flowers; no cup drop; big and loose bunch; smaller berries; higher number of fruity shoots and high fertility.

Essential ampelographic characteristics

The tip of the young shoot is covered with hairs. Hairs cover also the upper surface of the first three leaves and the lower surface of the first four or five leaves. The leaves are light-bronze on the protuberances of the leaf blade. The shoot axis is brown covered with hairs.

The mature leaf is medium size, rounded or slight cordate, deeply five lobed. The leaf blade is plane, the upper surface is reticular-wrinkled and dark-green. The upper leaf sinuses are deep, sometimes very deep, close, with an oval or wide-elliptic lumen and a rounded or sharp base with rare tooth on the base. Open lyre-shaped leaf sinuses are very rare. The lower leaf sinuses are deep, closed with oval or wide elliptic lumen or seldom open, lyre-shaped with narrow and sharp base, sometimes with a tooth on the base. On the lower lobes there are secondary little leaf sinuses. The petiole sinus is open, lyre-shaped and arched with a wide plane or sharp base. The lower leaf side is covered with dense bristly cobwebby hairs. The petiole is as long as the main veins or longer. The leaves are red in autumn.

The flower is hermaphrodite.

The bunch is medium size, cylindrical or cylindrical-conical, winged, sometimes with three or four wings, medium dense, sometimes loose.

The berry is medium size, rounded or slightly flat and black-blue. The skin is medium thick, not firm, covered with bloom, easy to wipe. The flesh is juicy, not concentrated, with pink veins. The juice is pink. The taste is neutral and slightly astringent. The seeds are one or two, rarely three or four per berry (MARCHENKO and PETTEL' 1953).

Phenology

Time of bud burst: end of April

Time of blooming: first half of June

Time of veraison: first part of August

Time of ripening: second part of September



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigor

Bud fertility (bunches per winter bud): 0.9-1.1

Shoot fertility (bunches per shoot): 1.2-1.4

Shoot fruiting: 70.0-92.0 %

Bunch weight: 210-280 g

Berry weight: 2.2 g

Yield: 8-25 t·ha⁻¹

Climate and cultivation requirements

'Asyl Kara' grows in warm regions, especially on sandy soils. Higher bud-load and fruitless shoot toppings are recommended in those areas where winter covering is necessary. 'Asyl Kara' is trained on the "fan like" system with four or six spurs, long pruning and 12 buds.

Resistance to diseases and unfavorable weather

The variety is highly susceptible to berry drying. It is low-resistant towards the fungal diseases, especially towards *Plasmopara viticola*. 'Asyl Kara' has medium resistance to the European grapevine moth (*Lobesia botrana*), and it is highly susceptible to winter and spring frost. It is more salt resistant than other varieties.

Juice characteristics

Sugar: 18.0-25.0 %

Total acidity: 5.4-9.2 g·L⁻¹

Wine and grape characteristics

'Asyl Kara' is used for making ordinary table wines, strong wines, spirits and brandy in blend with 'Alyi Terskii' grapes.

Bor Kara N.

Synonyms

'Kara Bor' (Dagestan).

Meaning of the name

Very dark-blue.

Historical notes and cultural importance

No data about origin of 'Bor Kara' is available. It is an old, rare, local Dagestan variety. It is found only in few places and mixed with other varieties (PEITEL' 1963).

Taxonomy and intra-variety variability

Proles *pontica* Negr.

No biotypes or clones of this variety are registered so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with dense cobwebby hairs with a rose-red tint on the edge. The axis of the young shoot is brown-red.

The mature leaf is large, oval, elongated, deeply five lobed. The blade is almost plane, reticular-wrinkled on the upper surface and matt. The upper leaf sinuses are deep, closed with an elliptic lumen or open with a narrow or wide elliptic lumen and with a slightly sharp base. The lower leaf sinuses are medium or deep, closed with a narrow elliptic lumen or open, lyre-shaped, narrow arched and with a rounded base. The petiole sinus is closed with a wide elliptic lumen and rounded base. The lower leaf side is covered with medium dense bristly cobwebby hairs. The petiole is as long as the medium vein or shorter.

The flower is hermaphrodite. There are six stamina. The filaments are as long as the anther or shorter. The ovary is wide-conical, uneven, with a gradual transition to a very short cylindrical style. The stigma is smaller and whole.

The bunch is large, cylindrical-conic, with lobes, medium dense, quite often dense. The peduncle is medium (4-5 cm) and usually lignified up to joint.

The berry is medium or large, rounded or slightly flat, with clear longitudinal segmentation (veining), dark blue, with medium dense bloom. The skin is medium thick and medium firm. The flesh is juicy and not concentrated. In the berry there are often two or three seeds.

The seed is big, rounded and dark-brown. The chalaza is located in the middle of the seed's body; it is rounded, almost flat or slightly hollow in the middle. The beak is short, conical and truncated.

The mature cane is yellowish-brown with clear dark stripes. The nodes are more intense in color than the internodes (PEITEL' 1963).

Phenology

Time of bud burst: end of April

Time of blooming: middle period of June

Time of veraison: second ten days of August

Time of ripening: second part of September

The vegetative period is 134-140 days in Derbent (South Dagestan).

Vegetative and yielding characteristics

The habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility (bunches per winter bud): 0.5

Shoot fertility (bunches per shoot): 1.01

Bunch weight: 286 g (up to 600-700 g)

Berry weight: 2.7 g

Yield per vine: 2.0-8.0 kg (average - 5.1 kg)

Yield: 16 t·ha⁻¹ (on light-brown soils in Dagestan, "fan like" training system, 2.0 x 1.5 m planting layout, irrigation by winter supply)

Climate and cultivation requirements

'Bor Kara' shows a late vegetative period and good cane maturation. It demands an expanse "fan like" training system, high bud load and fruit load regulation by cutting.



Resistance to diseases and unfavorable weather

'Bor Kara' has poor resistance towards *Plasmopara viticola*. Susceptibility towards grey mold (*Botrytis cinerea*) is medium. Frost resistance is poor. Berry shot is almost absent.

Juice characteristics

Sugar: 15.0-17.0 % (19 % in single years with some old vines)

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

'Bor Kara' is blended with other red varieties, especially with 'Asyl Kara', to make red table wines. The mono varietal wines are poor, worse than those made by 'Asyl Kara'.

Boryu Izyum B.

Synonyms

Unknown.

Meaning of the name

Wolf's grape.

Historical notes and cultural importance

Historical data about the origin of this Dagestani variety is not available. It was discovered with other local varieties in the village of Kumtorkala (PEITEL' 1963). 'Boryu Izyum' is rare and has only local importance.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

No clones of the variety have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is hairless, glossy, light green with a slight, light-bronze tint. The shoot axis is hairless, light-green and light grey on the dorsal side.

The mature leaf is medium size, rounded, medium or deeply five lobed, with small secondary leaf sinuses on all lobes. The leaf blade is slightly undulated or funnel-shaped, with uplifted edges. The upper leaf surface is light green and smooth. The upper leaf sinuses are medium, rarely deep, closed with narrow elliptic lumen; often open, narrow lyre or V-shaped. The lower leaf sinuses are medium or small, close, without lumen or with narrow elliptic lumen; often it is open, narrow elliptic or V-shaped. The petiole sinus is open, deep, vaulted, chinked or lyre-shaped, with a rounded base and often with teeth on one side or on both. The teeth on the ends of the lobes are sharp-triangular or with slightly convex sides and a sharp top, bigger than the lateral teeth. The lateral teeth are narrow triangular, very pointed, with straight or slightly convex sides and a sharp top. The lower leaf side has rare bristles next to the veins bifurcation, sometimes all along the main veins. The petiole is almost as long as the main vein and red-violet.

The flower is hermaphrodite. The stamens are five, rarely six or seven. The filaments are longer than the anther. The ovary is twisted, with a direct transition to the conical style. The stigma is capitated, well-developed and slightly double.

The bunch is medium size, cylindrical or cylindrical-conical, shouldered, medium dense, sometimes loose. The peduncle is medium size, lignified in the base or, more often, up to the joint.

The berry is medium size, almost large, rounded or slightly flat, green-golden, with a clear hilum. The skin is medium thick, covered with dense bloom, hard to peel off. The flesh is medium juicy and fleshy. The taste is neutral. In the berry there are two or three, sometimes four seeds.

The seeds are medium size, oval, slightly short-cut to the beak and light-brown. The chalaza is located in the higher part of the seed's body; it is oval and hollow in the middle. From the chalaza to the beak there is a clear furrow. The beak is medium, wide, blunt truncated, with a protuberance on the end.

The mature cane is light brown with dark longitudinal stripes. It is covered with clear wax bloom. The internodes are darker (PEITEL' 1963).

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

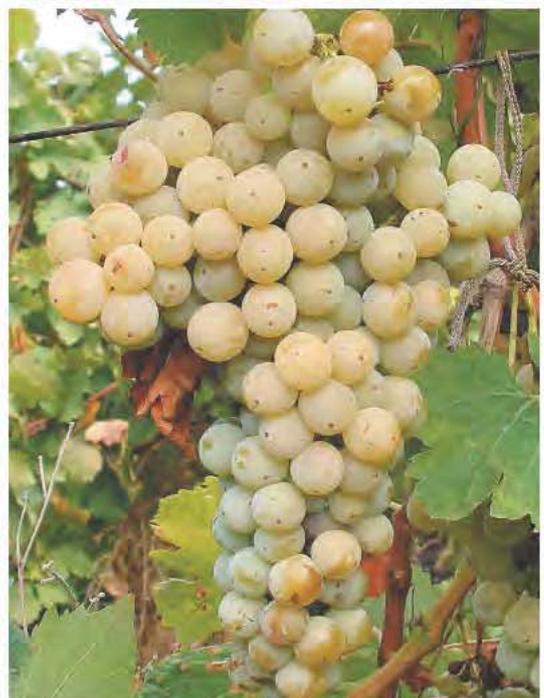
Time of ripening: first ten days of September

The vegetative period is 131-145 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium



Bud fertility (bunches per winter bud): 0.7

Shoot fertility (bunches per shoot): 1.39

Shoot fruiting: 57.0 %

Bunch weight: 225 g

Berry weight: 3.7 g

Yield per vine: 4.5-6.5 kg

Yielding: high (14-20 t·ha⁻¹ in Derbent, with the "fan like" training system, four fruity spurs per vine and irrigation).

Climate and cultivation requirements

'Boryu izyum' is a medium time ripening variety with good cane maturation. It is suitable for the viticultural zones of Dagestan. Berry rot is not observed.

Resistance to diseases and unfavorable weather

The variety is not resistant to *Plasmopara viticola*. Susceptibility towards *Erysiphe necator* and berry dry-rot is low. 'Boryu izyum' is not particularly resistant to frost and drought.

Juice characteristics

Sugar: 14.0-15.0 %

Total acidity: 4.0-5.0 g·L⁻¹

Wine and grape characteristics

'Boryu Izyum' is a rather poor quality, local table grape variety. Transport resistance is low.

Bruskovaten'kii N.

Synonyms

'Bruskovatyi' (Don).

Meaning of the name

It is supposed to be the surname of a Cossack, Bruskovatyi.

Historical notes and cultural importance

This is a rare local wine variety of Don. Single vines are found within the old vineyards of the Konstantinovskii district of Rostov (ALIEV *et al.* 1963).

Taxonomy and intra-variety variability

Proles orientalis subproles caspica Negr.

No phenotypic variations have been revealed so far. 'Bruskam' is a 'Bruskovaten'kii's offspring.

Essential ampelographic characteristics

The tip of the young shoot is green with brown-reddish stripes. The first distal leaves are entire, three lobed and copper-brown. On the lower side there are green veins and hairs.

The mature leaf is medium size, rounded, medium three or five lobed. The upper leaf surface is reticular-wrinkled and the lower side is hairless. The upper leaf sinuses are medium, closed with an oval lumen, rarely with a sharp base. The lower leaf sinuses are small, open, lyre-shaped, almost with parallel sides and a slightly sharp base. The petiole sinus is closed with an elliptic lumen and a sharp or rounded base. The teeth in the end of the lobes are small, triangular with a wide base and slightly convex sides. The lateral teeth are similar. The lower leaf side is hairless, rarely with weak cobwebby hairs. The petiole is longer than the medium vein.

The flower is female.

The bunch is small, cylindrical and loose.

The berry is small (16 x 15 mm), slightly oval, black, with dense bloom and a bluish shade. The skin is dense, firm and rough. The flesh is juicy. The juice is colorless. The seeds are one or two per berry (ALIEV *et al.* 1963).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September

The vegetative period is 140 days in Don.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility (bunches per winter bud): 0.4

Bunch weight: 100 g

Yield per vine: 0.5-0.8 kg

Yield: 1.5-2.2 t·ha⁻¹

Climate and cultivation requirements

'Bruskovaten'kii' shows a medium vegetative period and almost full cane maturation. The best pollinator varieties are 'Bulanyi', 'Krasnostop Zolotovskii'.

Resistance to diseases and unfavorable weather

The variety is susceptible towards *Plasmopara viticola* and low-susceptible towards *Erysiphe necator*.

Juice characteristics

Sugar: 19.9-24.2 %

Total acidity: 5.5-12.0 g·L⁻¹

In Novocherkassk, in the middle of September, average total acidity and sugar content are 21.8 % and 8.2 g·L⁻¹ respectively.



Wine and grape characteristics

'Bruskovaten'kii' is blended with other local varieties to make table wine. The mono varietal wine is poor.

Bulanyi N.

Synonyms

'Yasnyi', 'Kubyshechnyi', 'Kormilets' (Don).

Meaning of the name

Named after the color of the berry.

'Kormilets' = Then name is linked with high and regular harvesting of the variety.

Historical notes and cultural importance

According to SKUN' (1953) 'Bulanyi' is one of the most widespread varieties in the old vineyards of the River Don's basin. Thus, the variety has several synonyms in different regions. 'Bulanyi' is also a good pollinator for 'Pukhlyakovskii'. It is suggested that the variety was originated in Don at the beginning of the XVII century. According to the "Statistical description of the Don's Cossack lands", (1822-1832) (SKUN' 1953) 'Bulanyi' was introduced from Astrakhan together with 'Slitnoi', 'Zheludevyi' and other varieties. However, the absence of 'Bulanyi' in the old vineyards of Astrakhan and the lack of references about it, put this hypothesis in doubt. More likely, 'Dzhevat Kara' was introduced from Crimea to Don and a seedlings of this variety have given origin to 'Bulanyi'.

'Bulanyi' was introduced from Rostov into the neighboring viticultural regions, arriving in Volga at the end of the XVIII century and to North Caucasus at the beginning of XIX century. 'Bulanyi' is sometimes confused with 'Sevryuk', 'Krutoi', 'Chalyi', 'Krestatic' and 'Mozak Chernyi', but it is a distinct variety.

Nowadays, 'Bulanyi' is a rare variety, grown in small plots mostly in the South of Russia.

Taxonomy and intra-variety variability

Proles *orientalis* Negr. subproles *meridionali-balcanica* Trosch. (TROSHIN 1999, 2002, 2007; TROSHIN *et al.* 1996, 1999).

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light-green, hairless or rarely with very sparse hairs. The young leaves are hairless, glossy, with a deep and sharp tooth. The third leaf is light, greenish-brown or sometimes greenish-bronze on both sides.

The mature leaf is big, rounded, often asymmetric, medium or slightly five lobed. The upper leaf side is dark-green, glossy, smooth or gross vesicular. The leaf blade is less folded at mid veins with involute lower lobes. The leaf is slightly revolute. The main veins are violet towards the base. The upper leaf sinuses are medium, closed, with an irregular elliptic lumen or with a sharp or rounded base; sometimes lyre-shaped, almost with parallel sides. The lower leaf sinuses are small, open, lyre-shaped almost with parallel sides and a sharp base, rarely closed and chinked. The petiole sinus is closed, narrow elliptical or chinked, sometimes overlapped and lyre-shaped. The lower leaf side is hairless. The petiole is shorter than the medium vein, red-brown or red-violet, sometimes with stripes. The teeth at the end of the lobes and lateral teeth are large, triangular, slightly convex on both sides and with sharp tips.

The flower is hermaphrodite.

The bunch is medium size (15-17 cm), conical, often winged, medium dense or dense.

The berry is medium size, rounded or slightly flattened and black-blue. The skin is thick, firm, rough, with dense bloom. The pulp is fleshy and medium thick. The taste is neutral, astringent, sometimes with a slight herbal aroma. In the berry there are between 1 and 3 seeds (SKUN' 1953).

Phenology

Time of bud burst: end of April

Time of blooming: first half of June

Time of veraison: the first part of August

Time of ripening: the second part of September



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility (bunches per winter bud): 0.6-0.9

Shoot fertility (bunches per shoot) is 1.3-1.5

Shoot fruiting: 50-60 %

Bunch weight: 150-260 g

Berry weight: 2.2 g

Yield: 14-23 t·ha⁻¹

Climate and cultivation requirements

'Bulanyi' is a modest variety with a very good ability to adapt to different conditions.

In Don, the best yield is achieved in fertile and soils rather rich in water, mainly on the alluvial black "Chernozem" soils, or on "Chernozem" soils situated on the hills. It grows well also on sandy soils. Wide planting layout, long pruning, the 'fan like' training system and leaving a large amount of wood are recommended for 'Bulanyi'.

Resistance to diseases and unfavorable weather

Resistance towards *Plasmopara viticola* is high. Grey mold (*Botrytis cinerea*) on berry is observed only in a rainy autumn. The variety is low-resistant towards frost.

Juice characteristics

Sugar: 14.8-21.7 %

Total acidity: 4.7-8.7 g·L⁻¹

In the middle of September, in Novocherkassk, the average sugar content and acidity reach 18.5 % and 6.4 % respectively.

Wine and grape characteristics

'Bulanyi' is a high yield table-wine variety. It has big and attractive bunches, pleasant flavor, and high transport resistance.

Bulanyi Belyi B.

Synonyms

'Belobulanyi' (Don).

Meaning of the name

White Bulanyi.

Historical notes and cultural importance

'Bulanyi Belyi' is a local variety whose origin is unknown. It is similar to 'Bulanyi' (black), however, there are very few studies about this variety. It is found in single vines within the old vineyards of the River Don basin, particularly in the Novocherkassk and Razdorsk districts of Rostov (ALIEV *et al.* 1963).

Taxonomy and intra variety variability

Proles *orientalis* Negr. subproles *meridionali-balcanica* Trosch. (TROSHIN 1999, 2002, 2007; TROSHIN *et al.* 1996, 1999).

There are no registered clones.

Essential ampelographic characteristics

The tip of the young shoot is green with reddish edges. The first distal leaves are five lobed, brownish-red with greenish veins. The lower leaf side is covered with rare bristles.

The mature leaf is large, circular and medium five lobed. The leaf blade is reticular-wrinkled, funnel-shaped or folded at mid vein. The lower leaf sinuses are medium, often closed, wide elliptic with a sharp base, seldom chinked. The petiole sinus is closed with elliptic or chinked lumen and a sharp base. The teeth on the ends of the lobes are large, wide-triangular with slightly convex sides. The lateral teeth are large, triangular with a wide base and slightly convex sides. The lower leaf side is hairless. The petiole is as long as the medium vein.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conical or conical, rarely winged, medium thick or loose.

The berry is small, rounded, light green with white tints. The skin is thick. The flesh is juicy and neutral. There are two-three seeds per berry (ALIEV *et al.* 1963).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

The vegetative period is 140-150 days on the lower basin of the river Don.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility (bunches per winter bud): 0.7

Bunch weight: 125 g

Yield per vine: 1.9-3.3 kg

Yield: 6-10 t·ha⁻¹

Climate and cultivation requirements

Cane maturation is good.

Resistance to diseases and unfavorable weather

The variety has medium resistance to *Plasmopara viticola*. It is medium frost resistant and sufficiently drought resistant. Berry shot is usually not observed.

Juice characteristics

Sugar: 18.6-21.8 %

Total acidity: 4.4-10.1 g·L⁻¹



Wine and grape characteristic

'Bulanyi Belyi' is a double aptitude variety. It makes up to 10.0 % alcohol, ordinary table wines and it is consumed fresh.

Buryi N.

Synonyms

'Astrakhanskii Krasnyi' (Astrakhan' and Volgograd territories), 'Silogradskii', 'Sypun', 'Vengerets' (Hungarian), 'Yadrenika' (Russia).

Meaning of the name

Brown.

'Astrakhanskii krasnyi' = Red from Astrakhan'.

Historical notes and cultural importance

'Buryi's geographic origin is unknown.

SKUIN' (ALIEV *et al.* 2006) suggests, due to the morphological similarity, that 'Buryi' is a 'Hungarian Blue' seedling. The spreading pattern of the two varieties is similar.

According to I.A. AVILOV (1896) (SKUIN' 1963) and other authors, 'Hungarian blue' and 'Buryi' grew together in many old vineyards of the Don basin. For a very long time 'Buryi' was not recognized as a separate variety. The 120 year-old 'Buryi' vines confirm the ancient presence of this variety in the Don region. However, 'Buryi' is present in Astrakhan', where it is also considered as a native variety. This suggests that 'Buryi' was introduced to Don and North Caucasus from Astrakhan'. In the past it was also widespread in Rostov, Stavropol', Krasnodar and Volgograd. However, nowadays, 'Buryi' is less important than in the past, and it is rarely planted in new vineyards.

Taxonomy and intra-variety variability

Proles *orientalis* Negr.

No biotypes have been described or registered.

Essential ampelographic characteristics

The tip of the young shoot is greenish-yellow with a brown-reddish hue and hairless. Hairs become visible from the third leaf on.

The mature leaf is large, circular and strongly five lobed. The leaf profile is slightly rolled. The upper leaf surface is smooth, slightly glossy. The lower leaf sinuses are closed, deep, with an oval lumen and a rounded or pointed base. The lower leaf sinuses are closed, deep, with a wide elliptical or triangular lumen and a rounded or pointed base. The petiole sinus is overlapped, and oval; but also open, lyre-shaped and with a pointed base. The teeth on the end of the lobes are triangular, large, with slightly convex tops. The lateral teeth are serriform, slightly convex on both sides and with a sharp top, slightly delayed along an edge. The hairs are weak and bristly. The petiole is shorter than the medium vein, wine-red, attached to the shoot making a straight angle.

The flower is female.

The bunch is medium or rather large, conic or rarely winged and dense. The peduncle is long (5-6 cm).

The berry is medium or large (about 18 mm in diameter), slightly flat, violet-red with dark-brown bloom. The skin is rather thick, rough, difficult to peel off, covered with not very dense bloom. The flesh is firm and astringent. In the berry there are two or three seeds.

The seed is large, wide and light brown. The chalaza is rounded and located in the center of the seed's body. The beak is short (SKUIN' 1963).

Phenology

Time of bud burst: second part of April

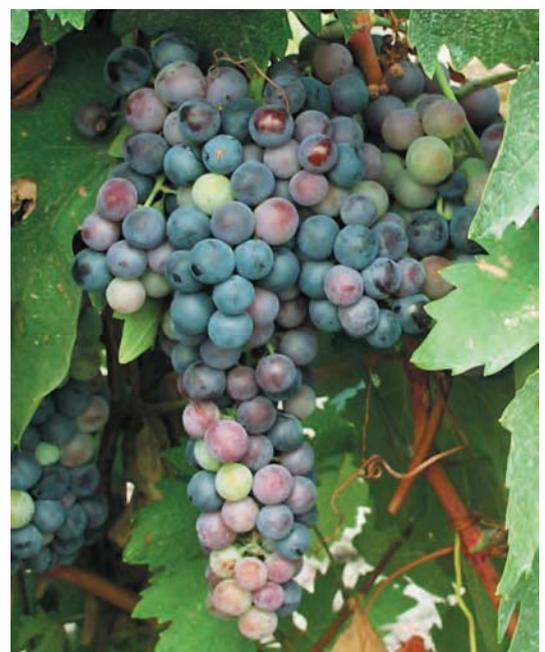
Time of blooming: first ten days of June

Time of veraison: first part of August

Time of ripening: middle of September

The vegetative period is 136 days in Novocherkassk and 144 days in the Razdorskii district of Rostov.

The length of the period from bud burst to ripening is 136 days in Novocherkassk and 144 days in the Razdorskii district of the Rostov territory.



Vegetative and yielding characteristics

Vigor of shoot growth: medium and vigorous

Bud fertility: 0.5

Bunch weight: 180-330 g

Berry weight: 3.5 g

Yield per vine: 1.5-2.5 kg

Yield: 3.6-6.2 t·ha⁻¹

Climate and cultivation requirements

Cane maturation is good. It is suitable for cultivation in North Caucasus.

Plants with old wood yield more. The best pruning is 10-12 buds per cane.

Flower drop is weak. Berry shot is observed in absence of pollinators. The

best pollinators are 'Vengerskii Sinii' ('Hungarian Blue'), 'Bulanyi' and

'Kosorotovskii'. The best quality is achieved on light fertile soils.

Resistance to diseases and unfavorable weather

The variety has low susceptibility towards fungal diseases. Resistance to

frosts is medium. Drought resistance is low.

Juice characteristics

Sugar: 16.5-19.7 %

Total acidity: 6.8-9.8 g·L⁻¹

In Novocherkassk, in the middle of September, the average sugar content and total acidity are 17.8 % and 6.6 g·L⁻¹ respectively.

Wine and grape characteristics

'Buryi' is used mainly as a table grape for local consumption. The berries are weakly attached to the peduncle and have a rather strong skin. The variety fears transport and it is not suitable for storage. Fresh grape sensorial grade is 6.5-7.0/10.

Chil' Gyulyabi R.

Synonyms

Unknown.

Meaning of the name

'Spotted' or 'Blue-Spotted Flower'.

Historical notes and intra-variety importance

No data are available about the origin of this rare Dagestani variety. 'Chil' Gyulyabi' has no similarity with 'Gyulyabi Dagestanskii', except for the pink berries (PEITEL' 1966).

'Chil' Gyulyabi' is a high yield variety and it is worth investigating its suitability for the production of semisweet and low alcohol wines.

Taxonomy and intra-variety variability

Proles *orientalis* Negr.

'Onitskanskii Belyi', among other varieties, is a progeny of 'Chil' Gyulyabi'.

Essential ampelographic characteristics

The tip of the young shoot is hairless, green with a light-bronze tint and glossy. The axis of the young shoot is hairless, green, with a red-brown tint on the sun-exposed side.

The mature leaf is medium size, circular, deeply five lobed. The leaf blade is slightly wide or vaguely bent down. The upper leaf surface is dark green, low reticular-wrinkled, almost smooth. The main leaf veins are usually red-brown almost up to the middle of the leaf. The lower leaf sinuses are medium and deep, closed with a wide or narrow, oval or elliptical lumen; rarely they are open, lyre-shaped with a narrow mouth. The base of the leaf sinuses is sharp. The petiole sinus is open, lyre-shaped with a sharp or rounded base, frequently with teeth on one side or on both. The petiole sinus usually is overlapped, with an elliptical lumen. The teeth on the ends of lobes are large, high cupola-shaped. The lateral teeth are triangular with a wide base, straight, arched or rounded-serriform. The lower leaf side is hairless. The petiole is hairless, red-brown, and shorter or equal to the medium vein.

The flower is hermaphrodite, with five, rarely six stamina. The filaments are longer than the anther. The ovary is oval. The style is short, almost cylindrical. The stigma is well developed and disc shaped.

The bunch is large, cylindrical, frequently with well developed upper lobes, loose, sometimes very loose with deformed berries. The bunch peduncle is medium and lignified up to the node. The seeds are easy to separate from the flesh.

The seed is medium size, pear-shaped and grey-brown. The chalaza is oval, pressed in the middle, closed, flat on the edge and slightly shifted to the top of the seed. The beak is lighter in color, medium, thick, cylindrical, expanded in the end, obtuse truncated, sometimes slightly bifurcated.

The mature cane is red-brown, covered with thick bloom. The nodes are dark red-violet (PEITEL' 1966).

Phenology

Time of bud burst: end of April or beginning of May

Time of blooming: second ten days of June

Time of veraison: third ten days of August

Time of ripening: middle of September

The vegetative period is 149 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

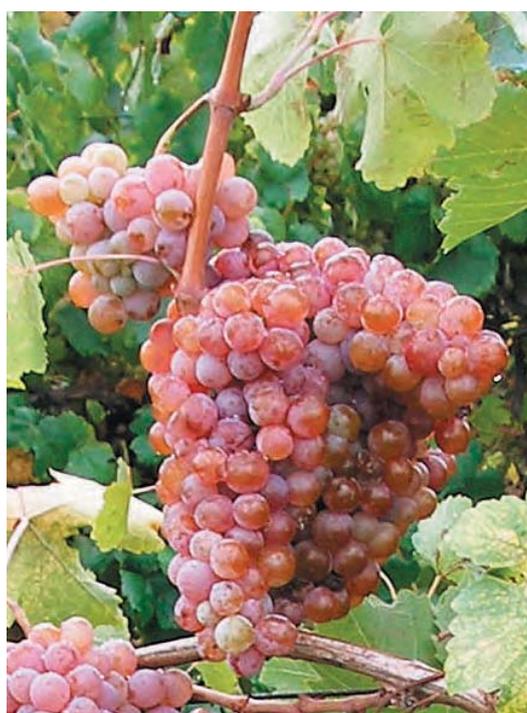
Vigor of shoot growth: vigorous

Bunch weight: 330 g

Berry weight: 3.79 g

Bud fertility: 0.7-0.9

Bud fertility (bunches per winter bud): 1.23



Shoot fruiting: 54.0-74.0 %

Yield per vine: 4.3-5.3 kg

Yield: sufficiently high (13-16 t·ha⁻¹ in Derbent with "fan like" training system, many spurs loading, planting layout 2.0 x 1.5 m and water irrigation)

Climate and cultivation requirements

'Chil' Gyulyabi' is a late ripening table grape variety. Cane maturation is 60-70 % on average. It needs moderate spur load and medium pruning. Berry shot is not observed. Fruit drop was not recorded.

Resistance to diseases and unfavorable weather

'Chil' Gyulyabi' is very susceptible to fungal diseases, especially to *Plasmopara viticola* and *Erysiphe necator*. It is also susceptible towards the European grapevine moth (*Lobesia botrana*).

In a rainy autumn it suffers from grey mold (*Botrytis cinerea*). Frost resistance is poor.

Juice characteristics

Sugar: 15.6 % (14.0-17.2)

Total acidity: 6.6 g·L⁻¹ (5.6-6.7)

Wine and grape characteristics

'Chil' Gyulyabi' is mainly used in blend to make table wine, and also for local fresh consumption. Transport resistance is poor, due to the soft skin. Berry crush load is 538 g; pedicel detachment force is 280 g.

The experimental sweet wine sensorial grade is 7.4/10.

The tests carried out in the lower River Don Basin (Novocherkassk) showed a higher sugar content than the grapes grown in Derben. This suggests the possibility of making light, fresh, harmonious white table wines, with grapes from non-irrigated vineyards.

Chol Ber N.

Synonyms

'At Guz' (Dagestan).

Meaning of the name

Horse Eye.

Historical notes and cultural importance

'Chol Ber' is a rare local variety. Its origin is unknown. Single vines or small groups are found in the vineyards in Northern Dagestan. 'Chol ber' is rather close to 'Khop Khalat'. It is interesting for breeding.

Taxonomy and intra-variety variability

Proles orientalis Negr.

No phenotype variations have been revealed so far.

Essential ampelographic characteristics

The mature leaf is medium size, rounded, weakly three or rarely five lobed. The blade is almost plain or slightly funnel-shaped. The upper leaf surface is slightly reticular-wrinkled. The upper leaf sinuses are open, small, only just expressed or wide V-shaped; rarely medium, lyre-shaped with a narrow mouth and a sharp base. The lower leaf sinuses are open, small, slightly expressed, sometimes chinked. The petiole sinus is open, vaulted, wide or square-shaped with a rounded base; often sagittate with a sharp base. The teeth on the ends of the lobes are triangular, with straight sides and sharp. The lateral teeth are similar, triangular-serriform or serriform with slight convex sides and a sharp but small top. The lower leaf side is hairless, only along the veins there are very rare bristles. The petiole is red-brown and as long as the medium vein or longer.

The flower is female.

The bunch is large, conic, rarely cylindrical-conic, frequently with a small wing, medium dense or rarely loose. The peduncle is short or medium, lignified. The pedicel is long and warty.

The berry is large, rarely medium, round or slightly oval, black or dark blue and covered with thick bloom. The skin is medium thick and firm. The flesh is fresh, juicy and slightly crispy. The juice is colorless. The flavor is simple, sour and only of moderate quality. In the berry there are between one and five seeds, more often two.

The seed is big or medium, dark brown and yellowish-brown near the beak. The seed's body is slightly oval or oval. The chalaza is rounded or oval, slightly pressed in the middle; it is almost in the center of the seed's body. The beak is short and medium, thick, blunt-truncated or slightly double ended.

The mature cane is dark brown and covered with weak bloom (PEITEL' 1966).

Phenology

Time of bud burst: end of April

Time of blooming: middle of June

Time of veraison: middle of August

Time of ripening: third ten days of September - first ten days of October

The vegetative period is 149-152 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium and higher than medium

Shoot fruiting: 53.0 %

Bud fertility: 0.58

Shoot fertility (bunches per shoot): 1.09

Bunch weight: 210-315 g (370 g rarely)

Berry weight: 3.52 g

Yield per vine: 2.3-9.2 kg

Yielding: high, but not stable (between 7.8-27.7 t/ha, average 15.1 t·ha⁻¹, in Derbent)



Climate and cultivation requirements

'Chol Ber' is a very late table grape variety with good cane maturation. Berry shot is not observed. Fruit drop was not reported.

Resistance to diseases and unfavorable weather

The variety is medium susceptible to *Plasmopara viticola* and *Erysiphe necator*. Susceptibility towards the European grapevine moth (*Lobesia botrana*) is rather low.

Juice characteristics

Sugar: 15.0 %

Total acidity: 6.9 g·L⁻¹

Wine and grape characteristics

'Chol Ber' is consumed fresh. It is suitable for winter storage and it keeps up to spring. Transport resistance is medium. The appearance is satisfactory.

Dokur B.

Synonyms

Unknown.

Meaning of the name

Chubby or Turgid. *Dokur* = Plump, Swelled (in Lezgian).

Historical notes and cultural importance

Dokur is a rare, native, Dagestani variety whose origin is unknown. It is found in single vines inside the old fruit orchards of the Kasumkentskii district of Dagestan, where vigorous grapevines are trained over fruit trees (ALIEV and PEITEL' 1963).

It is worth further studies for its large bunches and fine berries with good sensorial value. It is also perspective for breeding.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No biotypes have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light lemon, with short bronze pubescence.

The mature leaf is medium or large, rounded, deeply five lobed. The leaf is funnel shaped with slightly revolute edges. The upper leaf surface is light green and smooth. The upper leaf sinuses are deep, closed, almost without a lumen or with oval or elliptic lumen and a sharp base. The lower leaf sinuses are deep or medium deep, closed, similar to the upper sinuses, or open and lyre-shaped. The petiole sinus is closed, with an oval lumen, a sharp base, or open and lyre-shaped. The teeth on the end of the lobes are triangular with slightly rounded tops. The lateral teeth are triangular with slightly convex sides or serriform with sharp tips. The lower leaf side is hairless. The petiole is shorter than the medium vein.

The flower is hermaphrodite.

The bunch is large or medium, cylindrical-conic, medium dense or dense. The peduncle is short.

The berry is large, oval and white. The skin is thick and firm. The flesh is juicy. The taste is ordinary. There are between two and four seeds per berry.

The seeds are medium and dark-brown. The chalaza is oval, pressed in the middle. The beak is long and cylindrical, oblique truncated in the end (ALIEV and PEITEL' 1963).

Phenology

Time of bud burst: end of April

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: end of September - first ten days of October

The vegetative period is 148-160 days in Dagestan.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium or vigorous

Bud fertility: 0.4-0.6

Shoot fruiting: 25.0 %

Bunch weight: 300-310 g

Yield per vine: 2.1-3.0 kg

Yield: medium (7 t·ha⁻¹, in South Dagestan and Lower Don)

Climate and cultivation requirements

'Dokur' is a late ripening table grape variety. Cane maturation is good. It is suitable for cultivation in the South of Dagestan.

Resistance to diseases and unfavorable weather

'Dokur' is medium susceptible towards *Plasmopara viticola*, *Erysiphe necator* and grey mold (*Botrytis cinerea*). Resistance to winter frosts and



drought is not high. The flower drop is medium and usually it does not influence bunch density.

Juice characteristics

Sugar: 16.0-18.4 %

Total acidity: 5.5-9.3 g·L⁻¹

'Dokur' reaches a satisfactory amount of sugar for a table grape variety.

In irrigated conditions, in Southern Dagestan, sugar content reaches 16 % with 5-6 g·L⁻¹ total acidity. In Novocherkassk the average sugar content is 17.5-18.5 % and total acidity is 7.6-8.1 g·L⁻¹.

Wine and grape characteristics

'Dokur' is a local table grape.

Dubut B.

Synonyms

'Ag Izyum', 'Chakhiyab-Bakhin Tsibil', 'Shire-Tspits' (Dagestan).

Meaning of the name

Pergola (in Dagestani).

Historical notes and cultural importance

'Dubut' is an old, rare, Dagestani native variety. It is found in different regions of Dagestan in small mono varietal vineyards or mixed with some other varieties (PEITEL' 1963).

It is recommended for fresh consumption, for making ordinary white wines and pasteurized grape juice.

Taxonomy and intra-variety variability

Proles *pontica* Negr.

No variations have been discovered so far.

Essential ampelographic characteristics

The tip of the young shoot is grey-white with a pink tint on the edge, and covered with dense hairs.

The mature leaf is large, circular, three or five lobed and weakly or medium dissected. The leaf profile is slightly funnel-shaped with slightly revolute edges. The upper leaf surface is light green, matt, slightly reticular-wrinkled, almost smooth. The lower leaf sinuses are medium, seldom little, open, chinked or V-shaped, rarely closed with a narrow elliptic lumen or without lumen. The lower leaf sinuses are small, rarely medium, open, chinked, sometimes V-shaped, rarely lyre-shaped, almost with parallel sides and sharp base. The petiole sinus is open, vaulted, square or lyre-shaped with a sharp base. The teeth on the ends of lobes are narrow triangular with both sides rectilinear. The lateral teeth are similar, but smaller. The lower leaf side is covered with thick cobwebby hairs and bristles along the veins. The petiole is shorter or as long as the medium vein, covered with bristly hairs and traces of cobwebby hairs, pale-green and brown on the sun-exposed side (PEITEL' 1963).

The flower is hermaphrodite. The stamina are five, rarely six. The ovary is round or oval, slightly ridged, with a thin and high style. The stigma is well developed.

The bunch is large, conical or wide conical, shouldered and medium dense.

The berry is large, slightly oval and yellowish-green. Overripe berries have golden-pink sunburns, and are covered with slightly visible brown points. The skin is rather thick and medium firm. The flesh is juicy. The taste is harmonious, with pleasant sweetness and freshening acidity. There are two or three seeds per berry.

The seed is medium size, light-brown, oval and often asymmetric. The chalaza is large, located in the upper part of the seed, oval and pressed. The beak is medium size and conic.

The mature canes are light brown covered with weak grey bloom; the nodes are a little bit darker. (EGOROV *et al.* 2004).

Phenology

Time of bud burst: third ten days of April - beginning of May

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

The vegetative period 143-153 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility (bunches per winter bud): 0.8

Shoot fertility (bunches per shoot): 1.18

Shoot fruiting: 54.0 %



Bunch weight: 300-350 g

Berry weight: 3.5 g

Yield per vine: 2.4-3.0 kg

Yielding: 8-10 t·ha⁻¹ (18-20 t/ha on irrigated soils in Derbent).

Climate and cultivation requirements

'Dubut' is a double aptitude late ripening variety. Cane maturation is good. The variety is suitable for cultivation in Dagestan. Berry shot is usually low (1-3 %).

Resistance to diseases and unfavorable weather

The variety is low-susceptible towards *Plasmopara viticola* and European grapevine moth (*Lobesia botrana*) and medium susceptible towards *Erysiphe necator*. It is more resistant to grey mold (*Botrytis cinerea*) and it is rather frost and drought resistant. It grows on many different soils.

Juice characteristics

Sugar: 17.4 (up to 21.5 % in particular suitable years)

Total acidity: 5.0-7.0 g·L⁻¹

Wine and grape characteristics

'Dubut' is used for local fresh consumption, it is suitable to produce pasteurized grape juice and it is seldom used for wine making.

The variety has a large bunch with beautiful yellowish-green, juicy, pleasant, fresh, spicy berries. Resistance to transport is medium. Berry crush load is 800 g; pedicel detachment force is 370 g. In Derbent, good quality light table wines are made with 'Dubut'. Wine sensorial grade is 7.4/10 (PEITEL, 1963).

Dzhagar R.

Synonyms

Unknown.

Meaning of the name

Light-Pink (in Dagestan).

Historical notes and cultural importance

'Dzhagar' is a rare, local variety whose origin is unknown. Single vines are found in the vineyards of Tabasaranskii in Dagestan (PETTEL' 1963).

Taxonomy and intra-variety variability

Proles *occidentalis* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first young leaves are light-bronze and covered with several hairs. The axis of the young shoot is brown-red.

The mature leaf is circular, very large, deeply five lobed, with additional small leaf sinuses on the lower side. The leaf is slightly folded at mid vein with revolute edges, slightly reticular-wrinkled and matt. The upper leaf sinuses are deep, closed with wide elliptic or oval lumen or rarely with a triangular sharp lumen, with a tooth on the base. The lower leaf sinuses are deep, rarely medium, closed with an oval lumen, with one tooth on the base. The petiole sinus is overlapped and without lumen. The teeth on the ends of the lobes are triangular, both sides are rectilinear, with a sharp top. The lateral teeth are similar, but smaller. The lower leaf side is covered with weak cobwebby hairs. The petiole is shorter than the medium vein.

The flower is hermaphrodite. The stamens are five, seldom six. The filament is slightly longer than the anther. The ovary is conic. The style is conic, medium in length, sharp, limited from the ovary. The stigma is small, well developed and slightly bifurcated.

The bunch is large, cylindrical-conical, frequently winged, medium dense. The peduncle is short, thin, slightly lignified at the base.

The berry is large, round, light pink and covered with dense bloom. The skin is thick and firm. The pulp is fleshy and juicy. The taste is simple. There are two or three seeds per berry.

The seed is large, dark-brown, almost rounded. The chalaza is red-brown, oval to triangular, slightly convex or flat, located almost in the middle of the body. The beak is medium, slightly conic, with a blunt point.

The mature cane is light yellow with well expressed red-brown nodes (PETTEL' 1963).

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative period is 148-155 days in Derbent - in Southern Dagestan.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility: 0.8

Shoot fertility (bunches per shoot): 1.0-1.6

Shoot fruiting: 60.0 %

Bunch weight: 250-310 g

Berry weight: 3.7 g

Yield per vine: 4.1-10.2 kg

Yield: high (24.9 t·ha⁻¹ in Derbent, on light-brown soils, with "fan like" training system, many spurs, winter watering, one irrigation during the season, planting density 2.0 x 1.5 m 7,5 kg of grape per vine average).



Climate and cultivation requirements

'Dzhagar' is a late table grape variety. Cane maturation is good. It is suitable for cultivation all over Dagestan.

Resistance to diseases and unfavorable weather

'Dzhagar' has medium susceptibility to fungal diseases. It is slightly susceptible to grey mold (*Botrytis cinerea*). It is not very resistant to winter frost and drought. Non-significant berry shot is common.

Juice characteristics

Sugar: 16.0-18.0 %

Total acidity: 6.1-6.4 g·L⁻¹

Sugar content reaches up to 21.5 % in good vintages. Sugar reaches up to 23.0-24.0 % in case of late harvesting (end of September - beginning of October).

Wine and grape characteristics

Grape of 'Dzhagar' is locally used for fresh consumption. Quality and transport resistance are good. Berry crush load is 1,355 g; pedicel detachment force is 355 g (PEITEL' 1963).

Efremovskii B.

Synonyms

Unknown.

Meaning of the name

It is connected to the surname of a Cossack who multiplied the seedling.

Historical notes and cultural importance

'Efremovskii' is a local rare variety from the River Don basin, where it is spread as single vines in old vineyards. According to ALIEV *et al.* (2006) 'Efremovskii' is a spontaneous cross of native and Eastern table grape varieties.

Taxonomy and intra-variety variability

Proles pontica Negr.

Due to the small number of plants, no variations are reported.

Essential ampelographic characteristics

The tip of the young shoot is green with brownish-reddish stripes on the young distal leaves.

The mature leaf is large, slightly elongated, deeply five lobed, with additional leaf sinuses. The upper leaf surface is reticular-wrinkled and weakly funnel-shaped. The upper leaf sinuses are very deep, closed with an oval lumen and a rounded base. The lower leaf sinuses are deep, often open, lyre-shaped with narrow mouth and a slightly pointed base. The petiole sinus is closed with a narrow elliptic lumen and a sharp base. The teeth on the ends of the lobes are large, triangular, elongated, with slight convex sides and a little rounded top. The lateral teeth are large, quite often the same size and shape. The lower leaf side is covered with bristly cobwebby hairs.

The flower is hermaphrodite.

The bunch is medium or large (up to 17-18 cm in length), conic, shouldered and loose.

The berry is large (20-22 × 18-20 mm), slightly oval and white. The skin is thin and easy to peel off. The flesh is juicy or fleshy-juicy. Flavor is ordinary.

The seed is medium size, grayish-brown and oblong. The chalaza is oval, convex, almost in the middle of the seed's body. The beak is cylindrical, of medium length, with a tip slightly bent to the ventral side (ALIEV and GRAMOTENKO 1963).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: first part of June

Time of veraison: first ten days of August

Time of ripening: first part of September

The vegetative period is 140 days in Novochoerkassk, and 149 days in Yalta.

Vegetative and yielding characteristics

Vigor of shoot growth: vigorous

Bud fertility: 0.5

Bunch weight: 300 g

Berry weight: 4-5 g

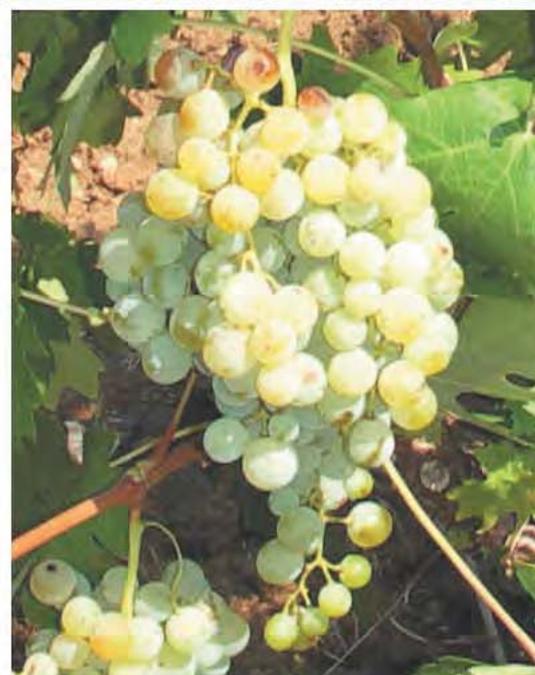
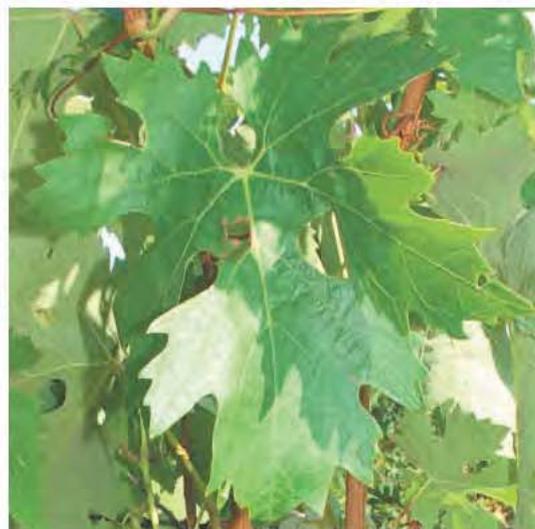
Yield per vine: 1.0-2.5 kg

Climate and cultivation requirements

'Efremovskii' is a middle-late variety. Cane maturation is good. The best quality yield is achieved on light fertile soils.

Resistance to diseases and unfavorable weather

'Efremovskii' is highly susceptible to *Plasmopara viticola*, slightly susceptible to European grapevine moth (*Lobesia botrana*). In Yalta, it is susceptible towards *Erysiphe necator*. Resistance to frost is not high and resistance to drought is low.



Juice characteristics

Sugar: 17.0-19.3 %

Total acidity: 5.4-9.0 g·L⁻¹

Several experimental vintages show that, in Novocherkassk, in the middle of September, Efremovskii reaches 18.0 % sugar and 7.4 g·L⁻¹ total acidity on average. In case of late harvest, sugar reaches 23.0 % in the South of Crimea.

Wine and grape characteristics

The variety is used in Don as a table grape. The wines produced in Southern Crimea are very poor quality and not very interesting.

Emchek Izyum B.

Synonyms

'Kechi-Amjaghi', 'Gechi Mamasi', 'Kozie Soski' (Dagestan).

Meaning of the name

Goat nipple.

Historical notes and cultural importance

No historical data about 'Emchek Izyum's origin are available. It was spread in the plains of Dagestan, usually as single vines mixed with other varieties. It is rarely spread also in Stavropol' Krai, Checheno-Ingushetii (Russia) and Armenia.

'Emchek Izyum' is rare now and only of local importance. It has big fruits, which make it interesting for breeding programs for high-yielding, high-quality table grapes.

Taxonomy and intra-variety variability

'Emchek Izyum' is a result of a crossing between varieties belonging to the Eastern and Black Sea basin groups (PETTEL' 1966).

No clones of this variety have been described.

Essential ampelographic characteristics

The tip of the young shoot is orange and covered with dense hairs. The young shoot is slightly hairy and green.

The mature leaf is medium size, circular or kidney-shaped, three or five lobed, medium or deeply lobed. The leaf blade is flat. The upper leaf surface is gross reticular-wrinkled or minor vesicular. The upper leaf sinuses are deep, rarely medium deep, open, lyre-shaped with narrow mouth or closed, with or without a fusiform lumen, with a sharp base. The lower leaf sinuses are medium deep, open, with a sharp base; rarely small, V-shaped or sometimes absent. The petiole sinus is open, vaulted, wide or lanceolate, rarely lyre-shaped with a sharp base. The teeth on the end of the lobes are large, narrow triangular, with sharp or rounded little tops. The lateral teeth are triangular-serriform, both sides are slightly convex, with sharp, rarely rounded tops. The hair on the lower leaf side is cobwebby, medium dense, mixed with some bristles (mainly on the lower leaves). The petiole is violet-red and as long as the main vein or shorter.

The flower is hermaphrodite, with five, six, sometimes seven stamina. The filaments are longer than the anther. The ovary is narrow conical. The stigma is well developed, high, often bifurcated.

The bunch is medium or large, almost cylindrical, with more or less developed wings and loose. The peduncle is long and weakly lignified in the base.

The berry is large, long, of various shapes, narrow to the tip, sometimes slightly asymmetric, greenish-yellow with sunburn spots, rarely with a pink tint, covered with thick bloom. The skin is difficult to peel off the flesh and it is medium thick. The pulp is fleshy-juicy and gentle; it is sweet, pleasant, slightly astringent, with original muscat-like aroma. There are one to four, more often two or three, seeds in the berry.

The seed is medium size, prolonged-oval, often asymmetric, one-side developed, brown with grayish tint. The chalaza is in the high part of the seed's body, oval, closed and pressed in the middle. The beak is medium and cylindrical.

The mature cane is light brown. The nodes are darker than the internodes (PETTEL' 1966).

Phenology

Time of bud burst: end of April - the begging of May

Time of blooming: middle part of June

Time of veraison: middle part of August

Time of ripening: second ten days of September

The vegetative period is 143 days in Derbent.



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility: 0.91

Bud fertility (bunches per winter bud): 1.24

Shoot fruiting: 74.0 % (with one bunch 54.0 %; with two 20.0 %)

Bunch weight: 232 g

Berry weight: 2.6 g

Yield per vine: 5.2-7.7 kg

Yield: high (23.0 t·ha⁻¹ average in Derbent with the 'fan like' training system, four spurs per vine, 2.0 x 1.5 m planting layout and irrigation. 15.6 t·ha⁻¹ in Pricumye).

Climate and cultivation requirements

'Emchek Izyum' is a medium late table grape variety. Cane maturation is good. It is suitable for cultivation in viticultural areas of Northern Caucasus. Green management and growth stimulators are recommended.

Resistance to diseases and unfavorable weather

Susceptibility towards *Erysiphe necator* is high; medium towards *Plasmopara viticola*. It is heavily damaged by the European grapevine moth (*Lobesia botrana*). It is medium susceptible to winter frost. Berry shot is often significant, thus bunches become very loose and with uniform berries. In dry years, berries remain undeveloped, unripe and unattractive.

Juice characteristics

Sugary: 15.6-18.0 % (21.0-22.0 % in Pricumye)

Total acidity: 4.2-7.5 g·L⁻¹

Wine and grape characteristics

'Emchek Izyum' is used locally for fresh consumption. Transport resistance is medium, allowing short term transport. Grapes appearance, shape and quality are variable. Berry crushing load is 1042 g and pedicel detachment force is 245 g. Fresh grape sensorial grape is 8.1/10.

Genusa Tsibil N.

Synonyms

Unknown.

Meaning of the name

Grey berry.

Historical notes and cultural importance

'Genusa Tsibil' is a rare, Dagestan variety. According to Peitel' (ALIEV 1963), the variety was discovered in the village of Bol Gocaltl, in the Hunzakhsii district.

The variety has local importance now, but it is promising for testing in other areas of North Caucasus. It is suitable for breeding programs.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspica* Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with thick hairs. The leaves are green with a light-bronze tint.

The mature leaf is medium size, rounded or slightly elongated, deeply five lobed, slightly funnel shaped. The upper leaf surface is reticular-wrinkled. The lower leaf sinuses are deep, often medium, closed with an oval lumen and a pointed base, rarely with a tooth on the base. The upper leaf sinuses are medium, deep or small, closed with an oval lumen or open and lyre-shaped. The petiole sinus is closed with an elliptic lumen and a sharp base. The teeth on the end of the lobes are narrow triangular or triangular with convex sides. The lateral teeth are small, sharp, convex on both sides. The hairs on the lower leaf side are bristly.

The flower is hermaphrodite. The stamina are five, rarely six or seven. The filaments are longer than the anther. The ovary is oblate-cylindrical and ridge. The style is conic and short. The stigma is small.

The bunch is large, rarely medium, cylindrical-conical or conical, often winged, from very thick to loose. The peduncle is of medium length and fully lignified.

The berry is medium size, round, dark blue (grey), covered with dense bloom. The skin is medium thick and firm. The flesh is juicy and melting. The juice is colorless and neutral. There are two-four seeds in the berry, easy to separate from the flesh.

The seed is medium, light brown with a grayish tint, slightly oval or rounded. The chalaza is slightly oval, pressed, closed, almost in the center of the seed. The beak is short and cylindrical.

The mature cane is yellow-brown. The nodes are dark red-violet (ALIEV 1963).

Phenology

Time of bud burst: first ten days of April

Time of blooming: second ten days of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September

Vegetative period is 143 - 149 days in the South of Dagestan.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Shoot fertility 0.6-0.8

Bud fertility (bunches per winter bud): 1.1

Shoot fruiting: 52.0 %

Bunch weight: 317 g

Berry weight: 2.56 g

Yield per vine: 4.8-7.2 kg

Yield: high (16.0-24.0 t·ha⁻¹ in Dagestan with irrigation)



Climate and cultivation requirements

'Genusa Tsibil' is a late wine variety. Cane maturation is quite satisfactory. It is suitable for cultivation in South Dagestan. Shoots are fertile from the 9th to the 12th bud, so long pruning is required. Berry shot is not observed.

Resistance to diseases and unfavorable weather

The variety is slightly susceptible to *Plasmopara viticola* and *Erysiphe necator*. In some years it is strongly damaged by *Planococcus citri*. Frost and drought resistance is poor.

Juice characteristics

Sugar: 16.4-17.5 %

Total acidity: 5.9-6.6 g·L⁻¹

In Novocherkassk: 22.0-23.0 % sugar and 6.0-7.3 g·L⁻¹ total acidity.

Wine and grape characteristics

'Genusa Tsibil' makes good quality deep red wines, it is also used in blend with other low-colored wines.

Gok Ala N.

Synonyms

'Karachi' (Dagestan).

Meaning of the name

Dark-skinned.

Historical notes and cultural importance

'Gok Ala's origin is unknown. It is a rare, local variety and in the past, it was spread as single vines in the vineyards of Dagestan (PEITEL' 1963).

Taxonomy and intra-variety variability

Proles pontica Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is hairy, golden with a yellow-orange tint and pink edges. On the lower side of the distal leaves there are violet-pink spots.

The mature leaf is medium size, rounded or slightly oval, very deeply five lobed, with additional leaf sinuses on all lobes. The blade is funnel-shaped with bent and uplifted edges. The upper leaf surface is matt, dark grey-green, reticular-wrinkled, rarely gross vesicular. The upper leaf sinuses are deep, closed or sometimes open, frequently with one or two teeth in the base. The lower leaf sinuses are deep, rarely medium, open, lyre-shape, rarely with a narrow elliptic lumen and a pointed or one-toothed base. The petiole sinus is open, lyre-shaped with a sharp base, rarely closed with an elliptic lumen, frequently with one or two teeth. The teeth in the end of the lobes are large, narrow-triangular, with a sharp or a slightly rounded top. The lower leaf side is covered with medium dense cobwebby hairs, there are bristles along the veins. The petiole is red-brown, as long as the main vein or shorter.

The flower is hermaphrodite.

The bunch is large, cylindrical-conic, lobed, often winged or branched, medium dense or loose. The peduncle is rather long, lignified and bent.

The berry is medium size, round or slightly flat, black-dark blue, with a reddish tint, covered with plenty grey bloom. The skin is medium thick, firm, easily separated from the flesh. The flesh is juicy. The taste is neutral. The juice is slightly pink. In the berry there are two, rarely between one-four, seeds.

The seed is medium, dark-grey, wide, oval and rarely asymmetric, with a shallow hollow. The chalaza is almost in the middle of the seed towards the beak, round, pressed in the middle. The beak is short, blunt truncated.

The mature cane is light brown. The nodes are darker than the internodes (PEITEL' 1963).

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

The vegetative period is 141-145 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

Bud fertility (bunches per winter bud): 0.7

Shoot fertility (bunches per shoot): 1.15

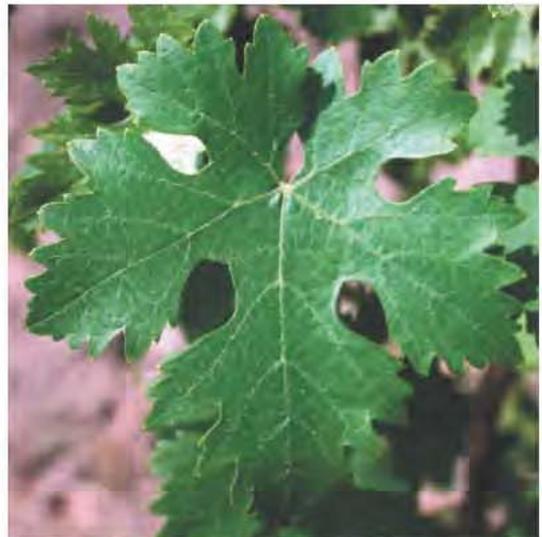
Shoot fruiting: 47.5 %

Bunch weight: 280-300 g

Berry weight: 2.9 g

Yield per vine: 3.5-5.4 kg

Yielding: good (16.4 t·ha⁻¹ in the Caspian Lowlands of Derbent, on light-brown soils, with the "fan like" training system, several fruity spurs, planting layout 2.0 x 1.5 m and winter irrigation)



Climate and cultivation requirements

'Gok Ala' is a medium late wine grape variety with good cane maturation. It needs long pruning with 9-12 buds or more. Berry shot is usually not significant.

Resistance to diseases and unfavorable weather

Susceptibility towards *Erysiphe necator* is low and medium towards *Plasmopara viticola*. 'Gok Ala' is not frost-resistant, but it is highly drought-resistant.

Juice characteristics

Sugar: 16.7-19.9 %

Total acidity: 6.5-8.3 g·L⁻¹

The characteristic of wine

'Gok Ala' is used for table wines, usually in blend with other varieties. Mono varietal wines are light in color, alcoholic and not very interesting.

Gyulyabi Dagestanskii R.

Synonyms

'Mardzheni', 'Dogerek Kizil', 'Boz-Izyum', 'Al-Izyum', 'Makhber-Baartsinab-Tsibil', 'Baar-Tsibil' (Dagestan).

Meaning of the name

Blue Flower from Dagestan.

'Dogerek kizil' = Round red.

Historical notes and cultural importance

'Gyulyabi Dagestanskii' is an ancient variety with a large number of variations and clones. It was probably introduced in Dagestan from Southern Caucasus. It is included in the official list of varieties recommended for cultivation in North Caucasus, established by the "Russian Federation State Commission for Selection Achievements, Tests and Protection" since 1959 (Catalogue of Varieties 2007). The variety occupies 13 ha (TROSHIN 2007).

Taxonomy and intra-variety variability

Proles pontica Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

According to M.I. PEITEL' (1953) there are two 'Gyulyabi' groups in Dagestan: 'Gyulyabi Pink' ('Dagestanskii') and 'Gyulyabi White' ('Gyulyabi Guk'). Each group has its own clones and variations. The differences concern more the generative organs (flower, berry) than the vegetative traits (leaves, shoots) or other traits (poor frost resistance). All 'Gyulyabi' variations probably share a common ancestor, possibly 'Gyulyabi Dagestanskii' (pink), the most widespread form.

'Gyulyabi Guk' is a variation, with white berries showings marked lenticels.

'Gyulyabi Guk' is less productive than 'Gyulyabi Dagestanskii'.

In both groups there is a "Gyulyabi Dropper - Late Ripening" ('Dzhendur Gyulyabi') clone with: different flower, bunch and berry shape; different types of flowers in the same inflorescence, from hermaphrodite to male; later flowering; loose or very loose bunch due to flower drop and berry drop; cylindrical, cylindrical-conical or irregular bunch; lower bunch weight; medium size oval berry with a very weak aroma or no aroma at all; considerably lower yield; often fruitless.

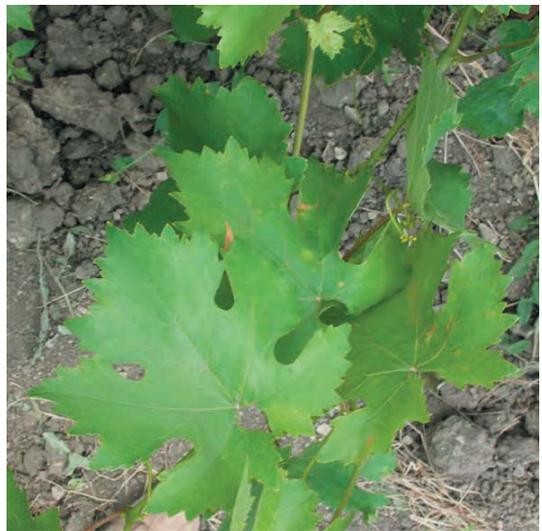
'Gyulyabi Stamensr' (Dropper) has male flowers with long stamina and reduced ovaries. Only some flowers on the end of inflorescence develop the ovary and a rudimentary stigma. The inflorescence is large, with many flowers, however they generally drop, occasionally there are 5-6 medium size, round and white berries.

The most valuable clone is 'Gyulyabi Urozhainyi' (High-yield), selected by the "Dagestan Experimental Breeding Station for Viticulture and Horticulture". This clone is recommended for cultivation in North Caucasus and Dagestan since 2006. It is medium-late. The mature leaf is deeply dissected. On the lower leaf side there are weak hairs. The bunch is big (320 g), cylindrical and medium dense. The berry is medium size and rounded-oval. The skin is pink, thin. There are two seeds per berry on average. Flavor is neutral. Yield is very high (ANONYMOUS 2007).

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are pink on the edges, wider on the lower side, often extended to almost the whole blade. The tip and the first distal leaves are covered with dense hairs. The first (and sometimes the second) leaf is yellow-orange; the second and third leaves are golden. The leaves show strong goffering and they are deeply five lobed, with sharp narrow lateral teeth, which get larger on the end of the lobes. The shoot axis is slightly brownish and covered with hairs.

The mature leaf is large, oval to circular, deeply five lobed. The leaf blade is undulated, funnel-shaped, slightly rolled, folded at mid vein and revolute. The upper surface is grey-dark-green, matt, reticular-wrinkled. The upper leaf sinuses are deep or very deep, sometimes medium, closed with an oval or triangular lumen, rarely open, lyre-shaped and with a narrow mouth. The base of the leaf sinuses is pointed, frequently with one or to two teeth. The lower leaf sinuses are deep, rarely medium deep, open, lyre-shaped and



with a narrow mouth; sometimes closed with oval lumen and a pointed, rarely toothed, base. The petiole sinus is overlapped, with a small elliptic lumen, frequently with one or two teeth (varietal character). The petiole is equal to the main vein and red-brown. On the lower leaf side there are weak cobwebby hairs.

The flower is hermaphrodite.

The bunch is medium size, cylindrical or cylindrical-conical, sometimes lobed, medium dense, rarely loose.

Berry size is variable, it is round or oval, dark-pink, rarely with a violet hue, sometimes the dense bloom gives grayish-pink color. The skin is thin and firm. The flesh is juicy, sour-sweet and with a weak muscat aroma, in some years absent. The juice is colorless. The seeds are one or three per berry, easy to separate from the flesh (PEITEL' 1953).

Phenology

Time of bud burst: late (end of April)

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: very late (second half of September)

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Cane maturation: good

Bud fertility (bunches per winter bud): 0.9-1.1

Shoot fertility (bunches per shoot): 1.2-1.6

Shoot fruiting: 55.0-78.0 %

Bunch weight: 300 g

Berry weight: 2.4 g

Yield: 13.0-19.0 t·ha⁻¹

Climate and cultivation requirements

'Gyulyabi Dagestanskii' grows well on light-chestnut and chestnut soils, sufficiently heavy and slightly loamy soils, and on gravelly soils in Dagestan. Long pruning (9-12 buds per cane) is recommended. Bud fertility is very high, also the latent and secondary buds are fertile, so the plants are productive even if the winter buds are damaged. Heavy flower drop is usual, hence shoot tipping before blooming is recommended to allow better fruit set.

Resistance to diseases and unfavorable weather

'Gyulyabi Dagestanskii' is relatively resistant to *Plasmopara viticola* and European grapevine moth (*Lobesia botrana*), and a little bit less resistant to *Erysiphe necator*. Frost resistance is poor unless the vines are covered with soil.

Juice characteristics

Sugar: 16.0-19.6 %

Total acidity: 5.0-8.3 g·L⁻¹

The characteristic of grape

'Gyulyabi Dagestanskii' is a rather late, high yield table and wine grape variety. Transport resistance is low and therefore, grapes are consumed locally. The grapes are strongly bitter. In dry weather the grapes have a pleasant aroma. 'Gyulyabi Dagestanskii' is normally used for table and dessert winemaking, as well as for grape juice production.

Khatmi B.

Synonyms

'Kanfet Izyum' (Dagestan).

Meaning of the name

Candy Raisin.

Historical notes and cultural importance

Some authors suggest 'Khatmi' is original of Dagestan. It is found mainly mixed with other varieties in the Derbent and Lenin districts of Dagestan (PEITEL' 1966). 'Khatmi' is a rare variety: covering 3 ha only (TROSHIN 2007). The high-yield clone 'Khatmi Urozhaiyni' is included in the official list of varieties recommended for cultivation in North Caucasus, established by the "Russian Federation State Commission for Selection Achievements, Tests and Protection" since 2006. 'Khatmi' and 'Khatmi Urozhaiyni' are recommended for fresh consumption and for short distance transport (ANONYMOUS 2007).

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr. var. *transcaucasica* Gram. et Trosch. (TROSHIN 1999, 2002, 2007).

The variety has several biotypes. A high-yield clone, 'Khatmi Urozhaiyni', was selected by the Dagestan Testing Station of Viticulture and Horticulture (RADZHABOV *et al.* 2003; ANONYMOUS 2007).

Progeny of 'Khatmi' includes 'Muscat Transportabelnyi'.

Essential ampelographic characteristics

The tip of the young shoot is dark-bronze, with traces of cobwebby hairs. The third, fourth and fifth leaves are green, with red-violet veins. The shoot axis is red-brown.

The mature leaf is large, circular, sometimes oval, deeply five lobed. The leaf blade is almost flat or slightly funnel-shaped and dense. The upper leaf surface is dark green, smooth or slightly reticular-wrinkled. The lower leaf sinuses are deep, open, lyre-shaped, sometimes closed, with an elliptic lumen. The lower leaf sinuses are medium deep or deep, open and lyre-shaped. The petiole sinus is open, lyre-shaped, often closed, with an elliptic lumen and a pointed base, sometimes with one tooth. The teeth on the ends of the lobes are triangular with both sides convex and a sharp top; sometimes they are cupola-shaped, slightly larger than the lateral teeth. The lateral teeth are triangular with strongly convex sides, almost cupola-shaped. The lower leaf side is hairless. The petiole is shorter than the medium vein and brown-red.

The flower is hermaphrodite, with five, rarely six stamina. The filaments are longer than the anther. The ovary is round and smooth. The style is medium and slightly conical. The stigmas are well developed, bifurcated.

The bunch is medium size, conical, medium dense, sometimes loose. The bunch peduncle is short, lignified at the base.

The berry is medium or almost large, circular, yellowish-green, with golden sunburn spots, covered with medium dense bloom. The skin is thick, difficult to peel off the crispy and medium firm flesh. The berries are pleasant with an original muscat aroma. The seeds are easy to separate from the flesh. There are between one and four seeds per berry, more often two or three.

The seed is medium, oval and dark-brown.

Canes are red-brown with violet bloom on the nodes (PEITEL' 1966).

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: middle of September

The vegetative period is 132 days in Novocherkassk, 145 in Krasnodar and 136 in Derbent.



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bud fertility: 0.9-1.3

Bunch weight: 150-200 g

Yield per vine: 4.4-6.7 kg

Climate and cultivation requirements

'Khatmi' is a medium time variety with good cane maturation. It is suitable for cultivation in the mountains and in the plains of Dagestan, particularly, on the light-brown carbonate soils of Derbent. The usual training system is the "fan like" with many spurs and 1,600-3,300 vines·ha⁻¹.

Resistance to diseases and unfavorable weather

'Khatmi' is susceptible to *Erysiphe necator* and *Gloeosporium ampelophagum* S. It is medium susceptible to *Plasmopara viticola* and European grapevine moth (*Lobesia botrana*), and rather resistant towards grey mold (*Botrytis cinerea*). In some years, bunches are so loose that they are not marketable due to almost total flower drop. 'Khatmi' is more cold-resistant than 'Agadai'.

Juice characteristics

Sugar: 17.4-20.1 %

Total acidity: 5.0-5.9 g·L⁻¹

On the east-facing slopes of the hill foots of Derbent sugar content reaches 23.0-25.0 % with 7.0-6.0 g·L⁻¹ total acidity. On the Caspian plain, sugar is 7-9 % lower.

Wine and grape characteristics

Berry crush load is 995 g and pedicel detachment force is 284 g.

During transport, many berries drop. 'Khatmi' makes a good, aromatic compote.

Khop Khalat N.

Synonyms

'Basar Tsibil', 'Zhol Khalat', 'Nat Khop Tsibil' (Dagestan).

Meaning of name

Bunch up to the elbow, Long bunch.

Historical notes and cultural importance

The origin of 'Khop Khalat' is unclear. Morphology suggests it is original of the Caspian Sea, possibly from ancient irrigated oasis. Probably, it was introduced in Dagestan from South Caucasus. The variety was found only in Dagestan, in single vines or small vine groups in the Northern uplands (PETEL' 1966). Nowadays, 'Khop Khalat' is a rare local variety. It is suitable for breeding programs aiming at obtaining new varieties with large bunches.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

There are no registered clones.

Essential ampelographic characteristics

The tip of the young shoot is covered with very weak cobwebby hairs. The first young leaves are slightly three lobed and elongated. The following leaves are hairless or with weak bristly hairs on the lower side. The leaves are bronze. The axis of young shoot is brownish.

The mature leaf is very large, oval, rarely round, weekly three or five lobed. The leaf blade is thick, vaguely bent down, almost flat or sometimes weak funnel-shaped. The upper leaf surface is dark green, glossy, reticular-wrinkled. The main veins are brown-red only at the petiole point. The upper leaf sinuses are low, V-shaped, medium deep, open, chinked; or closed, with narrow lumen, sometimes closed with an oval lumen. The base is slightly sharp. The lower leaf sinuses are deep; more often closed, with an elliptic or oval lumen; rarely open, lyre-shaped. The base of the leaf sinuses is sharp, frequently with a basal tooth. The petiole sinus is open, vaulted, deep, lyre-shaped. The base of the sinus is round, rarely flat, sometimes with a tooth. The teeth on the ends of the lobes are triangular with a slightly rounded top. The lateral teeth are straight, serriform-triangular with slightly convex sides with a sharp and rather wide top. The lower leaf side is hairless. The petiole is brown-red and shorter than the medium vein.

The flower is female. The stamens are five or six. The filaments are shorter than the anthers. The ovary is narrow conical, smooth, with a small style. The stigma is high, slightly bifurcated.

The bunch is large, very long (up to 60 cm), narrow cylindrical or narrow conical, often shouldered or winged, very loose, sometimes medium loose. The peduncle is long, herbaceous, lignified up to node. The pedicel is thin and long.

The berry is medium or large, circular, sometimes slightly oval, dark blue and covered with dense bloom. The skin is thick and rough. The flesh is juicy and slightly crispy. The juice is colorless. The taste is simple, mediocre, moderate sweet and slightly sour. In the berry there are one-two, rarely three or five, seeds.

The seed is large, grayish-brown with a darker beak. The body is oval, gradually going on to the beak. The chalaza is oval, sometimes rounded, hollow, open, in the top half of the seed's body. The beak is medium, almost cylindrical, ridged, ovate, with a slightly bifurcated end.

Cane is red-brown, with weak bloom. The nodes are darker, than the internodes (PETEL' 1966).

Phenology

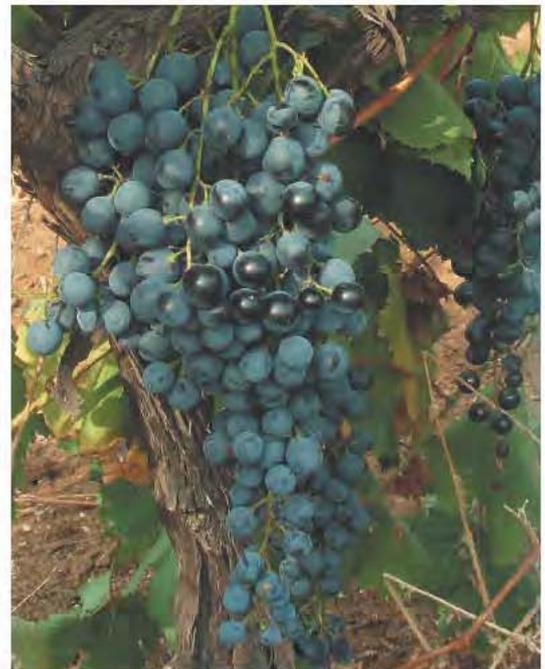
Time of bud burst: end of April

Time of blooming: middle of June

Time of veraison: middle of August

Time of ripening: second part of September

The length of period from bud burst to ripening is 147 days (from 145 to 156) in Derbent.



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility: 0.7-0.8

Shoot fertility: 1.25

Shoot fruiting: 80.6 %

Bunch weight: 289 g

Berry weight: 3.26 g

Yield per vine: 5.9 kg

Yield: high (17.8 t·ha⁻¹ in Derbent, on light-brown carbonate soils, "fan like" training system, 2.0 x 1.5 m planting layout, winter irrigation; 35-40 t·ha⁻¹ in Dagestan's mountains, with 16-18 kg per vine and bigger bunches (up to 50-60 cm and 600-800 g).

Climate and cultivation requirements

'Khop Khalat' is a late table grape variety with good cane maturation. Pollinator varieties have not been selected. The most suitable pollinators are late flowering. 'Khop Khalat' needs an expanse training system and long pruning: 16-20 buds in the humid regions, 7-14 in the drier ones.

Resistance to diseases and unfavorable weather

'Khop Khalat' is medium susceptible to *Plasmopara viticola* and *Erysiphe necator*. It is rather resistant to grey mold (*Botrytis cinerea*) and to European grapevine moth (*Lobesia botrana*) due to the loose bunch.

Juice characteristics

Sugar: 17.5 %

Total acidity: 8.0 g·L⁻¹

Grapes achieve 19.4-22.3 % sugar and 7.0-9.14 g·L⁻¹ total acidity in good years.

Wine and grape characteristics

'Khop Khalat' is consumed fresh. Medium transport resistance allows short distance movement. Berry crush load is 927 g; pedicel detachment force is 324 g. Bunches keep on the vines or in hanging wicker baskets during the winter. Flavor considerably improves throughout conservation, acidity is reduced and a particularly pleasant aroma appears.

Khotsa Tsibil B.

Synonyms

'Gelbert' (Dagestan).

Meaning of the name

Grape from Khotsa.

Historical notes and cultural importance

'Khotsa Tsibil' is a rare, local Dagestani variety whose origin remains unknown. Single vines are found in Cherkei, in the Buinakskii district, where it was collected for the ampelographic collection of the Derbent Experimental Station for Viticulture and Horticulture (ALIEV 1966).

Taxonomy and intra-variety variability

Proles pontica subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the lower leaf side of the first distal leaves is covered with dense cobwebby hairs. The first two or three leaves are green with a weak orange tint. The axis of the young shoot is almost hairless and light green.

The mature leaf is of medium size, rounded or slightly elongated, medium three or five lobed. The leaf blade is weakly funnel-shaped with revolute edges. The upper leaf surface is glossy, reticular-wrinkled or slightly vesicular. The upper leaf sinuses are small, open and V-shaped or deep, closed, with oval lumen and sharp base. The lower leaf sinuses are small, V-shaped, rarely medium deep, closed with an oval lumen or open, lyre-shaped with a sharp base. The petiole sinus is closed, with an elliptic lumen, quite often open, lyre-shaped with a sharp base. The teeth in the end of the lobes are narrow triangular with sharp tops or triangular with slightly convex sides. The lateral teeth are triangular with a wide base, convex sides and almost cupola-shaped. The lower leaf side is covered with medium dense cobwebby hairs. The petiole is usually shorter than the medium vein.

The flower is hermaphrodite.

The bunch is conic, medium or large, medium dense or rarely dense. The peduncle is short to long, lignified up to base.

The berry is small or medium, rounded and greenish-yellow. The skin is very thick, rough, entirely separated from the flesh, covered with dense bloom. The flesh is juicy. The taste is simple, with a harmonious combination of sugar and acidity. There are two seeds per berry.

The seed is medium size, grey-brownish. The seed's body is slightly oval and swollen. The chalaza is inversely oval, pressed, located almost in the middle of the seed's body. The beak is short or medium, conical, weakly rounded in the end.

The mature cane is yellowish-brown, the internodes are darker red-violet (ALIEV 1966).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: second ten days of June

Time of veraison: middle of August

Time of ripening: middle or end of September

The vegetative period is 140 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility (bunches per winter bud): 0.8

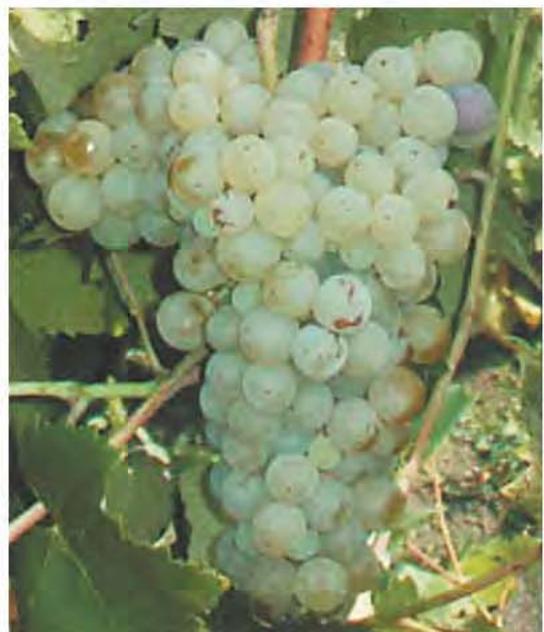
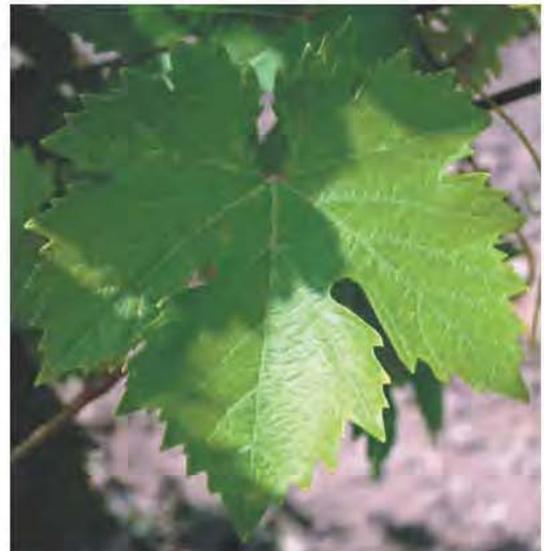
Shoot fertility (bunches per shoot): 1.1

Shoot fruiting: 54.0 %

Bunch weight: 196 g

Berry weight: 1.82 g

Yield per vine: 4.7 kg



Yielding: high (14 t·ha⁻¹ in Derbent on light chestnut carbonate soils, with the "fan like" training system, many fruity spurs, 2.0 x 1.5 m planting layout and winter irrigation)

Climate and cultivation requirements

'Khotsa Tsibil' is a medium late wine variety with good cane maturation. Extreme "fan like" training system, long pruning (8-10 buds/cane) and up to 50 % shoot thinning are recommended.

Resistance to diseases and unfavorable weather

It is susceptible to *Plasmopara viticola* and *Erysiphe necator*. It is rather resistant to grey mold (*Botrytis cinerea*). Berry shot is not observed.

Juice characteristics

Sugar: 17.2-19.1 %

Total acidity: 5.2-7.6 g·L⁻¹

Wine and grape characteristics or wine

'Khotsa Tsibil' is used for making sufficient dry table wines. The wines are light straw in color, with a well expressed varietal aroma. The wine is full bodied and rough; sensorial grade 7.2/10.

Kizilovyi N.

Synonyms

'Donskoi Chernyi', 'Donskoi' (Don).

Meaning of the name

Similar to Cornelian Cherry.

Historical notes and cultural importance

'Kizilovyi' is a rare, double aptitude native variety of the River Don basin. Its origin is unknown. In the past, it was spread in Rostov Krai, Stavropol Krai, Dagestan, Chechaya and Kabardino-Balkaria (LEVITSKII and SKUN' 1965). 'Kizilovyi' is a consistent, high yield variety, with good salt resistance, high in sugar and it is suitable for the regions with winter covering, black and especially salty soils. Thus, 'Kizilovyi' should be tested in those regions.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, almost white, covered with dense cobwebby hairs. The edges of the tip and the following young distal leaves are slightly wine-red.

The mature leaf is medium size, circular, three or rarely five lobed, weakly dissected or sometimes almost entire. The leaf blade is slightly funnel-shaped. The upper leaf surface is light green, slightly blistered, rarely smooth. The upper leaf sinuses are medium or small, open, lyre-shaped with a pointed base; or V-shaped, sometimes closed, with an elliptic lumen. The lower leaf sinuses are small, open, V-shaped, rarely absent. The petiole sinus is open, lyre-shaped with narrow mouth and a rounded base, sometimes arched or closed, with a rounded lumen. The teeth on the ends of the lobes are narrow triangular and sharp. The lateral teeth are triangular or serriform with sharp tops. The bristly or cobwebby hairs on the lower leaf side are rather dense. The petiole is violet-red, covered with rare hairs and shorter than the main vein.

The flower is hermaphrodite, with five stamina. The filaments are longer than the anther. The ovary is conic, rather smooth and turns into a cylindrical style.

The bunch is medium (13-15 cm), wide conical, usually winged, dense and medium dense. The bunch peduncle is 4-5 cm long and lignified.

The berry is medium size, oval, dark red with black or dark blue tints, covered with dense bluish bloom. The skin is thin, not firm, easy to peel off. The flesh is juicy, gentle, hard to separate from the seeds. The flavor is pleasant, sometimes a little lacking. There are two-three seeds per berry. The seed is medium, long, pear-shaped and brownish-red. The chalaza is located in the middle of the seed's body, oval, pressed. The beak is long, cylindrical, covered with warts, truncated and slightly bifurcated towards the end. The cane is light-brown with a red tint. The nodes are darker than the internodes (LEVITSKII and SKUN' 1965).

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: first part of August

Time of ripening: second part of September

The vegetative period is 132 days in Rostov, 130-140 in Kabardino-Balkaria and 149 in Stavropol' Krai.

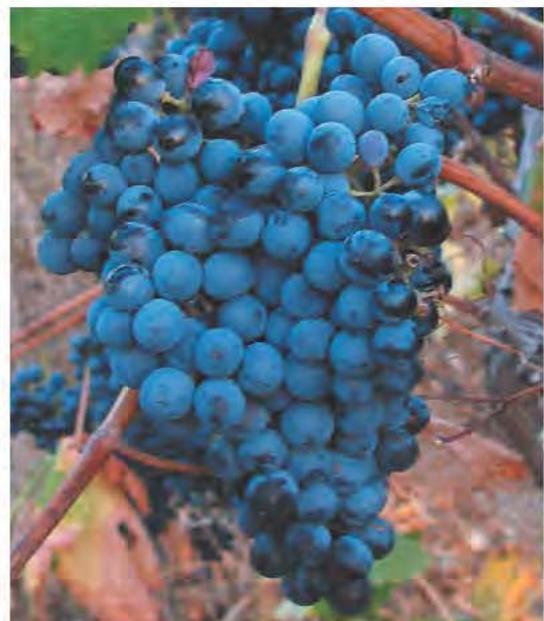
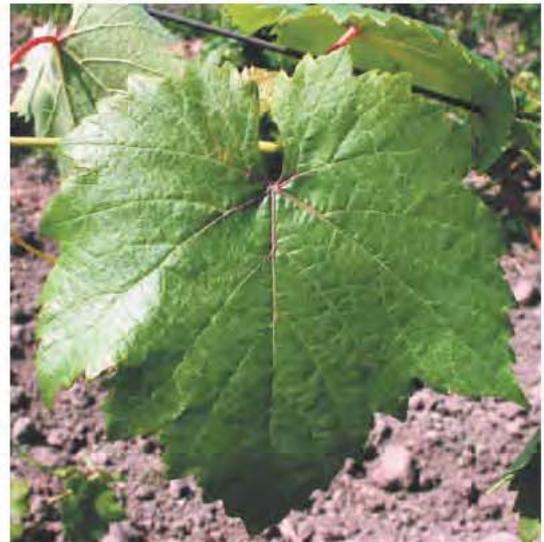
Vegetative and yielding characteristics

Vigor of shoot growth: medium or vigorous

Cane maturation: high

Bud fertility: 0.6-0.7

Bunch weight: 160-250 g



Berry weight: 1.7 g
Yield per vine: 1.3-4.0 kg
Yield: 4-12t·ha⁻¹

Climate and cultivation requirements

'Kizilovyi' is a medium late variety with good cane maturation, suitable for North Caucasus.

The fertile, rather rich in water, black and sandy soils of the Don's basin are the best for 'Kizilovyi'.

Growth and yield are lower on dry slopes. The variety grows well in the steppe and on fertile pre-Caucasian back-soils. Irrigated vineyards on meadow-alkaline soils developed on the alluvial deposits of Stavropol' Krai have high vigor and yield.

Resistance to diseases and unfavorable weather

'Kizilovyi' is medium resistant to *Plasmopara viticola*. It is susceptible towards Spider mites (fam. *Tetranychidae*) and rather salt resistant. It suffers from grey mold (*Botrytis cinerea*) in a rainy autumn.

Juice characteristics

Sugar: 18-21 %

Total acidity: 7.0-5.0 g·L⁻¹

At mid September in Novocherkassk, 'Kizilovyi' reaches 21.8 % sugar and 5.4 g·L⁻¹ total acidity.

Wine and grape characteristics

'Kizilovyi' makes good quality red table and sweet wines. It is rarely consumed fresh locally.

Klinchatyi N.

Synonyms

'Zimni' (North Caucasus).

Meaning of the name

Wedge-shaped.

'Zimnyi' = Wintry.

Historical notes and cultural importance

'Klinchatyi' covers a morphologically homogeneous group of local varieties of North Caucasus, Dagestan and Northern Ossetia (PEITEL' 1965). 'Klinchatyi' is promising for making marinades.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr. var. *transcaucasica* Gram. et Trosch. (TROSHIN 1999, 2002, 2007).

'Klinchatyi's genetic variations are currently under investigation.

Essential ampelographic characteristics

The tip of the young shoot is light bronze and covered with hairs. The distal leaves (first to third) are covered with hairs on the upper side, hairs become weak on the lower side of the fourth leaf. The first three leaves are light bronze, the following leaves are bright green. The shoot axis is green.

The mature leaf is medium size, circular, slightly wide, deeply five lobed. The leaf blade is funnel-shaped with involute edges. The upper leaf surface is dark green, slightly reticular-wrinkled and almost smooth. The upper leaf sinuses are medium deep, open, lyre-shaped with almost parallel sides and a sharp base. The lower leaf sinuses are similar. The petiole sinus is open, vaulted, deep, with a sharp base. The teeth on the end of the lobes are large, triangular, with straight sides and sharp tips. The lateral teeth are similar or serriform. The hairs on the lower leaf side are weak and cobwebby. The petiole is slightly brown-red and shorter than the main vein. The main veins are brown-red towards the petiole. Leaves are dark red in autumn.

The flower is hermaphrodite with five stamina. The filaments are 1.5 times longer than the anther. The ovary is almost cylindrical or conical, slightly ridged. The style is short, cylindrical-conical. The stigma is capitated.

The bunch is medium or almost large, conic, frequently winged and loose. The berry is large, oval, with a pointed tip, dark blue or almost black, covered with dense bloom. The skin is medium thick and firm. The pulp is fleshy-juicy and dense. The taste is simple, with higher acidity. There are two-three seeds per berry.

The seed is large, light brown, oblong, gradually narrowed towards the beak. The chalaza is almost in the middle of the seed's body, rounded, hollow in the middle, rolled on the edge and closed. The beak is medium, slightly skew-truncated. The mature cane is yellow-brown with dark stripes and strong dim grayish bloom. The nodes are dark brown (PEITEL' 1965).

Phenology

Time of bud burst: end of April

Time of blooming: middle of June

Time of veraison: second ten days of August

Time of ripening: end of September

The vegetative period is 149-159 days in Derbent.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

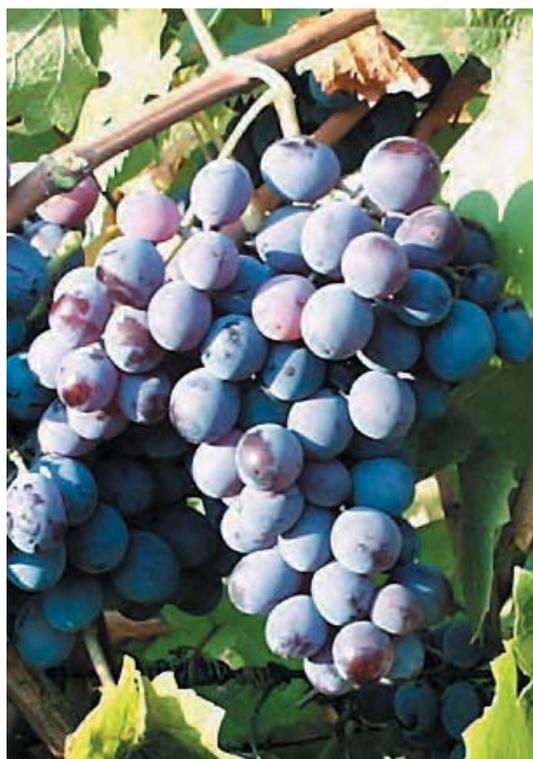
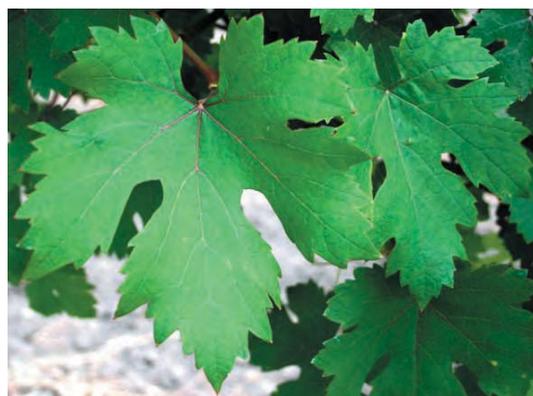
Bud fertility: 0.9

Shoot fertility (bunches per shoot): 1.33

Bunch weight: 140 g

Yield per vine: 5.1-6.5 kg

Yield: high (6-7 t·ha⁻¹. 20 t·ha⁻¹ on light-brown soils of Dagestan, 2 x 1.5 m planting layout, "fan like" training system, many spurs, winter irrigation, sometimes season irrigation).



Climate and cultivation requirements

'Klinchatyi' is a late variety with good cane maturation. Berry shot is not high (about 5.0 %). It is suitable for cultivation in Northern Caucasus.

Resistance to diseases and unfavorable weather

The variety is highly resistant to fungal diseases, medium resistant to frost and drought.

Juice characteristics

Sugar: 15.0-16.0 % (19.0 % in more favorable years)

Total acidity: 9.0-11.0 g·L⁻¹

Wine and grape characteristics

'Klinchatyi' has attractive bunches and berries, simple taste and good transport resistance. Berry crush load is 1,400 g and pedicel detachment force is 320 g. The grape is used for fresh consumption, winter storage and for marinades.

Kosorotovskii B.

Synonyms

Unknown.

Meaning of the name

'Kosorotov' is a Cossack surname.

Historical notes and cultural importance

The variety was widespread in the River Don basin, especially in the Konstantinovskii and Semikarakorskii districts (ELETSKII and LAZAREVSKII 1954). According to M.A. LAZAREVSKII, it is a crossing of Don's major variety 'Pukhlyakovskii' with 'Plavai' (White round). This hypothesis is based on morphological similarity. However, 'Kosorotovskii' has hermaphrodite flowers and oval berries while 'Pukhlyakovskii' has female flowers and elliptic berries with sharp ends. It is perspective for cultivation in the River Don basin.

Taxonomy and intra-variety variability

Proles pontica Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The young shoot is wine-red. The first distal leaf is covered with dense cobwebby hairs, especially along the veins. The second leaf has only loose cobwebby hairs. The lower side of the third leaf is covered with thick felt red-orange hairs.

The mature leaf is medium size, deeply or medium five lobed. The upper blade is dark-green, matt, slightly vesicular or almost smooth. The leaf blade is funnel-shaped, folded at mid vein. The upper leaf sinuses are deep, closed with oval lumen, rarely open, lyre-shaped with rounded or plane base. The lower leaf sinuses are deep, open, lyre-shaped with almost parallel sides. The petiole sinus is closed with strongly overlapped blades, oval lumen and a sharp base. The petiole is equal to the main vein in length or it is longer and red. The lower leaf side is covered with dense felt hairs. The veins are covered with bristles.

The flower is hermaphrodite.

The bunch is medium or big (18-20 cm long), cylindrical, slightly conical, winged, dense or medium dense, sometimes loose.

The berry is medium or large (20 x 18 mm), slightly oval, with a round tip, green-white, light yellow in full ripening. The skin is thin, elastic, covered with dense bloom. The flesh is juicy, melting with a pleasant, harmonious taste (LAZAREVSKII and ALIEV 1965).

Phenology

The period of bud burst: at end of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of repining: first part of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility: 0.5-1.1

Shoot fertility: 1.1-1.5

Shoot fruiting: 50.0-80.0 %

Bunch weight: 140-200 g

Berry weight: 1.8-2.4 g

Yield: 8-24 t·ha⁻¹

Climate and cultivation requirements

'Kosorotovskii' is well adapted to the strong climate of Don (Rostov). Soil covering preserves the plants from the hardest winters. The variety suffers from water deficit: bunches and berries become smaller and the yield is significantly reduced. The best yield was obtained on the rather fertile and



rich in water black "Chernozem" sandy soils. "Fan like" training, with four to six long canes is the usual system. Shoot tipping before flowering increases fruit set. 'Kosorotovskii' is used as a pollinator for 'Pukhlyakovskii' and 'Moldavskii' because flowering time coincides.

Resistance to diseases and unfavorable weather

The variety is sufficiently resistant to *Plasmopara viticola* in the conditions of Don.

Juice characteristics

Sugar: 19.3-22.1 %

Total acidity: 7.4-10.6 g·L⁻¹

Wine and grape characteristic

'Kosorotovskii' is a medium ripening table-wine variety from Don. The variety has big bunches. The berries are beautiful, pleasant, with a good sugar/acidity ratio. Due to poor transport resistance, the variety has only local importance. It is suitable for making juice and well-colored, light, harmonic, fruity, quality table and sparkling wines.

Koz Uzyum B.

Synonyms

'Goz Uzyum', 'Ag-Khazri', 'Eshkek Uzyum', 'Khoma Tsibil', 'Orekhovyi', 'Asma Uzyum Belyi' (Dagestan).

Meaning of the name

Nut Raisin.

Historical notes and cultural importance

It is considered a native variety of Dagestan, where it was rarely spread (PEITEL 1954).

The long vegetative period limits distribution of 'Koz Uzyum' only in the southern regions of Russia.

Taxonomy and intra-variety variability

Proles orientalis subproles antasiatica Negr.

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot, the first and sometimes the second distal leaves are rarely hairy. The leaves are deeply five lobed; on the swellings of the blade they are light-bronze, rarely wine-red. The shoot is hairless, green; on the external side it is brown.

The mature leaf is medium size, round, deeply five lobed, with additional leaf sinuses on the lower lobes. The leaf blade is solid, slightly undulating, funnel-shaped or plain. The upper leaf surface is dark green, slightly glossy, slightly reticular-wrinkled or smooth. The upper leaf sinuses are deep, close, rarely open, lyre-shaped with a narrow and sharp base. The lower leaf sinuses are medium, sometimes small, open, lyre-shaped almost with parallel sides and a sharp base. The petiole sinus is open, sagittate, sometimes lyre-shaped, with an open or toothed base. The petiole is as long as the main vein or shorter. The lower leaf side is hairy.

The flower is female.

The bunch is medium size, cylindrical-conical, branched or shouldered, very loose to medium dense depending on berry shot.

The berry is big, oval or rounded, golden and pink-yellow on the sunny side, with plenty of white bloom and little grayish-brown spots. The skin is medium thick, elastic, but not rough. Flesh is crispy, juicy, hard to peel off. The juice is slightly sweet with a weak muscat aroma. In the berry there are one-two, rarely three seeds (PEITEL 1954).

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: second part of August

Time of ripening: end of September

Vegetative and yielding characteristics

The habit of growth: semi-erect

Vigor of shoot growth: medium

Cane maturation: good

Bud fertility (bunches per winter bud): 0.6-1.1

Shoot fertility (bunches per shoot): 1.2-1.4

Shoot fruiting: 70.0-89.0 %

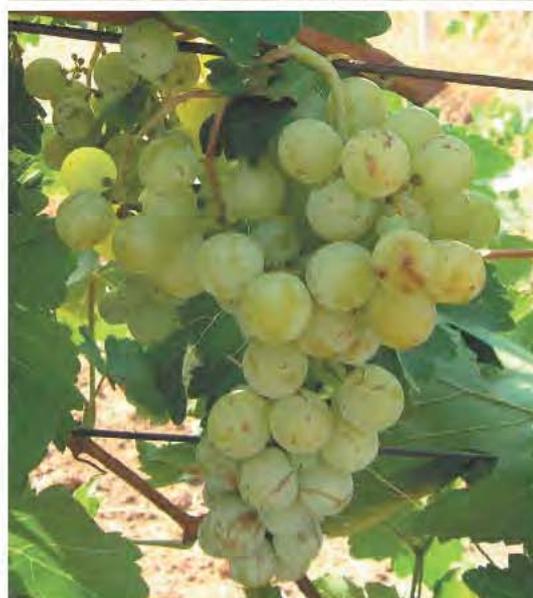
Bunch weight: 300 g (500-800 g the biggest)

Yield: 8-18 t·ha⁻¹

Climate and cultivation requirements

'Koz Uzyum' grows well on hard loamy soils, as well as on lighter sandy or gravel soils. The best quality is achieved on light, warm soils. In case of frost damage, 'Koz Uzyum' partially produces from secondary buds. The shoots from latent buds are usually fruitless.

The variety needs over 100,000 buds·ha⁻¹. Pruning is medium (5-8 buds per cane) or long (13-16 buds). 'Koz Uzyum' needs pollinator varieties like 'Asyl Kara' or 'Agadai'.



Resistance to diseases and unfavorable weather

Resistance to *Plasmopara viticola* is medium and low towards *Erysiphe necator*. Loose bunches protect the grapes from the European grapevine moth (*Lobesia botrana*), *Planococcus citri* (fem. *Pseudococcidae*) and grey mold. Frost resistance is good (-21.4 °C).

Juice characteristics

Sugar: 17.0-18.0 %

Total acidity: 6.6-8.1 g·L⁻¹

Wine and grape characteristics

'Koz Uzyum' is a high yield, transport resistant, late table grape variety. The main weaknesses are the necessity of cross pollination and low *Erysiphe necator* resistance. The late ripening grapes keep on the vines for a long period, making long fresh consumption possible. Fresh grape sensorial grade is 8.0/10.

Krasnostop Zolotovskii N.

Synonyms

'Krasnostop', 'Chernyi Vinnyi' (Don).

Meaning of the name

The variety was selected in the village of Zolotovskii, and its colored peduncle is called 'Stopka'.

'Chernyi Vinnyi' = Black for wine.

Historical notes and cultural importance

This variety was cultivated in the River Don basin for a long time. It is supposed that it originated from a seed in 1814. It was widespread in the Konstantinovskii district and rarely spread in the Ust-Donetskii district of Rostov (SKUN' 1954). It is grown in Rostov, Astrakhan', Volgograd, Krasnodar and Stavropol' Krai and in some neighbor countries.

The variety 'Krasnostop Zolotovskii' is included in the official list of varieties recommended for cultivation in North Caucasus, established by the "Russian Federation State Commission for Selection Achievements, Tests and Protection" since 1959 (ANONYMOUS 2007). In Russia the variety covers 414 ha (TROSHIN 2007).

Taxonomy and intra-variety variability

Proles pontica Negr.

ZOTKIN (1953) discovered a highly productive clone ('Krasnostop Anapskii') during the ampelographic screening of Kuban. This clone was registered by the Anapa Experimental Station for Viticulture and Winemaking in 2007. There are some offsprings of 'Krasnostop Zolotovskii' such as 'Vidnyi', 'Miledi' and other varieties.

Essential ampelographic characteristics

The tip of the young shoot is light green with a grey-white tint and covered with hairs. The shoot is covered with dense cobwebby hairs. One side is brown-red.

The mature leaf is medium size, circular, medium or rarely deeply five lobed. The upper leaf surface is reticular-wrinkled. The upper leaf sinuses are medium deep, rarely deep, closed with oval lumen. The lower leaf sinuses are small, V-shaped, lyre-shaped, or closed with a small lumen. The main veins and the petiole are wine-red up to the first bifurcation on the lower leaf side. The petiole sinus is open, lyre-shaped with a round base, rarely closed, with oval lumen. The teeth on the ends of the lobes are small and V-shaped. The lateral teeth are small, wide conic and cupola shaped. The petiole is as long as the main vein or longer. The hairs of the lower leaf side are dense, cobwebby, with short bristles. The leaves are light red in autumn.

The flower is hermaphrodite.

The bunch is small, rarely medium (8-15 cm in length), low conical, seldom cylindrical-conical, medium dense or loose.

The berry is small, rounded (13 x 14 mm) and black-blue, often with a violet tint, covered with thick bloom. The skin is thin, easy to peel off the flesh. The flesh is juicy, diffused; slightly slimy. The flavor is delicate, sweet and fresh at the same time (SKUN' 1954).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: second ten days of June

Time of veraison: first ten days of August

Time of ripening: middle period of September

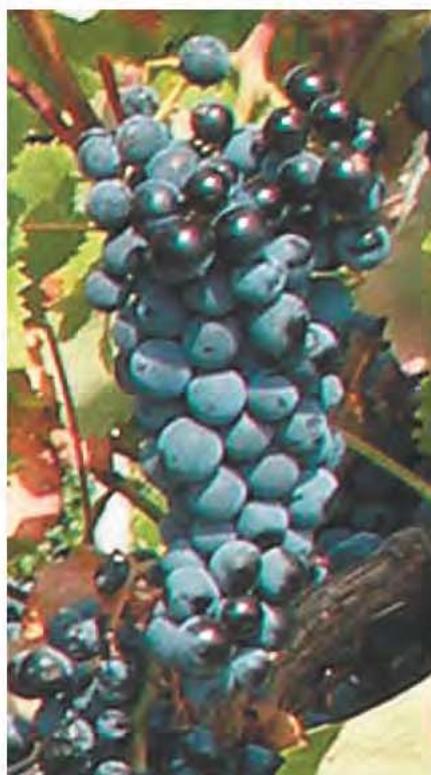
Vegetative and yielding characteristics

Habit of shoot growth: moderate (depending on the growing conditions)

Cane maturation: good

Bud fertility: 0.7-1.3

Shoot fertility: 1.1-1.6



Shoot fruiting: 66.0-94.0 %
Bunch weight: 60-100 g
Berry weight: 0.8-1.5 g
Yield: 6-8 t·ha⁻¹

Climate and cultivation requirements

'Krasnostop Zolotovskii's behavior strongly depends on the agricultural conditions. On dry slopes and low productive clayey or sandy black "Chernozem" soils, shoot growth and yields are low. Clay "Chernozem" developed above shale is more suitable. The recommended training system is the "fan like" with several canes. High bud load and good canopy management are recommended due to low shoot fertility. Vine overloading has a negative influence on shoot growth and grape quality. Some vines have strong flower drop and very loose bunches.

Resistance to diseases and unfavorable weather

The variety is rather resistant to fungal diseases and frosts. It is able to recover after heavy winter frost.

Juice characteristics

Sugar: 22.0-29.5 %
Total acidity: 7.6-10.1 g·L⁻¹
This variety is able to maintain high acidity.

Wine and grape characteristics

'Krasnostop Zolotovskii' is one of Don's best wine varieties. Ripening time is medium. It is used for good quality red table and dessert wines. It is also used in blend with other varieties for making table wine and Tsimlanskii sparkling wine.

Krasnyanskii N.

Synonyms

Unknown.

Meaning of the name

The name of the Cossack spreading the seedling.

Historical notes and cultural importance

'Krasnyanskii' is a little known local double aptitude variety from the River Don basin whose origin is unknown. It was frequently grown in the Ust-Donetsk district of Rostov (ALIEV *et al.* 1965). The variety is rare and it has only local importance now.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspic*a Negr.

There are no registered clones so far.

Essential ampelographic characteristics

The tip of the young shoot is darkish-green, the first three distal leaves are light wine-red.

The mature leaf is medium size, rounded, deeply five lobed. The upper leaf surface is smooth or slightly reticular-wrinkled, funnel-shaped or irregular. The upper leaf sinuses are deep, closed, with, or sometimes without, a small elliptic-oval lumen and strongly overlapped. The lower leaf sinuses are medium, open, lyre-shaped. The petiole sinus is closed with, or sometimes without, a small elliptic or large oval lumen. The teeth on the end of the lobes are triangular with a wide base and convex sides. The lateral teeth are wide with strongly convex sides, frequently cupola-shaped. Hairs on the lower leaf side are dense along the veins, bristly, the parenchyma is hairless.

The flower is hermaphrodite.

The bunch is medium size (12-18 cm), conical, medium dense or loose. The peduncle is long.

The berry is medium size (15-17 mm), rounded or slightly flat, dark raspberry color, with dense bloom. The skin is thin. The flesh is juicy. Flavor is ordinary, with an appreciable astringency.

The seed is medium, oval and grayish-brown. The chalaza is slightly oval or rounded and pressed in the middle. The abdominal sinuses are slightly divergent. The beak is short and cylindrical (ALIEV *et al.* 1965).

Phenology

Time of bud burst: late (end of April - beginning of May)

Time of blooming: first ten days of June

Time of veraison: first part of August

Time of ripening: second ten days of September

The vegetative period is 135-140 days in Rostov.

Vegetative and yielding characteristics

Vigor of shoot growth: medium or vigorous

Bud fertility: 0.5

Bunch weight: 153 g

Yield per vine: 2.3-2.7 kg

Yield: 7- 8 t·ha⁻¹

Climate and cultivation requirements

'Krasnyanskii' is a medium-time ripening, table and wine variety with good cane maturation. It is suitable for cultivation in the North-Caucasian region.

Resistance to diseases and unfavorable weather

'Krasnyanskii' has low susceptibility to *Plasmopara viticola* in Novochoerkassk. Because of its late blooming, the variety is a good pollinator for other late blooming varieties with female flowers. Among other Don native varieties, 'Krasnyanskii' is more resistant to winter and spring frosts.



Juice characteristics

Sugar: 17-25 %

Total acidity: 5-7 g·L⁻¹

'Krasnyanskii' achieves 19.7 % sugar and 6.3 g·L⁻¹ total acidity in mid September in Novocherkassk.

Wine and grape characteristics

'Krasnyanskii' is used for local fresh consumption or it is processed for winemaking in blend with other varieties. The table wine is light in color, mediocre in quality, and low in intensity. The juice is satisfactory. Despite skin softness, berries are mold resistant, hence 'Krasnyanskii' has good storage ability. For this reason it was used for winter storage in the past.

Krestovskii N.

Synonyms

Unknown.

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Krestovskii' is a little known variety from Don with unknown origin. It was found in single vines in the River Don basin (ALIEV and GRAMOTENKO 1965). ALIEV *et al.* (2006) suggest that 'Krestovskii' is a spontaneous cross of Eastern varieties with Don native varieties.

Nowadays 'Krestovskii' is a rare variety with only local importance.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspiica* Negr.

No biotypes or clones have been selected.

Essential ampelographic characteristics

The tip of the young shoot and the following three distal leaves are green with brown-reddish stripes. The leaves are five lobed, green-white with yellow-copper parenchyma stripes and a reddish hue. The lower leaf side is weakly hairy.

The mature leaf is medium size, round, deeply five lobed, with additional leaf sinuses on the lower lobes. The leaf blade is slightly funnel shaped. The upper leaf surface is smooth. The upper leaf sinuses are deep, closed, with an oval lumen and a sharp base. The lower leaf sinuses are deep or medium, often open, lyre-shaped with a narrow mouth and a sharp base. The petiole sinus is more often closed, with a wide elliptic sharp base, sometimes open, lanceolate, with a sharp base. The lateral teeth are big, narrow triangular with slightly convex sides. The lower leaf side is hairless. The petiole is as long as the main vein or longer.

The flower is hermaphrodite.

The bunch is medium or large, loose, cylindrical-conical or branched.

The berry is medium size (19 x 17 mm), rounded or slightly oval and black. The skin is thick and rough. The flesh is juicy. The juice is colorless. The taste is ordinary. There are three seeds per berry (ALIEV and GRAMOTENKO 1965).

Phenology

Time of bud burst: end of April – beginning of May

Time of blooming: first part of June

Time of veraison: first part of August

Time of ripening: end of September

The vegetative period is about 150 days in Novocherkassk and 158 days in Yalta.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: very vigorous

Bud fertility (bunches per winter bud): 0.2

Shoot fertility (bunches per shoot): low (about 0.1)

Bunch weight: 145-200 g (rarely 280 g)

Berry weight: 2.8 g

Yield per vine: 0.5-0.7 kg

Yield: 1.5-2.0 t·ha⁻¹

Climate and cultivation requirements

'Krestovskii' is a late double aptitude variety with good cane maturation.

Resistance to diseases and unfavorable weather

'Krestovskii' has medium resistance to *Plasmopara viticola* in Novocherkassk. It is strongly susceptible to *Erysiphe necator* and to European grapevine moth (*Lobesia botrana*) in Yalta.



Bunch: photo not available

Juice characteristics

Sugar: 19.6-27.3 %

Total acidity: 5.3-10.0 g·L⁻¹

'Krestovskii' reaches 21.1 % sugar and 7.6 g·L⁻¹ total acidity in Novocherkassk, by the end of September.

Wine and grape characteristics

'Krestovskii' is used for fresh consumption and for ordinary table wines.

Kukanovskii B.

Synonyms

'Belyi Kizilovyi', 'Pochatochnyi' (Don).

Meaning of the name

The name of the Cossack spreading the seedling.

Historical notes and cultural importance

'Kukanovskii' is a variety from the River Don basin with unknown origin. Single vines are found in the old vineyards of Konstantinovsk, Ust-Donetsk, Tsimlyansk and in other districts of Rostov.

'Kukanovskii' is a rare variety. It is recommended for testing in the irrigated regions of Rostov, using the "Vase of Don" training system.

Taxonomy and intra-variety variability

Proles *pontica* subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the lower side of the first two distal leaves are covered with medium dense cobwebby hairs, gradually looser on the following leaves. The top-leaves have deep yellow-orange tints. The shoot axis is green, covered with rare cobwebby hairs.

The mature leaf is medium size, circular, deeply five lobed. The leaf blade is slightly funnel-shaped, folded at mid vein and with revolute edges. The upper leaf surface is reticular-wrinkled. The lower leaf side is covered with dense or medium dense cobweb-bristly hairs. The upper leaf sinuses are closed, deep, with oval to cross-section oval lumens. The base of the leaf sinuses is very slightly pointed, sometimes with a tooth on the base. The lower leaf sinuses are open, mainly medium deep, lyre-shaped or almost with parallel sides and a sharp base, sometimes small and V-shaped; or deep and similar to the upper ones. The petiole sinus is closed with a wide, oval or almost rounded lumen or open and lyre-shaped. The base is sharp, or nearly rounded, sometimes with a tooth. The teeth on the ends of the lobes are very large, with an extended edge. The lateral teeth are large and high, triangular, serriform and sharp. The lower leaf side is covered with medium or weak, cobwebby-bristly hairs. The petiole is green, as long as the main vein or shorter.

The flower is hermaphrodite with five, sometimes six, rather short stamina. The ovary is cylindrical. The style is short. The stigma is small.

The bunch is medium-small (11-15 cm), cylindrical or conical, medium dense, in a bad year loose and irregular. The peduncle is long and weakly lignified, the pedicel is green, short and very slim.

The berry is medium or small, oval (16 mm) and green-white. The skin is medium thick, rough, covered with weak or medium dense bloom. The pulp is fleshy and juicy. Flavor is ordinary with a harmonious sugar/acidity ratio. There are two-three seeds per berry.

The seed is medium, oblong-oval and brown. The chalaza is slightly oval, pressed in the middle, located in the top part of the body. The abdominal grooves are parallel. The beak is medium, almost cylindrical, expanded on the end.

The mature cane is dark yellow. Node and internodes are similar in color (LAZAREVSKII 1965).

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: middle of August

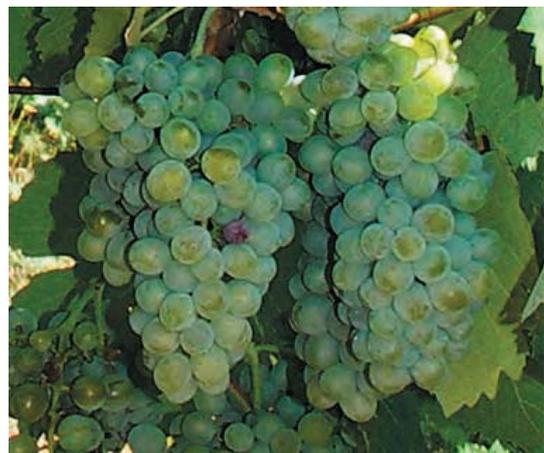
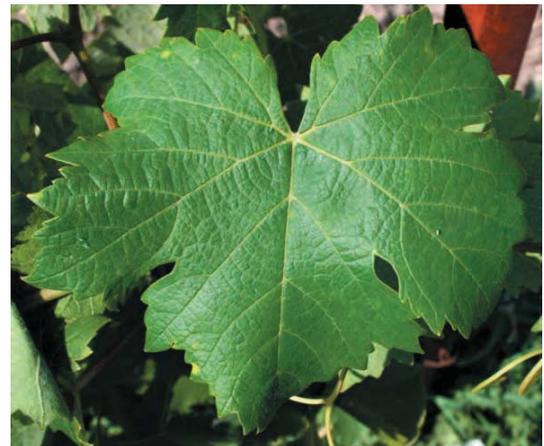
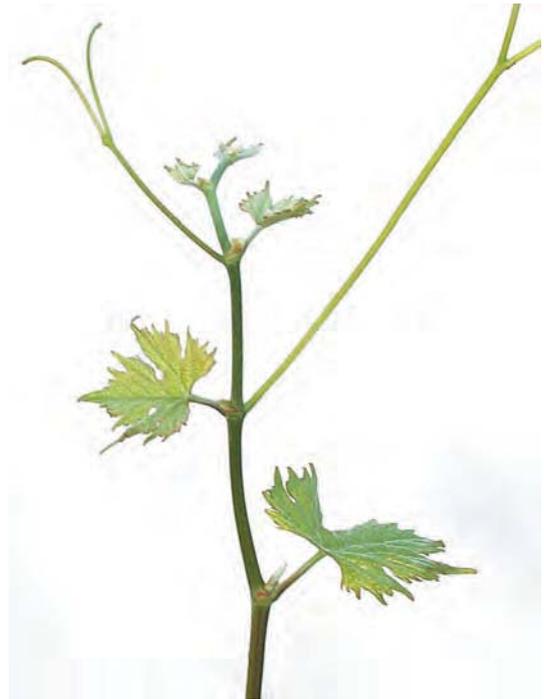
Time of ripening: first ten days of September

The vegetative period is 134-138 days in Novocherkassk.

Vegetative and yielding characteristics

Vigor of shoot growth: vigorous

Cane maturation: good



Bud fertility: 0.4
Shoot fertility (bunches per shoot): 1.2
Shoot fruiting: 27.0 %
Bunch weight: 80-85 g
Berry weight: 1.8-2.0 g
Yield per vine: 1.7-2.0 kg
Yield: 5-6 t·ha⁻¹ (in Lower Don, close to the Azov Sea, in non irrigated black "Chernozem" soils, "fan like" training system, several fruity canes and 2.0 x 1.5 m planting layout).

Climate and cultivation requirements

'Kukanovskii' is a medium timing wine variety. The "Vase of Don" training system and irrigation are recommended to achieve high yield. Berry shot is not observed.

Resistance to diseases and unfavorable weather

The variety is medium susceptible to *Plasmopara viticola* and *Erysiphe necator*.

Juice characteristics

Sugar: 21.8-23.1 %
Total acidity: 6.8-8.0 g·L⁻¹
In a good year, sugar content is between 20.1 % and 25.8 %; total acidity is 7.5-10.1 g·L⁻¹.

Characteristic of wine

'Kukanovskii' is used for making white table wines, alone or in blend. The mono varietal wine is of good quality, fresh and light, with 7.2-7.5/10 sensorial grade.

Kumshatskii Belyi B.

Synonyms

'Belyi Kumshatskii', 'Kumshatskii', 'Belyi Krupnyi' (Don).

Meaning of the name

Kumshatskaya is a village in Rostov (Stanitsa) . Belyi = White. 'Kumshatskii Belyi' and 'Belyi Kumshatskii' = Kumshatskaya White. 'Belyi Krupnyi' = Big White.

Historical notes and cultural importance

'Kumshatskii Belyi's origin is not well established. Probably, it was introduced by the Cossacks from Bessarabia or from the Balkan along with many varieties, including 'Moldavskii'. Until 1930 it was only spread in Kumshatskaya. Single vines of this variety were found in the village of Kamyshovskii in the Tsimlyanskii district. It spread in Rostov towards the end of XIX century for its enological value; unfortunately all the vineyards where destroyed by severe winter frost (GEL'MBREKHT and ELETSKII 1965). The variety is now rare and has only regional value.

Taxonomy and intra-variety variability

Proles *pontica* subproles *ostcaucasica* Al. ALIEV et al. (2006)

There are no registered clones of this variety. There are some 'Kumshatskii's offsprings such as 'Pridonskii' ('Pervyi').

Essential ampelographic characteristics

The tip of the young shoot is golden-bronze and weakly hairy.

The mature leaf is big, strongly undulate, funnel-shaped, deeply five lobed, usually with a long medium lobe. The upper leaf surface is light green, reticular-wrinkled on the edges, big vesicular or folded in the middle. The upper leaf sinuses are very deep or medium, closed, with an oval or triangular lumen and a flat base. The lower leaf sinuses are deep, open lyre-shaped or closed with oval lumens. The petiole sinus is closed, overlapped and with oval lumen; the base is often bordered by veins, frequently without lumen. The teeth on the end of the lobes are large triangular with sharp or slightly rounded tops. The lateral teeth are serriform with convex sides and rounded tops. The hairs on the lower leaf side are medium, cobwebby and bristly. The main veins are slightly hairy. The petiole is green and longer than the main vein.

The flower is hermaphrodite with five, sometimes six stamina, with the filament slightly longer than the anther. The ovary is oval, ridged, gradually passing in a long conic style. The stigma is large.

The bunch is large (18-20 cm in length), cylindrical-conic or winged, very dense, rarely medium dense. The bunch peduncle is big, green and lignified at the base.

The berry is large or medium size (16-18 mm in diameter), circular, sometimes flat and yellow with pink tint. The skin is thick or medium thick, covered with slight bloom. The flesh is gentle and juicy. The taste is simple, pleasant and harmonious. There are two-three seeds per berry. The seed is medium, grey-brown and round-oval. The chalaza is round, pressed, located in the middle of the seed's body. The beak is small, cylindrical, slightly bent and bifurcated on the end.

The mature cane is light pink. The nodes are dark and red-brown (GEL'BREKHT and ELITSKII 1965).

Phenology

Time of bud burst: end of April - begging of May

Time of blooming: second ten days of June

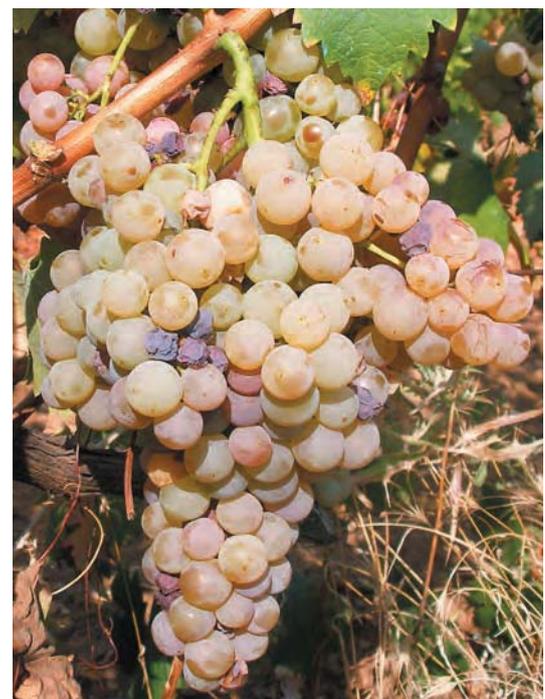
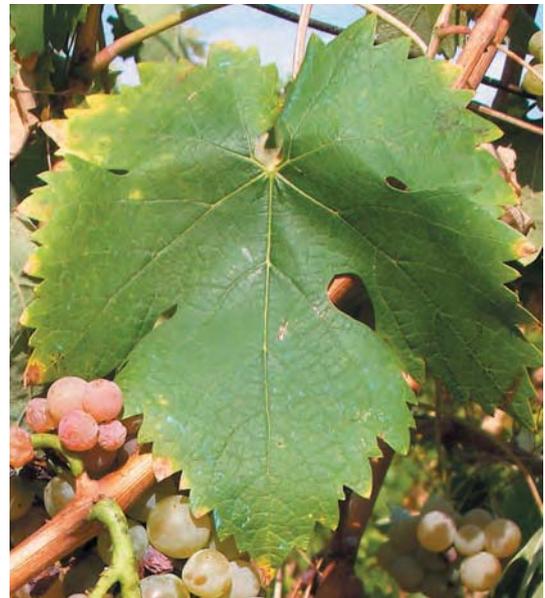
Time of veraison: second ten days of August

Time of ripening: first part of September

The vegetative period is 127-135 in Tsimlyanskii, 139-145 days in Novocherkassk.

Vegetative and yielding characteristics

Vigor of shoot growth: vigorous



Bud fertility (bunches per winter bud): 0.7
Shoot fertility (bunches per shoot): 1.1-1.2
Shoot fruiting: 64.0 %
Bunch weight: 250-340 g
Berry weight: 3.4 g
Yield per vine: 10.0-12.0 kg
Yield: 15-20 t·ha⁻¹

Climate and cultivation requirements

'Kumshatskii Belyi' is a medium ripening table grape variety with good cane maturation. Berry shot is absent. It is suitable for Lower Don.

Resistance to diseases and unfavorable weather

'Kumshatskii Belyi' is heavily susceptible towards *Plasmopara viticola*. It is susceptible towards grey mold (*Botrytis cinerea*) in rainy weather. 'Kumshatskii Belyi' is more resistant to winter frost and it recovers more quickly than other native varieties in case of damage.

Juice characteristics

Sugar: 17.0-20.0 % (up to 24.0 % in dry years)
Total acidity: 7.0-9.0 g·L⁻¹
'Kumshatskii Belyi' reaches 20.8 % sugar and 7.4 g·L⁻¹ acidity in Novocherkassk (ALIEV *et al.* 2006).

Wine and grape characteristics

'Kumshatskii Belyi' is a medium time, double aptitude variety. It makes high-quality, light, fresh and tasty mono varietal wines called 'Kumshatskoe' as well as sparkling wines. It is used in blend to make strong wines with low acidity. 'Kumshatskii Belyi' is locally consumed fresh.

Kumshatskii Chernyi N.

Synonyms

Unknown.

Meaning of the name

Kumshatskoi is a village on the River Kumshat in Rostov. 'Chernyi' = Black.

Historical notes and cultural importance

'Kumshatskii Chernyi' is a little known, rare variety from Don. It was discovered among vines of the variety 'Kumshatskii Belyi' in the old vineyards of the Tsimlyanskoe district of Rostov (LAZAREVSKII 1970). 'Kumshatskii Chernyi' differs for berry color, but also for other peculiarities: *i.e.*, smaller friable bunches, smaller berries, additional leaf sinuses, petiole sinus morphology. According to ALIEV *et al.* (2006), 'Kumshatskii Chernyi' is a mutant of 'Kumshatskii Belyi'.

Taxonomy and intra-variety variability

Proles pontica, subproles *ostcaucasica* Al. (ALIEV *et al.* 2006)
No biotypes or clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green with light brown-reddish stripes. The first leaves are five lobed, green-white, light pink. The lower leaf sides are more hairy.

The mature leaf is large, slightly elongated, deeply five lobed, strongly extended in width, quite often there are additional leaf sinuses. The upper leaf side of the blade is reticular-wrinkled. The upper leaf sinuses are very deep, close to the medium blade, with wide oval lumens and a round or flat, quite often slightly pointed, sometimes toothed, base. The lower leaf sinuses are deep, similar to the upper sinuses. On the end of the lobes, teeth are large, high, sharp triangular. Lateral teeth are also large, high, but with a wide base. The petiole sinus is closed, with an oval lumen, often bordered by veins. The lower leaf side is covered with strong bristle.

The flower is hermaphrodite.

The bunch is medium size, conical and cylindrical-conical, loose, sometimes very loose.

The berry is medium size (16-17 mm), rounded, slightly flat and dark blue. The skin is medium thick. The flesh is juicy and soft (LAZAREVSKII 1970).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility: 0.6

Bunch weight: 120-130 g

Berry weight: 2.5 g

Yield per vine: 2.0-3.5 kg

Climate and cultivation requirements

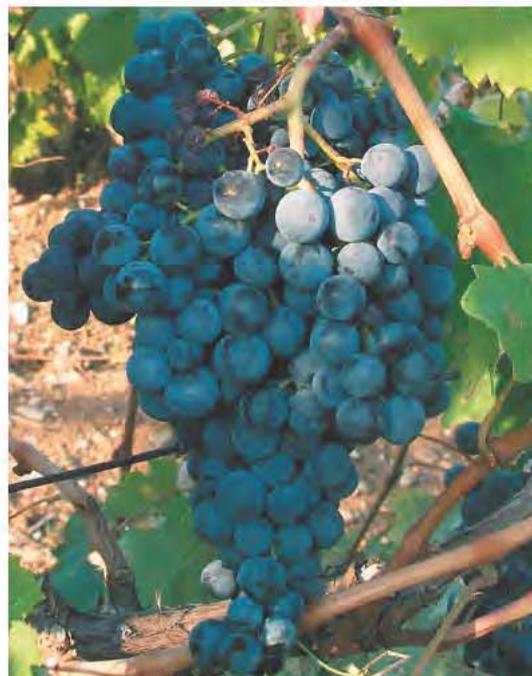
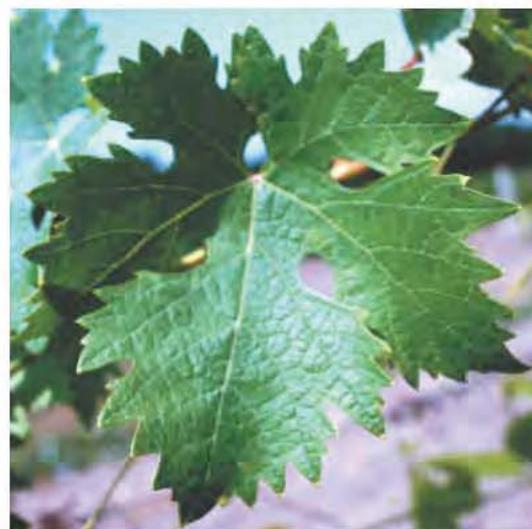
'Kumshatskii Chernyi' has a long vegetative period and good cane maturation.

Resistance to diseases and unfavorable weather

'Kumshatskii Chernyi' is similar to 'Kumshatskii Belyi' for what concerns biotic and abiotic stress. Resistance to fungal diseases is weak.

Juice characteristics

Sugar: 19.6 %



Total acidity: $7.3 \text{ g}\cdot\text{L}^{-1}$

'Kumshatskii Chernyi' reaches 19.7 % sugar and $7.0 \text{ g}\cdot\text{L}^{-1}$ total acidity in Lower Don in late September (ALIEV *et al.* 2006).

Wine and grape characteristics

The wines of this variety are not of very high quality. Grapes are used in blend with other varieties.

Makhbor-Tsibil N.

Synonyms

'Makhbar Tsibil' (Dagestan).

Meaning of the name

'Makhbor-Tsibil' = Velvet grape/berry (in Avarian).

Historical notes and cultural importance

'Makhbor-Tsibil' is a rare variety, discovered in the village of Cherkei, in the Buinakskii district of Dagestan, and collected for the Experimental Station for Viticulture, in Derbent. Single vines were found in the Kazbekovskii district (ALIEV and PEITEL' 1965).

'Makhbor-Tsibil' is promising for the Southern viticultural regions of Russia.

Taxonomy and intra-variety variability

Proles pontica Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

No phenotypic variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is slightly hairy. The young distal leaves on the upper surface have weak hairs, or are almost hairless. The tip and the lower leaf side are wine-red with a green background and covered with dense hairs. The axis of the young shoot is deep wine-red.

The mature leaf is medium size, circular, deeply five lobed; frequently with additional leaf sinuses. The leaf blade is wide funnel-shaped, with slightly revolute edges. The blade surface is matt, green, smooth or slightly reticular-wrinkled. The upper leaf sinuses are deep, closed, with an elliptic lumen, seldom open, lyre-shaped with a narrow mouth. The lower leaf sinuses are medium or deep, open, lyre-shaped with a narrow mouth or with parallel sides, rarely closed with a small elliptic lumen. The petiole sinus is closed, with elliptic lumen. It is seldom open, lyre-shaped with a sharp or pointed base. On the end of the lobes, teeth are larger than the lateral ones, narrow-triangular, sharp with straight sides. The lateral teeth are similar, but with slightly convex sides. Hairs on the lower leaf side are loose, cobwebby, bristly on the veins. The petiole is shorter than the medium vein. The main veins are red-grey up to half of length. The petiole also is red-grey. The autumn color of leaves is bright red.

The flower is hermaphrodite with five, sometimes six stamina. Filaments are much longer than the anther. The ovary is round and smooth. The style is high, barreled, separated from the ovary. The stigma is high and bifurcated.

The bunch is medium or large, conical, frequently winged, medium dense or dense. The peduncle is 5-7 cm and lignified up to node.

The berry is medium size, rounded, black, covered with thick bloom, giving a gray tint. The skin is medium thick. The flesh is juicy. The juice is colorless. The flavor is ordinary, very soft and sweet, overripe berries are simple and sweet. There are two-three seeds per berry. The seed is little and oval. The chalaza is in the middle of the body, round, with a swelling in the middle. The beak is short, conical and sharply dissected.

The mature cane is red to light brown, darker on the nodes and with dark stripes on the internodes (ALIEV and PEITEL' 1965).

Phenology

Time of bud burst: third ten days of April

Time of blooming: second ten days of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

The vegetative period is 136-140 days in Derbent with 2,900 °C sum of active temperature.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium, vigorous (in irrigated conditions)



Bud fertility: 0.3-0.8
Bunch weight: 283 g
Berry weight: 2.2 g
Shoot fertility (bunches per shoot): 1.05
Shoot fruiting: 19.0 - 71.0 %
Productivity of bearing shoot: 297 g
Yield per vine: 2.1-6.0 kg
Yield: high (19.8 t·ha⁻¹, over 30 t·ha⁻¹ in a good year)

Climate and cultivation requirements

'Makhbor-Tsibil' is a medium-late wine variety with early and good cane maturation, even in a bad year (50-60 %). Heavy flower and berry drop is not observed.

Resistance to diseases and unfavorable weather

Plasmopara viticola and *Erysiphe necator* resistance is medium. Gray mold susceptibility is low, higher in case of rain or of European grapevine moth (*Lobesia botrana*) attacks.

Juice characteristics

Sugar: 19.1-23.1 %
Total acidity: 5.2-7.5 g·L⁻¹
'Makhbor-Tsibil' reaches 26.0 % sugar and 5 g·L⁻¹ total acidity in Novocherkassk (ALIEV *et al.* 2006). Late harvest allows higher sugar accumulation, but causes sharp acidity drops.

Wine and grape characteristics or wine

'Makhbor-Tsibil' gives intense red sweet wines. The sensorial grade of the experimental wines made and in Derbent and in Novocherkassk is 7.8-8.3/10 and 7.5-8.4/10 respectively.

The variety is very valuable for making sweet "Kagor" style wines. It is also suitable to be blended with 'Krasnostop Zolotovskii', 'Saperavi' and other wines high in acidity.

Mushketnyi B.

Synonyms

'Ladanok', 'Muscat' (Don).

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Mushketnyi' is a rarely spread local variety and it is not clear when or how it arrived in Don. Its presence in the old vineyards of Ust-Donetsk and Konstantinovsk suggests a local origin. SKUIN' (1965) suggests it is a seedling of some rare muscat variety. A putative parental is 'Durman' ('Muscat of Constantinople'), a very similar variety arrived in Don in ancient time. According to ALIEV *et al.* (2006) this variety is a spontaneous cross between native and Eastern varieties.

Taxonomy and intra-variety variability

Proles pontica Negr. (SKUIN' 1965)

No variations have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is greenish with white hairs and brown-red teeth ends. The first distal leaves are five lobed, green with white hairs, the lower leaf side is more hairy.

The mature leaf is large, deeply to slightly five lobed, V-shaped. The leaf surface is smooth, dark green, slightly glossy, reticular-wrinkled, sometimes slightly vesicular. The leaf blade is rough, thick, wide funnel-shaped, with slightly revolute edges. The upper leaf sinuses are deep, closed, with an oval lumen and a rounded, toothed base; or open, lyre-shaped with a narrow mouth. The lower leaf sinuses are frequently small, rarely medium, V-shaped or lyre-shaped with a narrow mouth. The petiole sinus is usually closed with a narrow elliptic or oval lumen; or open, lyre-shaped with a narrow mouth and a pointed or round base. The teeth on the end of the lobes are large, triangular, sharp, with convex sides. The lateral teeth are rather large, triangular-serriform, with convex sides. The lower leaf side is covered with medium cobwebby hairs and dense and very short bristles. The main veins are covered with dense bristle. The petiole is brown-red and as long as the main vein.

The flower is female.

The bunch is medium or large (20-22 cm), cylindrical or cylindrical-conical, frequently winged or irregular, dense or very dense. The peduncle is short and herbaceous.

The berry is medium size (17-19 mm), rounded or oblate, greenish-white, yellow with brown sunburn on the exposed side. In the base of the berry there is a hilum surrounded by large dark spots. The skin is thick, rough and covered with thick bloom. The flesh is juicy and melting. The flavor is simple, muscat, astringent. In the berry there are two seeds. Seeds are medium, wide, almost rectangular, slightly asymmetric and grey. In the middle of the seed's body there is a rounded chalaza. The beak is short, conic, obtuse, slightly wrinkled on the dorsal side (SKUIN' 1965).

Phenology

Time of bud burst: second part of April

Time of blooming: first part of June

Time of veraison: first part of August

Time of ripening: first part of September

The vegetative period is 138 days in Novochoerkassk, 146 days in Yalta, and 151 days in Tashkent.

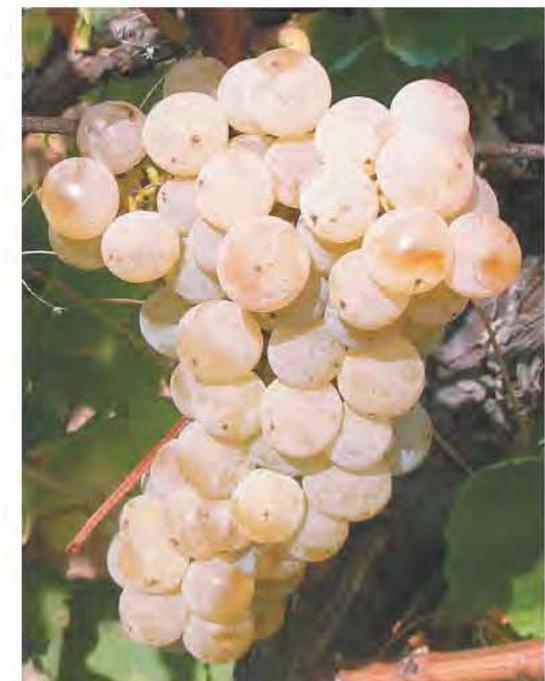
Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility: 0.9

Bunch weight: 120-250 g



Berry weight: 3.5 g
Yield per vine: 1.7-2.0 kg
Yield: 5-6 t·ha⁻¹

Climate and cultivation requirements

'Mushketnyi' is a medium ripening table grape with good cane maturation. Long pruning is used to increase yield. Underdeveloped green shoots are removed during the vegetative period. A wide training system makes larger and better quality berries and bunches. Berry shot is seldom reported.

Resistance to diseases and unfavorable weather

Susceptibility towards *Plasmopara viticola*, *Erysiphe necator* and grey mold is medium. In Rostov, 'Mushketnyi' grows better than other European varieties. It grows on several kinds of soils. It is sufficiently drought resistant and rather cold resistant.

Juice characteristics

Sugar: 20.0-26.0 %
Total acidity: 7.0-8.0 g·L⁻¹
'Mushketnyi' achieves 19.6 % sugar and with 8.3 g·L⁻¹ total acidity in Novochoerkassk in mid September.

Wine and grape characteristics

'Mushketnyi' is consumed fresh. Flavor quality is not particularly good, sensorial grade is only 6.5/10, but it is better than other local varieties such as 'Bulanyi' and 'Buryi'. Transport resistance is sufficient, berry crush load is 970 g and pedicel detachment force is 300 g.
'Mushketnyi' is rarely used in winemaking, because the wines are very poor quality, low in extract and bitter.

Narma B.

Synonyms

'Ongu-Yunka-Uzyum' (Dagestan).

Meaning of the name

Soft.

Historical notes and cultural importance

'Narma' is a local Dagestani variety (PEITEL' 1954). It is in the official list of varieties recommended for cultivation in North Caucasus, established by the "Russian Federation State Commission for Selection Achievements, Tests and Protection" since 1959 and covers 13 ha (TROSHIN 2007).

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspiica* Negr. var. *transcaucasica* Gram. et. Trosch. (TROSHIN 1999, 2002, 2007).

Berry color and size depend on the growing conditions: 'Ag Narma' (white), 'Gyug Narma' (green), 'Sary Narma' (yellow), 'Kara Narma' (black). 'Muscat Transportabelnyi' is one of 'Narma's' offsprings.

Essential ampelographic characteristics

The tip and the first, sometimes also the second, distal leaves are slightly hairy. The leaves are green with a yellow or red shade, slightly strongly colored with dominant red tones. The shoot tip is sometimes brown-red.

The mature leaf is big, rounded or slightly oval, deeply five lobed, with small additional leaf sinuses. The leaf is black-green, glossy, thick, smooth or slightly reticular-wrinkled, slightly funnel-shaped, folded at mid vein with revolute edges. The petiole sinus is open, lyre-shaped or deep, vaulted, square, sometimes sagittate, with a sharp base. The petiole is light brown and shorter than the main vein. The lower leaf side is hairless.

The flower is hermaphrodite.

The bunch is medium size (15-19 x 9-13 cm), conical, rarely cylindrical-conical, often winged, loose to medium dense.

The berry is big (20.0 x 20.5 mm), rounded, with weak bloom. Color varies from light green to pink-yellow depending on the growing conditions. These differences in berry color were wrongly considered a genetic difference. The skin is thin, tender and easy to peel off. The flesh is juicy and melting. The taste is sweet, without aroma or with an original aroma, similar to 'Chasselas Blanc'. The seeds are about 1-4, often 2 per berry; they are easy to separate (PEITEL' 1954).

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September

Vegetative and yielding characteristics

Vigor of shoot growth: medium

Cane maturation: good

Bud fertility (bunches per winter bud): 0.6-1.0

Shoot fertility (bunches per shoot): 1.2-1.5

Shoot fruiting: 71.0-86.0 %

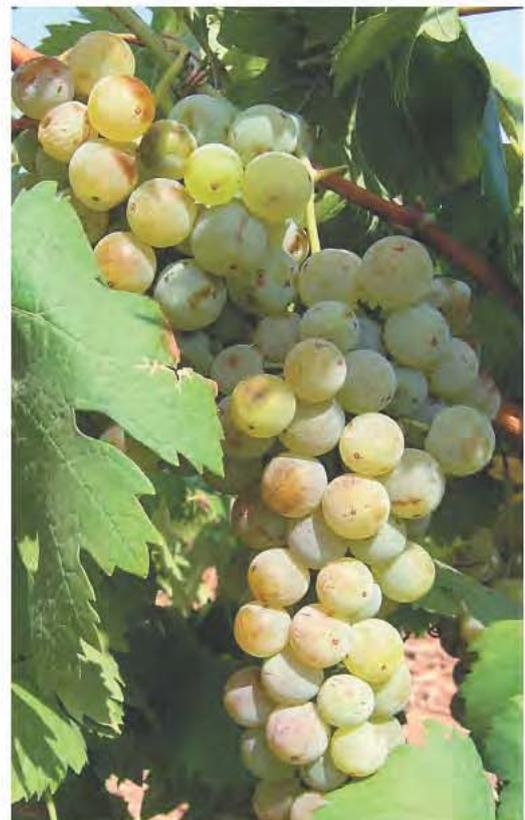
Bunch weight: 230-270 g

Berry weight: 3.3-4.0 g

The yield: high (14.5 t·ha⁻¹ and up to 30.0 t·ha⁻¹ in case of high loading)

Climate and cultivation requirements

'Narma' grows well on moderately clayey and light sandy soils. On light, fertile soils, where the berries reach higher juice and sugar content, grapes have better quality. Rain increases yield, but favors grey mold when it is too frequent. The "fan like" training system, long pruning and 35-50 buds per vine are recommended.



Resistance to diseases and unfavorable weather

The variety is susceptible towards *Plasmopara viticola*, but rather resistant towards *Erysiphe necator* and European grapevine moth (*Lobesia botrana*). It is more frost resistant than 'Agadai', 'Gyulyabi' or other local varieties.

Juice characteristics

Sugar: 18.3-18.9 %

Total acidity: 6.0-7.0 g·L⁻¹

Wine and grape characteristics

'Narma' is a double aptitude, medium ripening, high-yield variety. It is used for ordinary table wine, brandy and juices. The grape is also used for local fresh consumption. Transport resistance is not high.

Pervenets

Praskoveiskii N.

Synonyms

'Pervenets', 'Praskoveiskii Pervenets' (Stavropol'e).

Meaning of names

First-born (Early ripening) from Praskoveya (A village in Budionovskiy, Stavropol' Krai).

Historical notes and cultural importance

'Pervenets Praskoveiskii' is a typical table grape variety. According to T.G. ORLOVA (1954) 'Pervenets Praskoveiskii' was selected in the 19th century from 'Halili White' seedlings. The varieties share similar traits like early ripening, hairless leaf, flower type, and the shapes of anther, berry and seed. The variety was widespread in Stavropol' Krai in the 19th century, covering about 50 ha. Nowadays it is reduced to 15 hectares, but it is becoming popular among the fancy Russian viticulturists. It is used in breeding programs for early ripening varieties (TROSHIN 1999).

Taxonomy and intra-variety variability

Proles orientalis Negr.

The variety has several clones with different productivity, uniformity and stability of quantitative traits. The clones are currently under the evaluation process, therefore they are not registered yet.

Essential ampelographic characteristics

The tip of the young shoot is glossy. The first three distal leaves are light-bronze, more colored towards the edges; on the fourth leaf bronze color disappears. The first leaf is covered with rare, short and white hairs, on the second leaf hairs become loose and on the third they disappear. The shoot axis is light green, with a wine-red hue on the nodes.

The mature leaf is medium size, rounded or slightly oval, from whole to strongly five lobed. The leaf blade is flat, or slightly funnel-shaped. The upper leaf surface is smooth and glossy. The veins are wine-red up to the middle of the leaf. The upper sinuses are medium, open, chinked, lyre-shaped with almost parallel sides and a sharp base, sometimes with a narrow mouth and a sharp base; rarely the leaf sinuses are closed with widely elliptical lumen. The lower leaf sinuses are small, open, chinked, sometimes medium, lyre-shaped with almost parallel sides and a sharp base. The petiole sinus is medium, open, vaulted with a sharp base, usually square, rarely deep, seldom lyre-shaped with a sharp base. The teeth on the ends of lobes are narrow triangular, with a sharp top. The lateral teeth are triangular or triangular-fusiform with convex sides and a sharp top. Bristly hairs cover only the veins of the leaves, the lower and partially the medium part of the shoot. The petiole is as long as the main vein or shorter.

The flower is hermaphrodite. The number of stamens is six-seven and seldom five. The filament is as long as the anther. The ovary is smooth and conic. The stigma is small and almost sedentary.

The bunch is medium size (13-18 x 11-15 cm), widely conical and dense. The bunch peduncle is short, slightly wine-red, thin, strong and lignified.

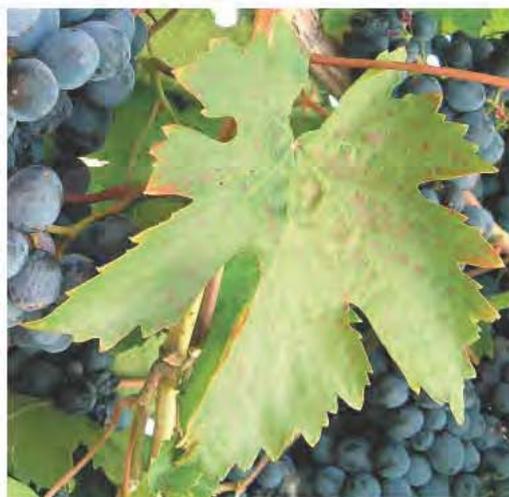
The berry is medium size (12-20 x 9-17 mm), oval, dark blue, almost black at full maturity. The skin is thin, easily torn, with weak bloom, easy to peel. Flesh is firm, taste is simple, slightly herbaceous, with a harmonious sugar/acid ratio. In the berry there are two or three seeds.

The seed is medium size (5.5 x 3.5 mm), almost triangular, with a gradual transition to the beak. The chalaza is oval. The beak is short, light yellow and slightly bifurcated.

The mature cane is pale yellow, with brown stripes on the back surface of the internodes. The nodes are brown (ORLOVA 1954).

Phenology

Time of bud burst: third ten days of April



Time of blooming: first ten days of June
Time of veraison: second ten days of July
Time of ripening: first ten days of August
The vegetative period 102-106 days, and 200 days until leaf fall.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect
Vigor of shoot growth: medium
Bud fertility (bunches per winter bud): 0.4-0.9
Bunch weight: 130-200 g
Yield per vine: 2.4-4.2 kg
Yield: high and consistent (12-14 t·ha⁻¹ near the river Kuma, in good weather).

Climate and cultivation requirements

'Pervenets Praskoveiskii' is an early ripening variety with good cane maturation. It needs a lower thermal sum than 'Chasselas Blanc'. Selective harvest is performed in late July, and full harvest in the beginning of August. It needs medium or high pruning and 7-8 buds per cane to produce large berries. It is salt resistant and it grows well on the salty soils of the village of Praskoveia in the Budenovskii district of Stavropol' Krai. It prefers light and humid soils. Berry shot is not observed.

Resistance to diseases and unfavorable weather

Resistance towards *Plasmopara viticola* and grey mold (*Botrytis cinerea*) is medium.

In case of abundant irrigation or rain, berries crack open and get moldy. The variety is remarkably frost resistant, particularly in Michurinsk's hard winter.

Juice characteristics

Sugar: 13.5-15.1 % (lower than 'Chasselas Blanc')
Total acidity: 5.8-7.2 g·L⁻¹

Wine and grape characteristics

'Pervenets Praskoveiskii' is exclusively used as table grape. The berries are strongly attached to the peduncle, the flesh is sufficiently firm, the skin is thin and fragile and transport resistance is low. For this reason, 'Pervenets Praskoveiskii' is marketed only locally.

Plechistik N.

Synonyms

'Rogataya kist', 'Letun', 'Osypnyak', 'Goryun', 'Chernyi Vinnyi', 'Vinnyi' (Don).

Meaning of the name

Shouldered.

'Vinnyi' = For wine. 'Chernyi vinnyi' = Black for wine. 'Ossipniak' = Drop. 'Goryun' = perishable (due to low *Plasmopara viticola* resistance).

Historical notes and cultural importance

'Plechistik' is a seedling of an unknown variety grown in the Don area for a long time (GEL'MBREKHT 1955). 'Plechistik', in blend with 'Tsimlyanskii Cherny', makes a well-known and unique red sparkling wine, from the old vineyards of Tsimlar (LAZAREVSKII 1965). The variety is recommended for cultivation in Rostov, Volgograd and Astrakhan' since 1959 (ANONYMOUS 2007). 'Plechistik' covers 85 ha in Russia (TROSHIN and RADCHEVSKII 2005).

Taxonomy and intra-variety variability

Proles pontica Negr.

The variety has clones with longer and erect shoots, large and red-violet internodes and black-brown, thicker and deeply dissected leaves.

Essential ampelographic characteristics

The tip of the young shoot and the first two distal leaves are wine-red with a bronze hue on the edges and are covered with thick hairs.

The mature leaf is medium or big, rounded or slightly prolonged, deeply five to seven lobed. The leaf blade is folded, black-green, cobwebby-wrinkled or slightly vesicular. The upper leaf sinuses are deep, closed with an open, oval lumen or seldom with a transversal-oval lumen, sometimes toothed. The lower leaf sinuses also are deep, closed, with oval lumen or open, lyre-shaped. The hairs on the lower leaf side are dense and bristly - cobwebby. The teeth on the end of the lobes are big, sharp-triangular. The lateral teeth have slightly convex sides. The petiole sinus is closed, elliptic, transversal-elliptic or oval; rarely open, lyre-shaped with a sharp base. The petiole is wine-red, as long as the middle vein or shorter.

The flower is female.

The bunch is medium size (16-18 x 12-14 cm), conical and cylindrical, winged (often with two wings, or shoulders). Bunch density depends on pollination, from very loose to very dense.

The berry is medium or small (14.5-15 x 15-16 mm), rounded or flat, rarely slightly oval, black-blue, covered with bloom. The skin is thin and not firm. The juice is colorless. Seeds are one-four, rarely two, per berry (GEL'MBREKHT 1955).

Phenology

Time of bud burst: end of April-beginning of May

Time of blooming: first ten days of June

Time of veraison: first part of July-first ten days of August

Time of ripening: end of August-first ten days of September

Vegetative and yielding characteristics

Vigor of shoot growth: higher than medium

Bud fertility (bunches per winter bud): 0.6-0.9

Shoot fertility (bunches per shoot): 1.2-1.4

Shoot fruiting: 53.0-64.0 %

Bunch weight: 140-240 g

Berry weight: 1.4-2.5 g

Yield: 5-11 t·ha⁻¹ (depending on pollination)

Climate and cultivation requirements

'Plechistik' needs pollinators ('Tsimlyanskii Chernyi' or 'Kumshatskii'). Flower drop and berry shot are normal. Double artificial pollination, performed in the middle and at the end of flowering, guarantees harvest. Topping is recommended. It is successfully cultivated on soils rich in water.



Resistance to diseases and unfavorable weather

The variety is highly susceptible towards *Plasmopara viticola*. It is rather frost and drought resistant.

Juice characteristics

Sugar: 20.0-25.0 %

Total acidity: 6.0-8.0 g·L⁻¹

Wine and grape characteristics

'Plechistik' is a medium ripening wine grape variety from the Don. The grape is used in blend with 'Krasnostop Zolotovskii' for making good quality table wines. It also is used in blend with 'Tsimlyanskii Chernyi' for making high quality red sparkling.

Pukhlyakovskii B.

Synonyms

'Korna Belaya', 'Mazhorka Belaya' (Russia), 'Kechkechecu Feher' (Hungary).

Meaning of the name

The surname of the Cossack who first spread it. Also the named of a village (Stanitsa).

Historical notes and cultural importance

'Pukhlyakovskii' is probably original of the Don area, as a seedling of an unknown variety.

Due to its similarity with the Hungarian variety 'Kechkechecu Feher', it has been proposed that the seeds were introduced from Hungary (ELETSKII and LAZARAVESKII 1955; LEFORT *et al.* 2003). However, ALIEV *et al.* (2006) suggest it is a spontaneous cross of a Don native and Eastern table grape variety. 'Pukhlyakovskii' is spread over Rostov, Volgograd, Astrakhan', Krasnodar, Stavropol' Krai and Ukraine. The variety is included in the official "State register of breeding achievements admitted for cultivation" in North Caucasus since 1959 and covers 4 ha (2007). It is interesting for non commercial viticulture and for breeding.

Taxonomy and intra-variety variability

Proles pontica subproles *balcanica* Negr.

Among commercial vineyards of 'Pukhlyakovskii' there are plants with oval berries and round tips, while typical berries have oval berries with a pointed tip.

Progenies of 'Pukhlyakovskii' are: Amphornyi, 'Garmonichnyi', 'Glubokorazreznoi', 'Desertnyi', 'Iskristyi', 'Iskushenie', 'Muscat Anapskii', 'Narodnyi', 'Nimrang Novyi', 'Novocherkasskii', 'Ovalnyi Zhemchug', 'Pridonskii' (pervyi), 'Prima', 'Pukhlyakovskii Alyi', 'Pukhlyakovskiy Krupnoyagodnyi', 'Pukhlyakovskii Magaracha' ('Pukhlyakovskii Ustoichivyi'), 'Pukhlyakovskii Muskatnyi', 'Pukhlyakovskii Novyi', 'Rostovskii Chernyi Rannii', 'Rostovskii Pozdnyi', 'Serdsevidnyi', 'Serebristyi', 'Syrpriz', 'Farforovyi', 'Tselnolistnyi', 'Chernomor', 'Shakhterskii' and other varieties (TIMUSH (1986-1987); RADZHABOV *et al.* 2003; TROSHIN 2007). The most interesting offspring is 'Pukhlyakovskii Ustoichivyi' (resistant), bred by the "Magarach" Institute.

Essential ampelographic characteristics

The tip of the young shoot has dense cobwebby hairs on both sides. The upper surface of the first leaf is hairless; the first, second and frequently the third leaves have dense white felt hairs on the lower leaf side. The leaves are green with a red-bronze hue. Quite often, the shoot axis is brownish-red in the upper part.

The mature leaf is medium or large, round, medium or deeply five lobed. The leaf blade is dark-green, thick, reticular-wrinkled. The upper leaf sinuses are deep or medium deep, closed with elliptic or oval lumen, rarely open and lyre-shaped; the base is rounded or slightly sharp. The lower leaf sinuses are medium, open, lyre-shape. The petiole sinus is open, rarely rounded. The petiole is wine-red, as long as the main vein or shorter. The teeth on end of the lobes are similar to the lateral teeth. Lateral teeth are triangular-serriform with convex sides and sharp. The lower leaf side is covered with medium dense bristly-cobwebby hairs.

The flower is female.

The bunch is medium or large (16-28 x 16-18 cm), almost cylindrical, rarely slightly conical, with one or rarely with two wings, forming double or triple bunches. Density depends on pollination.

The berry is large (20-22 x 16-19 mm), oval, with a pointed or round end, seldom oblong, greenish-white, with a yellowish hue at full maturity and covered with plenty of bloom. The skin is very thick, elastic and firm. The flesh is juicy, fleshy, melting, with a pleasant taste. There are 2-3 seeds per berry (ELETSKII and LAZARAVESKII 1955; LAZARAVESKII and ALIEV 1965).



Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: first-second ten days of August

Time of ripening: middle of September

Vegetative and yielding characteristics

Vigor of shoot growth: higher.

Cane maturation: good

Bud fertility (bunches per winter bud): 1.0-1.3

Shoot fertility (bunches per shoot): 1.6-1.8

Shoot fruiting: 60.0-81.0 %

Bunch weight: 120-175 g

Berry weight: 1.5-3.5 g

Yield: high but not stable (depending on pollination)

Climate and cultivation requirements

'Pukhlyakovskii' is a late variety that needs a significant amount of heat during the season.

It grows well on water-rich and light soils on south and southwest facing slopes (berries become a beautiful golden color). On very fertile black "Chernozem" soils, berries stay green at ripening, but quality is not reduced.

'Pukhlyakovskii' needs pollinator varieties like 'Bulanyi', 'Kosorotovskii', 'Kumshatskii', 'Gars Levelyu', 'Chasselas White', 'Senso', 'Kokur Belyi' as well as artificial pollination.

Resistance to diseases and unfavorable weather

The variety is *Plasmopara viticola* resistant and sufficiently frost-resistant. Grafting on cold-resistant rootstocks can increase resistance of roots to winter frosts, and drought, increasing also yield.

Juice characteristics

Sugar: 18.0-25.0 %

Total acidity: 5.3-7.6 g·L⁻¹

Wine and grape characteristics

'Pukhlyakovskii' is local, late ripening, double usage River Don basin variety with rather good transport and storage ability. The beautiful bunches and good quality berries are consumed fresh. Moreover, it is used for making table wines, white sparkling wines and grape juice. 'Pukhlyakovskii' is also suitable for conservation and for making pickles.

Rish Baba B.

Synonyms

'Damskie Pal'chiki', 'Derbent Tsibil', 'Irshe', 'Urudg Baba', 'Eresh' (Dagestan); 'Al'van', 'Derbendi Rozovyi', (Absheron peninsula, Azerbaijan); 'Gelim Barmak', 'Kizyl Gelin Barmak', 'Kizyl Uzuim', 'Khovom' (Turkmenistan).

Meaning of names

Grandfather's beard.

'Derbendi Rozovyi' = Pink Derbent.

Historical notes and cultural importance

The origin of 'Rish Baba' is not clear, but its distribution in the old viticultural regions of Central Asia and South Caucasus suggests it is an ancient variety. Probably the variety had origin in Iran. 'Rish Baba' grows in small vineyards or as single plants in Dagestan (mainly in Derbent); in Azerbaijan (in Absheron and Kyurdamir), in Nakhichevan, Armenia, Turkmenistan (mainly in Kara-Kala, Chandyrskoi and Sumbarskoi). The variety is not widespread. It is interesting for breeding purposes, and also as an ornamental plant for pergolas and alleys (PEITEL' 1966).

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr. var. *transcaucasica* Gram. et Trosch. (TROSHIN 1999, 2002, 2007).

There are few studies about 'Rish Baba's clonal variations. PROTSENKO (PEITEL' 1966) suggested that the local Turkmen variety 'Kara-Izum' is a bud mutation of 'Rish baba', as they share many similar traits. Probably, the same clone spread in Derbent under the name 'Kara Rish' is also spread in the vineyards of Derbent. However, there are no registered clones so far.

Essential ampelographic characteristics

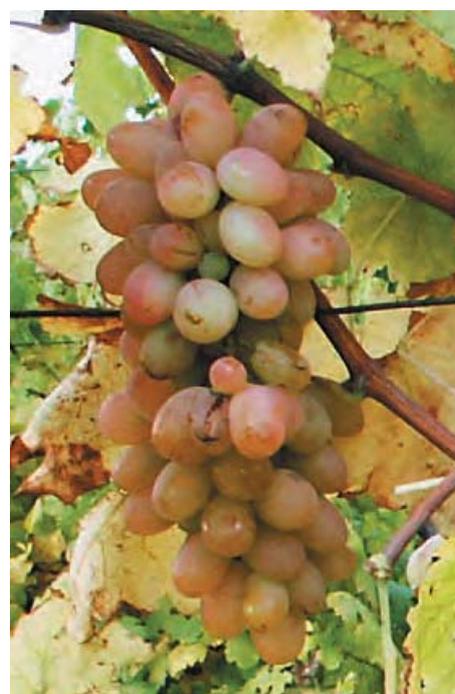
The tip of the young shoot is dark green with pink edges, covered with thick cobwebby hairs. The cobwebby hairs cover up to the second-third leaves, gradually reducing density, becoming almost imperceptible on the third leaf. Color is light or dark-bronze with a little violet tint. The shoot axis is slightly hairy and light green.

The mature leaf is large, transversal-oval, deeply five, rarely three lobed. The leaf blade is slightly funnel-shaped, the upper side is light green with a yellowish tint, reticular-wrinkled. The upper leaf sinuses are more often deep, rarely medium deep or very deep, closed, with oval lumen and overlapped, rarely with an elliptic lumen or open, lyre-shaped with a narrow mouth; the base is slightly pointed, sometimes with a tooth. The lower leaf sinuses are medium and small, sometimes deep, open, lyre-shaped with almost parallel sides, rarely with a narrow mouth; the base is slightly pointed or rounded, sometimes toothed. The petiole sinus is open, lanceolate or completely closed, with narrow chinked lumen and one or two teeth. The teeth on the end of the lobes are much larger than the lateral ones. The lateral teeth are triangular or triangular-serriform with almost straight sides and a sharp top. The lower leaf side is hairless, sometimes the veins are covered with short bristles. The petiole is reddish and slightly shorter than the main vein.

The flower is hermaphrodite, with five or six stamina. The stamina is longer than the anther. The ovary is oblate on each side, cylindrical, slightly narrowed in the base, frequently a little asymmetric. The style is short, almost cylindrical. The stigma is well developed, bifurcated.

The bunch is medium size, conic, rarely cylindrical-conic, sometimes winged, loose, rarely medium dense. The bunch peduncle is short, herbaceous, green, sometimes slightly lignified in the base and rather fragile.

The berry is large, oval, elongated, bent down, asymmetric, sometimes with a small intersection in the middle, with a rounded or slightly pointed top, green-white with light pink, and sometimes with a deep-pink tint on the sun exposed side and on the tip. The berry is more colored in the mountainous and sub-mountainous regions than on the plain. The skin is thin, elastic, hard to peel off, covered with bloom. The flesh is thick, crispy and rather



juicy. The berry is fresh, sweet with a pleasant gooseberry flavor. There are one to three seeds per berry; many seeds lack endosperm. The seed is very large, light-brown with dark-brown spots on the back, long, cylindrical. The chalaza is badly expressed, extended, flat, located in the top third of the seed's body. The beak is long, slightly conic with oblique a truncated and slightly bifurcated end.

The mature cane is light red-brown on the internodes and dark red-brown on the nodes (PEITEL' 1966).

Phenology

Time of bud burst: third ten days of April

Time of blooming: beginning of the second ten days of June

Time of veraison: second ten days of August

Time of ripening: second-third ten days of September

The vegetative period is 142 days in Novocherkassk, 143 days in Absheron, 150 days in Derbent, 153 days in Odessa, 156 days in Kara-Kala, 159 days in Tashkent, 172 days in Gyanja.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium (on non irrigated soils), vigorous (on irrigated soils)

Bud fertility (bunches per winter bud): 0.7-0.8

Shoot fertility (bunches per shoot): 1.1-1.5

Shoot fruiting: 41.9-73.0 %

Bunch weight: 180-280 g

Berry weight: 5.0-6.8 g

Yield per vine: 4.0-7.0 kg

Yield: from low to high (11 t·ha⁻¹ in Derbent on light-brown soils, "fan like" training system, four fruity canes on vertical trellis, 2.0 x 1.5 m planting layout, winter irrigation; 9.0-14.0 t·ha⁻¹ in Tashkent (Uzbekistan) on light grey soils, "fan like" training system on vertical trellis, 2.5 x 2.0 m planting layout, irrigation; 13.7 t·ha⁻¹ in Azerbaijan; 5.0-6.0 t·ha⁻¹ in Absheron; 9.2-14.0 t·ha⁻¹ in Turkmenistan).

Climate and cultivation requirements

'Rish Baba' is a table grape variety with a long vegetative period and good cane maturation. Ripening starts in the first ten days of October in Gyanja (Azerbaijan), in the first ten days of September in Absheron (Azerbaijan) and in the beginning of September in Kara-Kala and Nukhur (Turkmenistan). Often, the berries have empty seeds (without endosperm). There are also seedless berries conserving the typical varietal morphology. Expanse training systems with 9-12 buds per cane pruning are recommended. 'Rish Baba' has no particular soil preference.

Resistance to diseases and unfavorable weather

'Rish Baba' is rather drought-resistant and salt-tolerant. The variety is slightly susceptible towards *Plasmopara viticola*, slightly less towards *Erysiphe necator*. It is highly susceptible towards European grapevine moth (*Lobesia botrana*) and *Planococcus citri* Risso. In Turkmenistan it suffers from *Eriophyes vitis* Pgst. (PROTSENKO 1966).

Juice characteristics

Sugar: 16-20 %

Total acidity: 2.0-3.5 g·L⁻¹

Wine and grape characteristics

'Rish baba' is consumed fresh. It is suitable for winter storage and for making fruit candy, grape jelly and marinade. It has very beautiful bunch and berries, good transport resistance and a simple fresh taste. Sensorial grade is 6.8/10.

Sarakh B.

Synonyms

'Sary Ak' (Dagestan).

Meaning of the name

Yellow-white.

Historical notes and cultural importance

The origin of 'Sarakh' is not clear. It was found mixed with other varieties in Dagestan and Checheno-Ingushetiya. Almost mono varietal vineyards were found in Dagestan only (ADAMANOV and PEITEL' 1966). The variety is rare, but it is promising for breeding.

Taxonomy and intra-variety variability

Proles pontica Negr.

According to ADAMANOV and PEITEL' (1966) there are a few productive variations with more dissected leaves and deeper leaf sinuses, however no clones have been selected so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with dense hairs. The first two distal leaves have the upper sides covered with hairs; hairs gradually disappear on the third and fourth leaf. The young leaves are deeply dissected, the first leaf is white, the second-third are yellow-orange. The shoot axis is hairy, light green with a dirty-brown tint on the sun-exposed side.

The mature leaf is very large and rounded, deeply five lobed, with additional leaf sinuses on all blades, sometimes the leaves become seven or nine lobed. The leaf blade is slightly funnel-shaped; the upper surface is reticular-wrinkled or smooth. The upper leaf sinuses are very deep, more often closed with wide elliptic, oval or triangular lumen; rarely open, lyre-shaped, with a very narrow mouth; the base of the sinuses is round or flat, sometimes toothed or pointed. The lower leaf sinuses are deep or very deep, more often open, lyre-shaped with narrow mouth; rarely closed, with overlapping lobes and elliptic lumen; the base of the sinuses is round, occasionally toothed or slightly pointed. The petiole sinus is open and lyre-shaped, or closed, with an elliptic lumen and round or sharp base, sometimes with one or two teeth. The teeth on the end of the lobes are very large, narrow triangular with a sharp top. The lateral teeth have the same shape or they are serriform-triangular and large. The hairs on the lower leaf side are medium dense and cobwebby. The petiole is green with a pink shade, shorter than the main vein or sometimes equal.

The flower is hermaphrodite with five, rarely six stamina. The filaments are a little bit longer than the anther. The ovary is round-oval and smooth. The stigma is high and headed.

The bunch is medium or large, cylindrical or slightly conical, winged, usually loose, rarely medium dense. The bunch peduncle is medium or long and fully lignified.

The berry is large, oval, yellowish-green with brown points. The skin is thick, smooth, firm, difficult to peel off, covered with medium dense bloom. The pulp is fleshy-juicy. The taste is simple, moderate sweet, freshening and harmonious. In the berry there are one to four, more often two-three, large, gray brown seeds. The seed's body is oval with a thick, long beak, gradually narrow and rounded on the end. The chalaza is oval or rounded and pressed. The mature cane is light-brown. The nodes are darker than the internodes (ADAMANOV and PEITEL' 1966).

Phenology

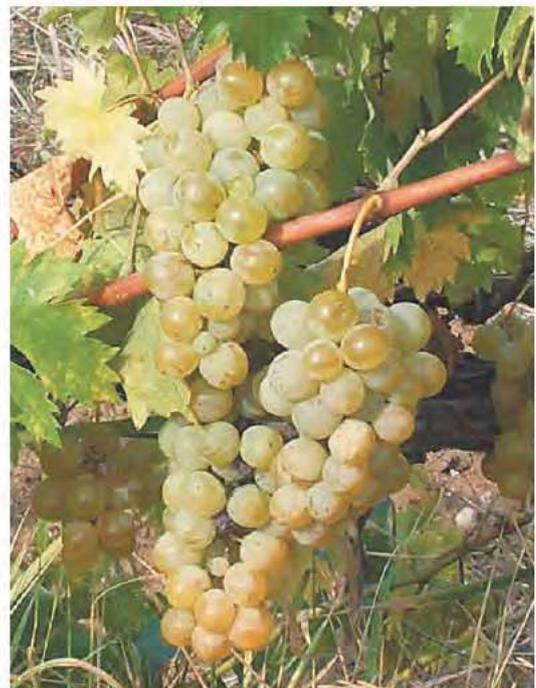
Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

The vegetative period is 144 days in Derbent, 154 days in Khasavyurt.



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility (bunches per winter bud): 0.8

Shoot fertility (bunches per shoot): 1.14-1.47

Shoot fruiting: 42.7-95.0 %

Bunch weight: 210-245 g

Berry weight: 2.3-3.4 g

Yield per vine: 4.4-4.6 kg

Yielding: high (12-18 t·ha⁻¹, sometimes 20-25 t·ha⁻¹ in Khasavyurt on chestnut soils, with vigorous training systems like "Moldavian vase" or "fan like" with many fruity canes, 2.25-2.50 x 1.25 m planting layout)

Climate and cultivation requirements

'Sarakh' is a medium late, double aptitude variety with good cane maturation. Long pruning is recommended. 100-130 thousand buds/ha is the recommended bud load in Khasavyurt. Berry shot is not observed. Flower drop is usually weak, but in a bad year it can be strong, forming defective bunches.

Resistance to diseases and unfavorable weather

The variety is slightly susceptible to *Erysiphe necator*, *Plasmopara viticola* and European grapevine moth (*Lobesia botrana*). It is medium susceptible to grey mold (*Botrytis cinerea*). Drought and frost resistance are weak.

Juice characteristics

Sugar: 13.0-16.0 %

Total acidity: 4.3-8.1 g·L⁻¹

Sugar accumulation and acidity is higher in Khasavyurt than in Derbent.

Wine and grape characteristics

'Sarakh' is a low transport resistance table grape variety: berry crush load is 902 g, pedicel detachment force is 443 g. Pleasant fresh taste, large size and firmness make this variety very suitable for fresh consumption and short range transport. Sensorial grade is 7.0/10.

'Sarakh' is mainly used locally for winemaking in blend with other varieties. Experimental mono varietal wines are good and harmonious (Y. I. ПОТАПЕКО).

Shampanchik Konstantinovskii B.

Synonyms

'Sizen'kii', 'Sinen'kii' (Don).

Meaning of the name

Selected and multiplied in the village (Stanitsa) Kostantonovskii, where it is used for making sparkling wines.

'Sizen'kii', 'Sinen'kii' = Bluish grey.

Historical notes and cultural importance

There are no data about the origin of this variety. Single vines were found in the old vineyards of the River Don basin (ALIEV 1966). The berries are typically bluish grey, thus the synonym 'Sinen'kii' (LAZAREVSKII 1956; ALIEV *et al.* 2006). This is a rare local variety. It is interesting for breeding.

Taxonomy and intra-variety variability

Proles pontica subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

Registered clones of this variety have not been released so far.

Essential ampelographic characteristics

The tip of the young shoot and the following three distal leaves are covered with dense felt hairs. The young shoot is pale-green with a very light orange hue.

The mature leaf is medium size, rounded, deeply five lobed, frequently with slightly expressed additional leaf sinuses on the main lobes. The leaf blade is wide and funnel shaped. The upper leaf surface is slightly reticular-wrinkled, almost glossy. The upper leaf sinuses are deep and very deep, closed, with elliptic or oval lumen and a slightly pointed, almost flat base, quite often with a tooth on the base. The lower leaf sinuses are medium deep, open, lyre-shape, sometimes closed, with an elliptic lumen and a slightly pointed base. The petiole sinus is open, lyre-shaped with a narrow mouth, or closed with an oval lumen; the base is often bordered by the veins. The teeth on the end of the lobes are narrow triangular, very sharp, rather high. The lateral teeth are triangular-serriform and very sharp. The lower leaf side is covered with dense bristly-cobwebby hairs. The petiole is often slightly shorter than the middle vein.

The hermaphrodite flower has five stamina. The filaments are as long as the anther or slightly longer. The conic ovary and the cylindrical style are distinct. The stigma is capitate.

The bunch is medium size (13-15 cm, sometimes 17-20 cm), cylindrical or narrow conical, frequently with two shoulders, or winged, loose or medium dense. The peduncle is medium long.

The berry is small or medium (14 mm), rounded, grass-green, covered with dense bloom giving a bluish-grey tint. Overripe berries get a yellowish hue. The skin is thin and solid. The flesh is very juicy. The taste is ordinary and harmonious.

The seed is medium, oval and brown. The chalaza is oval, pressed in the middle, shifted to the top of the seed. The beak is short and conical.

The mature canes are light yellow, the nodes are light brown (ALIEV 1966).

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: first ten days of September

The length of period from bud burst to ripening is 130 days in the Lower Don (ALIEV 1966).

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium



Bud fertility (bunches per winter bud): 0.7

Shoot fertility (bunches per shoot): 1.3

Bunch weight: 120-160 g

Berry weight: 2.0 g

Yield per vine: 1.6-2.2 kg

Yield: 5.0 - 6.5 t·ha⁻¹

Climate and cultivation requirements

'Shampanchik Konstantinovskii' is a wine variety with a medium vegetative period and good cane maturation. It is suitable for cultivation on the Lower Don plains. Yield is significantly higher in water-rich soils. Strong flower drop is reported in drought. In this case bunches become very loose and berries small. Berry shot is not reported.

Resistance to diseases and unfavorable weather

'Shampanchik Konstantinovskii' has low susceptibility towards *Plasmopara viticola* (even if inflorescences and developing berries can be damaged) and to other fungal diseases. It has medium resistance to winter frosts and low resistance to drought.

Juice characteristics

Sugar: 20.2-26.8 %

Total acidity: 7.3-9.6 g·L⁻¹

'Shampanchik Konstantinovskii' has a particularly fast sugar accumulation, while acidity remains high. Average figures for mid September in Novocherkassk are: 23.2 % sugar and 8.1 g·L⁻¹ total acidity (ALIEV *et al.* 2006).

Wine and grape characteristics

'Shampanchik Konstantinovskii' gives high quality table wines of (7.5/8 sensorial grade). Overripe grapes give good quality semi sweet wines. Early harvested grapes are used for making sparkling wines.

Shampanchik Tsimlyanskii B.

Synonyms

'Shampan', 'Shampanskii', 'Shampanchik' (Don).

Meaning of the name

Shampanchik from Tsimlianskii. 'Shampan', 'Shampanskii', 'Shampanchik' = Sparkling.

The variety was selected and multiplied in the village (stanitsa) of Tsimlianskii, where it was used for making sparkling wines.

Historical notes and cultural importance

'Shampanchik Tsimlyanskii' is mentioned for the first time by E.G. KLAUSEN (1886) who investigated the vineyards of the Don river valley in 1884 (GEL'MBREKHT 1956). According to LAZAREVSKII (1953), it is very similar to the rare French variety 'Arbanc Blanc'. ALIEV *et al.* (2006) suggest 'Shampanchik Tsimlyanskii' is a West European seedling. It is a rare local variety.

Taxonomy and intra-variety variability

Proles occidentalis Negr.

No biotypes and clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are covered with dense cobwebby hairs and pink spots. The teeth on the end of the lobes are very long, hairless, green, with wine-red edges.

The mature leaf is medium size (12-16 cm), rounded, deeply five lobed. The leaf blade is slightly reticular-wrinkled or minor vesicular, rough, flat or funnel-shaped. The upper leaf blade is dark green. The upper leaf sinuses are deep, closed with a widely elliptic or rounded lumen and a sharp base; sometimes they are small, chinked, rarely open. The lower leaf sinuses are small, open, sometimes closed with a narrow elliptic lumen. The petiole sinus is closed, with an elliptic or oval lumen, rarely open, lyre-shaped, with a sharp base. The teeth on the ends of the lobes are large, narrow triangular with sharp teeth. The lateral teeth are direct or triangular with a sharp top, sometimes triangular-serriform. The hairs on the lower leaf side are weak, cobwebby mixed with bristles. The veins on the lower leaf side are hairless or covered with rare bristles. The petiole is as long as the main vein or shorter.

The flower is hermaphrodite with five stamina. The filaments are twice as long as the anther. The ovary is narrow conical, gradually passing in a style, slightly ridged. The style is cylindrical-conic. The stigma is small and capitate.

The bunch is small (9-12 cm in length), almost cylindrical, or medium size (10-14 x 6-8 cm), cylindrical-conic, often winged. The wing is small on the long peduncle, sometimes up to half of the bunch. The bunch is medium dense and rarely loose. The bunch peduncle is 2.0-4.5 cm, thin, lignified up to the first node.

The berry is small (12-13 mm) or medium (9-14 mm), rounded or slightly oval, grayish-green or green-yellow, with brown sunburn spots on the sun exposed side. The skin is thin, densely covered with spots. The flesh is juicy. The taste is ordinary, not very delicate, high in sugar and acidity. There are two-three seeds per berry. The seed is medium size (5.0-6.0 x 3.0-3.5 mm), dark-chestnut-colored, with lighter abdominal grooves and a beak, wedged, with a developed left side. The chalaza is in the top of the seed's body, reverse oval and concave. The beak is short and conic.

The mature cane is thin with quite long internodes. Even in very favorable conditions the shoots stay thin (varietal trait). The shoot is orange-brown, red-brown on the nodes (GEL'MBREKHT 1956).



Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September

The length of period from bud burst to ripening is 130 days in Don, 145 days in Moldova and 148 days in the Southern coast of Crimea.

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: relatively low, moderate

Bud fertility (bunches per winter bud): 0.6-0.8

Bunch weight: 45-80 g

Berry weight: 0.7-1.0 g

Yield per vine: 1.3-2.0 kg

The yield: 4.0-6.0 t·ha⁻¹

Climate and cultivation requirements

'Shampanchik Tsimlyanskii' is a typical medium ripening wine variety.

Cane maturation is good.

Resistance to diseases and unfavorable weather

It has lower susceptibility towards *Plasmopara viticola*, *Erysiphe necator* and grey mold (*Botrytis cinerea*) compared to other European varieties. It is medium frost and drought resistant.

Juice characteristics

Sugar: 23.5-25.5 %

Total acidity: 7.5-10.0 g·L⁻¹

'Shampanchik Tsimlyanskii' has a particularly fast sugar accumulation, while acidity remains high. Average figures for Novocherkassk are: 24.9 % sugar and 10.1 g·L⁻¹ total acidity (ALIEV *et al.* 2006).

Wine and grape characteristics

'Shampanchik Tsimlyanskii' is used for high quality dessert and table wines.

Shilokhvostyi N.

Synonyms

'Kishkun' (Don).

Meaning of the name

The name is linked with the leaf and the young shoot.

Historical notes and cultural importance

Data about the origin of the variety are not available. It is a local Don variety, very rarely spread as single vines. 'Shilokhvostyi' was discovered mixed with other varieties in the old vineyards of the Semikarakorskii district of Rostov (ALIEV 1966). 'Shilokhvostyi' is a spontaneous cross of native and Eastern table grape variety (ALIEV *et al.* 2006).

Yield instability makes 'Shilokhvostyi' a low value table grape variety. It has local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No biotypes or clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green with a reddish edge. The first distal leaves are five lobed, greenish with a lemon-yellow tint. The lower leaf blade is more hairy.

The mature leaf is medium size, round or slightly elongated, deeply five lobed, with frequent additional leaf sinuses. The leaf blade is slightly funnel shaped. The upper leaf side is reticular-wrinkled, the lower is covered with medium dense cobwebby hairs. The upper leaf sinuses are very deep, more often open, lyre-shaped with a narrow mouth, but quite often closed, with oval lumen and a slightly pointed base. The lower leaf sinuses are deep, open, lyre shaped with a narrow mouth or closed, with an oval lumen and a sharp base. The petiole sinus is often closed, with an elliptic lumen and a sharp base, sometimes open, lyre-shaped with a narrow mouth. The teeth on the end of the lobes and the lateral teeth are large and triangular. The hairs on the lower leaf side are cobwebby, mixed with bristles. The petiole is often shorter than the middle vein.

The flower is female.

The bunch is large (20 cm), cylindrical-conical, shouldered and loose. The peduncle is long.

The berry is large or medium (20-22 x 17-18 mm), oval, dark blue, with thick bloom. The skin is thick and strong. The pulp is juicy and slightly fleshy. The taste is ordinary, not harmonious. In the berry there are 1-3 seeds. The seed is large, oblong, light brown. The chalaza is close to the top of the seed's body, oval, very slightly pressed in the middle. The abdominal sinuses are almost parallel. The beak is long, expanded (ALIEV 1966).

Phenology

Time of bud burst: second part of April

Time of blooming: first part of June

Time of veraison: first part of August

Time of ripening: third ten days of September

The vegetative period is 147-157 days in Lower Don (Novocherkassk).

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bud fertility (bunches per winter bud): 0.3-0.5

Bunch weight: 240-250 g

Berry weight: 4.0 g

Yield per vine: 1.0-4.5 kg

Yielding: high (15.8 t·ha⁻¹, but unstable during years)



Climate and cultivation requirements

'Shilokhvostyi' is a late variety with good cane maturation. No particular pollinator variety has been detected. Flower drop is rather strong, causing loose bunches. Berry shot is rare and very low.

Resistance to diseases and unfavorable weather

'Shilokhvostyi' is medium susceptible towards *Plasmopara viticola*. It is moderately frost and drought resistant.

Juice characteristics

Sugar: 17.0-18.5 %

Total acidity: 7.5-8.9 g·L⁻¹

'Shilokhvostyi' has moderate sugar and acidity. Average figures for Novocherkassk in the second ten days of September are: 18.3 % sugar and 8.4 g·L⁻¹ total acidity (ALIEV *et al.* 2006).

Wine and grape characteristics

'Shilokhvostyi' is consumed fresh locally. In a good year it has large beautiful bunches and pleasant berries.

Sibir'kovyi B.

Synonyms

'Sibirek' (Don).

Meaning of the name

'Sibir'kovyi' could be the nickname of a Cossack who returned from Siberia and spread the variety.

Historical notes and cultural importance

'Sibir'kovyi' is one of the most valuable old varieties of the Don river valley. Similarities with 'Gars Levelyu' and 'Furmint' suggest that the seedling was introduced from Hungary. Many mono varietal 'Sibir'kovyi' vineyards were established due to its high technological value. Alas, the vineyards were destroyed by Phylloxera, thus this variety was abandoned, along with other high quality varieties such as 'Krasnostop Zolotovskii', 'Kumshatskii' etc. (LAZAREVSKII 1955). Recently, small farmers started to replant the variety on the Don's right riverbank. Nowadays, 'Sibir'kovyi' is mainly spread in Rostov, it is rare in commercial vineyards, but it is a perspective source of genes for breeding. 'Sibir'kovyi' is recommended for making high-quality white table wines.

The variety is included in the official list of varieties recommended for cultivation in North Caucasus, established by the "Russian Federation State Commission for Selection Achievements, Tests and Protection" since 1959. 'Sibir'kovyi' covers less than 16 ha (TROSHIN 2007).

Taxonomy and intra-variety variability

Proles pontica subproles *balkanica* Negr.

No biotypes or clones have been registered so far.

Offsprings of 'Sibir'kovyi' include 'Muscat aksaiskii', 'Stepnyak' etc.

Essential ampelographic characteristics

The tip of the young shoot is covered with cobwebby hairs. The glossy, green young leaves with an orange hue have only rare cobwebby hairs on the upper side, while the lower side is covered with thick white felt hairs with pink spots.

The mature leaf is medium or large, rounded, deeply five, rarely seven lobed. The leaf blade is frequently revolute. The upper leaf sinuses are deep, closed with an elliptic or oval lumen; sometimes they are small, open, chinked. The lower leaf sinuses are deep, open, lyre-shaped with a narrow mouth. The petiole sinus is closed with deep lower lobes and small elliptic lumen; sometimes open and lyre-shape. The teeth on the end of the lobes are slightly larger than the peripheral, triangular with very sharp tops. The lateral teeth are triangular or serriform, frequently with slightly convex side and sharp top. The lower leaf side is covered with cobwebby hairs of various density and with rather dense and short, imperceptible bristles. The petiole is wine-red and shorter or sometimes as long as the main vein.

The flower is hermaphrodite, with five stamina. The ovary is narrow, oval-conic with quite long styles. The stigma is rather large and head-cylindrical.

The bunch is medium size or large (20 cm), slightly conic or nearly cylindrical, often with big wings, loose or medium dense.

The berry is medium (17 x 15 mm), oval and greenish-white with a yellowish shade, covered with plenty of white bloom. The skin is thin, easy to tear and semi-translucent. The flesh is juicy and melting. Taste is ordinary. The seed is medium, oval and brown. The chalaza is large, oval, with a swelling in the middle. The beak is short and thin (LAZAREVSKII 1955).

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: first ten days of August

Time of ripening: first ten days of September



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: high

Bud fertility (bunches per winter bud): 0.9

Shoot fruiting: 53-64 %

Bunch weight: 120-140 g

Berry weight: 1.8-2.0 g

Yield per vine: 2.5-4.1 kg

Climate and cultivation requirements

'Sibir'kovyi' is characterized by a short-medium vegetative period and sufficient cane maturation, but slightly late. The variety is suitable for the southern and middle Russian viticultural zones.

Resistance to diseases and unfavorable weather

The variety is low resistant towards *Plasmopara viticola* and high susceptible to *Erysiphe necator*. Resistance to winter frosts and drought is quite moderate.

Juice characteristics

Sugar: 16.7-19.1 %

Total acidity: 5.9-7.0 g·L⁻¹

According to the Institute of Novocherkassk sugar reaches 19.7 % and total acidity 6.6 g·L⁻¹ in the middle of September (ALIEV *et al.* 2006).

Wine and grape characteristics

'Sibir'kovyi' makes high quality, well-colored and harmonious white table wines. However, overripe grapes make tasteless, unpleasant and bitter wines.

Slitnoi N.

Synonyms

'Chastokolen' (Don).

Meaning of the name

Dense.

Historical notes and cultural importance

'Slitnoi' is a rare local variety with unknown origin. It is spread as single vines in the old mixed vineyards of the Don river valley. In the past this variety was particularly spread in the villages of Bessergenevskaya and Melikhovskaya in Rostov (ALIEV 1966; ALIEV *et al.* 2006).

Taxonomy and intra-variety variability

Proles pontica Negr. subproles *meridionali-balcanica* Trosch. (TROSHIN *et al.* 1996, 1999; TROSHIN 2002, 2007).

No biotypes or clones of this variety have been registered so far.

Essential ampelographic characteristics

The tip of the young shoot is light green with reddish distal leaves. The first distal leaves are three or five lobed, green with a brownish tint. The lower leaf side is more hairy.

The mature leaf is medium size, round, almost entire or weakly three lobed, the lower leaf sinuses sometimes are slightly expressed. The leaf blade is bent down or undulated, frequently with involute edges. The upper leaf surface is almost smooth or slightly reticular-wrinkled. The upper leaf sinuses are usually small, chinked or V-shaped; sometimes they are medium deep, open, lyre-shaped; or closed, with oval lumen and a rounded or slightly pointed base. The lower leaf sinuses are slightly expressed, V-shaped or almost absent. The petiole sinus is closed, with narrow elliptic lumen and a sharp base, sometimes open and lyre-shaped. The teeth on the end of the lobes are slightly expressed, triangular and sharp. The lateral teeth are low, with slightly convex sides, almost cupola-shaped. The hairs on the lower leaf side are bristly, denser on the proximal leaves. The petiole is usually shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium size, rarely big (up to 20 cm), slightly conic, dense and very dense (thus the name of the variety). The peduncle is short.

The berry is medium size (16-18 mm), rounded, dark blue with dense bluish bloom. The skin is thin and easy to wound. The flesh is juicy. The taste is ordinary and acid. In the berry there are one-two seeds. Seeds are medium, oval and light brown. The chalaza is oval, very slightly pressed in the middle, frequently almost flat, located approximately in the middle of the seed's body. The beak is short and cylindrical (ALIEV 1966).

Phenology

Time of bud burst: middle of April

Time of blooming: first part of June

Time of veraison: middle of August

Time of ripening: third ten days of September

The average vegetative period is 146 days in Lower Don.

Vegetative and yielding characteristics

Vigor of shoot growth: medium or low (in arid condition)

Bud fertility (bunches per winter bud): 0.7

Bunch weight: 140 g

Berry weight: 2.5 g

Yield per vine: 3.8 kg

Yield: 10.9 t·ha⁻¹

Climate and cultivation requirements

'Slitnoi' has a long vegetative period and good cane maturation. It requires no particular cultivation conditions.



Resistance to diseases and unfavorable weather

'Slitnoi' is medium susceptible towards *Plasmopara viticola*. It is medium frost resistant (-20 °C) and poorly drought resistant. Berry Shot is not reported.

Juice characteristics

Sugar: 19.3 % (with variation 15.2-22.6 %)

Total acidity: 8.5 g·L⁻¹ (with variation 7.6-8.9)

The variety usually has moderated sugar accumulation and high acidity. In the third ten days of September sugar content level is 19.1 % and total acidity is 8.6 g·L⁻¹ in Lower Don.

Wine and grape characteristics

'Slitnoi' gives low quality, pale, tasteless, unharmonious table wines.

Staryi Goryun N.

Synonyms

Unknown.

Meaning of the name

Old Goryun. (The word Goryun comes from the Russian word Goret = Burned by *Plasmopara viticola*).

Historical notes and cultural importance

'Staryi Goryun' was found in single vines and mixed with other varieties in almost all the old vineyards of Rostov, more often in Ust-Donetsk and in the adjacent districts. 'Staryi Goryun' is morphologically and biologically similar to 'Plechistik' (syn. 'Goryun'). Such similarity suggests that 'Staryi Goryun' is a seedling of 'Plechistik'. The name 'Old Goryun' supports this idea (ALIEV 1966).

It is preferable to grow this rare variety together with 'Tsimlyanskii Chernyi' and 'Plechistik'.

Taxonomy and intra-variety variability

Proles *pontica* Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

No registered clones of the variety have been revealed so far.

Essential ampelographic characteristics

The mature leaf is large, rounded or slightly elongated, very deeply five lobed, usually with additional leaf sinuses on the main lobes. The leaf blade is revolute. The upper leaf blade is almost smooth or slightly reticular-wrinkled. The upper leaf sinuses are very deep, closed, with wide oval lumen or almost with a triangular lumen; the base is nearly round or very slightly pointed, sometimes with one tooth. The lower leaf sinuses are deep, often closed, with oval lumen; rarely open, lyre-shaped with a narrow mouth. The base of the leaf sinuses is very slightly sharp, almost rounded. The petiole sinus is closed, with an oval or round lumen and a round base, sometimes with a tooth. The teeth on the end of the lobes are very large, triangular and sharp. The lateral teeth are also large, usually with slightly convex sides. The hairs on the lower leaf side are thick, cobwebby, mixed with short bristles. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is medium or large (15-16 cm in length), widely conic, with well-developed shoulders, medium dense or loose. The peduncle is of medium length and herbaceous.

The berry is smaller than medium or medium size (17 x 16 mm), round, dark blue, with dense bloom. The skin is thick and strong. The flesh is juicy. The taste is ordinary and rather harmonious. In the berry there are two or three small, slightly oval and grey-brown seeds. The chalaza is oval, almost flat, rarely very slightly pressed in the middle, located towards the seed's top. The beak is short and cylindrical (ALIEV 1966).

Phenology

Time of bud burst: second part of April

Time of blooming: first part of June

Time of veraison: first ten days of August

Time of ripening: middle part of September

The vegetative period is 136-145 days in Lower Don (Novocherkassk).

Vegetative and yielding characteristics

Vigor of shoot growth: high

Bunch weight: 200 g

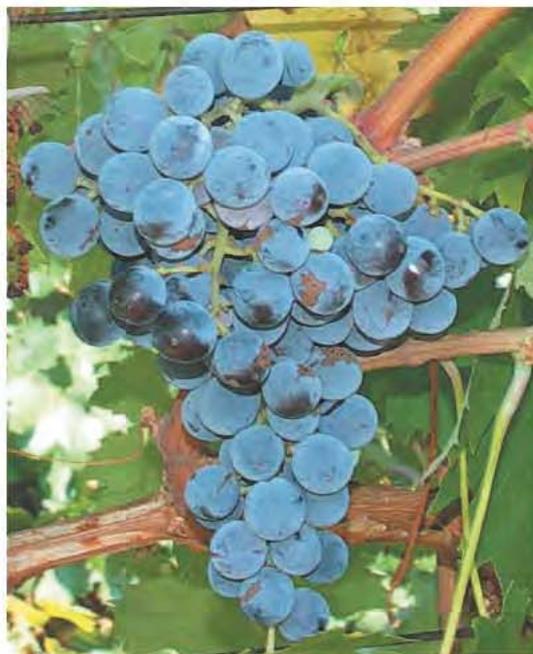
Bud fertility: 0.6

Yield per vine: 2.0 kg

Yield: high (in the Lower Don with no irrigation, vigorous training systems like the 'Don vase'; 3-7 t·ha⁻¹ in non irrigated vineyards with trellis)

Climate and cultivation requirements

'Staryi Goryun' is a middle-late wine variety with very good cane maturation. It is suitable for cultivation in Lower Don. Berry shot was not observed.



Resistance to diseases and unfavorable weather

The variety is strongly susceptible to *Plasmopara viticola*, susceptible to *Erysiphe necator* and grey mold (*Botrytis cinerea*). It is highly resistant to winter frosts (-22 °C) and sufficiently resistant to drought.

Juice characteristics

Sugar: 17.9-25.8 %

Total acidity: 7.8-8.8 g·L⁻¹

The average sugar and acidity contents in Novocherkassk, in mid September are 20.6 % and 8.1 g·L⁻¹ respectively (ALIEV *et al.* 2006).

Wine and grape characteristics

'Staryi Goryun' is used for making satisfactory, deep, varietal and harmonious red table wines. Late harvest grapes are used for sweet wine production. Occasionally, the variety is consumed fresh locally.

Sypun Chernyi N.

Synonyms

Unknown.

Meaning of the name

'Sypun' = Fallen (overripe berries fall).

Historical notes and cultural importance

The origin of 'Sypun Chernyi' is not well established. However, it is found only in the Don river valley, suggesting it is a native local variety (ALIEV 1966). Nowadays, it is rarely spread in the old vineyards of the area, mixed with other native varieties. According to M.A. LAZAREVSKII (1959), 'Sypun Chernyi' shares some morphological similarities with 'Plechistik' and 'Thimlyanskii Chernyi'. It is recommended for red winemaking in blend with other local grapes.

Taxonomy and intra-variety variability

Proles *pontica* Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

There are no registered clones so far.

Essential ampelographic characteristics

The tip of the young shoot is white-greenish, evenly colored and covered with well visible hairs. The first distal leaves are five lobed and green. The lower leaf side is more hairy.

The mature leaf is medium or large, rounded, deeply five lobed, frequently with rather shallow additional leaf sinuses on the main lobes. The leaf blade is funnel-shaped or flat. The upper leaf surface is reticular-wrinkled; the lower side is covered with medium dense cobwebby hairs, mixed with short bristle. The upper leaf sinuses are deep or very deep, more often closed, with wide oval or almost triangular lumen; the base is round or flat, sometimes very slightly sharp and with one tooth. The lower leaf sinuses are medium deep or deep, similar to the upper sinuses, sometimes small with almost parallel sides. The petiole sinus is closed, with a narrow elliptic lumen and a sharp, almost round, base. The teeth on the end of the lobes are very large and triangular. The lateral teeth are triangular and large. The hairs on the lower leaf side are cobwebby, mixed with short bristle. The petiole is shorter than the main vein.

The flower is hermaphrodite.

The bunch is small (up to 12 cm in length), conic, medium dense and dense.

The berry is small (13-14 x 12-13 mm), round or very slightly oval, dark blue, with dense bluish bloom. The skin is thick, rough, easy to peel off. The flesh is juicy. The taste is simple, with a rather harmonious combination of sugar and acidity. In the berry there are two-four medium size, oblong-oval and brown seeds. The oval, flat or slightly convex chalaza is almost in the middle of the seed's body or slightly shifted upwards. The beak is medium and cylindrical (ALIEV 1966).

Phenology

Time of bud burst: middle of April

Time of blooming: first part of June

Time of veraison: first part of August

Time of ripening: middle of September

The vegetative period is 136-146 days in Lower Don (Novocherkassk).

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

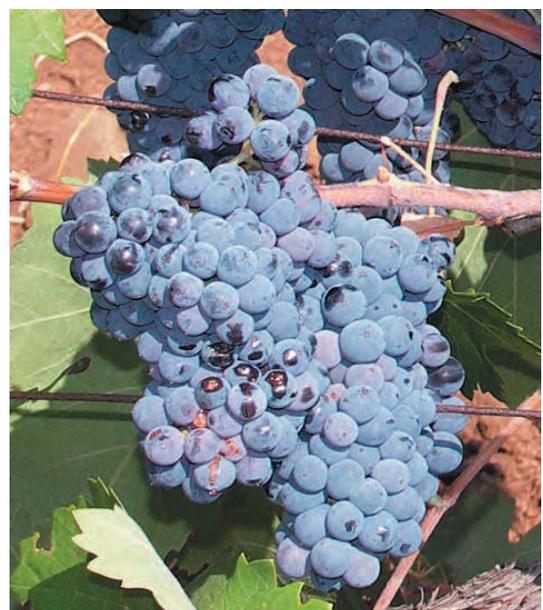
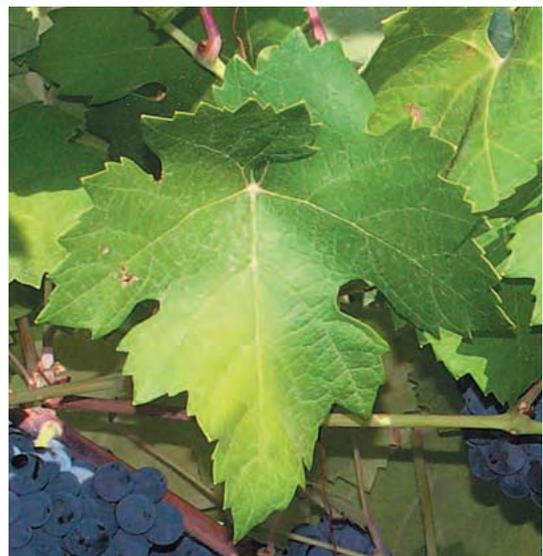
Bud fertility (bunches per winter bud): 0.6-0.7

Bunch weight: 80 g

Berry weight: 1.4 g

Yield per vine: 2.0-2.5 kg

Yield: 6.0-7.2 t·ha⁻¹



Climate and cultivation requirements

'Sypun Chernyi' is a medium late wine variety, with good cane maturation and suitable for cultivation on the plains of Don.

Resistance to diseases and unfavorable weather

Plasmopara viticola, *Erysiphe necator*, grey mold (*Botrytis cinerea*), winter frost (-20 °C) and drought susceptibility is medium. Berry shot is not observed.

Juice characteristics

Sugar: 18.8-24.2 %

Total acidity: 7.6-10.3 g·L⁻¹

In Lower Don in the middle of September, sugar accumulation and total acidity reach 20.4 % and 7.9 g·L⁻¹ respectively. The sugar/acid ratio at full maturity is suitable for making red table wines (ALIEV *et al.* 2006).

Wine and grape characteristics

'Sypun Chernyi' makes 10 % alcohol, high extract, ordinary wines. However, it is normally used in blend with lower quality varieties. Young wine sensorial grade is 7.5/8.

Tolstokoryi B.

Synonyms

'Astrakhanskii Tolstokoryi', 'Stolovyi', 'Khatni'.

Meaning of the name

With thin rough skin.

Astrakhan = the name of the city. Stolovyi = for the table.

Historical notes and cultural importance

'Tolstokoryi' is a local variety of Astrakhan introduced in the 17th century from South Caucasus or Central Asia (KUKHTIN 1956). This variety is similar to the Dagestani variety 'Koz Uzyum'.

The variety is rarely spread nowadays. It is recommended for table grape breeding programs.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

There are no registered clones of this variety so far.

Essential ampelographic characteristics

The tip of the young shoot is light green with a light pink-violet hue on the nodes and bluish grey, easily erased bloom.

The mature leaf is medium size (18 x 16 cm), rounded, deeply five lobed. The upper leaf surface is light green, matt, slightly vesicular. The leaf blade is funnel shaped, with involute edges. The upper leaf sinuses are deep, closed with narrow elliptic lumen; rarely open, lyre-shaped with almost parallel sides and a sharp base. The lower leaf sinuses are medium, open, lyre-shaped with almost parallel sides and a sharp base; rarely closed with narrow elliptic lumen and a sharp base. The petiole sinus is open, lyre-shaped with a sharp base. The teeth on the end of the lobes are triangular with rounded, rarely sharp top. The lateral teeth are triangular and serriform. The lower leaf sides are covered with medium dense bristles, thicker along the veins. The petiole is as long as the main vein or slightly longer. Leaves are primrose yellow in autumn.

The flower is female with five stamina and very short twisted filaments. The ovary is widely conic, gradually passing in a thick style. The stigma is large, disc shaped.

The bunch is medium size or large (16 x 6 cm to 24 -10 cm), conical or cylindrical-conical, seldom winged. Bunch density depends on pollination. The bunch peduncle is 7 cm long, covered with small yellow-brown points, herbaceous, very flexible, lignified in the base.

The berry is large (20 x 18 mm or 22 mm in diameter), slightly oval to round, greenish-white, golden-yellow on the sun exposed side, with brown points, transparent veins and plenty of bloom. The skin is thick, rough and hard to peel off. The flesh is crispy and melting. The taste is very pleasant with a good combination of sugar and acidity. In the berry there are two large, yellow-brown, oblong seeds. The chalaza is oval, pressed, clearly appreciable. The beak is thick, cylindrical, oblique on the back. The mature cane is brownish-yellow with a pink hue (KUKHTIN 1956).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: first ten days of June

Time of veraison: first part of August

Time of ripening: first part of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium and higher than medium

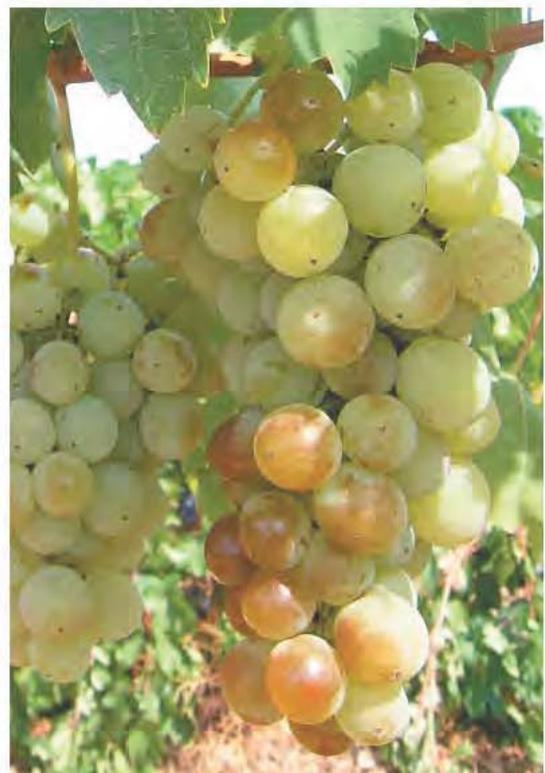
Bud fertility (bunches per winter bud): 0.5-0.8

Bunch weight: 170-350 g

Berry weight: 3.8-4.8 g

Yield per vine: 1.7-3.5 kg

Yield: 6-10 t·ha⁻¹



Climate and cultivation requirements

'Tolstokoryi' has a long vegetative period and good cane maturation. It is suitable for cultivation in the middle viticultural zones of Russia. It requires hermaphrodite varieties like 'Ag Izyum', 'Vengerka Chernaya', an expanse training system with high bud load, long tipping before blooming and canopy management towards ripening. Berry shot and flower drop are reported (KUKHTIN 1956).

Resistance to diseases and unfavorable weather

In Lower Volga, 'Tolstokoryi' is less susceptible towards *Plasmopara viticola* and grey mold (*Botrytis cinerea*) than other Euro-Asian varieties. Winter frost and drought resistance is not high.

Juice characteristics

Sugar: 17.0-21.5 %

Total acidity: 5.4-7.4 g·L⁻¹

Wine and grape characteristics

'Tolstokoryi' is grown for fresh consumption. Thick skin and firm flesh make it highly transport resistant and suitable for storage. Quality is high.

Tsimladar N.

Synonyms

Unknown.

Meaning of the name

Gift of stanitsa (village) Tsimlyanskii (Tsimladar is the name of a district in Rostov).

Historical notes and cultural importance

'Tsimladar' was discovered by L.K. Gel'mbrekht and it was named after the place where it was found. It is close to other Tsimlyansk varieties. It is possibly a spontaneous seedling of 'Tsimlyanskii Chernyi' (GEL'MBREKHT 1970; ALIEV *et al.* 2006).

The variety is rare. It is recommended for table and fortified red winemaking.

Taxonomy and intra-variety variability

Proles pontica Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

No selected clones are released so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, white and hairy. The ends of the teeth are brownish. The leaf blade has light anthocyanin coloration.

The mature leaf is medium or large, medium five lobed, rounded or slightly elongated, frequently with additional leaf sinuses, mainly on the central lobe. The upper leaf surface is reticular-wrinkled; the lower is covered with medium dense cobwebby-bristly hairs. The upper leaf sinuses are deep, closed, with large oval lumen; the base is round, almost flat, sometimes slightly pointed. The lower leaf sinuses are medium deep, similar to the upper ones, or lyre-shaped with a narrow mouth. The teeth are large, high and wide, with convex sides. The petiole sinus is closed by a deeply overlapped base, or with a small oval lumen. The base is often bordered by veins. The lower leaf side is covered with medium dense cobwebby hairs.

The flower is hermaphrodite.

The bunch is medium size (16-18 cm in length), cylindrical-conical with shoulders, dense or medium dense.

The berry is medium size or small, rounded, dark-blue or black, with dense bloom. The skin is thick, but not firm. The flesh is juicy. The taste is ordinary (GEL'MBREKHT 1970).

Phenology

Time of bud burst: third ten days of April

Time of blooming: first part of June

Time of veraison: first part of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Bud fertility (bunches per winter bud): 0.8

Bunch weight: 130 g

Berry weight: 1.5 g

Bunches per: 1.1

Yield per vine: 3.4-4.3 kg

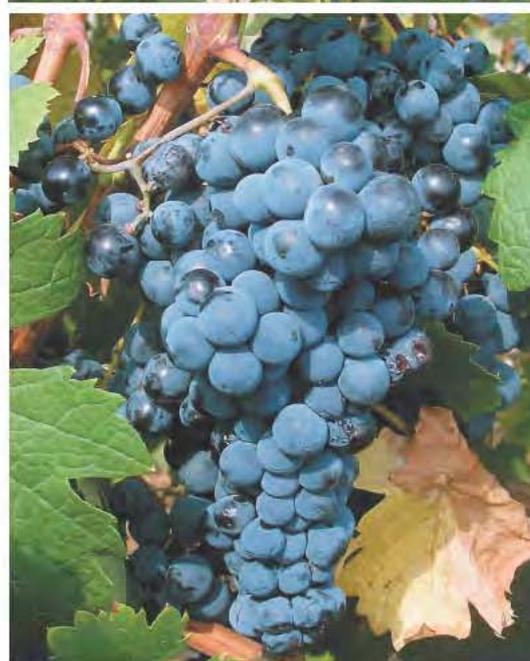
Yield: higher than medium or high (in irrigated conditions)

Climate and cultivation requirements

'Tsimladar' is a medium ripening wine variety with good cane maturation.

Resistance to diseases and unfavorable weather

Susceptibility towards fungal diseases is high. Frosts and drought resistance is medium.



Juice characteristics

Sugar: 20.0-24.0 %

Total acidity: 8.0-9.2 g·L⁻¹

In mid-September, in Novocherkassk, the average sugar content and acidity are 21.5 % and 8.7 g·L⁻¹ respectively (ALIEV *et al.* 2006).

Wine and grape characteristics

'Tsimladar' is used alone or in blend to make rather intense, harmonious red table wines. In blend with other Tsimlyansk varieties like 'Tsimlyanskii Chernyi' and 'Plechistik' it makes high-quality red sparkling wines.

Tsimlyanskii Belyi B.

Synonyms

'Belyi', 'Belyi Vinnyi', 'Plakun', 'Starinnyi' (Don).

Meaning of the names

White from Tsimlyansk (selected in Tsimlyansk).

Belyi = White. Belyi Vinnyi = White for wine. Starinnyi = Old. Plakun = Weeper.

Historical notes and cultural importance

Data about the origin or the occurrence of this variety in the vineyards of the Don river valley is not available. E. Klausen gives the first brief description 1886 (GEL'MBREKHT 1956). The variety is rarely spread nowadays. It is recommended for making white table, sparkling and strong wines.

Taxonomy and intra-variety variability

Proles *pontica* Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

Two biotypes have been discovered: the first with large berries, the second with strong flower drop and small berries. GEL'MBREKHT (1956) discovered a clone with deeply dissected lobes, darker leaves, blistered leaf blade and dark red-violet shoots. However, no selected clones are released so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two, sometimes three, leaves are covered with dense hairs. The tip is bright-pink, the distal leaves are bronze or red-bronze, rarely golden-orange.

The mature leaf is medium or large, rounded, deeply five lobed, with deep additional leaf sinuses on the main veins. Lateral blades are sometimes slightly expressed. The leaf blade is funnel shaped, slightly revolute. The upper leaf surface is almost smooth or slightly reticular-wrinkled. The upper leaf sinuses are deep or very deep, closed, with an oval or triangular lumen and sharp, rarely with a flat or rounded base; sometimes open, lyre-shaped, with a narrow mouth. The lower leaf sinuses are medium, sometimes small or deep, open, lyre-shaped, with almost parallel sides and a narrow mouth. The petiole sinus is closed, elliptic, bordered by veins; rarely open, lyre-shaped, with a sharp base. The teeth on the ends of the lobes are large, triangular, with a sharp top. The lateral teeth are large, serriform or one-side convex. The hairs on the lower leaf side are rare or medium dense, cobwebby and rusty-yellow. The petiole is as long as the main vein or longer.

The flower is hermaphrodite. The stamens are six, rarely five. The filament is up to twice as long as the anther. The ovary is narrow conical and ridged. The style is bound to the ovary and thick. The stigma is flat and wide.

The bunch is medium size (12-17 x 9 cm), cylindrical-conical, dense, medium dense, rarely loose. The peduncle is 3.0-3.5 cm, bright green, rather thick, rounded-bent, lignified up to the first node.

The berry is medium size or small (13-14 mm in diameter), rounded or weakly oblate, greenish-white on the exposed side and green in the shadow. The skin is thin, not firm, semi-translucent, covered with bloom. The flesh is juicy and delicate. The taste is simple. In the berry there are three to six medium size (5.0-6.5 x 4.0-4.5 mm), dark brown and rounded-oval seeds. The chalaza is rounded and pressed. The beak is conical, slightly oblique on the dorsal side.

The mature cane is yellow-brown (GEL'MBREKHT 1956).

Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

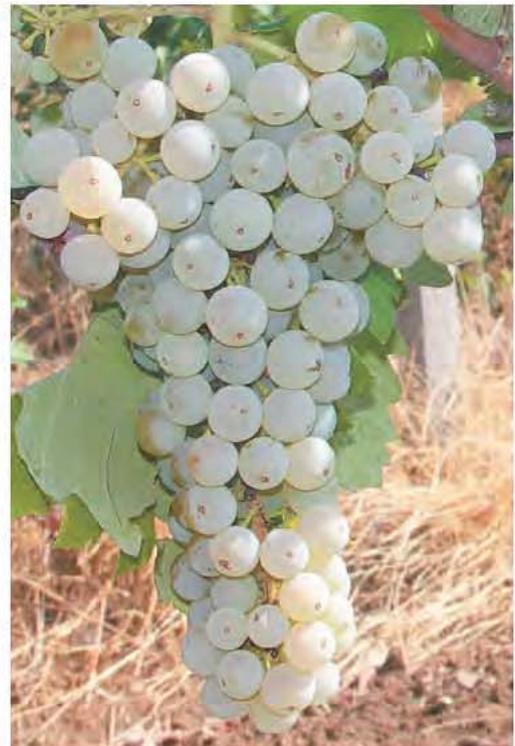
Time of veraison: middle of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium



Bud fertility (bunches per winter bud): 0.5-1.0

Bunch weight: 80-120 g

Berry weight: 1.2 g

Yield per vine: 1.7-2.2 kg

Climate and cultivation requirements

'Tsimlyanskii Belyi' is a medium late wine variety with good cane maturation. Yield should be contained to favor sugar accumulation, because of a fast acidity drop in good ripening conditions.

Resistance to diseases and unfavorable weather

'Tsimlyanskii Belyi' is more susceptible towards *Plasmopara viticola* than 'Tsimlyanskii Chernyi' and 'Plechistik'. In rainy weather berries crack open and the juice drops down, hence the synonym 'Plakun' (Weeper). Drought resistance is medium.

Juice characteristics

Sugar: 18.0-24.0 %

Total acidity: 5.6-8.6 g·L⁻¹

Average sugar content is 23.0% and total acidity is 8.5 g·L⁻¹ in Novocherkassk in mid September. In several years, 'Tsimlyanskii belyi' achieves up to 26.0 % sugar, but acidity drops sharply, which is negative for wine quality (ALIEV *et al.* 2006).

The wine and grape characteristics

'Tsimlyanskii belyi' makes 11.0-13.0 % alcohol table wines with 6.5-7.3 g·L⁻¹ total acidity, as well as high quality sparkling wines. Until 1930, 'Tsimlyanskii belyi' was used in Southern Crimea to make good quality white "Porto" style wines. GELMBREKHT (1956) reports that it is used for making sweet and semisweet wines with overripe grapes since the 1930s.

Tsimlyanskii Chernyi N.

Synonyms

'Grushevyi', 'Grushovyi', 'Rogataya Kist', 'Khrupkaya Kist', 'Chernyi Vinnyi' (Don).

Meaning of the name

Black from Tsimlyansk (selected in the village of Tsimlyansk). Grushevyi, Grushovyi = Pear-shaped. Rogataya Kist' = Shouldered / Winged bunch. Khrupkaya Kist' = Fragile bunch. Chernyi Vinnyi = Black for wine.

Historical notes and cultural importance

'Tsimlyanskii Chernyi' is a native variety, growing only in the Don river valley since ancient times (GEL'MBREKHT 1956). It is often found in mixed vineyards together with 'Plechistik', for which it is the pollinator.

Now it is widespread in the Commonwealth of Independent States. It is included in the official list of varieties recommended for cultivation in North Caucasus, established by the "Russian Federation State Commission for Selection Achievements, Tests and Protection" since 1959 (Catalogue of Varieties 2007). Total area is 308 ha in Russia (TROSHIN and RADCHEVSKII 2005).

Taxonomy and intra-variety variability

Proles pontica Negr *subproles ostcaucasica* Al. (ALIEV *et al.* 2006).

Four variations were described during the ampelographic screening of the vineyards of Don:

- with loose bunch, small berries, normally developed flowers, very loose bunch, slightly curved and five lobed leaf blade, poor vigor;
- with big bunch, branched, loose flowers, large berries, less crispy and almost not astringent, less fragile bunch peduncle, slightly red pedicel;
- with big bunch, dense, often double or winged, cylindrical and cylindric-conic, large berries, rather deeply dissected leaves;
- with medium bunch, very dense, cylindrical, large berry base, herbaceous bunch peduncle and yellow-orange shoots.

However, there are no registered clones so far.

'Azhumyi', 'Astoriya', 'Atlasnyi', 'Vechernii', 'Grubolistnyi', 'Korund', 'Nizhnedonskoi', 'Ochi Chernye', 'Satsimler', 'Tsilindricheskii', 'Shagrenevyi', etc. are offsprings of 'Tsimlyanskii Chernyi' (NOSULCHAK *et al.* 2006).

Essential ampelographic characteristics

The tip of the young shoot is covered with dense felt hairs. The tip and the first leaves are covered with violet-red, sometimes by grayish-pink spots located among the veins of the young shoot, in particular on the lower leaf sides.

The mature leaf is medium or large, rounded, medium or deeply five lobed, often with slightly expressed lateral lobes, giving the impression of three lobes. The leaf is dark-red with a bluish tint. The blade is curved, undulated and funnel shaped. The upper leaf surface is reticular-wrinkled, sometimes reticular-bubbled. The upper leaf sinuses are deep, closed with oval or triangular lumen; often with a tooth on the base. The lower leaf sinuses are smaller, open, lyre-shaped or chinked. The petiole sinus is closed, elliptic or cross-section-elliptic; sometimes open, lyre-shaped with a flat base, limited by veins. The teeth on the ends of the lobes are triangular with a sharp top, with straight or slightly convex sides. The lateral teeth are serriform and peaked. The hairs on the lower leaf side are dense, felt, mixed with bristle, giving a sage-green hue. The petiole is longer than the medium vein.

The flower is hermaphrodite.

The bunch is medium size (14-17 cm in length), cylindrical-conic or cylindrical with a small blade, medium dense or loose. The bunch peduncle is green, rarely lignified, easy to break.

The berry is medium or small (15-18 mm in diameter), round or slightly oval, dark-blue or almost black, with plenty of bloom. The skin is medium firm. The flesh is juicy and astringent. The seed is medium size, oval, dark brown or reddish. There are two seeds per berry (GEL'MBREKHT 1956).



Phenology

Time of bud burst: third ten days of April

Time of blooming: first ten days of June

Time of veraison: first part of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Bud fertility (bunches per winter bud): 0.6-0.8

Bunch weight: 90-160 g

Berry weight: 1.5-2.0 g

Yield per vine: 1.3-2.7 kg

Climate and cultivation requirements

'Tsimlyanskii Chernyi' is characterized by a middle-long vegetative period and good cane maturation. It is suitable for cultivation in North Caucasus.

Yield is not high, but rather stable and high quality.

Resistance to diseases and unfavorable weather

'Tsimlyanskii Chernyi' is very susceptible towards *Plasmopara viticola* and grey mold (*Botrytis cinerea*) and to a lesser extent, towards *Erysiphe necator*. Frost resistance is medium (-19, -20 °C) and drought resistance is high.

Juice characteristics

Sugar: 21.3-24.5 %

Total acidity: 5.7-7.6 g·L⁻¹

Wine and grape characteristics

'Tsimlyanskii Chernyi' is used in the production of high quality red table and dessert wines. It is also used for making the well known Tsimlyanskii and Tsimlyanskii sparkling wines, as a rule, in blend with 'Plechistik'. The table wine is well colored, full and harmonious, with a pleasant varietal aroma. The dessert wine is rich in extract, full, with good taste and softness.

Varyushkin N.

Synonyms

Unknown.

Meaning of the name

Grape of Varya (Varya is a Cossack feminine name).

Historical notes and cultural importance

'Varyushkin' is an ancient variety of the river Don valley. It was spread in the Konstantinovskii district in Rostov (ALIEV *et al.* 1963) but now it is very rare (1 ha in Russia). However, it is included in the official list of varieties recommended for cultivation in North Caucasus, established by the "Russian Federation State Commission for Selection Achievements, Tests and Protection" since 1959. 'Varyushkin' is recommended for making high-quality red, semi sweet and dessert wines.

Taxonomy and intra-variety variability

Proles pontica Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

Biotypes or clones of this variety have not been detected.

Essential ampelographic characteristics

The tip of the young shoot and the first three leaves are greenish-yellow with a strong brown hue. The lower side is white and covered with dense cobwebby hair.

The mature leaf is medium size, rounded, deeply five lobed. The leaf blade is funnel-shaped and reticular-wrinkled. The upper leaf sinuses are deep, closed with large elliptic or oval lumen; rarely open, lyre-shaped with pointed or one-toothed base, (typical trait). The lower leaf sinuses are medium deep, more often open, lyre-shaped with narrow and sharp mouth, sometimes with a tooth on the base. The petiole sinus is closed with a narrow chinked or elliptic lumen, frequently with a tooth. The teeth on the end of the lobes are small, triangular, both sides are convex and sharp, rarely with a rounded top. The lateral teeth are little and large alternate, triangular-serriform, with convex sides and sharp. The lower leaf side is covered with rare cobwebby hairs. The petiole is equal to the medium vein and violet-red.

The flower is hermaphrodite, with five stamina. The filaments are longer than the anther. The ovary is conical and ridge. The style is short and conic. The stigma is split in two or three.

The bunch is medium, rarely large, conic or conical-cylindric, winged, medium dense or dense.

The berry is medium or small (15-14 mm in diameter), round, dark-blue or black, with dense bloom. The skin is firm and rather thick. The flesh is juicy. The taste is harmonious. In the berry there are two large, grey-brown and oblong seeds. The chalaza is in the top third of the body, small, almost round, pressed. The beak is long, cylindrical, with a blunt top (ALIEV *et al.* 1963).

Phenology

Time of bud burst: end of April

Time of blooming: first ten days of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

The vegetative period is 134-140 days in Novocherkassk.

Vegetative and yielding characteristics

The Habit of shoot growth: semi-erect

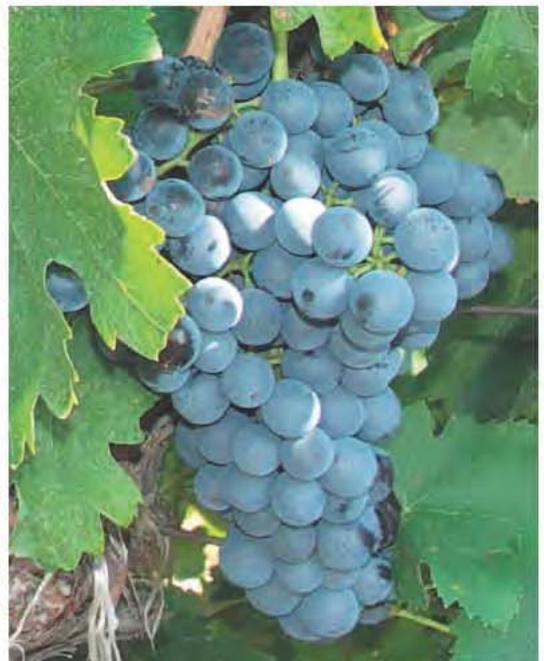
Vigor of shoot growth: medium

Bud fertility (bunches per winter bud): 0.6-0.8

Bunch weight: 130-170 g

Berry weight: 2.5 g

Yield per vine: 1.2-3.0 kg



Climate and cultivation requirements

The variety 'Varyushkin' is characterized by medium length of vegetation and good cane maturation. It is suitable for cultivation in the plains of Don.

Resistance to diseases and unfavorable weather

The variety is slightly susceptible towards *Plasmopara viticola* and resistant towards *Erysiphe necator*. It is rather frost resistant, but very susceptible to drought with reduced yield and growth.

Juice characteristics

Sugar: 22.8-23.5 %

Total acidity: 6.9-8.6 g·L⁻¹

Wine and grape characteristics

'Varyushkin' wines are full bodied, well colored, soft and harmonious.

Yai Izyum Belyi B.

Synonyms

'Il'inskii', 'Yazlik Izyum' (Dagestan).

Meaning of the name

Early or summer grape with white berries.

Historical notes and cultural importance

'Yai Izyum Belyi' is a Dagestani variety whose origin is unknown. It is very close to 'Halili White' and it could be one of its variations. However, 'Yai Izyum Belyi' has longer internodes, oval and less oblong berries, conic and wingless bunches. It was spread in some districts of Dagestan, from where it spread in Russia and in other countries of the Soviet Union (PEITEL' 1970).

'Yai Izyum Belyi' is a rare variety, recommended for breeding programs as a source of early ripening and production of quality genes.

Taxonomy and intra-variety variability

The variety belongs to the Eastern table grape eco-geographical group Proles *orientalis* subproles *antasiatica* Negr. var. *mediasica* Gram. et Trosch. (TROSHIN 1999, 2002, 2007).

Biotypes of 'Yai Izyum Belyi' were not described as well as clones of the variety were not selected.

Essential ampelographic characteristics

The tip of the young shoot is green with brown-reddish stripes. The first distal leaves are five lobed, green, with yellow-copper tint. The lower leaf side has more hairs.

The mature leaf is medium size, round or slightly oval, medium five lobed. The petiole sinus is open, lyre-shaped with a round, rarely sharp, base. The lower side is hairless, only in the main veins' intersections there might be some rare bristles.

The flower is hermaphrodite.

The bunch is medium size, conic, lobed, medium dense, sometimes even dense, seldom loose.

The berry is medium size, oval with round or slight obtuse end, greenish-yellow, covered with weak bloom and frequently by small, light grey-brown spots. In a dry year the berries get a light violet-pink tint on the exposed side. The flesh is thick and elastic (PEITEL' 1970).

Phenology

Time of bud burst: end of April

Time of blooming: beginning of June

Time of veraison: beginning of July

Time of ripening: first ten days of August

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Cane maturation: good

Bud fertility (bunches per winter bud): 0.8

Bunch weight: 170-260 g

Yield per vine: 2.4-4.5 kg

Yield: high (8-12 t·ha⁻¹)

Climate and cultivation requirements

'Yai Izyum Belyi' is a very early table grape variety.

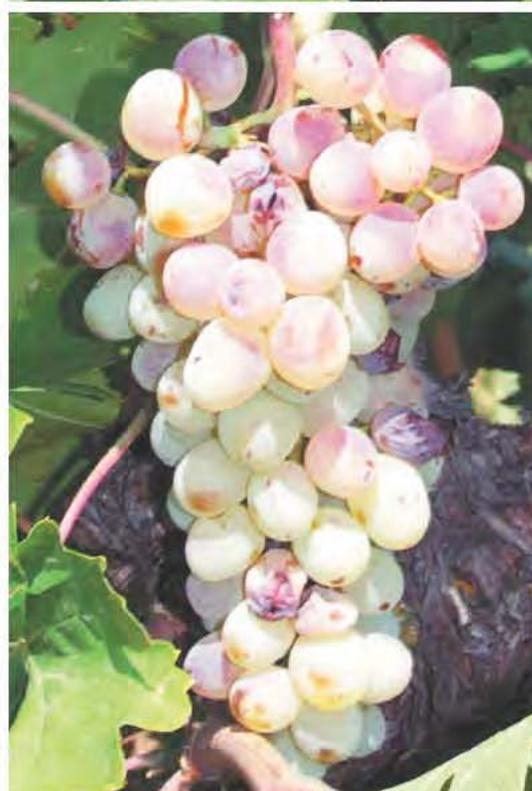
Juice characteristics

Sugar: 14.0-16.0 %

Total acidity: 6.0-8.0 g·L⁻¹

Resistance to diseases and unfavorable weather

'Yai Izyum Belyi' has poor resistance towards fungal diseases, frosts and drought.



Wine and grape characteristic

Grape of 'Yai Izyum Belyi' is used for local fresh consumption. It is valuable because it is early ripening, and it is marketed before other grapes.

Yai Izyum Rozovyi R.

Synonyms

'Avraimi', 'Kyrmyzy Yai Izium' (Dagestan).

Meaning of the name

Early/summer grape with a pink bunch. Rozovyi = pink.

Historical notes and cultural importance

This is a native Dagestani variety. It was spread in small groups or single vines among other local varieties in Dagestan (PEITEL' 1966).

The variety is rare. It is a promising high-yield, very early ripening table grape variety. Topping before blooming and green pruning allow two crops per season. 'Yai Izium Rozovyi' was included in the official list of recommended varieties for Dagestan in the second half of the last century. It is interesting to test it in Southern Russia, while it does not seem suitable for the northern areas, due to late cane ripening.

Taxonomy and intra-variety variability

Proles *pontica* Negr. subproles *ostcaucasica* Al. (ALIEV *et al.* 2006).

No clones have been selected so far.

Essential ampelographic characteristics

The tip of the young shoot is flannel-white, pink along the edges (typical trait). It is covered with dense hairs. The shoot axis is green and covered with hairs.

The mature leaf is large, rounded, weakly three or five lobed, almost whole. The leaf blade is funnel-shaped, undulated with involute edges. The upper leaf surface is reticular-wrinkled on the edge; in the central part, between the main veins, it has swellings and large wrinkles. The upper leaf sinuses are small or very small, open and V-shaped, rarely medium deep, narrow lyre-shaped or closed, with an elliptic lumen; the base is sharp. The lower leaf sinuses are very small, V-shaped or absent, seldom deep and lyre-shaped. The petiole sinus is open, lyre-shaped, with a sharp base. The teeth on the end of the lobes are large, narrow triangular with straight sides, frequently with a long edge and a one-sided bent (beak). The lateral teeth are triangular with straight or slightly convex sides and a sharp top. The lower leaf side is covered with weak cobwebby hairs. The petiole is light violet-red, with thick grey bloom, as long as the medium vein or sometimes shorter.

The flower is hermaphrodite, with five, often six stamens. The filament is as long as the anther or longer. The ovary is conic, gradually narrower towards the style. The style is medium in length and almost cylindrical. The stigma is narrow.

The bunch is medium size, conic, thick, winged, sometimes very dense.

The bunch peduncle is short, lignified in the base.

The berry is medium size, oval-oblong with an expanded base and a narrow tip, light pink with a violet hue and covered with thick bloom. The skin is thin and not firm. The flesh is firm and medium juicy. The taste is simple, moderately sweet and pleasantly rough. In the berry, there are two seeds, rarely one-four. The seed is small, oval or cordate, light brown. The chalaza is in the top half of the seed's body, oval, pressed, closed, with the roller on the edge. The beak is long, cylindrical and truncated.

The mature cane is red-brown with stripes on the internodes, covered with a dense grey-violet waxy bloom. The nodes are slightly darker than the internodes (PEITEL' 1966).

Phenology

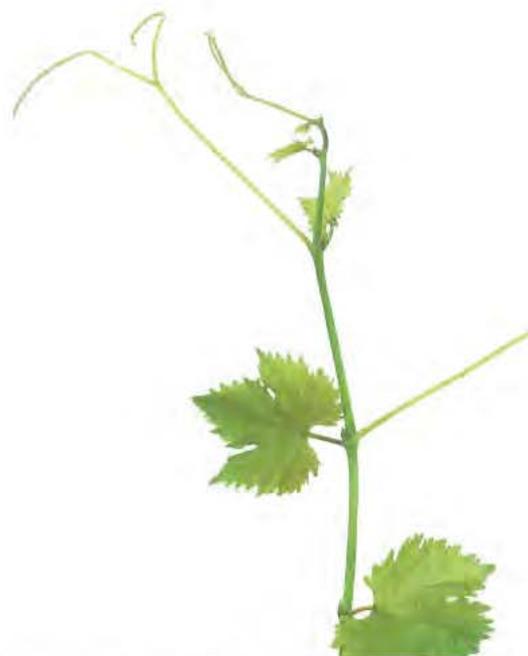
Time of bud burst: third ten days of April

Time of blooming: middle of June

Time of veraison: middle of July

Time of ripening: first ten days of August

The vegetative period is 105 days in Derbent.



Vegetative and yielding characteristics

Habit of shoot growth: semi-erect
Vigor of shoot growth: medium or vigorous
Cane maturation: medium
Bud fertility (bunches per winter bud): 0.89
Shoot fertility (bunches per shoot): 1.21
Shoot fruiting: 73.0 %
Bunch weight: 200 g
Berry weight: 1.5-1.8 g
Yield per vine: 4.2-5.4 kg
Yielding: high (14-18 t·ha⁻¹ average in Derbent with the "fan like" training system, 2.0 x 1.5 m planting layout and irrigation)

Climate and cultivation requirements

'Yai Izyum Rozovyi' is a table grape variety with a very short vegetative period. It has sufficient (60-75 %), but late cane maturation. The variety is suitable for the Northern regions of Caucasus. The variety bears on the lateral shoots, and even the latent buds from old wood are fertile.

Resistance to diseases and unfavorable weather

'Yai Izyum Rozovyi' is more susceptible towards *Erysiphe necator* than to *Plasmopara viticola*. Susceptibility to European grapevine moth (*Lobesia botrana*) is low. Resistance to winter frosts is poor and resistance to drought is moderate. Berry shot is insignificant.

Juice characteristics

Sugar: 14.0-17.0 %
Total acidity: 4.7-6.8 g·L⁻¹
The sugar content of the berry reaches 20 % with 4.6 g·L⁻¹ total acidity if the grapes are left on the vines until the middle of August. Berry crush load is 550-850 g; pedicel detachment force is 130-160 g.

Wine and grape characteristics

'Yai Izyum Rozovyi' is consumed fresh locally, or in close distance. It bears attractive bunches and berries. Taste is simple, but rather good.

Zheludevyyi N.

Synonyms

'Astrakhanskii Rozovyyi' (Astrakhan' territory), 'Kara Agadai', 'Dzhut Agadai', 'Kara Rish Baba', 'Kara Emchek', 'Sapta Durmaz', 'Sufta Durmaz' (Dagestan).

Meaning of the name

Acorn shaped.

Astrakhanskii Rozovyyi = pink of Astrakhan'.

Historical notes and cultural importance

The origin of 'Zheludevyyi' is unknown, but it is found only in North Caucasus (SKUIN' 1963).

It is not suitable for the vineyards of Rostov Oblast due to late ripening, however it may be interesting for the southern areas of European Russia.

Taxonomy and intra-variety variability

Proles orientalis subproles *antasiatica* Negr.

No biotypes or clones have been selected so far.

'Sevan', 'Farforovyyi' and other varieties are offsprings of 'Zheludevyyi'.

Essential ampelographic characteristics

The tip of the young shoot is light green with a white top. The distal leaves are five lobed, green, covered with bristly hairs on the lower leaf side.

The mature leaf is medium or big, rounded or slightly elongated, deeply five lobed. The leaf blade is slightly funnel-shaped or flat with revolute edges, thin but solid. The upper leaf surface is smooth, slightly glossy. The upper leaf sinuses are deep, closed with elliptic lumen; rarely open, lyre-shaped with a narrow chinked and sharp base. The lower leaf sinuses are medium, sometimes deep, open, lyre-shaped with almost parallel sides and a pointed base. The petiole sinus is widely open, sagittate or arched, narrow with a sharp base. The teeth on the ends of the lobes are rather large, narrow triangular with a sharp top. The lateral teeth are also large, sharply triangular and serriform. The lower leaf side is hairless and only the main veins are covered with rare bristles at the base. The petiole is shorter than the main vein, light pink, with a weak bloom.

The flower is hermaphrodite.

The bunch is large (20-25 cm in length), wide, slightly conical, shouldered and loose. The peduncle is long, fragile, weakly lignified, with a very fragile stem.

The berry is very large, oblong, bananoid, wider when close to the pedicel and with a slightly truncated end. The color depends on the zone of cultivation and varies from dark pink to blue-red: on the end of the berry, color is more intense with a violet tint. Berries are also variegated: light green with a dark red tip; overripe berries are almost black with a bluish shade due to bloom. The skin is thin, strong, hard to peel off, covered with dense bloom. The flesh is dense, rather juicy and crispy. The flavor is not special but harmonious. In the berry there are one-two large, oblong, oval and light brown seeds. The chalaza is oval, convex and in the middle of the seed's body. The beak is long, truncated-conic and rather thin (SKUIN' 1963).

Phenology

Time of bud burst: end of April - beginning of May

Time of blooming: first ten days of June

Time of veraison: first part of August

Time of ripening: third ten days of September (Novocherkassk)

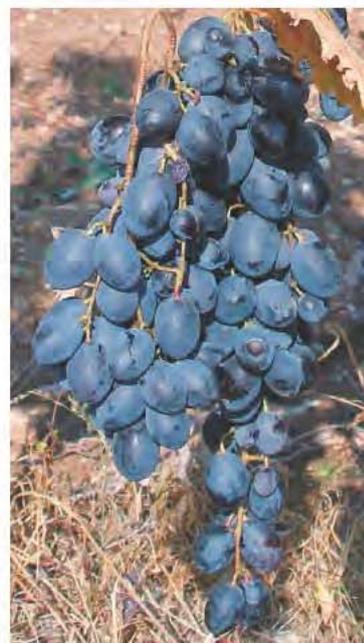
second ten days September (Derbent, Tashkent)

second part of September (South coast of Crimea)

The vegetative period is 140 days in Derbent, 147 days in Novocherkassk,

154 days on the South coast of Crimea, 155 days in the surroundings of

Tashkent.



Vegetative and yielding characteristics

Vigor of shoot growth: high

Bud fertility (bunches per winter bud): 0.6

Bunch weight: 125-230 g

Yield per vine: 1.2-2.1 kg

Yield: 3.6-6.2 t·ha⁻¹

Climate and cultivation requirements

'Zheludevyyi' is a medium late table variety with good cane maturation. It is suitable to grow on fertile, rather moist soils and on small slopes with "black like", sandy soils. Drought sharply decreases berry size.

Resistance to diseases and unfavorable weather

Susceptibility towards *Plasmopara viticola* and *Erysiphe necator* is low. Frost resistance is low. Drought resistance is satisfactory. Strong berry shot is not reported.

Juice characteristics

Sugar: 16.0-18.0 %

Total acidity: 6.0-7.0 g·L⁻¹

In Don, towards the middle of September, average sugar content is 17.8 % and total acidity is 5.9 g·L⁻¹.

Wine and grape characteristics

'Zheludevyyi' is used for fresh consumption. Transport resistance parameters are rather high: berry crush load ranges between 1,100 and 1,500 g, while pedicel detachment force between 115 and 248 g. However, transport resistance is insignificant due to the fragility and instability of the grape stem. 'Zheludevyyi' is remarkable among Rostov's varieties for its beautiful bunches and big, good, tasty berries. In the Don river valley it is better than 'Moldavskii', in Dagestan it is appreciated more than 'Agadai', in Astrakhan it is considered equivalent to 'Kazbinka'.

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T a b l e

Some general transliterations and translations from Russian and Dagestanian to English

| Transliteration | Translation |
|-----------------|-----------------|
| Belyi, belaya | White |
| Rozovyi | Pink |
| Krasnyi | Red |
| Chernyi | Black |
| Zelenyi | Green |
| Zheltyi | Yellow |
| Sinii | Blue |
| Vino | Wine |
| Vinograd | Grape |
| Loza | Vine |
| Izyum | Raisin |
| Kishmish | Seedless raisin |
| Tsibil | Column |

Viticulture and winemaking in Ukraine

V. VOLYNKIN, N. ROSHKA, A. POLULYAKH

National Institute of Vine and Wine "Magarach", Yalta, Crimea, Ukraine

Introduction

Ukraine is located in the south of Eastern Europe, with a territory of 603,700 km². The population is 47,430,000 people and the capital city is Kiev. Ukraine borders on Russia to the north east, on Belarus to the north, on Poland, Slovakia and Hungary to the west, on Romania and Moldova to the south west. The Black Sea and the Azov Sea are situated in the southern part. The coastline is 2,835 km long and strongly dissected, with plenty of river mouths, bays and harbors. The territory of Ukraine is mainly flat; lowlands, highlands and mountains account for 70 %, 25 % and 5 % respectively.

The climate throughout the largest part of the country is moderately continental, with several differences in Carpathia and in the Crimean mountains. Eastwards, the climate becomes continental. The climate in the south coast of Crimea is close to dry subtropical (Mediterranean) conditions.

Because of its latitude, Ukraine embraces several natural zones, including mixed forests and forest steppes. In the mountains, natural zones are stacked depending on altitude. The forests known as Ukrainian Poless'ie account for nearly 20 %, while 34 % and 40 % of the territory is covered with forest steppes and steppes, respectively.

Definite types of soils are associated with a certain natural zone: soddy-podzolic and soddy soils are spread in Ukrainian Poless'ie, in the zone of mixed forests; gray forests and dark gray podzolized soils are in the forest steppe zone, on the right bank of the river Dnieper. The most fertile soils, the chernozem soils, formed themselves under the steppes and certain forest steppe zones. Chestnut soils, which have good fertility as well, are spread under dry steppe vegetation, on the lower areas along the coast of the Black Sea, of the Azov Sea and in Crimea (AVIDZBA and VOLYNKIN 2007a, AVIDZBA and VOLYNKIN 2007b).

History of viticulture in Ukraine

Viticulture in the south of Ukraine has an ancient history. Grapes began to be cultivated in the Northern Black Sea region more than 2,500 years ago. Before the Greek colonies emerged in the area, the native Tauric population had been engaged in winemaking, possibly, using local wild grapes. The area was invaded by several nomadic tribes, including Huns and Tatars, which ruined its economy and led to a decline of viticulture. Revival came in 1280 in the area of the modern Crimea towns of Feodosia and Sudak, thanks to the effort of the Genovese colonies. The so-called "Surozh wines" were produced here, this is why they are renowned in history in association with the ancient name of Sudak. The Turkish conquest of Crimea in 1475 caused a stagnation of viticulture, due to prohibition of alcohol consumption imposed by the Koran. That period saw a diffusion of table grapes, such as 'Chabache', 'Tashly' and 'Asma'. After the annexation of Crimea by Russia in 1783, viticulture in the region improved, developing varieties imported from Greece, Turkey, Caucasus and Western Europe.

The beginning of the 19th century was associated with importation of French grape varieties in Crimea. In 1814, the first official grapevine collection was established on the South Coast within the framework of the Nikita Botanical Gardens. That is where planting material of the best European grapes came from, in order to be grown and distributed with the aim of establishing vineyards throughout the coastline of the Peninsula. In 1828, a school of practical winemaking was founded on a farm in the location of Magarach, and it was named after the place. Sixty-six years later, in 1894, the Nikita Winemaking College was established, with the task to train specialists for the needs of commercial viticulture and winemaking in Crimea and throughout viticultural and winemaking regions of Russia.



Fig. 1: Grape harvest in 1870.



Fig. 2: Pages of history: the winery "Massandra" and its vineyard.

Thanks to the initiative of the Russian aristocrat Lev Golitsyn, who was passionate about wine and had a profound knowledge of the subject, a wine cellar was built in the location of Massandra in 1894-1897. Massandra is now the head winery of a corporation producing quality wines. It was initially intended for storing about one and a half million bottles of wine at a time; by the beginning of the 20th century, Massandra was regarded as a model farm for viticulture and winemaking throughout the whole of Russia.

The winemaking school gave rise to the "Magarach" Institute, which in the Soviet time became very effective and successfully addressed important tasks of the country's industry, for instance zonation of grape varieties and specialization of wine growing micro-regions. July 1936 saw the establishment of the wine corporation, "Massandra", which became the authorized user of Crimea's vineyards, from the mouth of Boulganak River, north of Sevastopol, to Sudak in the east. In 1940, the total grape cultivation surface of Crimea accounted for 11,800 ha, of which 2,730 ha were owned by the state and 8,900 ha by collective farms.

As planting material from European grapes was in deficiency, producers of Franco-American hybrids planted phylloxera-infested vineyards in the Right-Bank Ukraine. In 1933, these varieties accounted for 74 % of Ukraine's total grape area. Most of them were grown in the provinces of Odessa and Nikolaev. Nevertheless, in 1939, the Decree of the Economical Board of the Soviet People's Commissars prohibited further cultivation of Franco-American hybrids throughout the country.

By the beginning of the Second World War, Ukraine's total grape area accounted for 103,200 ha. The viticulture and winemaking sector of the Ukrainian Soviet Socialist Republic was extremely damaged over the war period. Large areas of vineyards were ruined. The census of 1946 indicates that a total of 77,600 ha survived, including the area of Crimea, today a part of Ukraine. Since vineyards had been neglected and had heavy proportions of missing plants, remarkably low yields were harvested in the first post-war years. Even specialized viticultural farms produced only 980 kg of grapes per ha. Measures to improve farming conditions of neglected vineyards and the size of new grapevine plantings were determined and affirmed by the Decree of 27th June 1944 of the Soviet People's Commissar of the Ukrainian Soviet Socialist Republic.

By 1st January 1979, the Fruit and Wine Industries Administration of the Ukrainian Soviet Socialist Republic embraced a total of 345 state farms with different specializations. Viticulture involved 108 farms, 105 farms worked in horticulture and 43 in the nursery business. In addition to viticulture farms, around 200 grape-related enterprises were affiliated to the Fruit and Wine Industries Administration of the Ukrainian Soviet Socialist Republic, including 120 grape processing enterprises with a total capacity of 935,000 tons per harvesting, five sparkling wineries and six brandy houses. In 1978, the vineyard area of Crimea was 93,400 ha, which accounted for 39.2 % of its total agricultural area. The grape area of the region showed a 16-fold increase compared to the period before the October Revolution in 1917 and a 10-fold increase in comparison with the period prior to the Second World War.

The census of 1998 indicates that a total of 273 grape varieties were cultivated in Ukraine.

By the year 2000, the total vineyard area of Ukraine accounted for 109,600 ha, with an annual gross yield of 513.800 t and an



Fig. 3: Pages of history: old winery "Massandra" - grape presses



Fig. 4: Pages of history: distillation.



Fig. 5: Pages of history: bottling.



Fig. 6: Pages of history: wine tasting.



Fig. 7: Vineyard along the Black Sea coast.



Fig. 8: Vineyard on a hill.



Fig. 9: Vineyard on a lowland.

average productivity of $5,170 \text{ kg}\cdot\text{ha}^{-1}$. By 2007, the total surface of vineyards was 93,300 ha. Of the total surface, 80,700 ha were covered by wine grapes and 12,600 ha by table grapes - so, today wine grapes account for more than 80 % of the country's total grapevine cultivation area. The largest plantings of table grapes are established in the provinces of Crimea and Odessa. Vineyards are located at altitudes on the average of 50 to 100 m a.s.l. The extreme altitudes are as high as 500 m. The 2007 annual gross yield amounted to 359.700 t of grape.

In 2001, wine production in Crimea amounted to 154,900 hl of wine (15 % dry wines and 85 % fortified wines), 10,900 hl of sparkling wine and 18,900 hl of brandy.

Crimea's wine production is one of Ukraine's largest commercial winemaking activities and relies on the use of the country's richest grape variety assortment. Crimea is among several provinces of Ukraine where specialized wine production according to zones of viticulture and winemaking has been put into practice.

Recently, big efforts have been made to improve the variety assortment of Ukrainian vineyards. As a result, new wine grapes with multiple resistances to unfavorable factors have been released; this enables a better quality and a better stability of wine production.

The improvements of the general conditions of vineyards, hence of grapes, led to a growth in volumes of wine production and to favorable structural changes throughout Ukraine (AVIDZBA 2006, AVIDZBA 2008, AVIDZBA *et al.* 2007; MATCHINA and VOLYNKINA 2007; ZAGOROUKO *et al.* 2007).

Winemaking in terms of figures

Ukraine produces table, fortified, dessert, liqueur and sparkling wines among which white fortified wines lead the industry. The 2006 annual wine production was 2,870,000 hl. In the viticultural regions of the country, the tradition of homemade wines is still alive. Ukrainian wines are mainly sold on the domestic market.

Ukraine produces wines associated to definite regions of production (with controlled appellations of origin). White Muscat of the Red Stone, Muscat Koktebel, Naddniprianske, Solnechnaia Dolina are the best representatives. The domestic per capita wine consumption of Ukraine is one liter.

Ukrainian wineries attempted to produce pomace brandy, but the product was not in demand. The country produces brandy and grape juice.



Fig. 10: Modern winery.

Production of table grapes

Table grape cultivars 'Cardinal', 'Queen of Vineyards', 'Moldova', 'Italy', 'Chasselas Blanc', 'Muscat Yantarnyi', 'Muscat of Hamburg' and 'Pearl of Czaba' should be mentioned as those cultivated on the highest commercial scale in Ukraine. The 2006 annual production of table grapes for fresh consumption was 16,000 tons of table grape, including both seeded and seedless varieties. Raisins or seedless raisins are not produced.

Grapevine collections

The first grapevine collection on the south coast of Crimea began in 1814, within the framework of the Nikita Botanical Gardens. In 1826, it already grew around 300 varieties. After the school for grape and wine growing "Magarach" was established in 1828, the collection became part of its experimental and commercial plantings. The collection was initially intended for introduction of new varieties. International varieties from West Europe were brought there and autochthonous Crimean varieties were searched for, new accessions were carefully studied and tested and afterwards distributed to commercial plantings of Crimea and Southern Russia. In the second half of the 20th century, the collection became a gene bank of grapevine genetic resources. In the 1960s, it maintained around 900 varieties and forms of grapevine, while in the 1980s the number of accessions reached 3,000. At present, the collection of the "Magarach" Institute contains 3,462 varieties and forms of grapevine, being Europe's second and the world's fourth. The collection is world-renowned, has been registered at FAO and was granted the status of Ukraine's national heritage in December 2001.

Other Ukrainian collections are:

- Grapevine collection of the Tairov Institute for Viticulture and Enology (Odessa) which maintains a total of 433 varieties and forms of grapevine of different origins.
- Grapevine collection of the Transcarpathia Institute of Agroindustrial Production, growing 33 varieties and forms of grapevine mostly typical of the region's commercial variety assortment.
- Grapevine collection in the village of Solnechnaia Dolina: it is a collection of autochthonous Crimean varieties located the village of Solnechnaia Dolina of the Sudak region of Crimea, which is an endemic center of early viticulture. At present, the collection grows around 20 autochthonous Crimean varieties.

In the grapevine collection of the National Institute for Vine and Wine "Magarach", the family *Vitaceae* Lindley is represented by 3 species of the genus *Ampelopsis* Michaux, 2 species of the genus *Parthenocissus* Planch. and 23 species of the genus *Vitis* Linn. The collection grows 860 varieties of interspecific origin. The species *Vitis vinifera* L. is represented by two subspecies. The subspecies *Vitis vinifera* ssp. *sylvestris* Gmel. is represented by 195 accessions of wild grapevine collected in Crimea, Georgia and on Mount Kopetdag in Turkmenistan. The subspecies *Vitis vinifera sativa* D.C. is represented by 1,432 local and autochthonous varieties imported from 41 countries. There are 249 varieties of the Black Sea Basin eco-geographical group *convar. pontica* Negr., 101 varieties of the West European eco-geographical group *convar. occidentalis* Negr., 407 varieties of the East European eco-geographical group *convar. orientalis* Negr., and 730 varieties of intraspecific origin, including 261 new varieties released in Ukraine.

The collection is annually inspected through an inventory of the existing genetic resources: each inspection is followed by a reparation and restitution of losses. A total of 115 varieties have been added to the collection between 2001 and 2008.

Being a worldwide bank of grapevine genetic resources, the collection of the "Magarach" Institute enables comparative studies of varieties and accessions from different centers of origin. Such studies help researches to detect synonyms and homonyms. Besides, it provides material for breeding experiments and studies in viticulture and winemaking.

Old local varieties

A total of 86 autochthonous Crimean varieties have been characterized. At present, Ukrainian collections grow 81 autochthonous Crimean varieties.

Descriptions of autochthonous varieties are available in various important ampelographies (KORZHINSKII 1904, IVANOV 1947, FROLOV-BAGREIEV 1946-1956, NEGRUL 1963-1966, NEGRUL 1970, GOLODRIGA 1984, TIMUSH 1987). Also genetic relationships of autochthonous Crimean varieties with other autochthonous varieties of the Black-Sea Basin are investigated. This kind of material is used in breeding for drought resistance.

As a result of natural and artificial selection, local Crimean varieties have become capable of growing and producing yields of high quality in arid climates and on poor stony soils containing considerable amounts of salts and lime. Eight local Crimean varieties ('Kokour Belyi', 'Kapselskii', 'Soldaia', 'Asma', 'Chabache', etc.) have been added to the standard grape assortment of Ukraine.

Wild grapevine *Vitis vinifera* ssp. *sylvestris* Gmel.

At present, the wild grapevine grows in the forests of the mountainous area of Crimea.

Studies of the wild grapevine began in the 19th century, though research lacked in continuity. Herbarium samples of the species can still be found at the Nikita Botanical Gardens (Yalta, Crimea).

The financial support of the IPGRI has given a new impetus to this research (TUROK *et al.* 2006; MAGHRADZE *et al.* 2007, AVIDZBA *et al.* 2008). Since 2003, several expeditions were launched in the forests of the mountainous area of the South Coast of Crimea with the aim of updating data about natural habitats of the wild grapevine and of discovering and collecting forms of the species. Analysis of data from the past (MALIKOV 1968, RAMISHVILI 1988, YANUSHEVICH and PELIAKH 1971) and current research (VOLYNKIN 2006, VOLYNKIN *et al.* 2007, POLULYAKH and VOLYNKIN 2008, VOLYNKIN and POLULYAKH 2008 a, VOLYNKIN and POLULYAKH 2008 b, VOLYNKIN and POLULYAKH 2008 c) has led to a modern classification of *Vitis vinifera* ssp. *sylvestris* Gmel. At present, the collection of the "Magarach" Institute maintains a total of 166 accessions of the wild grapevine of Crimea.

As far as protection is concerned, the wild grapevines have been registered in the Red Book of Ukraine as Crimean endemic and relict species. At present, more than 100 forms of the wild grapevines that have recently been collected are maintained at the 'Magarach' Institute, waiting to be introduced in the collection.

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Ukraine: native varieties of grapevine

V. VOLYNKIN, A. POLULYAKH*, A. CHIZHOVA, N. ROSHKA

National Institute of Vine and Wine "Magarach", Yalta, Crimea, Ukraine

* Author of the photos

English translation: E. GUELGAR, National Institute of Vine and Wine "Magarach", Yalta, Crimea, Ukraine

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Notes: N-Noir (black), B-Blanc (white), Rg-Rouge (red), G-Gris (gray), R-Rose (pink)

Abla Aganyn Iziium B.

Synonyms

'Janyn Iziium', 'Nuiu Iziium' (Crimea).

Meaning of the name

Grape of Abla aga. (Abla is a masculine first name. Aga means Sir).

Historical notes and cultural importance

'Abla Aganyn Iziium' is a local Crimean variety. It was found in Sudak's old vineyards as single vines in the 1970s.

The variety is not widespread. It can be recommended for ordinary winemaking in blend with other varieties. It is perspective in Crimea as a high yielding variety and as breeding material.

Taxonomy and intra-variety variability

Proles *orientalis* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, with red edge and covered with weak felt hairs. The first distal leaves are copper-red with medium dense cobwebby hairs on the lower surface.

The mature leaf is medium size, rounded, rather deeply five lobed and hairless. The leaf blade is undulate. The upper surface is dark green, glossy, slightly reticular-wrinkled or almost smooth. The upper leaf sinuses are deep, seldom medium-deep, open, lyre-shaped with a narrow mouth and a rounded, rarely flat base. The lower leaf sinuses are medium-deep, open, lyre-shaped with a rounded or pointed base. The petiole sinus is closed, elliptical or chinked and with a sharp base. The teeth at the end of the lobes are large, with rectilinear sides and a wide base. The lateral teeth are large and triangular or triangular-serriform. The petiole and the main veins in the petiole area are wine-red.

The flower is hermaphrodite.

The bunch is large, conical and cylindrical-conic, dense to medium dense.

The berry is large, rounded or slightly oval and yellow-green. The skin is thin. The flesh is juicy with a simple and harmonious taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 5.4 kg

Bunch weight: 300-400 g

Bud fertility: 0.66

Climate and cultivation requirements

'Abla Aganyn Iziium' is a medium ripening variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout at and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards fungal diseases and European grapevine moth (*Lobesia botrana*). It has good resistance to drought.

Juice characteristics

Sugar: 16.0-18.0 %

Total acidity: 6.0-5.3 g·L⁻¹

Wine and grape characteristics

'Abla Aganyn Iziium' wines have not been studied sufficiently. Blending is recommended for ordinary winemaking.



Adjem Misket B.

Synonyms

Unknown.

Meaning of the name

Imported Muscat.

Historical notes and cultural importance

'Adjem Misket' is a local Crimean variety. It was found as single vines in Sudak's old vineyards.

It is not widespread.

Taxonomy and intra-variety variability

Proles occidentalis Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green with copper-red edge and covered with weak felt hairs. The young distal leaves are copper-red. The first three young leaves are covered with dense hairs on both sides.

The mature leaf is medium size, strongly dissected, rather deeply five to seven lobed. The leaf blade is rounded, infundibular-plicate. The upper surface is slightly vesicular and sometimes reticular-wrinkled. The upper leaf sinuses are deep, closed with oval lumen. The lower leaf sinuses are medium-deep, open, lyre-shaped with a sharp base or chinked. The petiole sinus is closed with a chinked or fusiform lumen. The teeth at the end of the lobes are triangular with slightly convex sides. The lateral teeth are large, triangular-serriform. The leaves are covered with sparse cobwebby hairs and bristles along the veins.

The flower is female.

The bunch is small, conical or cylindrical-conic, loose.

The berry is medium size, oval, usually yellow-green, pink when overripe, with a slight muscat aroma. The skin is thick and a little astringent. The flesh is juicy.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 2.4 kg

Bunch weight: 190 g

Bud fertility: 0.67

Climate and cultivation requirements

'Adjem Misket' is a medium to late ripening variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 45-60 buds per vine.

Resistance to diseases and unfavorable weather

'Adjem Misket' has low resistance towards fungal diseases.

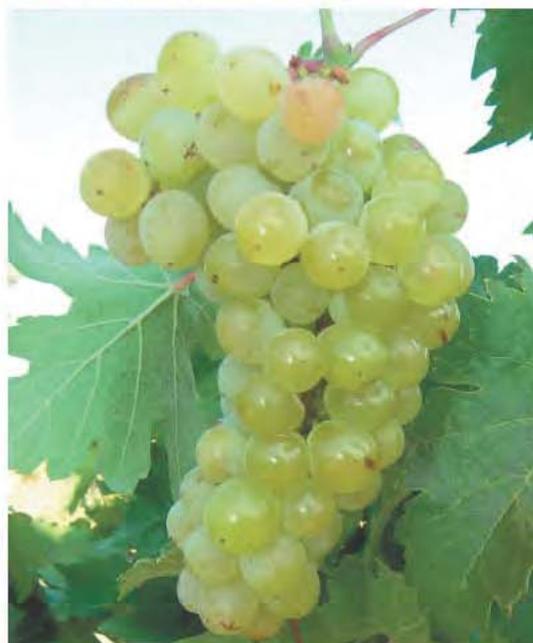
Juice characteristics

Sugar: 21.0-22.0 %

Total acidity: 3.0 g·L⁻¹

Wine and grape characteristics

'Adjem Misket' is for local consumption due to low transport resistance and mediocre palatability.



Aibatly B.

Synonyms

Unknown.

Meaning of the name

Probably it is a toponym.

Historical notes and cultural importance

'Aibatly' is a local Crimean variety. It was found as single vines in the old vineyard of Sudak.

The variety is not widespread.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green with wine-red edges. The first young distal leaves are green with wine-red tint. The crown and the lower surface of the young leaf have sparse hairs.

The mature leaf is medium size, rounded, medium three to five lobed and rolled. The leaf is covered with bristle hairs along the veins. The upper surface is reticular-wrinkled. The upper leaf sinuses are medium-deep, more frequently closed with oval lumen. The lower leaf sinuses are shallow, chinked or V-shaped. The petiole sinus is closed with strongly overlapping lobes and a narrow elliptical or chinked lumen, sometimes with a tooth. The teeth at the end of the lobes are triangular with rounded tips. The lateral teeth are triangular-serriform.

The flower is female.

The bunch is medium size, conical, medium dense to loose.

The berry is medium size, oval and yellow-green. The skin is thick. The flesh is juicy and tender. The taste is simple and harmonious.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 5.4 kg

Bunch weight: 300-310 g

Bud fertility: 0.85

Climate and cultivation requirements

'Aibatly' is a medium to late ripening variety, suitable for cultivation in the pre-mountainous zones and on the South Coast of Crimea, with 1.5x3.0 m planting layout and 45-60 buds per vine.

Resistance to diseases and unfavorable weather

'Aibatly' has medium resistance towards fungal diseases.

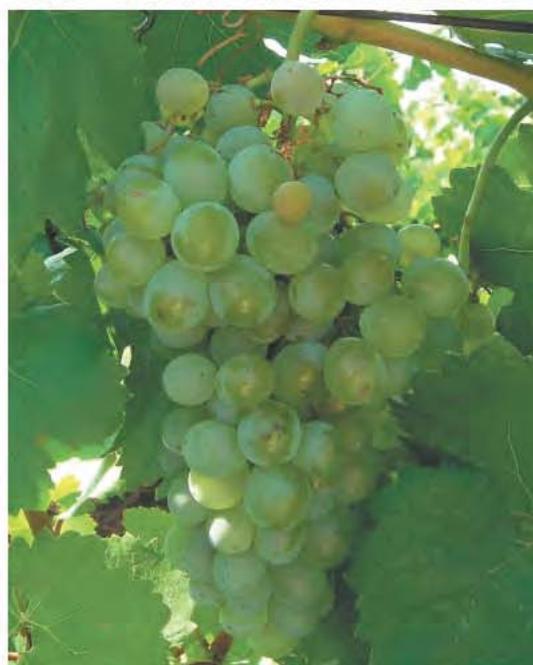
Juice characteristics

Sugar: 21.0-23.0 %

Total acidity: 3.6-4.0 g·L⁻¹

Wine and grape characteristics

'Aibatly' is used for making strong wines in blend with other varieties. Mono varietal wines are simple.



Akseit Kara N.

Synonyms

Unknown.

Meaning of the name

Akseit is a name. Kara = black.

Historical notes and cultural importance

'Akseit Kara' is a local Crimean variety. It was found as single vines in Sudak's old vineyards.

The variety is not very interesting, due to unstable yield and comparatively mediocre palatability.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first young distal leaves are white due to dense felt hairs, edged with pink.

The mature leaf is medium size, rounded and elongated, medium three lobed. The leaf has weak cobwebby hairs with bristles along the veins. The leaf blade is slightly undulate, the margins are involute. The upper surface is strongly reticular-wrinkled and slightly blistered. The upper leaf sinuses are medium-deep, open, lyre-shaped with a rounded or sharp base, sometimes with a tooth on the base. The lower leaf sinuses are shallow, V-shaped, seldom chinked or lyre-shaped with a sharp base. The petiole sinus is closed with an elliptic lumen and a pointed base, sometimes with a tooth. The teeth at the end of the lobes are triangular with a wide base. The lateral teeth are triangular or triangular-serriform. The petiole is red-brown with dark longitudinal stripes.

The flower is hermaphrodite.

The bunch is medium size, narrow conical, seldom cylindrical and medium dense.

The berry is medium size, oval, dark violet with a thick solid skin. The flesh is juicy. The taste is simple and harmonious.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 6.7 kg

Bunch weight: 340 g

Bud fertility: 0.84

Climate and cultivation requirements

'Akseit Kara' is a medium to late ripening variety. It is suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has poor and medium resistance towards *Plasmopara viticola* and *Erysiphe necator* respectively.

Juice characteristics

Sugar: 16.0-18.0 %

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

'Askeit Kara' is a table grape variety with local importance.



Albourla Rg.

Synonyms

'Sambul AI' (Crimea).

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Albourla' is a local Crimean variety. It was found as single vines in Sudak's old vineyards.

It is a high productive table grape variety. Its cultivation is possible in the mountainous-lowland and pre-mountainous areas of Crimea, due to low soil requirements. The variety is worth further evaluation in the steppe of Crimea.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green striped with copper-red on the edge and covered with sparse hairs. The young distal leaves are copper-red with weak hairs and rather deeply dissected.

The mature leaf is medium size, rounded, rather deeply three to five lobed and hairless. The leaf blade is undulate. The upper surface is slightly blistered or nearly smooth. The upper leaf sinuses are deep, seldom medium-deep and closed with a narrow elliptic lumen. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is closed with elliptical or oval lumen and a pointed base. The teeth at the end of the lobes are triangular with a rounded tip. The lateral teeth are triangular or triangular-serriform with slightly convex sides. The main veins are intense wine-red. The petiole is wine-red.

The flower is hermaphrodite.

The bunch is large, conical and cylindrical-conic, dense to medium dense.

The berry is large, rounded, normally pink and dark red when overripe. The skin is thick. The flesh is juicy with a slight muscat aroma.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 5.4 kg

Bunch weight: 360 g

Bud fertility: 0.70

Climate and cultivation requirements

'Albourla' is a medium to late ripening variety. It grows well on slate clayey soils, using long pruning and 8 to 10 buds per fruity cane.

Resistance to diseases and unfavorable weather

'Albourla' has low resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases. *Erysiphe necator* is rather destructive. It is rather drought-resistant.

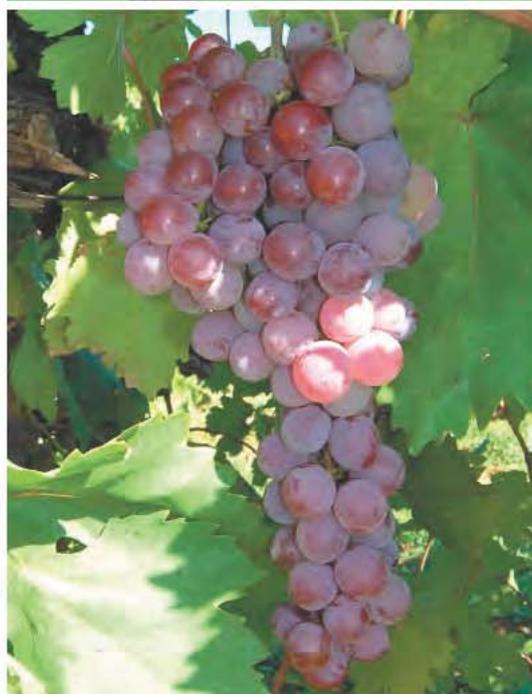
Juice characteristics

Sugar: 18.0-20.0 %

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

'Albourla' is a table grape variety with local importance.



Artin Zerva B.

Synonyms

Unknown.

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Artin Zerva' is a local Crimean variety. It was found as single vines in Sudak's old vineyards.

The variety is not widespread.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green with pink edges and covered with dense felt hairs. The first young leaves are white due to the thick felt hairs on both surfaces. The leaf margins are edged with pink. The fourth leaf is light green with bronze spots and covered with felt hairs on the lower surface.

The mature leaf is medium size, rounded, rather elongated, strongly five to seven lobed with dense bristle and cobwebby hairs. The leaf blade is undulate. The upper surface is reticular-wrinkled. The upper leaf sinuses are deep, closed with elliptic or oval lumen and a pointed base. On the central lobe there are often well-expressed secondary sinuses (typical trait). The lower leaf sinuses are deep, seldom medium-deep, open and V-shaped. The petiole sinus is open, lyre-shaped with a pointed base, sometimes limited by veins. The teeth at the end of the lobes are narrow triangular with slightly convex sides and an acute tip. The lateral teeth are large triangular or triangular-serriform. The petiole is violet, the pigmentation is not very intense and uneven.

The flower is hermaphrodite.

The bunch is medium size, cylindrical and cylindrical-conic, winged, dense to medium dense.

The berry is large, rounded or slightly oval and yellowish-green. The skin is thick. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: medium (second ten days of September)

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.9 kg

Bunch weight: 250-300 g

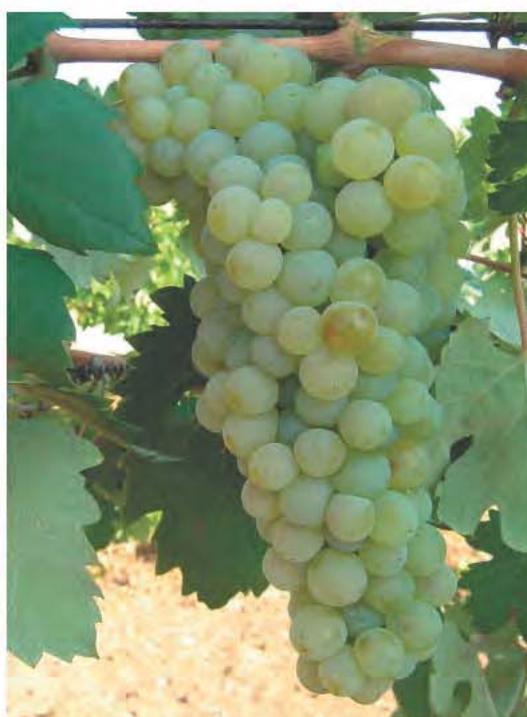
Bud fertility: 0.71

Climate and cultivation requirements

'Artin Zerva' is a medium-ripening variety suitable for cultivation in the pre-mountainous zones and on the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 45-60 buds per vine.

Resistance to diseases and unfavorable weather

'Artin Zerva' has low susceptibility towards the European grapevine moth (*Lobesia botrana*) and *Plasmopara viticola*. Considerable damage is caused by *Erysiphe necator* and by gray mold (*Botrytis cinerea*) in a rainy autumn.



Juice characteristics

Sugar: 20.0-22.0 %

Total acidity: 6.0-7.0 g·L⁻¹

Wine and grape characteristics

'Artin Zerva's technological characteristics have not been thoroughly studied exhaustively. The variety can be recommended for ordinary winemaking, in blend with other varieties.

Asma N.

Synonyms

'Chernyi Krymskii' (Moldova), 'Asma Chernaia' (Crimea).

Meaning of the name

Hanging.

Historical notes and cultural importance

'Asma' is an ancient Crimean variety mentioned by the Academician P. PALAS in 1799 (KORZHINSKII 1904; IVANOV 1947) as one of the most widespread and high-yielding varieties grown in the Sudak and Koz valleys and throughout the South Coast of Crimea.

The variety is included in the "Standard list" of grapevine varieties of Ukraine, recommended for cultivation in the pre-mountainous zones and on the South Coast of Crimea.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is edged with light pink and covered with dense cobwebby hairs. The first, second and third distal leaves are light green tinged with bronze. The first and second distal leaves have sparse cobwebby hairs on the upper and on the lower surfaces. The hairs disappear on the third leaf and further on.

The mature leaf is large, rounded, three lobed, seldom nearly entire and hairless. The leaf blade is slightly undulate or plicate, rolled and coriaceous. The upper surface is dark green, reticular-wrinkled. The upper leaf sinuses are medium-deep, seldom deep, closed with a narrow elliptical lumen and a pointed base. The lower leaf sinuses are shallow, open, lyre-shaped with nearly parallel sides and a pointed base. The petiole sinus is closed in natural conditions because the leaf blade is infundibular. The teeth at the end of the lobes are large, narrow triangular with pointed tips. The lateral teeth are large and triangular with acute tips. The petiole and the base of the main veins, up to the mid vein, are pink.

The flower is hermaphrodite.

The bunch is large, cylindrical, winged and dense.

The berry is large, oval, dark blue with a solid skin. The flesh is juicy and pulpy. The taste is simple and harmonious.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: third ten days of August

Time of ripening: last days of September and first days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium to vigorous

Yield per vine: 6.8 kg

Bunch weight: 540 g

Bud fertility: 0.66

Climate and cultivation requirements

'Asma' is a late-ripening variety, which grows well on slate and stone soils of Crimea. The best results are obtained in cultivation on well-heated light soils consisting of broken stone, provided with moderate irrigation. The planting layout is at 1.5 x 3.0 m and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards fungal diseases and winter frosts. It has good resistance to drought.



Juice characteristics

Sugar: 16.0-18.0 %

Total acidity: 8.0-7.0 g·L⁻¹

Wine and grape characteristics

'Asma' is a variety with low sugar and high acidity. It has good transport resistance and storage ability.

Biyas Aibatly B.

Synonyms

Unknown.

Meaning of the name

Biyas = White. Aibatly is probably a toponym.

Historical notes and cultural importance

The grape is a local Crimean variety. It was found as single vines in Sudak's old vineyards.

The variety is not widespread. It is recommended for ordinary winemaking in blend with other varieties.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green, striped with copper-red on the edge. The first young distal leaves are green tinged with copper-red and hairless. The mature leaf is medium size, rounded, medium three to five lobed. The leaf has no hairs, nevertheless dense bristle hairs are found along the veins. The leaf blade is firm and slightly infundibular. The upper surface is dark green, rectilinear-wrinkled or slightly blistered. The upper leaf sinuses are medium-deep, closed with oval lumen. The lower leaf sinuses are shallow and closed with oval lumen. The petiole sinus is closed and fusiform. The teeth at the end of the lobes are triangular with convex sides. The lateral teeth are serriform with one or both sides convex. The base of the main veins and the petiole are red-violet.

The flower is hermaphrodite.

The bunch is medium size, conical, sometimes winged, medium dense to loose.

The berry is medium size, rounded or slightly flattened and yellow-green. The skin is thin. The flesh is juicy with a simple and harmonious taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: medium (second ten days of September)

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium

Yield per vine: 5.7 kg

Bunch weight: 310-320 g

Bud fertility: 0.89

Climate and cultivation requirements

'Biyas Aibatly' is a medium ripening variety, suitable for cultivation in the pre-mountainous zones and on the South Coast of Crimea, with a planting layout of 1.5 x 3.0 m and 45-60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is affected by European grapevine moth (*Lobesia botrana*) and by fungal diseases.

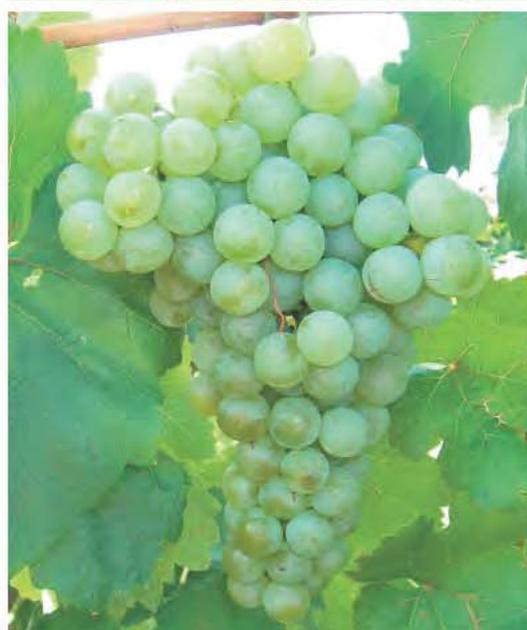
Juice characteristics

Sugar: 20.0-21.0 %

Total acidity: 4.0-3.3 g·L⁻¹

Wine and grape characteristics

'Biyas Aibatly' wine's technological characteristics have not been studied sufficiently.



Bogos Zerva B.

Synonyms

Unknown.

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Bogoz Zerva' is a local Crimean variety. It was found as single vines in Sudak's and Alushta's old vineyards.

The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green and rather reddish on the edge with sparse felt hairs. The first young distal leaves are copper-red with medium dense cobwebby hairs on the lower surface.

The mature leaf is medium size, rounded, medium five lobed with dense cobwebby-bristle hairs. The leaf blades are undulate. The upper surface is green, slightly reticular-wrinkled or nearly smooth. The upper leaf sinuses are deep, closed with an elliptic or rounded lumen and a pointed base. The lower leaf sinuses are deep or shallow, open and chinked. The petiole sinus is open, lyre-shaped with a pointed base. The teeth at the end of the lobes are triangular with a wide base. The lateral teeth are large, triangular or triangular-serriform.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conic and dense.

The berry is small, flattened, yellow-green with a thick and firm skin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 1.1 kg

Bunch weight: 250-260 g

Bud fertility: 0.56

Climate and cultivation requirements

'Bogos Zerva' is a medium ripening variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases (*Plasmopara viticola*) and *Erysiphe necator*). It may be affected by gray mold (*Botrytis cinerea*) in a rainy autumn.

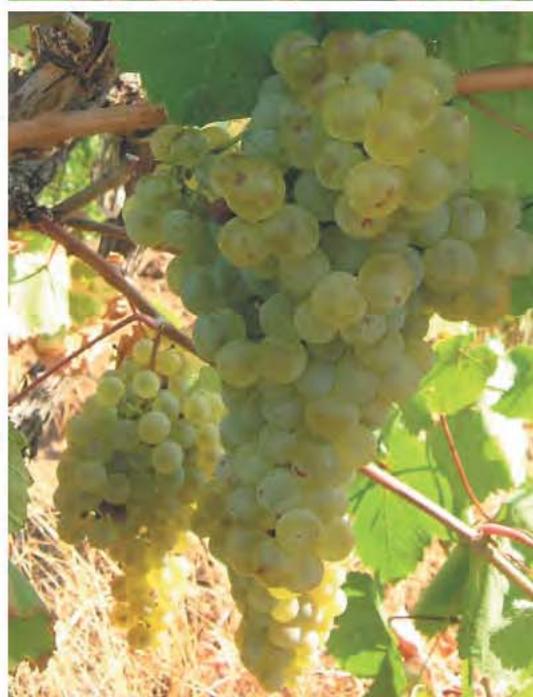
Juice characteristics

Sugar: 18.0-20.0 %

Total acidity: 6.0-5.0 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Bogos Zerva's wine have not been studied sufficiently. The grapes can be used for making strong white Porto style wines or ordinary strong wines in blend with other varieties.



Chernyi Krymskii N.

Synonyms

'Chernyi Kachinskii', 'Kara Izium' (Crimea).

Meaning of the name

Black from Crimea.

Historical notes and cultural importance

'Chernyi Krymskii' is a local Crimean variety. Two grape varieties - 'Izmirskii Ciia' or 'Smirnskii' and 'Kara Izium' - were cultivated in the western valleys of Crimea in the beginning of the 19th century. 'Kara Izium', without any doubt, is the same variety currently known as 'Chernyi Krymskii' because grapevine assortment of Crimea was unchanged since the 19th century.

The variety can be found mostly in small vineyards in the South-west of Crimea and has local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is covered with felt hairs. The first distal leaf has rather dense hairs. The crowns and the young leaves are edged with brown-red.

The mature leaf is medium size and large, oval, slightly three to five lobed. The leaf blade is slightly infundibular. The upper surface is strongly vesicular. The upper leaf sinuses are open, lyre-shaped with a rounded base, or chinked. The lower leaf sinuses are open, lyre-shaped with a rounded or pointed base, or only just expressed. The petiole sinus is closed. The teeth at the end of the lobes are triangular with an acute tip. The lateral teeth are wide triangular or slightly serriform. The mature leaf is covered with felt hairs. The main veins have bristle hairs.

The flower is hermaphrodite.

The bunch is large, cylindrical-conic and medium dense.

The berry is medium size and large, rounded and dark violet. The skin is thin. The flesh is crispy, juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.3 kg

Bunch weight: 190 g

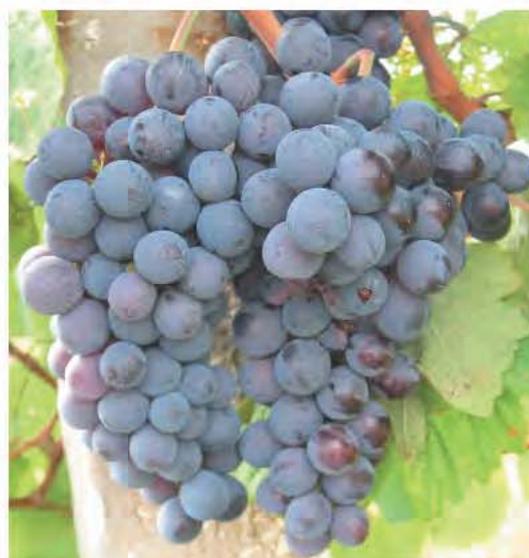
Bud fertility: 1.33

Climate and cultivation requirements

'Chernyi Krymskii' is a medium to late-ripening table and wine grape variety. It starts bearing comparatively late. Flower drop and berry shot was reported in the steppe zones of Crimea. To avoid them, young shoots topping is recommended. Vine bud load should be increased to compensate possible winter losses due to frost. It is well known as a highly long-living variety.

Resistance to diseases and unfavorable weather

The variety is resistant to lime soils and salinity and it is susceptible to winter frosts. *Plasmopara viticola* is very destructive. Berry cracks and rots in a rainy autumn.



Juice characteristics

Sugar: 16.0-18.0 %

Total acidity: 6.0-4.5 g·L⁻¹

Wine and grape characteristics

Due to low transport resistance, 'Chernyi Krymskii' grapes are used for fresh consumption only locally. It can be used to make ordinary blended table wines.

Chivsiz Sary B.

Synonyms

Unknown.

Meaning of the name

For *Chivriz* no hypotheses have been proposed. *Sary* = yellow.

Historical notes and cultural importance

'Chivsiz Sary' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and now it has only local importance.

Taxonomy and intra-variety variability

Proles *occidentalis* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are white due to thick felt hairs, edged with light pink.

The mature leaf is medium size and large, rounded or oval, medium three to five lobed. The upper surface is dark green and macroreticular-wrinkled. The upper leaf sinuses are medium-deep, open, lyre-shaped with a narrow mouth. The lower leaf sinuses are shallow, open, V-shaped. The petiole sinus is closed with a rounded or oval lumen and an acute base, sometimes bordered by veins. The teeth at the end of the lobes are large, triangular with slightly convex sides and a wide base. The lateral teeth are large, alternated with smaller ones, triangular and triangular-serriform and acute. The leaf is covered with medium dense cobwebby hairs. The petiole is unevenly red-violet.

The flower is hermaphrodite.

The bunch is medium size, conical and cylindrical-conic and dense.

The berry is large, oval, yellow-green with a medium thick skin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 3.0 kg

Bunch weight: 230 g

Bud fertility: 1.03

Climate and cultivation requirements

'Chivsiz Sary' is a medium ripening wine grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is rather resistant towards the European grapevine moth (*Lobesia botrana*) and *Plasmopara viticola*, susceptible towards *Erysiphe necator* and has good resistance to drought. The fruit rots in a rainy autumn.

Juice characteristics

Sugar: 17.0-18.0 %

Total acidity: 5.5-6.0 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Chivsiz Sary' wines have not been thoroughly studied due to limited amount of grapes. It can be used mostly for making strong wines as a part of a blend.



Dardagan B.

Synonyms

Unknown.

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Dardagan' is a local Crimean variety. It was found as single vines in Sudak's old vineyards.

The variety is not widespread now.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green and covered with dense hairs. The first young leaves are light green, tinged with pink and covered with dense thick felt hairs on both surfaces.

The mature leaf is medium size, rounded, three to five lobed and slightly to medium dissected. The leaf blades are slightly infundibular. The upper surface is slightly reticular-wrinkled or nearly smooth. The upper leaf sinuses are medium-deep, seldom shallow and closed with a narrow elliptical lumen. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is open, sagittate and frequently equilateral with a pointed base. The teeth at the end of the lobes are narrowing triangular and pointed. The lateral teeth are serriform and acute. The main veins in the petiole area and the petiole are red-violet with dense cobwebby hairs.

The flower is hermaphrodite.

The bunch is large, conical or cylindrical-conic, highly winged and very loose. The stem is very fragile.

The berry is medium size, oval, yellow-green with brown spots on the sunny side. The skin is thin. The flesh is crispy and juicy. The taste is simple and refreshing.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.6 kg

Bunch weight: 300-370 g

Bud fertility: 1.24

Climate and cultivation requirements

'Dardagan' is a medium ripening table grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with planting layout at 1.5 x 3.0 m and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low susceptibility towards *Plasmopara viticola*, while *Erysiphe necator* and European grapevine moth (*Lobesia botrana*) are more destructive. The variety is resistant to drought. Flower drop is very high.

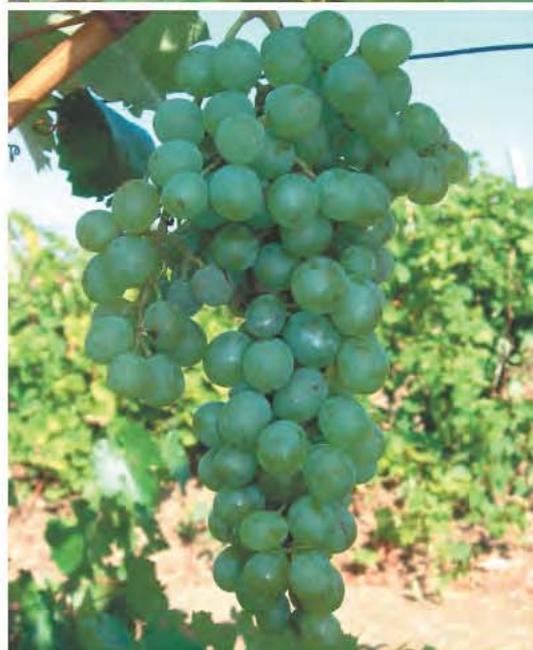
Juice characteristics

Sugar: 18.0-20.0 %

Total acidity: 6.0-5.0 g·L⁻¹

Wine and grape characteristics

Grape of 'Dardagan' has a low resistance to transport with very loose bunches and fragile stems, reducing its value as a table grape. The grape has local importance for fresh consumption.



Demir Kara N.

Synonyms

Unknown.

Meaning of the name

Black Iron.

Historical notes and cultural importance

'Demir Kara' is a local Crimean variety. It was found in single vines in the old vineyards of Sudak and Alushta.

The variety is not widespread now. It is promising for testing in the steppe and in the pre-mountainous regions of Crimea.

Taxonomy and intra-variety variability

Proles *occidentalis* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green, striped with intense wine-red and covered with sparse hairs. The first young leaves are wine-red with medium dense hairs.

The mature leaf is large, rounded, deeply five lobed. The leaf blades are undulate and rolled. The upper surface is slightly reticular-wrinkled or nearly smooth. The upper leaf sinuses are deep, closed, with elliptic or oval lumen and a rounded base. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is open, as a high-crowned arch, wide with a rounded and flat base which is often limited by veins. The teeth at the end of the lobes are small, triangular with a wide base. The lateral teeth are large and triangular-serriform. The main veins on both surfaces and the petiole are intense wine-red, and covered with dense cobwebby hairs.

The flower is hermaphrodite.

The bunch is medium size, conical, winged and dense.

The berry is medium size, rounded, black with a medium-thick and firm skin. The flesh is juicy. The skin and the flesh are astringent.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 5.2 kg

Bunch weight: 300-310 g

Bud fertility: 0.74

Climate and cultivation requirements

'Demir Kara' is a medium ripening wine grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is relatively resistant towards *Plasmopara viticola* and more susceptible towards *Erysiphe necator* and European grapevine moth (*Lobesia botrana*). It is drought-resistant.

Juice characteristics

Sugar: 19.0-22.0 %

Total acidity: 8.0-6.5 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Demir Kara' wine have not been studied exhaustively. The tested strong wines accessions had full harmonious taste.



Dere Iziium B.

Synonyms

Unknown.

Meaning of the name

Dere = lowland. Iziium = grape.

Historical notes and cultural importance

'Dere Iziium' is a local Crimean variety. It was found as single vines in Sudak's and Alushta's old vineyards.

The variety is not widespread and has only local importance now.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, striped with copper-red on the edge and covered with weak hairs. The first young leaves are light green, glossy and tinged with copper-red.

The mature leaf is medium size, rounded, slightly three lobed, nearly entire and hairless. The leaf blades are slightly undulate and asymmetrical. The upper surface is light green, slightly reticular-wrinkled or nearly smooth. The upper leaf sinuses are V-shaped or slightly expressed. The lower leaf sinuses are also slightly expressed. The petiole sinus is open, deep and sagittate. The teeth at the end of the lobes are triangular with convex sides and a rounded tip. The lateral teeth are serriform with convex sides and an acute tip.

The flower is hermaphrodite.

The bunch is medium size, conical and medium dense.

The berry is medium size, flattened and yellow-green. The skin is thick. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: medium (second ten days of September)

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 3.3 kg

Bunch weight: 250-280 g

Bud fertility: 1.63

Climate and cultivation requirements

'Dere Iziium' is a medium ripening wine grape variety suitable for cultivation in the pre-mountainous and steppe zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is relatively resistant towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases. It is winter frost resistant.

Juice characteristics

Sugar: 17.0-18.0 %

Total acidity: 6.0-5.0 g·L⁻¹

Wine and grape characteristics

Technological characteristics of the 'Dere Iziium's wine have not been studied sufficiently. It can be used for making ordinary strong wines in blend with other varieties.



Djevat Kara N.

Synonyms

'Polkovnik Kara' (Crimea)

Meaning of the name

Black Djevat. Djevat is a masculine first name.

Historical notes and cultural importance

'Djevat Kara' is a local Crimean variety. It was found as a minor variety in Sudak's old vineyards.

The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, white due to dense cobwebby hairs with pink spots on the edge. The first young distal leaves are light green with teeth, rather reddish on the edge and covered with cobwebby hairs.

The mature leaf is medium size to large, rounded, three to five lobed, medium dissected, with dense cobwebby hairs and short bristles. The leaf blades are undulate. The upper surface is dark green, strongly reticular-wrinkled or light blistered. The upper leaf sinuses are medium-deep, seldom shallow, practically without a lumen, or chinked. The lower leaf sinuses are shallow and slightly expressed. The petiole sinus is closed by strongly overlapping lobes, with narrow elliptic lumen and a pointed base. The teeth at the end of the lobes are triangular with slightly convex sides and an acute tip. The lateral teeth are large, triangular-serriform with convex sides and an acute tip. The main veins in the petiole area and the petiole are light red-violet.

The flower is hermaphrodite.

The bunch is medium size, conical, winged and medium dense to dense.

The berry is medium size, rounded, black with a thick and tough skin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 5.8 kg

Bunch weight: 310-320 g

Bud fertility: 1.17

Climate and cultivation requirements

'Djevat Kara' is a medium ripening wine grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards fungal diseases.

Juice characteristics

Sugar: 18.0-19.0 %

Total acidity: 4.0-3.3 g·L⁻¹

Wine and grape characteristics

The grapes of 'Djevat Kara' are used for making strong wines in blend with other varieties. It is also suitable for making juice and low alcohol wines.



Ekim Kara N.

Synonyms

Unknown.

Meaning of the name

Black doctor.

Historical notes and cultural importance

The grape is a local Crimean variety. It is believed that the variety was distributed from a private vineyard of Sudak at the end of the 19th century. The owner of this vineyard was a doctor in medicine ("a doctor") and the name 'Ekim Kara' means "Black doctor = the black grape from the doctor". The variety is included in the list of "Standard grapevine varieties", recommended for cultivation in Ukraine. Commercial vineyards of the variety are mostly in Sudak.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is edged with pink on the upper surface and is covered with sparse hairs. The first distal leaves are light pink tinged with brown and have sparse hairs. The subsequent leaves are light green and nearly hairless. The round and slightly dissected leaves are typical of the young shoot.

The mature leaf is medium size, rounded, three lobed, slightly dissected to nearly entire, hairless. The leaf blade is slightly undulate, infundibular. The upper surface is insignificantly blistered. The terminal lobe is rectangular, less frequently U-shaped. The upper leaf sinuses are shallow, open, chinked. The lower leaf sinuses are absent or only just expressed, V-shaped. The petiole sinus is closed, with narrow elliptical lumen and has strongly overlapping lobes, often without a lumen; less frequently it is open, lyre-shaped with a pointed base. The teeth at the end of the lobes and the lateral teeth are small with both sides convex. The veins are lilac-pink. The mature leaf has sparse cobwebby hairs on the lower surface and dense bristle hairs along the veins. The petiole is wine-red.

The flower is female.

The bunch is medium size and large, wide conical, often winged and loose to medium dense.

The berry is medium size, large, rounded, less frequently slightly oval and black. The skin is a rather thick, solid and covered with abundant bloom. The flesh is juicy, with a pleasant taste, nice sweetness and a slight acidity.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 4.6 kg

Bunch weight: 300 g

Bud fertility: 1.30

Climate and cultivation requirements

'Ekim Kara' is a late-ripening wine grape variety which grows well and has comparatively high yields on slopes, on loamy or sandy loam, more or less rich soils. The fruit may dry on the vine without rot. The variety should be planted in combination with pollinators.



Resistance to diseases and unfavorable weather

The variety has medium resistance to winter frosts, while it is very susceptible towards *Plasmopara viticola* and *Erysiphe necator*.

Juice characteristics

Sugar: 21.0-23.5 %

Total acidity: 4.0-5.0 g·L⁻¹

Wine and grape characteristics

The grape produces excellent quality dessert wines with a characteristic dark red color, an unusual bouquet, hinting of licorice, an unctuous taste with chocolate flavors and a slight astringency. Strong wines have an intense color, a pronounced bouquet and a full taste.

Emir Veis B.

Synonyms

Unknown.

Meaning of the name

Name of the Emir.

Historical notes and cultural importance

'Emir Veis' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspic*a Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, striped with wine-red on the edge and covered with sparse hairs. The first distal leaves are intense wine-red with sparse hairs.

The mature leaf is medium size, rounded and slightly three to five lobed. The leaf blade is slightly infundibular. The upper leaf sinuses are shallow, open and V-shaped. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is closed, with a chinked or elliptic-shaped lumen. The teeth at the end of the lobes are triangular, with slightly convex sides and an acute tip. The lateral teeth are triangular-serriform with slightly convex sides. The leaf is hairless. The base of the main veins is covered with short bristle hairs.

The flower is hermaphrodite.

The bunch is large, cylindrical, cylindrical-conic and dense.

The berry is large, rounded and yellow-green. The skin is thick. The flesh is pulpy, juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 7.3 kg

Bunch weight: 450 g

Bud fertility: 0.72

Climate and cultivation requirements

'Emir Veis' is a medium ripening table and wine grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is rather resistant towards the European grapevine moth (*Lobesia botrana*) and towards *Plasmopara viticola*, it is susceptible towards *Erysiphe necator* and has good drought resistance.

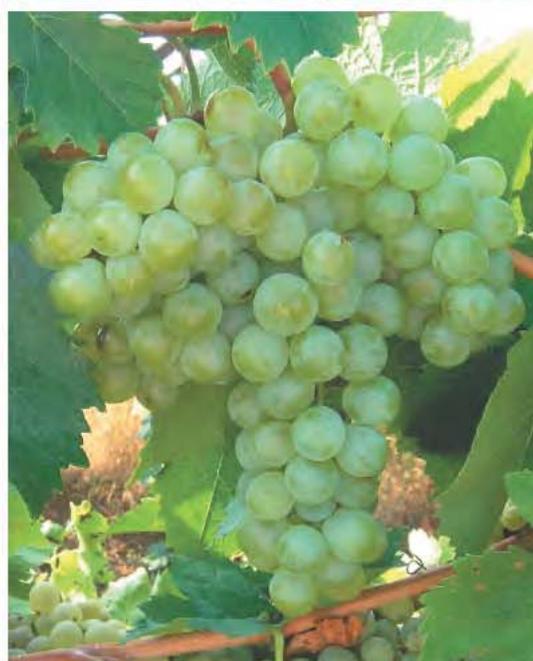
Juice characteristics

Sugar: 20.0-22.0 %

Total acidity: 8.6-7.0 g·L⁻¹

Wine and grape characteristics

'Emir Veis' could be used for making strong wines as a part of a blend. It has low transport resistance and it is not very promising as a table variety: it is consumed limitedly mostly to the local places of cultivation.



Firskii Rannii N.

Synonyms

'Smirskii' (Crimea).

Meaning of the name

Firskii is toponym. Rannii = Early (in Russian).

Historical notes and cultural importance

'Firskii Rannii' is a native Crimean variety. No evidence is available about its origin and the time of its introduction into cultivation. It was spread as single vines and small vine groups mixed together with 'Chernyi Krymskii' in the valleys of the rivers Belbek, Kacha and Alma.

The variety is not widespread and has only local importance.

Taxonomy and intra-variety variability

Proles *pontica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are green, edged with pink and covered with dense cobwebby hairs.

The mature leaf is large, rounded, sometimes rather elongated and deeply three to five lobed. The leaf blade is undulate, sometimes nearly flat and revolute. The upper surface is dark green, microreticular-wrinkled or nearly smooth. The upper leaf sinuses are deep, closed with an elliptic lumen and a rounded base, rarely with a tooth at the base. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is closed by transversal elliptic or rounded lumen and with a flat base and rarely bordered by veins. The teeth at the end of the lobes are small, wide triangular. The lateral teeth are small, wide triangular, alternating with serriform ones with acute tips. The mature leaf is covered with medium dense cobwebby-bristle hairs. The main veins are covered with short bristle hairs and by very sparse cobwebby hairs. The main veins on both surfaces and the petiole are cherry-red.

The flower is hermaphrodite.

The bunch is medium size, cylindrical to cylindrical-conic and dense.

The berry is medium size, rounded and black. The skin is thick, rough and firm. The flesh is juicy, poorly separated from the pulp, with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: early to medium (first ten days of September)

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: higher than medium.

Yield per vine: 4.9 kg

Bunch weight: 240 g

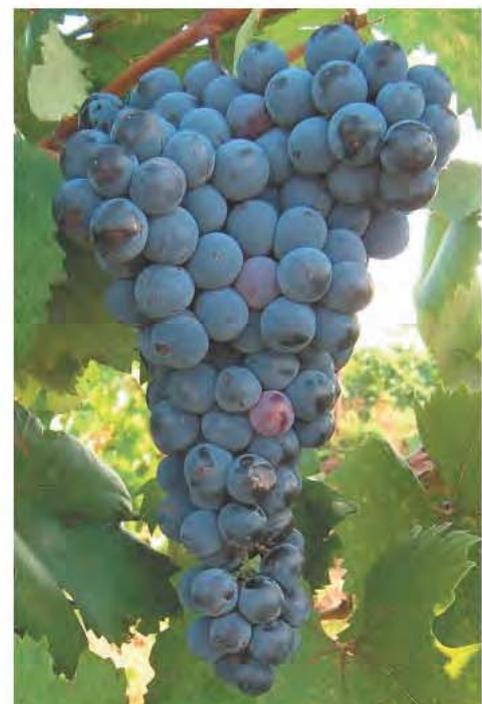
Bud fertility: 1.0

Climate and cultivation requirements

'Firskii Rannii' is an early to medium ripening wine grape variety, suitable for cultivation on the west coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases. It is gray mold (*Botrytis cinerea*) resistant and drought resistant. The grape is rather susceptible to winter frosts.



Juice characteristics

Sugar: 18.0-22.0 %

Total acidity: 7.0-6.0 g·L⁻¹

Wine and grape characteristics

'Firskii Rannii' can be used for making red table and strong wines as a part of a blend, also for improving low-bodied wines.

Kandavasta B.

Synonyms

'Kandalosta' (Crimea).

Meaning of the name

Not new, not renew; selected (*Kandalosta*).

Historical notes and cultural importance

'Kandavasta' is a local Crimean variety. It was found as single vines in Sudak's and Yalta's old vineyards. The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green, edged with copper-red and covered with hairs of medium density. The young distal leaves are light green with copper-red spots; covered with medium dense cobwebby hairs on both surfaces.

The mature leaf is medium size, rounded, medium and deeply dissected, five lobed with dense cobwebby-bristle hairs. The leaf blades are slightly infundibular. The upper surface is macro-blistered. The upper leaf sinuses are medium and deep, closed, with oval lumen and rounded base. The lower leaf sinuses are medium deep, open, lyre-shaped with a narrow mouth and a rounded base. The petiole sinus is closed, with elliptic or rounded lumen and having a pointed base. The teeth at the end of the lobes are small, triangular with a wide base and an acute tip. The lateral teeth are triangular-serriform, both sides convex and with an acute tip. The petiole and the main veins at the petiole point are very intense red-violet.

The flower is hermaphrodite.

The bunch is medium size, conical and dense.

The berry is medium size, rounded and yellow-green. The skin is thin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 5.2 kg

Bunch weight: 300-320 g

Bud fertility: 0.98.

Climate and cultivation requirements

'Kandavasta' is a medium ripening wine grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 bud loads per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards fungal diseases.

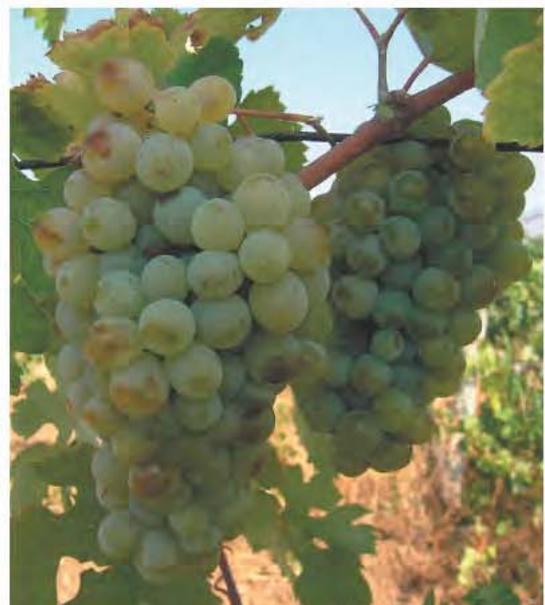
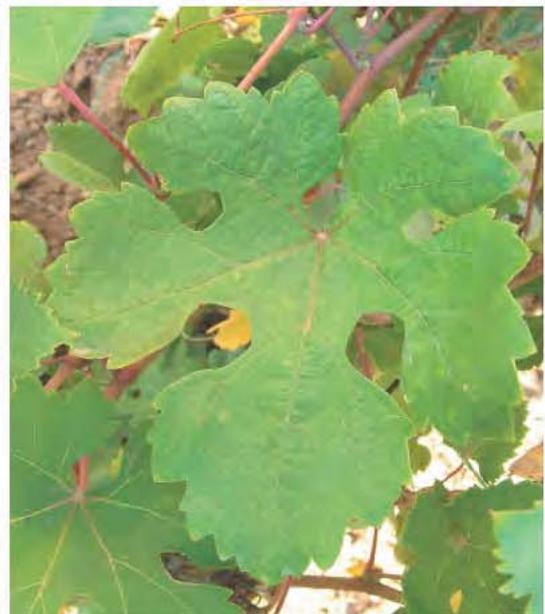
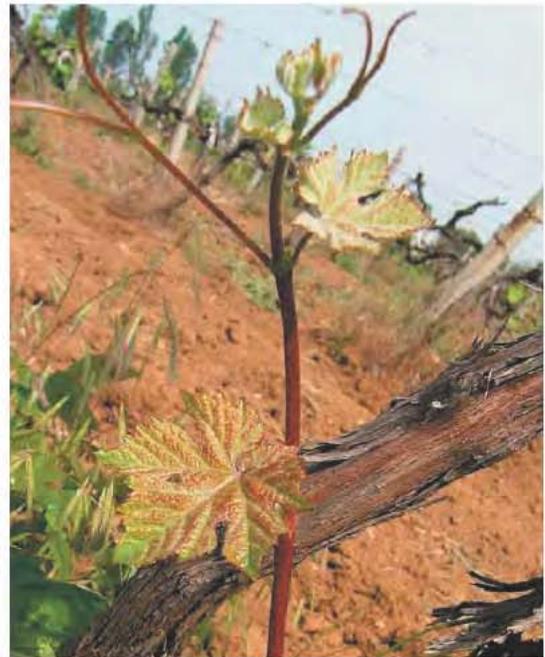
Juice characteristics

Sugar: 18.0-22.0 %

Total acidity: 5.0-7.0 g·L⁻¹

Wine and grape characteristics

'Kandavasta' is used for making ordinary, mediocre quality, strong wines.



Kapitane Yani Kara N.

Synonyms

'Adji Ibram Kara' (Crimea).

Meaning of the name

Black Capitan Yani.

Historical notes and cultural importance

'Kapitane Yani Kara' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety exists only in collections now.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspic*a Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, tinged with wine-red and covered with very sparse cobwebby hairs. The first young distal leaves are light green, edged with bronze and naked.

The mature leaf is medium size, rounded and slightly three to five lobed. The leaf blades are slightly funnel-shaped. The upper surface is slightly reticular or nearly smooth. The upper leaf sinuses are shallow, open and V-shaped. The lower leaf sinuses are shallow, open and slightly expressed. The petiole sinus is closed, with narrow elliptic lumen and a pointed base. The teeth at the end of the lobes are triangular with convex sides and a rounded tip. The lateral teeth are triangular-serriform, both sides are convex or they have one convex side and an acute or rounded tip. The main veins at the petiole point and the petiole are wine-red. The petiole has no hairs. The main veins have few bristle hairs.

The flower is hermaphrodite.

The bunch is large, cylindrical-conic, often winged and dense.

The berry is medium size, oval and black. The skin is medium-thick. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 7.2 kg

Bunch weight: 400 g

Bud fertility: 1.13

Climate and cultivation requirements

'Kapitane Yani Kara' is a medium ripening wine grape variety suitable for cultivation in the pre-mountainous zones and on the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases. Drought resistance is good.

Juice characteristics

Sugar: 19.0-21.2 %

Total acidity: 5.3-6.0 g·L⁻¹

Wine and grape characteristics

'Kapitane Yani Kara' is used in blend with 'Ekim Kara', 'Lara Kara' and 'Kefesiya' for winemaking.



Kapselski B.

Synonyms

'Kapselski Belyi', 'Matvienkovski', 'Solnechnaia Dolina-62' (SD-62) (Crimea).

Meaning of the name

Probably it is a toponym.

Historical notes and cultural importance

'Kapselski' is a local Crimean variety. It was found as single vines in the vineyards of the state farm 'Solnechnaia Dolina' in Sudak. The researchers who discovered and described this variety are P. M. Gramotenko, N. M. Matvienko, V. V. Pestretsov and L. P. Troshin (cit.: TROSHIN 1999).

The variety is included in the list of the 'Standard grapevine varieties' of Ukraine and it is cultivated on the South Coast of Crimea.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are light green, edged with not very intense pink and covered with felt hairs of medium density.

The mature leaf is large, rounded, deeply five lobed with sparse cobwebby-bristle hairs of medium density. The upper surface is slightly reticular-wrinkled. The leaf blade is involute. The upper leaf sinuses are deep with slightly overlapping lobes, with oval lumen and a pointed base. The lower leaf sinuses are open or closed and similar to the upper ones. The petiole sinus is open with a flat or pointed base. The teeth at the end of the lobes are long and triangular with convex sides. The lateral teeth are triangular with convex sides.

The flower is hermaphrodite.

The bunch is large, cylindrical-conic, winged and dense.

The berry is medium size, rounded and yellow-green. The skin is thick and firm. The flesh is medium-solid with a harmonious taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 5.9 kg

Bunch weight: 330 g

Bud fertility: 0.76.

Climate and cultivation requirements

'Kapselski' is a medium ripening wine grapevine variety, suitable for cultivation in the pre-mountainous zones and on the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is relatively *Plasmopara viticola* resistant.

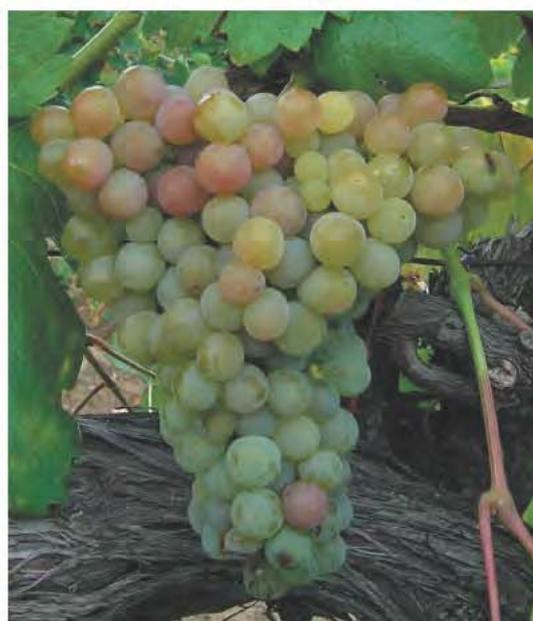
Juice characteristics

Sugar: 19.0-20.0 %

Total acidity: 6.0-5.3 g·L⁻¹

Wine and grape characteristics

'Kapselski' is used for making good quality table, dessert and 'Porto' style wines.



Kastel Chernyi N.

Synonyms

Unknown.

Meaning of the name

For Kastel no hypotheses have been proposed. Chernyi = black (in Russian).

Historical notes and cultural importance

'Kastel Chernyi' is a local Crimean variety. The variety is not widespread now.

Taxonomy and intra-variety variability

Proles *occidentalis* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is white due to dense cobwebby hairs, edged with bright wine-red. The first young distal leaves are intense wine-red with dense hairs.

The mature leaf is medium size, rounded and slightly three to five lobed. The leaf blade is undulate. The upper surface is blistered or nearly smooth. The upper leaf sinuses are medium deep, closed, oval or with an elliptic lumen and a slightly pointed base. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is closed with an elliptic or oval lumen. The teeth at the end of the lobes are triangular with a wide base and a rounded tip. The lateral teeth are serriform, both sides are convex and they have an acute tip. The main veins at the petiolar point and the petiole are violet-red of low intensity with dense cobwebby hairs.

The flower is hermaphrodite.

The bunch is small, conical and cylindrical-conic, and loose.

The berry is small, slightly oval and blue to black. The skin is thin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 3.6 kg

Bunch weight: 150 g

Bud fertility: 1.79

Climate and cultivation requirements

'Kastel Chernyi' is a medium ripening wine grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases. Drought resistance is good.

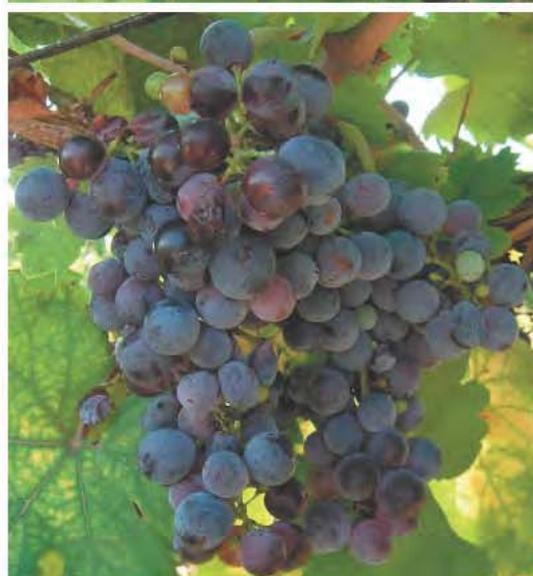
Juice characteristics

Sugar: 20.0-21.2 %

Total acidity: 4.0-3.5 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Kastel Chernyi' wine have not been studied sufficiently.



Kefesiya N.

Synonyms

'Kefe Izium' (Crimea).

Meaning of the name

1. Grape from Kaffa. Kaffa is an ancient town, currently known as Feodosia.
2. Kefe = Enjoy / Take pleasure. Kefeciya = Enjoyment / Pleasure.

Historical notes and cultural importance

'Kefesiya' is a Crimean autochthonous variety. Its name in Russian means "Coming from Feodosia", suggesting it was discovered in the town's surroundings.

'Kefesiya' is recommended and is under cultivation around Feodosia and in Sudak.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green and covered with very weak hairs. The first young leaves are light green, glossy and tinged with red.

The mature leaf is medium size, rounded, slightly three to five lobed, sometimes almost entire and hairless. The leaf blades are slightly infundibular, seldom grooved and rolled. The upper surface is reticular-wrinkled. The upper leaf sinuses are shallow, open, slightly expressed or V-shaped. The lower leaf sinuses are shallow and slightly expressed. The petiole sinus is closed, chinked with a pointed base or open and sagittate. The teeth at the end of the lobes are triangular with slightly convex sides. The lateral teeth are large, triangular or serriform with slightly convex sides. The petiole is violet-red.

The flower is female.

The bunch is large, wide conical and dense.

The berry is medium size, rounded, dark blue with a tough and astringent skin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: third ten days of August

Time of ripening: last ten days of September - first days of October

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 4.9 kg

Bunch weight: 380 g

Bud fertility: 1.30

Climate and cultivation requirements

'Kefesiya' is a late-ripening wine grape variety, suitable for cultivation on the soils of Crimea. The variety requires long pruning and pollinator varieties.

Resistance to diseases and unfavorable weather

The variety has low resistance towards the European grapevine moth (*Lobesia botrana*) and towards *Erysiphe necator*.

Juice characteristics

Sugar: 17.7-22.5 %

Total acidity: 5.4-6.0 g·L⁻¹

Wine and grape characteristics

The variety is suitable for making dessert wines of excellent quality.



Kahlil Izium B.

Synonyms

Unknown.

Meaning of the name

Grape of Khalil. (Khalil is a masculine name).

Historical notes and cultural importance

'Khalili Izium' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has only local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green, edged with pink and covered with medium dense cobwebby hairs. The first distal leaves are green, edged with pink and covered with medium dense cobwebby hairs on the upper surface and dense cobwebby hairs on the lower surface.

The mature leaf is medium size, rounded and deeply five to seven lobed. The leaf blade is slightly undulate. The upper surface is reticular-wrinkled. The upper leaf sinuses are deep, closed with wide elliptic or oval lumen and with a pointed base having a tooth. The lower leaf sinuses are medium-deep, open, lyre-shaped with a narrow mouth. The petiole sinus is wide, open and arch-shaped. The teeth at the end of the lobes are large, narrow triangular with a wide base, slightly convex sides and an acute tip. The lateral teeth are large, triangular-serriform with slightly convex sides or with one convex side and an acute tip. The mature leaf is covered with cobwebby-bristle hairs. The main veins are covered with bristle hairs. The petiole is uneven wine-red.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conic, winged and dense.

The berry is medium size, rounded and light green. The skin is thick. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 2.9 kg

Bunch weight: 350 g

Bud fertility: 1.31

Climate and cultivation requirements

'Khalil Izium' is a mid ripening table and wine grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

It has low resistance towards the European grapevine moth (*Lobesia botrana*) and towards *Plasmopara viticola* and it is relatively *Erysiphe necator* resistant. The fruit is susceptible towards Grey Mold (*Botritis cinerea*) in a rainy autumn. The grape has good resistance to drought.

Juice characteristics

Sugar: 18.0-20.0 %

Total acidity: 6.0-7.0 g·L⁻¹



Wine and grape characteristics

'Khalili Iziun' is not a very transport resistant grape. It is less palatable and attractive compared to other standard varieties. It is used for local fresh consumption. The grape is used for making small amounts of wine.

Khersonesskii N.

Synonyms

Unknown.

Meaning of the name

Kherson is the name of a city.

Historical notes and cultural importance

'Khersonesskii' is a local Crimean variety. It is similar to wild vines, or to vines escaped into the wild, according to its morphological traits. Its cultivation was very limited near the city of Sevastopol, where it was found as single vines mixed with other varieties.

The variety is not widespread now because of low yield and has only local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green striped with wine-red on the edge and is covered with sparse hairs. The first distal leaves are intense wine-red with weak hairs.

The mature leaf is medium size, rounded, 'bud-shaped', three to five lobed, slightly dissected to entire. The leaf blade is infundibular or grooved. The upper surface is light green, glossy and coriaceous. The upper leaf sinuses are shallow, closed, with narrow elliptical or chinked lumen and with a pointed base. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is wide, open, arch-shaped, one-sided, often with a flat base bordered by pink veins. The teeth at the end of the lobes are large, triangular with slightly convex sides and a rounded tip. The mature leaf is covered with sparse cobwebby hairs. The main veins are covered with short bristle hairs. The petiole is wine-red.

The flower is female.

The bunch is small, cylindrical-conic and very loose.

The berry is small, rounded, dark blue with a firm and very solid skin. The flesh is juicy with a grassy taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 1.8 kg

Bunch weight: 60 g

Bud fertility: 1.50

Climate and cultivation requirements

'Khersonesskii' is a medium to late-ripening wine grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is relatively resistant towards fungal diseases. Berry shot is high.

Juice characteristics

Sugar: 18.0-20.0 %

Total acidity: 7.2-8.0 g·L⁻¹

Wine and grape characteristics

'Khersonesskii' is used for making table wines in blend with other varieties.



Kok Khabakh B.

Synonyms

Unknown.

Meaning of the name

Blue pumpkin (Kok = blue, celestial. Khabakh = pumpkin).

Historical notes and cultural importance

'Kok Khabakh' is a native Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green striped with wine-red on the edge and is covered with sparse hairs. The first distal leaves are intense wine-red with weak hairs.

The mature leaf is medium size, rounded, sometimes slightly elongated, three to five lobed, with various dissection patterns. The leaf blade is undulate, sometimes plicate or grooved and rolled. The upper surface is microreticular-wrinkled or nearly smooth. The upper leaf sinuses are shallow and deep, closed with strongly overlapping lobes without a lumen or with a fusiform shape lumen. The lower leaf sinuses are shallow, open, V-shaped. The petiole sinus is open, lyre-shaped with a pointed base. The teeth at the end of the lobes are both sides convex with a wide base. The lateral teeth are both sides convex, high, small with an acute tip. The mature leaf is hairless. The main veins are covered with short bristle hairs. The petiole and the main veins at the petiolar point are light and uneven wine-red.

The flower is female.

The bunch is large, conical, winged and medium dense.

The berry is medium size, rounded or slightly oval and yellow-green. The skin is thin. The flesh is tender, juicy, with a special flavor of cucurbit.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 6.4 kg

Bunch weight: 200-300 g

Bud fertility: 1.23

Climate and cultivation requirements

'Kok Khabakh' is a medium to late-ripening table and wine grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is very *Plasmopara viticola* susceptible.

Juice characteristics

Sugar: 20.0-22.0 %

Total acidity: 8.6-7.0 g·L⁻¹

Wine and grape characteristics

Technological characteristics of the wine have not been studied exhaustively.

'Kok Khabakh' is a table grape variety with local importance.



Kok Pandas B.

Synonyms

'Tken izume' (Crimea).

Meaning of the name

Kok = Blue, celestial. 'Pandas' is probably a name.

Historical notes and cultural importance

'Kok Pandas' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and it is grown mostly in the "Solnechnaia Dolina" farm in Sudak.

Taxonomy and intra-variety variability

Vitis occidentalis Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first two leaves are white due to dense hairs, and bright pink on the edge.

The mature leaf is medium size, rounded, slightly three lobed and nearly entire with medium dense cobwebby hairs. The leaf blade is fusiform-grooved and rolled. The upper surface is coriaceous and blistered along the main veins. The upper leaf sinuses are shallow, open, lyre-shaped with a narrow mouth and a pointed base. The lower leaf sinuses are only just expressed. The petiole sinus is closed, chinked and with a pointed base. The teeth at the end of the lobes are large, triangular with slightly convex sides and a rounded tip. The lateral teeth are large, triangular with a wide base and a rounded tip. The main veins and the petiole are wine-red.

The flower is female.

The bunch is medium size, cylindrical and medium dense to loose.

The berry is medium size, rounded or slightly flattened, yellow-green with a firm skin. The flesh is pulpy and juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.5 kg

Bunch weight: 240 g

Bud fertility: 1.27

Climate and cultivation requirements

'Kok Pandas' is a medium to late ripening wine variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.

Juice characteristics

Sugar: 18.6-22.6 %

Total acidity: 5.4-8.0 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Kok Pandas' wine have not been studied exhaustively. The grapes can be used in blend with other local Crimean varieties.



Kokur Belyi B.

Synonyms

'Dolghii', 'Belyii Dolghii' (in Russia).

Meaning of the name

For Kokur no hypotheses have been proposed. Belyi = White (in Russian).

Historical notes and cultural importance

The origin of the 'Kokur Belyi' is unknown. It has been proposed that the variety is named after the island of Korkira (Korfu) in Greece, where it could have been imported from (FROLOV-BAGREEV 1954).

The variety has been cultivated in Sudak since ancient times. Today it is in the 'Standard list' of grapevine varieties, recommended for cultivation in Ukraine and Russia. It is cultivated in Crimea and in Southern Russia.

Taxonomy and intra-variety variability

Proles pontica Negr.

The variety has a clone known as 'Kokur Sudakskii' and was found in Sudak. The clone has denser bunches, larger and pointed berries and higher yield. 'Kokur Belyi' has two variations, 'Kokur Belyi Rassechenny' and 'Kokur Belyi Polourassechenny', which have stronger dissected leaves, smaller bunches and berries and a lower yield.

Essential ampelographic characteristics

The tip of the young shoot is light green, edged with bright pink and covered with dense hairs. The first distal leaves are red on the edge and golden-yellow in the middle. They are covered with felt hairs.

The mature leaf is large, slightly elongated and strongly five lobed. The lobes situated on a shoot leave are often dissected and the leaf becomes seven to nine lobed. The leaf blade is dark green, slightly vesicular, slightly infundibular or rolled. The upper leaf sinuses are deep, closed, oval or transversal-oval. The lower leaf sinuses are medium-deep or deep, lyre-shaped and become narrower towards the mouth. The petiole sinus is closed, elliptical or transversal-oval, often with a wide and flat base bordered by veins. The teeth at the end of the lobes are large, triangular with a pointed vertex and slightly convex sides. The lateral teeth are large serriform with one convex side. The petiole is light wine-red. The mature leaf is covered with cobwebby hairs and with bristles along the veins.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conic, winged and medium dense.

The berry is large, oval and yellow-green. The skin is thin. The flesh is juicy with a harmonious taste.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 6.3 kg

Bunch weight: 300 g

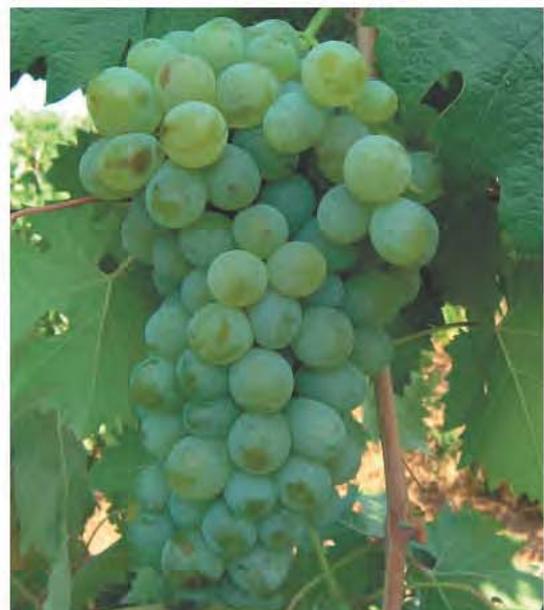
Bud fertility: 1.15

Climate and cultivation requirements

'Kokur Belyi' is a late-ripening variety and suitable for cultivation in the pre-mountainous and steppe regions of Crimea. The variety is very susceptible to flower drop and, as the vine is vigorous, it requires long pruning.

Resistance to diseases and unfavorable weather

The variety is very susceptible towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.



Juice characteristics

Sugar: 20.0-23.0 %

Total acidity: 8.0-7.2 g·L⁻¹

Wine and grape characteristics

The variety produces good quality table, dessert, strong and sparkling wines with excellent taste and bouquet.

Kokur Belyi

Rassechenny B.

Synonyms

'Kokur Belyi Petrushechnyi' (Crimea).

Meaning of the name

For Kokur no hypotheses have been proposed. Belyi = White (in Russian). Rassechennyi = Divided (in Russian).

Historical notes and cultural importance

'Kokur Belyi Rassechennyi' is proposed to be a variation of the variety of 'Kokur Belyi'.

The variety is not widespread and has only local importance.

Taxonomy and intra-variety variability

Proles *pontica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

Being a variation, 'Kokur Belyi Rassechennyi' differs from 'Kokur Belyi' for the stronger dissected leaves, smaller bunches and berries and lower yield.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 3.4 kg

Bunch weight: 250-300 g

Bud fertility: 0.96.

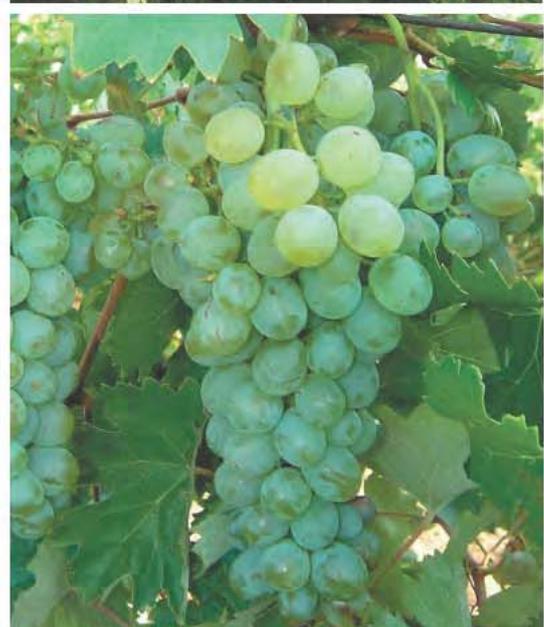
Juice characteristics

Sugar: 20.0-23.0 %

Total acidity: 8.0-7.2 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Kokur Belyi Rassechennyi' wine have not been studied exhaustively.



Kokurdes Belyi B.

Synonyms

'Biiiaz Kukuzet' (Crimea).

Meaning of the name

For Kokurdes no hypotheses have been proposed. Belyi = White (in Russian).

Historical notes and cultural importance

'Kokurdes Belyi' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, edged with wine-red and covered with sparse felt hairs. The first distal leaves are light green with copper-red spots and covered with dense cobwebby hairs on the lower surface.

The mature leaf is medium size, rounded, three to five lobed, slightly and medium dissected. The leaf blade is undulate or rolled. The upper surface is macroreticular-wrinkled. The upper leaf sinuses are medium-deep or shallow, closed, practically without a lumen or with a narrow chinked lumen. The lower leaf sinuses are open, lyre-shaped with a rounded or pointed base. The petiole sinus is closed with an oval or irregular lumen and with a pointed base. The teeth at the end of the lobes are narrowing triangular and pointed. The lateral teeth are large, triangular-serriform and acute. The mature leaf is hairless. The main veins are covered with sparse bristle hairs. The petiole is light and uneven red-violet.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conic and dense to medium dense.

The berry is medium size, oval and yellow-green. The skin is thick, rough and firm. The flesh is tender, juiceless with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: medium (second ten days of September)

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 6.0 kg

Bunch weight: 250 g

Bud fertility: 1.15

Climate and cultivation requirements

'Kokurdes Belyi' is a medium ripening, table and wine grapevine variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards *Erysiphe necator*, better resistance towards the European grapevine moth (*Lobesia botrana*) and *Plasmopara viticola*, good resistance to drought.

Juice characteristics

Sugar: 20.0-23.0 %

Total acidity: 7.0-6.0 g·L⁻¹



Wine and grape characteristics

The grapes of 'Kokurdes Belyi' are transport resistant with mediocre palatability. It is used for fresh consumption. The quality of mono varietal wines is not high.

Kokurdes Chernyi N.

Synonyms

'Kara Kukuzet' (Crimea).

Meaning of the name

For Kokurdes no hypotheses have been proposed. Cherny = Black (in Russian).

Historical notes and cultural importance

'Kokurdes Chernyi' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is white due to dense cobwebby hairs with bright crimson edge. The first distal leaves are light green with copper-red spots and are covered with dense cobwebby hairs on the lower surface.

The mature leaf is large, rounded, five lobed, and with various dissection patterns. The leaf blade is undulate. The upper surface is dark green and macroreticular-wrinkled. The upper leaf sinuses are medium-deep and deep, open, lyre-shaped with a narrow mouth and a pointed base, sometimes with a tooth at the base. The lower leaf sinuses are shallow or medium-deep, open, lyre-shaped with a narrow mouth and a pointed base; seldom with a tooth at the base. The petiole sinus is open, arch-shaped and wide. The teeth at the end of the lobes are narrow triangular. The lateral teeth are large, triangular-serriform and acute. The main veins at the petiolar area and the petiole are red-violet. The mature leaf is covered with cobwebby-bristle hairs on the lower surface.

The flower is hermaphrodite.

The bunch is large, cylindrical-conic and dense to medium dense.

The berry is medium size, black with a thick, rough and firm skin. The flesh is crispy, juiceless and with a simple taste.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium.

Yield per vine: 4.1 kg

Bunch weight: 300-310 g

Bud fertility: 0.74

Climate and cultivation requirements

'Kokurdes Chernyi' is a late ripening, black table grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is susceptible towards *Erysiphe necator*. It has higher resistance towards the European grapevine moth (*Lobesia botrana*) and *Plasmopara viticola*. It is relatively drought resistant.

Juice characteristics

Sugar: 18.0-21.0 %

Total acidity: 7.7-5.5 g·L⁻¹



Wine and grape characteristics

'Kokurdes Chernyi' is a table grape variety with good transport resistance and mediocre palatability. It is a commercial variety, but it could be used in breeding programs as well.

Kornishon Krymskii B.

Synonyms

Unknown.

Meaning of the name

For Kornishon no hypotheses have been proposed. Krymskii = from Crimea.

Historical notes and cultural importance

'Kornishon Krimskii' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green and covered with sparse hairs. The first distal leaves are light green with dense cobwebby hairs on the lower surface.

The mature leaf is medium size, rounded or slightly 'bud-shaped', three lobed and slightly dissected. The leaf blade is undulate or grooved-plicate. The upper surface is reticular-wrinkled. The upper leaf sinuses are shallow and medium-deep, open, chinked or V-shaped. The lower leaf sinuses are absent or similar to the upper ones. The petiole sinus is open, sagittate or arch-shaped with a flat base and sometimes bordered by veins. The teeth at the end of the lobes are triangular with an acute tip. The lateral teeth are triangular-serriform and acute. The mature leaf is covered with medium dense cobwebby hairs.

The flower is female.

The bunch is medium size, conical, loose and winged.

The berry is large, elongated oval and yellow-green. The skin is thin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first half of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 5.8 kg

Bunch weight: 240 g

Bud fertility: 1.53

Climate and cultivation requirements

'Kornishon Krimskii' is a medium ripening table grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine. Flower drop is strong with poor pollination.

Resistance to diseases and unfavorable weather

The variety is very susceptible towards *Plasmopara viticola*.

Juice characteristics

Sugar: 17.0-18.0 %

Total acidity: 4.0-5.3 g·L⁻¹

Wine and grape characteristics

'Kornishon Krimskii' has high transport resistance and low sensorial quality. It is used for fresh consumption locally.



Krona N.

Synonyms

'Solnechnaia Dolina-42', 'Solnechnaia Dolina-11', 'Solnechnaia Dolina-12', 'Solnechnaia Dolina-53', 'Solnechnaia Dolina-68' (Crimea).

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Krona' is a local Crimean variety. It was found as single vines in vineyards of the state farm 'Solnechnaia Dolina' in Sudak. The researchers who discovered and described this local variety are P. M. Gramotenko, N. M. Matvienko, V. V. Pestretsov and L. P. Troshin (TROSHIN 1999).

The variety is included in the "Standard list" of grapevine varieties of Ukraine, and it is recommended for cultivation on the South Coast of Crimea.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green, edged in wine-red and covered with sparse hairs. The first distal leaves are wine-red, glossy and hairless.

The mature leaf is large, rounded and slightly medium to five lobed. The leaf blade is infundibular. The upper surface is dark green and slightly reticular-wrinkled. The upper leaf sinuses are medium-deep, closed, with narrow chinked lumen or without a lumen. The lower leaf sinuses are smaller than medium, open, V-shaped, or closed with a chinked lumen. The petiole sinus is closed without a lumen or open and lyre-shaped. The teeth at the end of the lobes are long, triangular with one convex side. The lateral teeth are triangular and one side convex. The lower leaf surface is covered with bristle hairs of medium density.

The flower is female.

The bunch is medium size, cylindrical-conic, winged and dense to medium dense.

The berry is medium size, rounded, black with a firm and medium-thick skin. The flesh is juicy with a harmonious taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 4.3 kg

Bunch weight: 260 g

Bud fertility: 0.55

Climate and cultivation requirements

'Krona' is a medium ripening grapevine variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

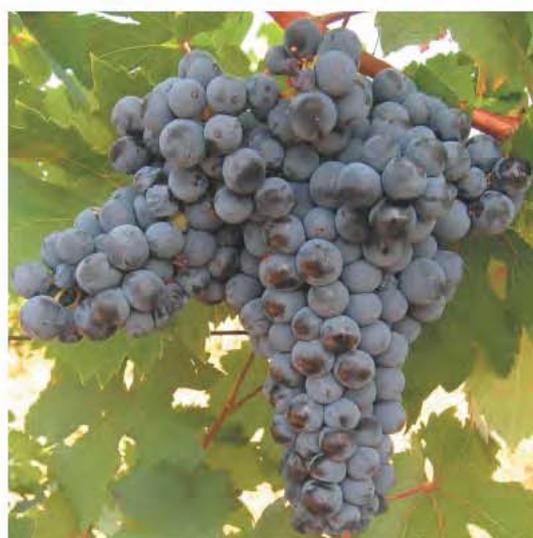
Resistance to diseases and unfavorable weather

The variety is relatively *Plasmopara viticola* resistant.

Juice characteristics

Sugar: 21.0-24.0 %

Total acidity: 6.0-5.45 g·L⁻¹



Wine and grape characteristics

'Krona' can be used for making table and dessert wines. 'Krona' is recommended to be part of a blend to produce the famous Crimean wine brand Chernyi Doctor, known for the dark ruby color and full-bodied taste with a prune flavor.

Kurseit Aganyn Iziium B.

Synonyms

Unknown.

Meaning of the name

Grape of Kurseit aga (Aga = Sir)

Historical notes and cultural importance

'Kurtseit Aganyn Iziium' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green and reddish on the edge with weak felt hairs. The first distal leaves are copper-red and are covered with medium dense cobwebby hairs.

The mature leaf is large, rounded, three to five lobed, with various dissection patterns and hairless. The leaf blade is slightly undulate and sometimes nearly flat. The upper surface is macroreticular-wrinkled. The upper leaf sinuses are medium-deep or deep, open, lyre-shaped with a narrow mouth and a rounded base. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is open, arch-shaped or lyre-shaped with a pointed base. The teeth at the end of the lobes are narrow triangular and pointed. The lateral teeth are triangular-serriform and acute. The petiole is intense red violet. The main veins at the petiolar point are light wine-red.

The flower is hermaphrodite.

The bunch is large, cylindrical-conic and dense to medium dense.

The berry is large, rounded or oval and yellow-green. The skin is thick. The flesh is pulpy, juicy with a slight muscat aroma.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 6.0 kg

Bunch weight: 360 g

Bud fertility: 0.79

Climate and cultivation requirements

'Kurtseit Aganyn Iziium' is a medium ripening grapevine variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

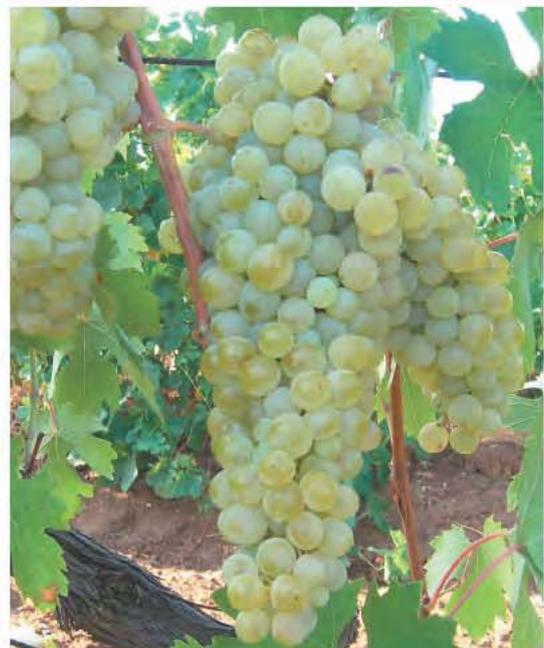
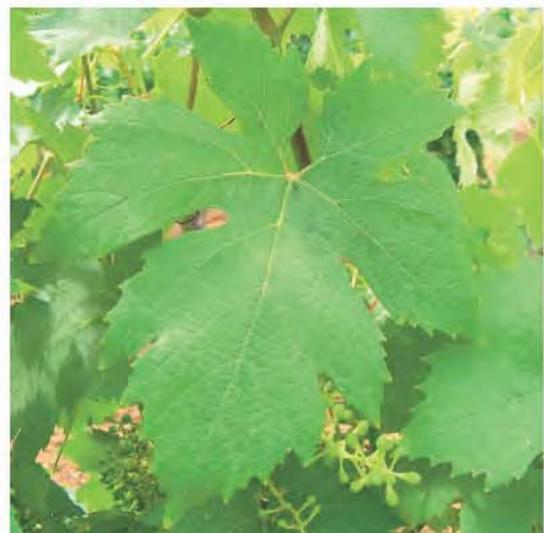
Resistance to diseases and unfavorable weather

The variety has medium resistance towards *Erysiphe necator*. It is susceptible towards the European grapevine moth (*Lobesia botrana*) and *Plasmopara viticola*. The grape has good drought resistance. The berries are damaged by grey mold (*Botrytis cinerea*) in a rainy autumn.

Juice characteristics

Sugar: 17.0-19.0 %

Total acidity: 6.0-5.0 g·L⁻¹



Wine and grape characteristics

'Kurtseit Agany Izium' has low transport resistance and mediocre palatability. For this reason it is used for fresh consumption only locally. The grape is worth further investigation for its winemaking properties and its high-yielding capacity.

Kutlaskii Chernyi N.

Synonyms

Unknown.

Meaning of the name

Kutlak is the name of a village. Chernyi = Black (in Russian).

Historical notes and cultural importance

'Kutlaskii Chernyi' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread. The grape is worth of further investigation for its winemaking properties and its high-yielding capacity in Crimea. It may also be used for breeding purposes.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, striped with copper-red and covered with sparse hairs. The first distal leaves are light green, tinged with copper-red and covered with medium dense cobwebby hairs on the lower surface.

The mature leaf is large, rounded, deeply five lobed and hairless. The upper leaf sinuses are deep, open or closed with an elliptic lumen and a pointed base. The lower leaf sinuses are medium-deep, open or closed with an elliptic lumen and a pointed base. The petiole sinus is open and lyre-shaped. The teeth at the end of the lobes are triangular. The lateral teeth are not large, both sides are convex and alternated with smaller triangular ones.

The flower is female.

The bunch is medium size, conical, winged and medium dense to loose.

The berry is medium size, slightly oval, black with a medium-thick skin.

The flesh is juicy with a simple and harmonious taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: first ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 6.4 kg

Bunch weight: 230 g

Bud fertility: 1.11

Climate and cultivation requirements

'Kutlaskii Chernyi' is a medium ripening table and wine grapevine variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases and has relative resistance to winter frosts.

Juice characteristics

Sugar: 19.0-21.0 %

Total acidity: 6.0-5.0 g·L⁻¹

Wine and grape characteristics

'Kutlaskii Chernyi' can be used for making table and strong wines as a part of a blend. It may also be used for local fresh consumption.



Manjil Al B.

Synonyms

Unknown.

Meaning of the name

Manjil is a toponym; or Manjil = stand.

Al = unevenly coloured; or Al = scarlet.

Historical notes and cultural importance

'Manjil Al' is a native Crimean variety. It is believed that it was found among the wild-growing vines of the slopes of Mount Manjil, thus the name.

The variety is not widespread now.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green striped with copper-red on the edge, hairless. The first distal leaves are yellow-green, edged with intense copper-red, with medium dense hairs.

The mature leaf is medium size, rounded, three to five lobed, medium and deeply dissected. The leaf blade is undulate, sometimes funnel shaped or grooved-plicate. The upper surface is reticular-wrinkled. The upper leaf sinuses are deep, less frequently medium-deep, open, lyre-shaped, narrow and with a pointed base. The lower leaf sinuses are shallow, less frequently medium-deep, open and V-shaped. The petiole sinus is open, lyre-shaped with a pointed base. The teeth at the end of the lobes are triangular with a wide base or rarely pointed. The lateral teeth are large, triangular-serriform with an acute tip. The mature leaf is hairless.

The flower is hermaphrodite.

The bunch is medium size, cylindrical, cylindrical-conical and medium dense.

The berry is large, oval and light green. The skin is thick. The flesh is juicy and tender with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 6.1 kg

Bunch weight: 290 g

Bud fertility: 0.96

Climate and cultivation requirements

'Manjil Al' is a medium to late ripening table grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards *Plasmopara viticola*, gray mold (*Botrytis cinerea*) and European grapevine moth (*Lobesia botrana*). It is rather drought resistant.

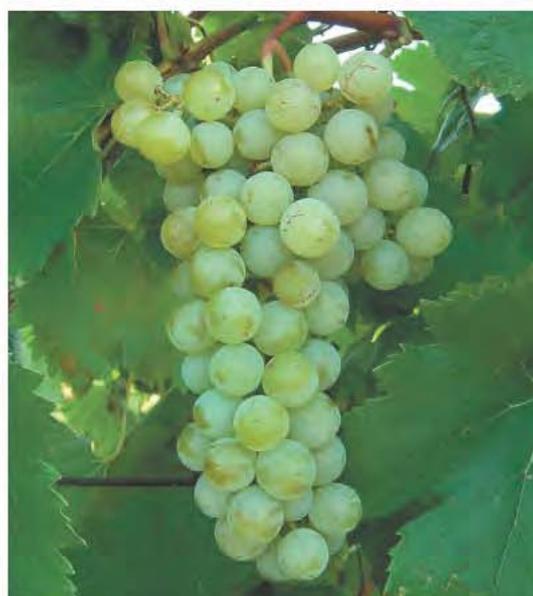
Juice characteristics

Sugar: 17.0-20.0 %

Total acidity: 6.0-5.0 g·L⁻¹

Wine and grape characteristics

'Manjil Al' is transport resistant and it is used for fresh consumption locally. The thick and rough skin is a drawback.



Misgiuli Kara N.

Synonyms

'Chabache Chernyi' (Crimea).

Meaning of the name

Black perfumed flower (Giul = Flower).

Historical notes and cultural importance

'Misgiuli Kara' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *caspiica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, edged with pink and covered with medium dense cobwebby hairs. The first distal leaves are green, tinged with copper-red and with sparse hairs.

The mature leaf is medium size, rounded, deeply five lobed and hairless. The leaf blade is undulate. The upper surface is microreticular-wrinkled or nearly smooth. The upper leaf sinuses are deep, closed with oval lumen. The lower leaf sinuses are medium-deep, open, lyre-shaped with a narrow chinked and a rounded base. The petiole sinus is closed with a narrow chinked and pointed base. The teeth at the end of the lobes are triangular with slightly convex sides and an acute tip. The lateral teeth are triangular with one or two convex sides and an acute tip. The petiole is violet, of low intensity and tinged with green.

The flower is female.

The bunch is medium size, cylindrical-conic and loose.

The berry is medium size and black. The skin is thick. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 3.7 kg

Bunch weight: 290 g

Bud fertility: 0.85

Climate and cultivation requirements

'Misgiuli Kara' is a medium ripening table and wine variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine. Yield is unstable. The cluster typically has several green immature berries.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and *Erysiphe necator*. It is less susceptible towards *Plasmopara viticola*. The grape has relative resistance to drought.

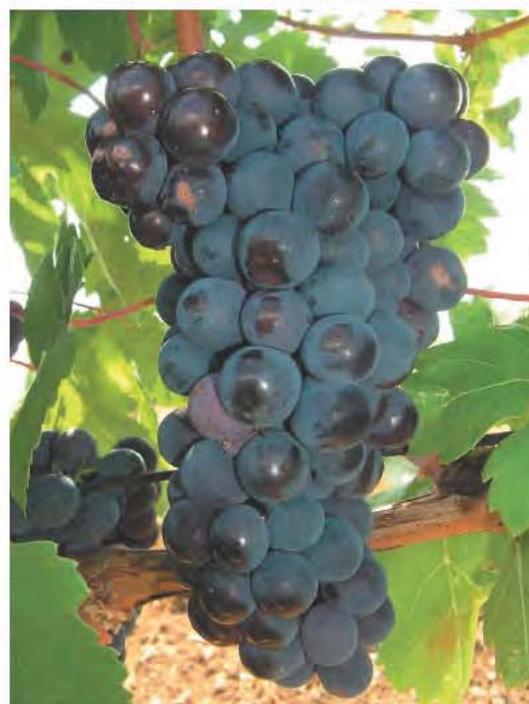
Juice characteristics

Sugar: 20.0-23.0 %

Total acidity: 5.0-6.0 g·L⁻¹

Wine and grape characteristics

Grape of 'Misgiuli Kara' is used for fresh consumption on the place of its cultivation. Technological characteristics of the wine have not been studied.



Misket B.

Synonyms

'Mishket', 'Muscatel', 'Crimea Muscat' (Crimea).

Meaning of the name

Grape with aroma.

Historical notes and cultural importance

'Misket' is a local Crimean variety. It was found as single vines in the old vineyards near the towns of Yalta and Alushta and in Sudak.

The variety has unstable medium yields, thus is not widespread and has only local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are white due to thick felt hairs, edged with wine-red. The young leaves are wine-red and covered with dense hairs on the lower surface.

The mature leaf is medium size, rounded, three to five lobed, slightly or medium-dissected. The leaf blade is undulate and slightly rolled. The upper surface is matt and reticular-wrinkled. The upper leaf sinuses are deep, closed, elliptical or narrow oval. The lower leaf sinuses are medium-deep, open, lyre-shaped with parallel sides and a rounded base. The petiole sinus is closed, oval; less frequently rounded or irregular and with a pointed base. The teeth at the end of the lobes are triangular with slightly convex sides and an acute tip. The lateral teeth are triangular-serriform. The main veins have bristle hairs. The base of the main veins and the petiole are violet-red tinged with brown. The leaves of the lower tier and the petiole are covered with dense cobwebby-bristle hairs.

The flower is female.

The bunch is medium size, conical, winged, and medium dense to loose.

The berry is medium size, rounded, yellow-green with a thick, rough and firm skin. The flesh is juicy with a slight muscat aroma.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 3.5 kg

Bunch weight: 290 g

Bud fertility: 0.98

Climate and cultivation requirements

'Misket' is a medium to late ripening table and wine variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

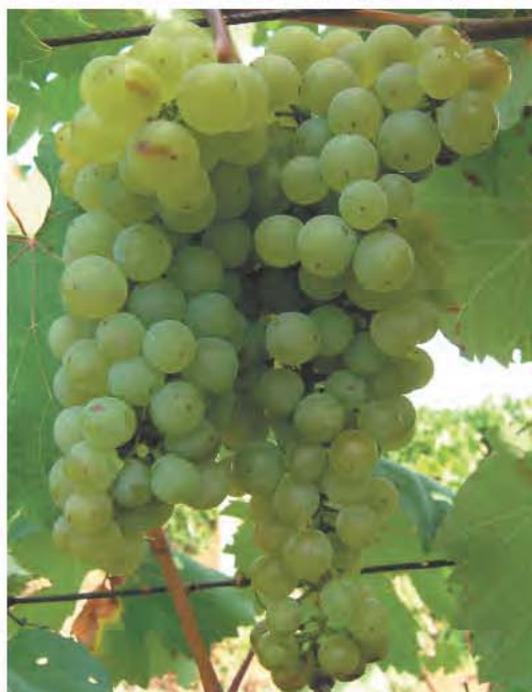
Resistance to diseases and unfavorable weather

The variety has low resistance towards *Plasmopara viticola*; *Erysiphe necator* is more destructive. It has good resistance to drought.

Juice characteristics

Sugar: 20.0-23.0 %

Total acidity: 7.0-6.5 g·L⁻¹



Wine and grape characteristics

'Misket' is used for making good quality strong and dessert wines. The dessert wines have a particular varietal, but not muscat, aroma. The variety is of little interest as a table grape due to the small and loose bunches.

Murza Iziium B.

Synonyms

'Gur Zerva' (Crimea).

Meaning of the name

Grape of the ruler / regent (Murza = ruler / regent. Iziium = Grape).

Historical notes and cultural importance

'Murza Iziium' is a local Crimean variety. Probably this variety appeared in Crimea in the 1820s -30s. It was found as a secondary variety in the old vineyards of Sudak.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles orientalis Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green with pale wine-red spots on the edge and covered with sparse hairs. The first distal leaves are green with pale copper-red spots and covered with sparse hairs.

The mature leaf is medium size, rounded, slightly or medium five lobed. The leaf blade is undulate and rolled. The upper surface is dark green, microreticular-wrinkled or nearly smooth. The upper leaf sinuses are shallow, open and V-shaped. The lower leaf sinuses are shallow, open, only just expressed. The petiole sinus is closed and U-shaped. The teeth at the end of the lobes are triangular with a rounded tip. The lateral teeth are triangular-serriform with convex sides. The mature leaf is hairless, but at the same time is covered with bristle hairs along the veins. The main veins and the petiole are wine-red.

The flower is hermaphrodite.

The bunch is medium size, conical and cylindrical-conic, dense.

The berry is medium size, rounded and greenish-white. The skin is thick.

The flesh is juicy, tender with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: low

Yield per vine: 7.6 kg

Bunch weight: 330 g

Bud fertility: 0.89

Climate and cultivation requirements

'Murza Iziium' is a medium ripening wine grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine. The grape does not grow well on poor, dry and stony soils.

Resistance to diseases and unfavorable weather

The variety has low resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.

Juice characteristics

Sugar: 19.0-22.0 %

Total acidity: 5.6-4.0 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Murza Iziium' wines have not been studied exhaustively. The grape is used for making table wines in blend.



Muscat Kutlaskii B.

Synonyms

Unknown.

Meaning of the name

Koutlaskii is a toponym.

Historical notes and cultural importance

'Muscat Kutlaskii' is a native Crimean variety. It is found as single vines in the Kutlak Valley of Sudak.

The variety is not widespread and has local importance.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are white due to dense cobwebby hairs with red edge.

The mature leaf is medium size, rounded, three and five lobed, slightly and medium-dissected. The leaf blade is flat, less frequently slightly fusiform and rolled. The upper surface is reticular-wrinkled. The upper leaf sinuses are shallow and medium-deep, open, lyre-shaped with parallel sides and a rounded base. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is open, lyre-shaped with an acute base. The teeth at the end of the lobes are triangular and narrow triangular with slightly convex sides and an acute tip. The lateral teeth are large, triangular alternating with small triangular-serriform ones. The mature leaf has cobwebby-bristle hairs of medium density. The petiole is light and uneven violet-red.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conic and medium dense.

The berry is medium size, rounded and yellow-green. The skin is rough and difficult to peel off. The flesh is juicy, pulpy and slightly crispy. The grape has particular varietal flavor and muscat aroma.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 2.1 kg

Bunch weight: 280 g

Bud fertility: 0.78

Climate and cultivation requirements

'Muscat Kutlaskii' is a medium ripening table grape variety, suitable for cultivation in the pre-mountainous zones and on the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.

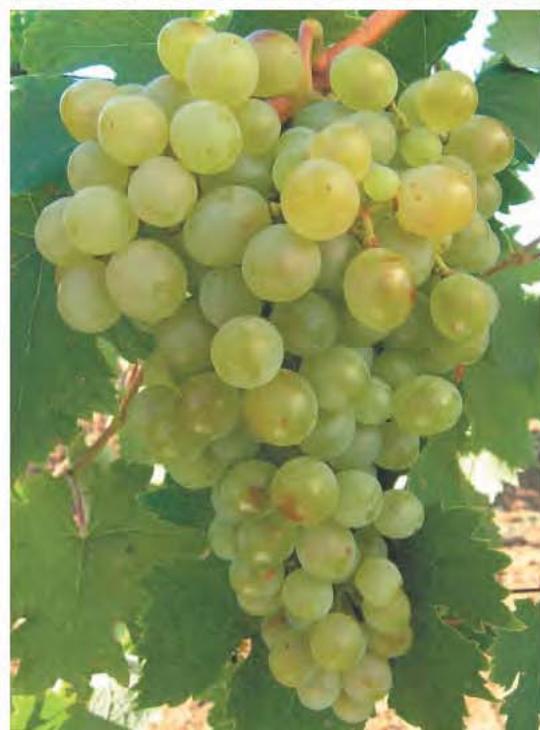
Juice characteristics

Sugar: 16.4-3.9 %

Total acidity: 5.2-3.9 g·L⁻¹

Wine and grape characteristics

'Muscat Kutlaskii' has low resistance to transport and is used for fresh consumption only on the places of its cultivation. The bunch is not particularly attractive compared to those of other table varieties.



Nasurla B.

Synonyms

'Muscat Nasurla' (Crimea).

Meaning of the name

Nasurla is a feminine name.

Historical notes and cultural importance

'Nasurla' is a Crimean variety. No evidence is available about the origin and the time of its introduction. It was found mixed with other varieties near Yalta and Alushta, on the South Coast of Crimea.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green with light wine-red spots and is covered with sparse hairs. The first distal leaves are green with light copper-red spots and are covered with medium dense cobwebby hairs on both surfaces.

The mature leaf is medium size, rounded, three to five lobed, slightly to medium dissected and asymmetrical. The leaf blade is coriaceous, reticular-wrinkled at the base of veins, often weakly blistered and infundibular. The upper leaf sinuses are shallow, open and only just expressed. The petiole sinus is closed without a lumen. The teeth at the end of the lobes are narrow triangular or triangular with one convex side. The lateral teeth are large, triangular with slightly convex or normally convex sides, alternated with small ones. The petiole is green. The mature leaf is covered with dense or medium-dense bristle hairs.

The flower is hermaphrodite.

The bunch is medium size, cylindrical or cylindrical-conic and dense.

The berry is medium size, rounded and greenish-white. The skin is firm. The flesh is pulpy, juicy with a muscat aroma.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: medium to late (third ten days of September)

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 7.7 kg

Bunch weight: 300 g

Bud fertility: 0.59

Climate and cultivation requirements

'Nasurla' is a medium to late ripening table grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases. Berry shot is frequently low.

Juice characteristics

Sugar: 17.1-20.1 %

Total acidity: 4.0-5.0 g·L⁻¹

Wine and grape characteristics

'Nasurla' has good palatability, but it is not very attractive or resistant to transport. Thus it is used for fresh consumption only locally.



Polkovnik Iziium B.

Synonyms

Unknown.

Meaning of the name

Grape of the colonel.

Historical notes and cultural importance

'Polkovnik Iziium' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles *orientalis* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is green, with pale wine-red spots on the edge and covered with sparse hairs. The first distal leaves are green, edged with copper-red and covered with sparse hairs. The young leaves are wine-red.

The mature leaf is medium size, rounded, three to five lobed, slightly or medium dissected. The leaf blades are strongly rolled, giving a pipe-like shape. The upper side is orange, smooth or reticular-wrinkled. The upper leaf sinuses are medium-deep, open, narrow chinked or lyre-shaped with a pointed base. The lower leaf sinuses are shallow and medium-deep, wide lyre-shaped, nearly arch-shaped with a pointed base. The petiole sinus is open, narrow or wide sagittate. The teeth at the end of the lobes are triangular with slightly convex sides and a rounded tip. The lateral teeth are similar but smaller and sometimes convex on both sides. The mature leaf is covered with bristle hairs. The petiole is light pink.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conic, often winged and dense to medium dense.

The berry is small and medium, oval and yellow-green. The skin is thin. The flesh is juicy, slightly viscous, with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 3.5 kg

Bunch weight: 200-250 g

Bud fertility: 0.85

Climate and cultivation requirements

'Polkovnik Iziium' is a medium ripening wine grape variety, suitable for cultivation in the pre-mountainous zones and in the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.

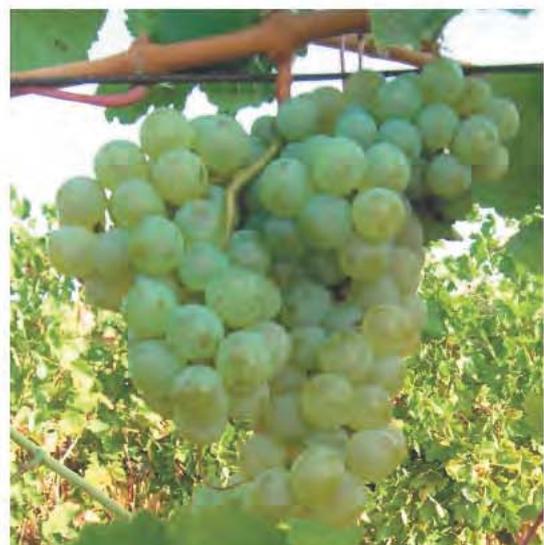
Juice characteristics

Sugar: 17.6-19.0 %

Total acidity: 4.0-5.0 g·L⁻¹

Wine and grape characteristics

'Polkovnik Iziium' can be used for making ordinary table wines as part of a blend. Technological characteristics of the wine have not been studied exhaustively.



Safta Durmaz N.

Synonyms

Unknown.

Meaning of the name

Shouldered, branched.

Historical notes and cultural importance

'Safta Durmaz' is a local Crimean variety. It was found as single vines in Sudak's old vineyards.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, striped with wine-red on the edge and covered with sparse hairs. The first distal leaves are wine-red with sparse hairs.

The mature leaf is medium size, asymmetrical, rounded, wedge-shaped and slightly three to five lobed. The upper surface is glossy, reticular-wrinkled, coriaceous and grooved. The upper leaf sinuses are shallow, open and V-shaped. The lower leaf sinuses are shallow, open and only just expressed. The petiole sinus is open, lyre-shaped and with a pointed base. The teeth at the end of the lobes are narrow triangular or triangular with slightly convex sides. The lateral teeth are triangular with slightly convex or convex sides and a rounded tip. The mature leaf is hairless. The main veins are covered with short bristle hairs. The main veins and the petiole are wine-red.

The flower is hermaphrodite.

The bunch is medium size, wide conical, winged or irregular and dense.

The berry is medium size, oval and black. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.8 kg

Bunch weight: 320 g

Bud fertility: 0.77.

Climate and cultivation requirements

'Safta Durmaz' is a medium to late-ripening wine grape variety, suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.

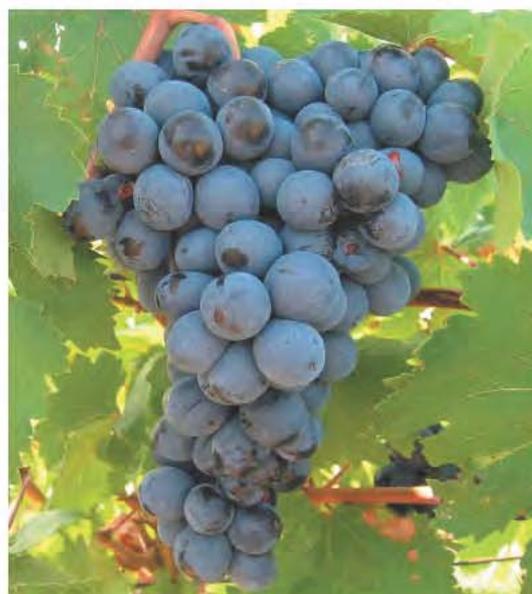
Juice characteristics

Sugar: 18 0.-21.0 %

Total acidity: 6.6-5.0 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Safta Durmaz' wine have not been studied exhaustively. The grape can be used for making table and strong wines as a part of a blend.



Sale Aganyn Kara N.

Synonyms

Unknown.

Meaning of the name

Black Sale Aga (Sale is a first name of a man. Aga = Noble Sir Kara = Black).

Historical notes and cultural importance

'Sale Aganyn Kara' is a local Crimean variety. It was found as single vines in Sudak's old vineyards.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, striped with wine-red on the edge and covered with weak hairs. The first distal leaves are intense wine-red with sparse hairs.

The mature leaf is medium size, rounded and deeply five to seven lobed. The leaf blade is undulate. The upper surface is microreticular-wrinkled. The upper leaf sinuses are deep, closed with a narrow elliptical or chinked lumen. The lower leaf sinuses are medium-deep, lyre-shaped with a rounded or slightly pointed base. The petiole sinus is open, sagittate or irregular with two, less frequently one, tooth, or closed without a lumen. The teeth at the end of the lobes are small, triangular with an acute tip. The lateral teeth are narrow triangular and triangular-serriform with an acute tip. The mature leaf is covered with cobwebby-bristle hairs. The petiole is light wine-red.

The flower is hermaphrodite.

The bunch is medium size, cylindrical conic, dense.

The berry is medium size, round and dark-violet. The skin is thin. The flesh is juicy with a simple taste

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: medium (second ten days of September)

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: low vigorous

Yield per vine: 4.6 kg

Bunch weight: 320 g

Bud fertility: 0.81

Climate and cultivation requirements

'Sale Aganyn Kara' is a medium ripening wine grape variety, suitable for cultivation in the steppe and pre-mountainous zones and on the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has low resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.

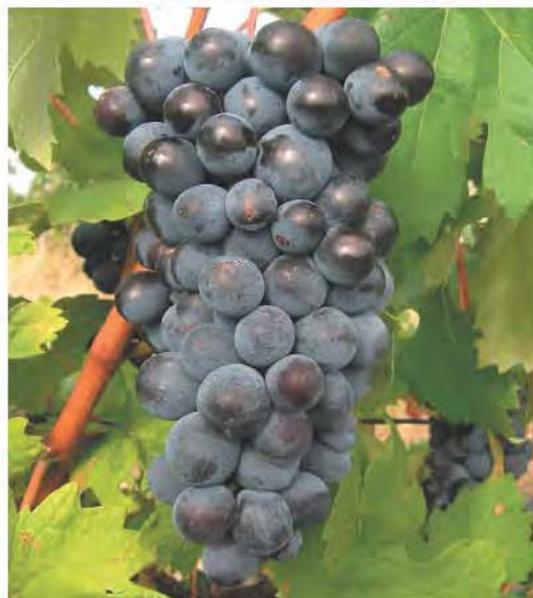
Juice characteristics

Sugar: 20.0-21.4 %

Total acidity: 5.0-4.0 g·L⁻¹

Wine and grape characteristics

'Sale Aganyn Kara' can be used as a part of a blend for making good quality strong and dessert wines.



Sary Kokur B.

Synonyms

Unknown.

Meaning of the name

Sary = Yellow. Kokur is probably a name or a surname.

Historical notes and cultural importance

'Sary Kokur' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles orientalis subproles *caspiica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are green and covered with sparse hairs.

The mature leaf is medium size or large, rounded, five lobed, with various dissection patterns and hairless. The leaf blade is undulate. The upper surface is microreticular-wrinkled or nearly smooth. The upper leaf sinuses are shallow and medium-deep, open, lyre-shaped with a narrow mouth or chinked. The lower leaf sinuses are shallow, open and chinked. The petiole sinus is closed with elliptic lumen; sometimes it is open, lyre-shaped with an acute base. The teeth at the end of the lobes are narrow triangular with a pointed vertex. The lateral teeth are narrow triangular and triangular-serriform with an acute tip. The petiole is light and uneven wine-red.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conic, winged and dense to medium dense.

The berry is medium size, oval and yellow-greenish. The skin is thin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.3 kg

Bunch weight: 310 g

Bud fertility: 0.93

Climate and cultivation requirements

'Sary Kokur' is a medium ripening wine grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety is very susceptible towards fungal diseases.

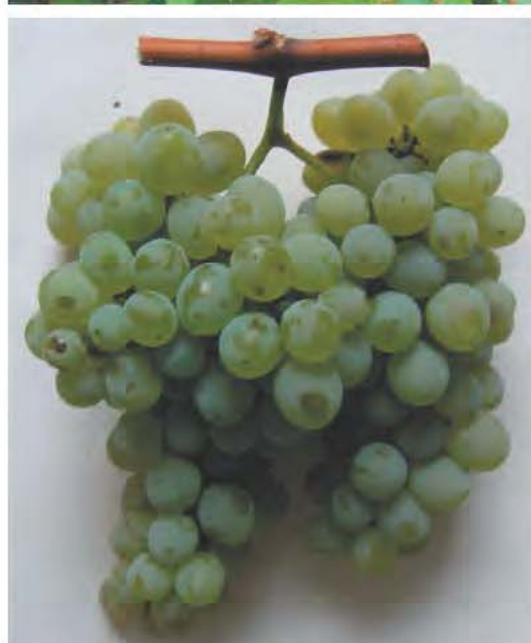
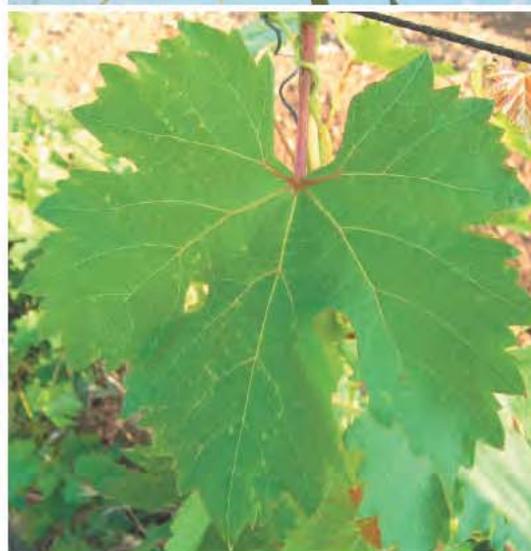
Juice characteristics

Sugar: 18.0-22.0 %

Total acidity: 5.6-5.0 g·L⁻¹

Wine and grape characteristics

Technological characteristics of 'Sary Kokur' wine have not been studied exhaustively. The grape can be used as a part of a blend for making table and strong wines.



Sary Pandas B.

Synonyms

Unknown.

Meaning of the name

Sary = Yellow. Pandas is probably a name or a surname.

Historical notes and cultural importance

'Sary Pandas' has been cultivated in Crimea from ancient times. This suggests it is an old Crimean variety.

Commercial vineyards are found in Sudak. It is included in the "Standard list" of grapevine varieties of Ukraine, recommended for cultivation on the South Coast of Crimea.

Taxonomy and intra-variety variability

Proles *pontica* subproles *balcanica* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is brown on the edge and is covered with felt hairs. The first distal leaves are pink on the edge and with felt hairs.

The mature leaf is medium size and large, elongated, slightly and medium five lobed. The leaf blade is slightly infundibular or rolled. The upper surface is light green, matt and medium-vesicular. The upper leaf sinuses are medium-deep, open, becoming very narrow at the exit, chinked or lyre-shaped with a pointed base. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is shallow, open sagittate or arch-shaped with an acute or rounded base. The teeth at the end of the lobes are serriform with convex sides. The lateral teeth are triangular with convex sides. The mature leaf is covered with cobwebby-bristle hairs on the lower surface.

The flower is female.

The bunch is medium size, cylindrical and cylindrical-conic and medium dense.

The berry is medium size, rounded and white-yellow in color. The skin is thin. The flesh is firm and rather crispy with a typical varietal aroma.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 3.1 kg

Bunch weight: 280 g

Bud fertility: 1.34

Climate and cultivation requirements

'Sary Pandas' is a late-ripening wine grape variety, suitable for cultivation on the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine. The variety should be planted on well-heated and illuminated soils together with pollinator varieties.

Resistance to diseases and unfavorable weather

The variety has low resistance towards the European grapevine moth (*Lobesia botrana*), towards fungal diseases and winter frosts.

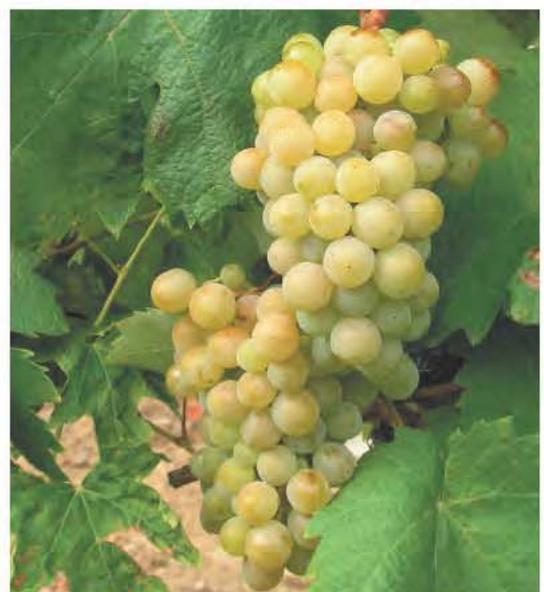
Juice characteristics

Sugar: 20.0-22.0 %

Total acidity: 8.0-6.0 g·L⁻¹

Wine and grape characteristics

'Sary Pandas' produces original dessert wines with a pronounced honey bouquet.



Shabash B.

Synonyms

Unknown.

Meaning of the name

The end.

Historical notes and cultural importance

The origin of 'Shabash' is unknown. However, since it is spread only in Crimea, it is probably a native variety.

The variety is on the "Standard list" of grapevine varieties of Ukraine, recommended for cultivation in Crimea and it is spread in commercial vineyards.

Taxonomy and intra-variety variability

Proles *orientalis* subproles *antasiatica* Negr.

'Tamalak Shabash' is a variation found in Sudak. It has smaller and stronger dissected leaves, different-shaped berries and it is prone to flower drop. The grape has no commercial importance.

Another large-berried variation was found in Alushta in 1952 (FROLOV-BAGEEV 1956). The berry is heavier (60 %), longer and wider (up to 20 %), slightly more sugary. This variation is interesting also for the higher yield and the lower number of seeds.

Essential ampelographic characteristics

The tip of the young shoot is pink on the edge and is covered with sparse hairs. The first distal leaves are light pink (typical trait). They are covered with sparse cobwebby hairs on the upper surface and have dense hairs on the lower surface. From the third leaf onward, leaves are hairless.

The mature leaf is large, oval and medium five lobed. The leaf blade is undulate. The upper surface is vesicular, reticular-wrinkled, slightly rolled and rough. The upper leaf sinuses are open, lyre-shaped with an acute base or chinked. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is open, lyre-shaped with a rounded base. The teeth at the end of the lobes are triangular with very acute tips. The lateral teeth are small and serriform with very acute tips. The mature leaf is covered with sparse bristle hairs. The petiole is light pink.

The flower is hermaphrodite.

The bunch is medium size and large, cylindrical-conic, branched at the base, medium dense to loose.

The berry is large, oval and white. The skin is thick. The flesh is crispy, juicy with a simple taste.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 7.2 kg

Bunch weight: 340 g

Bud fertility: 1.31

Climate and cultivation requirements

'Shabash' is a late-ripening table grape variety suitable for cultivation in Crimea with 1.5 x 3.0 m planting layout and 60 buds per vine. The grape is more transport resistant if it is grown on dry coarse soils, less if it is cultivated in more humid soils.



Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases. The grape is susceptible to winter frosts during the first years, due to the poor cane maturation.

Juice characteristics

Sugar: 16.0-17.0 %

Total acidity: 5.6-6.0 g·L⁻¹

Wine and grape characteristics

'Shabash' is transport resistant, with mediocre palatability and used for fresh consumption. The grape has good quality and it is also suitable for winter storage.

Shira Iziium B.

Synonyms

Unknown.

Meaning of the name

Sweet grape.

Historical notes and cultural importance

'Shira Iziium' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are white due to dense cobwebby hairs and edged with wine-red.

The mature leaf is medium size, rounded and deeply five lobed. The leaf blade is slightly infundibular. The upper surface is macroreticular-wrinkled or slightly blistered. The upper leaf sinuses are deep, closed with oval or acute-oval shape. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is closed, with an elliptic or a narrow elliptic lumen and with a pointed base. The teeth at the end of the lobes are small, both sides convex. The lateral teeth are both sides convex and alternating with serriform ones. The mature leaf has cobwebby-bristle hairs of medium density. The main veins are covered with short bristle hairs. The base of the main veins and the petiole are wine-red.

The flower is hermaphrodite.

The bunch is medium size, cylindrical-conic and dense to medium dense.

The berry is medium size, rounded and yellow-green. The skin is thin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: second ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 2.7 kg

Bunch weight: 260 g

Bud fertility: 0.70

Climate and cultivation requirements

'Shira Iziium' is a medium ripening wine grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine. The variety prefers fertile humid soils.

Resistance to diseases and unfavorable weather

The variety is rather resistant towards the European grapevine moth (*Lobesia botrana*), resistant towards *Plasmopara viticola* and susceptible towards *Erysiphe necator*. The fruit suffers from gray mold (*Lobesia botrana*) in a rainy autumn. The grape has poor resistance to drought.

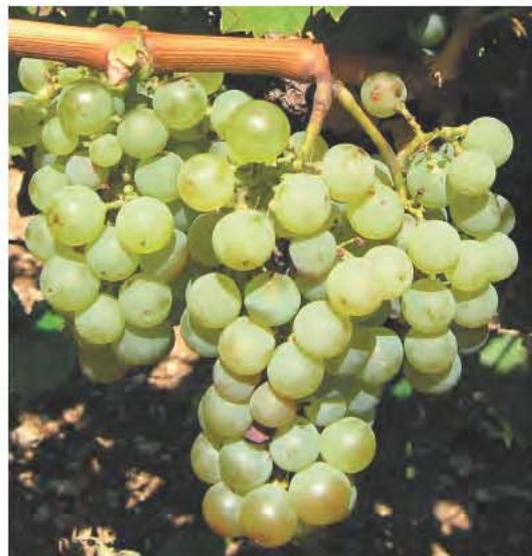
Juice characteristics

Sugar: 18.0-21.5 %

Total acidity: 6.6-7.0 g·L⁻¹

Wine and grape characteristics

The grape of 'Shira Iziium' is used as a part of a blend for making ordinary table and strong wines.



Soldaiya B.

Synonyms

'SD-56' (Crimea).

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Soldaiya' is a local Crimean variety. It was found in the vineyards of the state farm 'Solnechnaya Dolina' in Sudak in 1970. The researchers who discovered and described this local variety are P. M. Gramotenko, N. M. Matvienko, V. V. Pestretsov and L. P. Troshin (TROSHIN 1999). The variety is similar to the variety 'Pukhliakovskii'. It could be a cross between 'Pukhliakovskii' and 'Shabash'.

The variety is cultivated in the south-east coast of Crimea. It is also present in collections.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are white due to thick felt hairs, and tinged with red.

The mature leaf is medium size, rounded, five lobed, with various dissection patterns; or medium, rounded, sometimes rather elongated, three to five lobed and with various dissection patterns. The leaf blade is slightly infundibular. The upper surface is dark green, slightly wrinkled. The upper leaf sinuses are medium-deep and deep, open and lyre-shaped. The lower leaf sinuses are shallow, open, V-shaped. The petiole sinus is closed. The mature leaf has sparse cobwebby hairs on the lower surface.

The flower is hermaphrodite.

The bunch is medium size, conical and dense to medium dense.

The berry is medium size and large, slightly oval, white with a firm skin. The flesh is juicy with a typical varietal aroma.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: vigorous

Yield per vine: 8.9 kg

Bunch weight: 350 g

Bud fertility: 1.48

Climate and cultivation requirements

'Soldaiya' is a medium to late-ripening table and wine grape variety, suitable for cultivation in the south-east sea-coast zone of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine. The grape grows and bears well on coarse soils.

Resistance to diseases and unfavorable weather

The variety has relative resistance to drought, frosts and towards fungal diseases.

Juice characteristics

Sugar: 21.0-24.0 %

Total acidity: 3.9-5.0 g·L⁻¹

Wine and grape characteristics

The grape of 'Soldaiya' shows transport resistance and good storage properties in refrigerators. As a double usage grape, it is promising for making white dessert wines and for fresh consumption.



Solnechnodolinskii B.

Synonyms

'SD-2', 'SD-63' (Crimea).

Meaning of the name

Linked with a toponym.

Historical notes and cultural importance

'Solnechnodolinskii' is a local Crimean variety. It was found in vineyards of the state farm 'Solnechnaia Dolina' in Sudak in 1969. The researchers who discovered and described this local variety are P. M. Gramotenko, N. M. Matvienko, V. V. Pestretsov and L. P. Troshin (TROSHIN 1999). The variety shares some similarities with 'Sary Pandas'.

Since 1995, the variety has been included in the 'Standard list' of grape varieties of Ukraine, recommended for cultivation on the South Coast of Crimea.

Taxonomy and intra-variety variability

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green, striped with wine-red on the edge. The first distal leaves are light green with red spots and covered with medium dense cobwebby hairs.

The mature leaf is large and medium with an elongated central lobe, medium and deeply five lobed, hairless. The upper leaf sinuses are open, V-shaped, or closed with a narrow elliptic lumen. The lower leaf sinuses are open, V-shaped, or closed, with a narrow elliptic lumen. The petiole sinus is open, lyre-shaped or closed with a tooth. The teeth at the end of the lobes are triangular with convex sides. The lateral teeth are wide with one convex side.

The flower is hermaphrodite.

The bunch is large, conical, dense to medium dense.

The berry is medium size, oval, yellow-green with a thick and firm skin. The flesh is juicy with simple and harmonious taste. The amount of seedless berries in the cluster is up to 10 %.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.4 kg

Bunch weight: 380 g

Bud fertility: 0.84

Climate and cultivation requirements

'Solnechnodolinskii' is a medium to late-ripening wine grape variety, suitable for cultivation in the south-east zone of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.

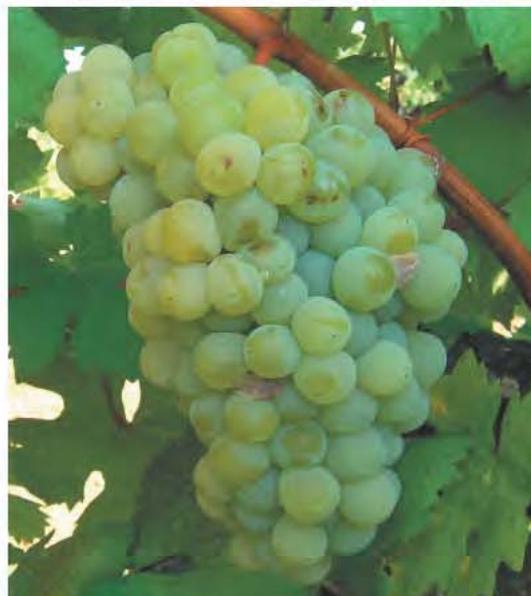
Juice characteristics

Sugar: 20.0-22.0 %

Total acidity: 6.0-5.0 g·L⁻¹

Wine and grape characteristics

'Solnechnodolinskii' is used for making dessert wines of good quality and is often blended with other varieties.



Tashly B.

Synonyms

'Tashly Misket', 'Tashly Iziun' (Crimea).

Meaning of the name

Stone/Stony (the variety has very dense bunches).

Historical notes and cultural importance

'Tashly' is a local Crimean variety. It was widely cultivated in Sudak and Alushta at the beginning of the 19th century, which suggests that it was cultivated there since ancient times.

The variety is spread mostly on the South Coast of Crimea. It was included in the "Standard list" of grapevine varieties of Ukraine in the middle of the 20th century, recommended for cultivation in Crimea.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is edged with pale copper-red and covered with felt hairs. The first distal leaves are edged with pink and covered with felt hairs on both surfaces.

The mature leaf is medium size, rounded and deeply three to five lobed. The leaf blade is rolled. The upper surface is macro-vesicular. The upper leaf sinuses are deep (the upper lobe is separated from the leaf body by a narrow 'belt': typical trait), open and lyre-shaped with a wide flat base; rarely having a large tooth. The lower leaf sinuses are less deep, open with a rounded or flat base. The petiole sinus is closed and chinked. The teeth at the end of the lobes are large and both sides convex. The lateral teeth are both sides convex and uneven. The mature leaf is covered with felt hairs on the lower surface. The main veins are covered with dense bristle hairs. The petiole is pink.

The flower is female.

The bunch is large, cylindrical-conic, winged and loose.

The berry is medium size and large, rounded or slightly oval, yellow with a thick, rough and firm skin. The flesh is juicy with a simple taste and a pronounced muscat aroma at full maturity.

Phenology

Time of bud burst: third ten days of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 8.0 kg

Bunch weight: 440 g

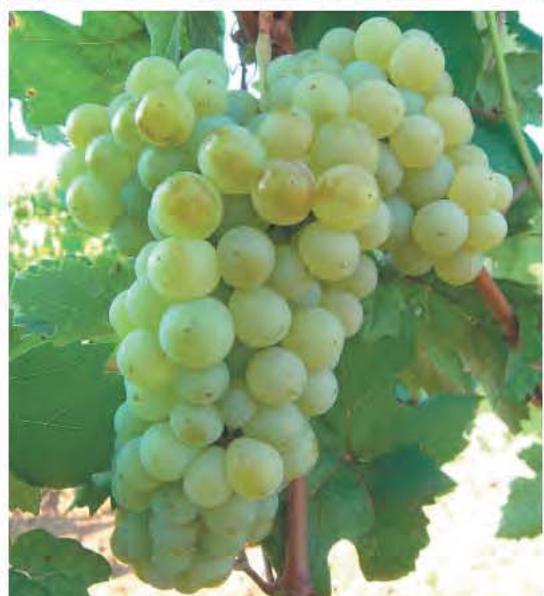
Bud fertility: 1.39

Climate and cultivation requirements

'Tashly' is a late-ripening table and wine grape variety, suitable for cultivation on the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine. The fruit ripens best on gravel soils protected from the wind. Being a grape with female flower, the variety needs pollinators.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases.



Juice characteristics

Sugar: 16.0-18.3 %

Total acidity: 6.6-7.0 g·L⁻¹

Wine and grape characteristics

'Tashly' is a transport resistant grape with good quality, used in blend for making ordinary table, strong and dessert wines. The grape is not widespread due to low sugar accumulation.

Yanykh Zerva N.

Synonyms

Unknown.

Meaning of the name

Yanykh = Smoked. For Zerva no hypotheses have been proposed.

Historical notes and cultural importance

'Yanykh Zerva' is a local Crimean variety. It was found as single vines in the old vineyards of Sudak.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles *orientalis* Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot and the first distal leaves are green, edged with copper-red and covered with hairs of medium density.

The mature leaf is medium size with acute outlines, asymmetrical, rounded or slightly wedged, slightly three to five lobed and hairless. The leaf blade is undulate or grooved. The upper surface is glossy. The upper leaf sinuses are shallow, open, more frequently V-shaped or narrow chinked. The lower leaf sinuses are shallow, open and V-shaped. The petiole sinus is open, sagittate with an acute base. The teeth at the end of the lobes are triangular with slightly convex sides and rounded. The lateral teeth are acute triangular and often serriform. The petiole is pale, light pink.

The flower is hermaphrodite.

The bunch is medium size, cylindrical, branched and loose.

The berry is elongated, asymmetrical and black. The skin is thin. The flesh is crispy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.1 kg

Bunch weight: 310 g

Bud fertility: 0.67

Climate and cultivation requirements

'Yanykh Zerva' is a medium to late-ripening table grape variety, suitable for cultivation in the pre-mountainous zones and on the South Coast of Crimea, with 1.5 x 3.0 m planting layout and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance towards the European grapevine moth (*Lobesia botrana*) and towards fungal diseases. It is very susceptible towards *Plasmopara viticola*. The grape has good resistance to drought.

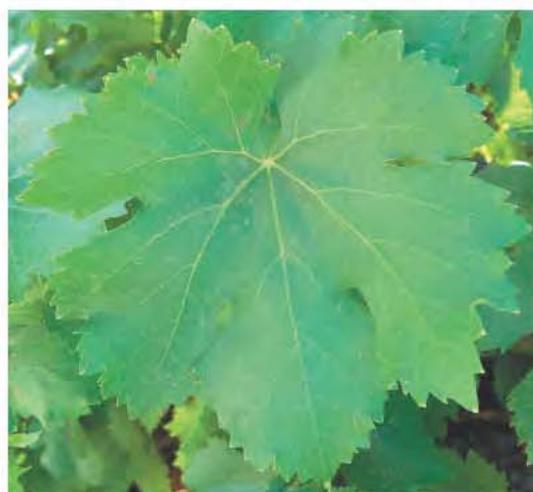
Juice characteristics

Sugar: 15.0-17.5 %

Total acidity: 5.3-7.0 g·L⁻¹

Wine and grape characteristics

'Yanykh Zerva' is not a very transport resistant variety and it is consumed locally.



Zerva B.

Synonyms

'Agach sap Zerva' (Crimea).

Meaning of the name

No hypotheses have been proposed.

Historical notes and cultural importance

'Zerva' is a local Crimean variety. It was found as single vines in Sudak's old vineyards and on the South Coast of Crimea.

The variety is not widespread and has local importance now.

Taxonomy and intra-variety variability

Proles pontica Negr.

No clones have been revealed so far.

Essential ampelographic characteristics

The tip of the young shoot is light green with hairs of medium density. The first young distal leaves are light green tinged with bronze and covered with rather weak hairs.

The mature leaf is medium size, rounded, rather elongated, deeply five lobed with secondary sinuses on the lobes. The leaf blades are undulate. The upper surface is slightly reticular-wrinkled. The upper leaf sinuses are deep, closed, with an oval or irregular lumen. The lower leaf sinuses are medium-deep, closed or open, oval or with an irregular lumen. The petiole sinus is closed, rounded or with an irregular lumen; the base is often limited by veins. The teeth at the end of the lobes are large, narrow triangular with slightly convex sides and an acute tip. The lateral teeth are large and triangular-serriform. The main veins at the base and the petiole are red-violet with cobwebby hairs.

The flower is hermaphrodite.

The bunch is large, cylindrical-conic, winged and very dense.

The berry is medium size, rounded, yellow-green with a thin and slightly astringent skin. The flesh is juicy with a simple taste.

Phenology

Time of bud burst: second half of April

Time of blooming: first half of June

Time of veraison: second ten days of August

Time of ripening: third ten days of September

Vegetative and yielding characteristics

Habit of shoot growth: semi-erect

Vigor of shoot growth: medium

Yield per vine: 4.0 kg

Bunch weight: 400-460 g

Bud fertility: 0.61

Climate and cultivation requirements

'Zerva' is a medium ripening wine grape variety suitable for cultivation in the pre-mountainous zones of Crimea, with planting layout at 1.5 x 3.0 and 60 buds per vine.

Resistance to diseases and unfavorable weather

The variety has medium resistance to fungal diseases. The berries are susceptible towards grey mold (*Lobesia botrana*) in a rainy autumn.

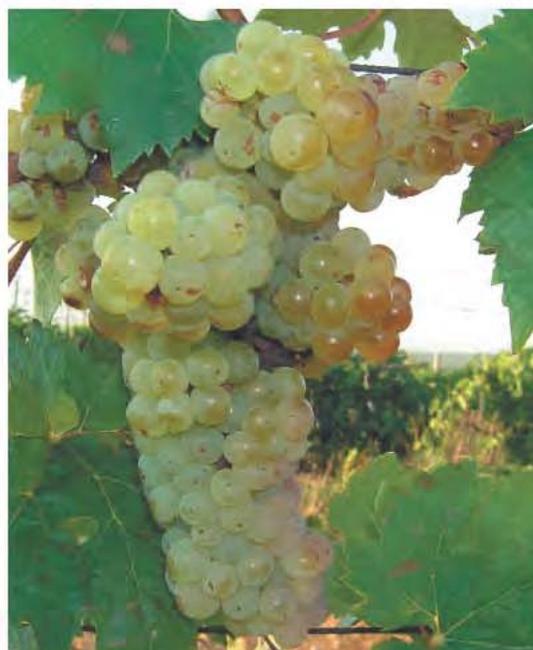
Juice characteristics

Sugar: 19.0-20.0 %

Total acidity: 5.0-5.3 g·L⁻¹

Wine and grape characteristics

'Zerva' mono varietal wine is poor. It can be used in blend with 'Kokur Belyi' to make white strong or table wines.



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Table

Some general transliterations and translations from local Crimean Tatarian to English

| Transliteration | Translation |
|-----------------|-------------|
| Biyas | White |
| Kara | Black |
| Sary | Yellow |
| Kok | Blue |
| Izium | Grape |
| Aga | Sir |
| Shira | Sweet |
| Al | Scarlet |

COST - European Cooperation in Science and Technology



Cost is a European Union program that supports international cooperation in science and technology. It is a multi-year program that provides funding for researchers from different countries to work together on projects. The program is managed by the European Commission and the European Science Foundation. It is a key instrument for the EU to support research and innovation in Europe and beyond.



The European Science Foundation (ESF) is an international organization that promotes scientific cooperation between scientists from different countries. It was founded in 1970 and has since then supported many international research projects. The ESF is a non-profit organization that is funded by governments and private donors. It is a key partner of the COST program.

The COST program is a key instrument for the EU to support research and innovation in Europe and beyond. It provides funding for researchers from different countries to work together on projects. The program is managed by the European Commission and the European Science Foundation. It is a key instrument for the EU to support research and innovation in Europe and beyond.



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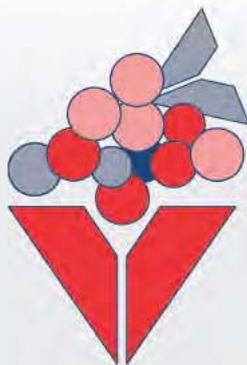


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The relevance and distribution of table grapes are testified by the impressive world production that gives this sector an increasingly global perspective, where Italy represents the European leader for both production and export. To realize this volume 82 authors have been involved, who are members of the most qualified national scientific world, representatives of leading grape production companies, Italian and foreign experts. Using a 360° approach, also thanks to the valuable statistical data made available by the OIV (International Organization of Vine and Wine), the volume tells students, technicians, food chain players and interested consumers the values of a fruit that is showing more and more important positive effects on human health.



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Considered by our ancestors as the result of fortunate spontaneous and natural phenomena, wine is the result of a good combination of vines, soils, climatic conditions, agronomic and vinification techniques which are similar to those adopted two thousand years ago, with the addition of control methods and tools coming from innovation. Thanks to the contribution of different experts, this book describes the values of this integration between tradition and innovation for the production of a good wine. The technical part is fully complemented by the chapters dedicated to the origin and history of wine, the role of wine in art and religion, the protection of the production areas of considerable landscape value, which make this volume absolutely unique.



David MAGHRADZE

David Maghradze is a senior research scientist at the International Center for Agricultural Research in the Dry Areas (ICARDA), based in Tashkent, Uzbekistan. He has a PhD in Plant Biology and Crop Science from the University of Milan, Italy. His research focuses on the linkage between viticulture and oenology, particularly on the ripening physiology, berry composition, and secondary metabolisms of grapevines. He has co-authored several books, peer-reviewed journal articles, and technical guidelines. He is currently the Head of the CGIAR Program Facilitation Unit for Central Asia and the Caucasus and the Regional Coordinator of ICARDA in the Dry Areas.



Laura RUSTIONI

Born in 1982. She grew up in Oltrepò pavese, an important Italian area for viticulture. In 2006 she obtained the Master in Viticultural and Enological Sciences, and in 2010 the PhD on Plant Biology and Crop Science. At present she has a post-doctoral fellowship at the University of Milano. Her experience is divided between technical application and scientific research. She had different working experiences in wineries as well as scientific collaborations all around the world. Her studies are focused on the linkage between viticulture and oenology, following the idea of the applicative importance of the research for the production in this field. Thus, the main research subjects are related to the ripening physiology, berry composition, and secondary metabolisms, including phenotyping methods for grapevines germplasm evaluation, projected on the grape evaluation for the oenological production, mostly focused on the phenolic compounds.



Jozef TUROK

Currently, Head of the CGIAR Program Facilitation Unit for Central Asia and the Caucasus and Regional Coordinator of the International Center for Agricultural Research in the Dry Areas (ICARDA), based in Tashkent, Uzbekistan. Key responsibilities include ensuring the implementation of the research for development agenda in Central Asia and the Caucasus Region (Azerbaijan, Armenia, Georgia, Kyrgyz Republic, Kazakhstan, Tajikistan, Turkmenistan and Uzbekistan), addressing shared research priorities and building needed partnerships along impact pathways. He was previously Regional Director for Europe and Acting Regional Director for Central Asia, West Asia and North Africa at Bioversity International. Scientific background in population genetics, PhD from Georg-August-University of Göttingen, Germany (1995); Master of Science in Forestry, Technical University, Zvolen, Slovakia. Co-authored books, peer-reviewed journal articles, and edited or compiled more than thirty technical guidelines, proceedings and other technical publications.



Attilio SCIENZA

Born in 1945. Graduated in Agricultural Sciences. At present full professor of Viticulture at the University of Milan. Director of the Master in "Management of the Viticultural System" and of the Degree Course in Viticulture and Enology of the same university. From 1985 to 1991 General director of the Istituto Agrario di San Michele all'Adige (Trento). Coordinator of several national research projects on grapevine physiology (abiotic stress and grapes ripening), genetics (wild and cultivated germplasm collection and identification, clonal selection and rootstock breeding) and cultural techniques. Co-ordinator of the IPGRI Project "Re-establishment of Georgian viticulture germplasm collection". He is author of more than 250 scientific publications devoted to physiology, genetic, ecology and cultivation practices of grapevines, including regional ampelography and monographic studies on the origin and history of viticulture.



Osvaldo FAILLA

Born in 1960. In July 1988 he graduated in Agricultural Science from the University of Milan. In May 1992 he received the title of Doctor of research. At present, he is associate professor of Arboriculture and Pomology at the University of Milan. Teaching activities comprehend grapevine biology and physiology; viticulture and fruit growing. His main research interest at present are devoted to grapes maturation and enological quality; genotypes x environment interaction and assessment of the viticultural land suitability; grapevines germplasm preservation and evaluation. Chair of the COST action FA100 "East-West Collaboration for Grapevine Diversity Exploration and Mobilization of Adaptive Traits for Breeding". Director of the Lombard Museum of History of Agriculture. Author of more than 150 publications including research papers, communications, reviews, articles and handbook chapters on science and cultivation of grapevines and fruit trees.



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