

Ampelographic characteristics of Azerbaijani local grape varieties

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Summary

The article aims to describe some local grapevine varieties cultivated in different areas of Azerbaijan. The cultivars are grown in the ampelographic collection of the Azerbaijani Scientific Research Institute of Viticulture and Wine-making. The report of their ampelographic traits was based on the OIV descriptors list. Comparing cultivars, it has been found that, although there have been similarities in various descriptor traits, most of the characteristics are distinctive of specific cultivars. A considerable polymorphism was found concerning the morphological features of leaves, clusters, berries, as well as considering some physiological and technological characteristics. In more detail, these genotypes differ between each other by the aspect of leaves; the shape, size and structure of bunches; the shape, color and flavor of berries; the productivity indices; the resistance to pests and diseases; the duration of their vegetative period; the sugar and acid contents; and the number of seeds in the berry.

Key words: local variety; bunch; berry; ampelographic collection; ampelographic description.

Introduction

In Azerbaijan, a big number of wild grapevines (*Vitis vinifera* L. subsp. *sylvestris*) and local cultivars can be observed. Archeological, paleobotanical and historical sources confirm that grapevines were spread and cultivated since a long time. One-two million year old grape leaf fossilized imprints have been found in the western sides of the Bozdag mountain (Gyok-gol region) and 500,000 year old grapevine fossils were found in Nakhichevan, in the Araz river basin. Grape seed remains of the V-IV century B.C. were also found in the Agstafa region. One of the most ancient wine-making artifacts in Azerbaijan is a wine jug found by Hummel in 1931 in the Gyok-gol region. It contained grape seeds and fossilized wine sediments. This finding is related to the Bronze Age (end of second and beginning of first millennium B.C.) (NEGRUL 1959, EFENDIYEV 1972, BABAYEV 1988, ALLAHVERDIYEV *et al.* 1978, SULEYMANOV *et al.* 1982, AMANOV 1998, SHERIFOV 2013).

In the period of intensive development of viticulture in Azerbaijan (1970-80s), the grapevine assortment of vineyards was enriched with foreign varieties from Western Europe, America, Moldova, Ukraine, Georgia and Central

Asia. According to the literature, in that period more than 600 grapevine varieties were cultivated in Azerbaijan and 400 of them were local. However, only 200 of them have been collected and included in field collections (SALIMOV *et al.* 2007, 2008, 2009 and SALIMOV 2011).

Many regions of Azerbaijan are rich in valuable local grapevine varieties which have not been explored yet (SHERIFOV 2005, PANAHOV *et al.* 2010 and 2012). Nowadays, Azerbaijan grape germplasm are studied with the support of national, foreign and international scientific organizations. Thanks to Bioversity International and the COST Action FA1003 (East-West Collaboration for Grapevine Diversity Exploration and Mobilization of Adaptive Traits for Breeding), research on local grapes have been recently carried out in Azerbaijan. Scientific expeditions have been conducted in different Azerbaijan regions (Garabagh, Quba-Khachmaz, Ganja-Gazakh, Nakhichevan, Sheki-Zaqatala, Shirvan, Apsheron, etc.). The main results obtained include the finding of some not yet characterized local genotypes and their collection in experimental vineyards for the ampelographic evaluation.

Material and Methods

Plants of the local grape varieties 'Ikijinsli Ag Shany', 'Khurmayi', 'Gilamy', 'Ag meleyi', 'Sabza', 'Gyrmyzy saabi', 'Novrast', 'Ag Khalily', 'Shahani', 'Ag Darbandy', 'Mahmudu' and 'Khan uzumu', were all grown in the same ampelographic collection of Azerbaijani Scientific Research Institute of Viticulture and Wine-making.

Morphological, biological and technological characterizations were coded according to 47 OIV descriptors (OIV, 2009, TROSHIN and MAGHRADZE 2013).

Results and Discussion

In Azerbaijan, viticulture and wine-making developed during centuries, producing hundreds of grape varieties selected for different purposes (table, wine, universal, seedless raisins) (SALIMOV *et al.* 2007, 2008 and 2009).

Local grape varieties are mainly grown in old vineyards located in ancient settlements and homesteads. Different training systems were also found, including high pergola and low bush cultivations. The varieties presented in this paper ('Ikijinsli Ag shany', 'Khurmayi', 'Gilami', 'Ag meleyi', 'Sabza', 'Qyrmyzy saabi', 'Novrast', 'Ag Khalily', 'Shahani', 'Ag Darbandy', 'Mahmudu', 'Khan uzumu') dif-

Table
Ampelographic characteristics of Azerbaijani grape cultivars

Cultivar	OIV descriptors																									
	1	3	4	6	7	8	16	51	53	67	68	70	72	74	75	76	79	80	81-1	81-2	83-2	84	87	94		
Ikjinsli Ag shany	5	1	3	5	1	1	1-2	2	1	4	2	1	1	1	1	3	9	1	1	1	1	1	1	1	1	
Khurmaya	5	3	1	3	1	1	1-2	1	1	4	2	1	1	1	1	2	3	3	1	1	1	3	1	1	1	
Gilami	5	3	1	3	2	2	1-2	3	1	4	3	1	1	2	3	3	3	2	1	1	1	1	3	7	7	
Ag meleyi	5	3	1	3	1	1	1-2	3	1	4	3	1	1	1	3	3	3	3	1	1	1	1	1	1	7	
Sabza	5	3	1	3	1	1	1-2	3	1	3	3	1	1	2	1	3	3	3	1	1	1	1	1	5	5	
Gyrmyzy saaby	5	3	1	3	1	1	1-2	3	1	4	3	1	1	2	1	3	3	3	1	1	1	1	1	1	5	
Novrast	5	5	1	3	2	2	1-2	4	1	3	3-4	1	1	2	3	3	3	3	1	1	1	1	1	7	7	
Ag Khalily	5	1	1	3	1	1	1-2	23	1	3	2-3	1	1	1	1	2	7	1	1	1	1	1	1	5-7	5-7	
Shahani	5	3	3	5	1	1	1-2	2	1	4	2-3	1	1	1	1	3	3	1	1	1	1	1	1	3	3	
Ag Darbandy	5	5	3	5	1	1	1-2	3	1	3	3	1	1	5	1	3	9	1	9	1	1	1	1	3	5-7	
Mahmudu	5	3	5	35	2	2	1-2	2-3	7	4	2-3	2	1	1	5	3	3-5	2	1	1	1	1	7	1	1-3	
Khan uzumu	5	3	1	3	2	2	1-2	1	1	4	1-2	1	1	1	1	2	3	2-3	1	1	1	3	1	1	1	
	151	155	202	204	206	208	209	220	221	223	225	231	235	236	241	301	303	351	502	503	504	505	506			
Ikjinsli Ag shany	3	1	9	5	3	2	2	7	79	7	1	1	2	1	3	5	5	7	7	7	9	9	9	3	3	
Khurmaya	3	5	9	5	3	2	2	7	79	7	6	1	3	1	3	5	3	7	7	7	9	9	9	3	3	
Gilami	4	1	7	5	3	2	2	5-7	7	3	6	1	1	1	3	5	5	7	7	5	7	7	3	3	3	
Ag meleyi	3	1	7	3	3	2	2	5-7	7	3	1	1	2	1	3	5	5	5	3-5	5	5	9	3	3	3	
Sabza	3	1	5-7	9	3	2	2	3	3	7	1	1	2	1	2	5	3	7	7	3	9	7	3	3	3	
Gyrmyzy saaby	4	1	7-9	5	3	2	2	9	7-9	5	3	1	2	1	3	5	5	7	7	7-9	9	7	3	3	3	
Novrast	3	1	9	5	5	2	2	9	7-9	8	1	1	2	1	3	5	3	9	7	7-9	9	9	3	3	3	
Ag Khalily	3	1	5-7	5	3	2	2	7	7	5	1	1	12	1	3	3	1	7	3	5-7	5	7	3	3	3	
Shahani	4	1	5-7	1	7	23	1	7	7	6	1	1	2	1	3	5	5	7	7	5-7	5	9	3	3	3	
Ag Darbandy	3	1	5-7	7	3	2	2	9	7-9	7	1	1	2	1	3	5	7	9	7	7	9	7	3	3	3	

concerning their morphological characteristics and sizes of the bunches and berries; phenology; ripening time; productivity and quality indices.

The cultivars have been characterized by 47 OIV (2009) ampelodescriptors. Results show that, although there are several similarities in the descriptor traits of some grape varieties, most characteristics considerably differ between cultivars. It was found that all the studied varieties are similar in young shoot opening type (OIV 001); number of consecutive tendrils of the shoot (OIV 016); area of anthocyanin coloration of main veins on upper side of blade of the mature leaf (OIV 070) (except 'Mahmudu'); goffering of blade of the mature leaf (OIV 072); teeth in the petiole sinus of mature leaf (OIV 81-1) (except 'Ag Darbandy'); petiole sinus base limited by vein of mature leaf (OIV 081-2); teeth in the upper lateral sinuses of mature leaf (OIV 083-2); density of erect hairs on main veins on lower side of blade of mature leaf (OIV 087) (except 'Ag Darbandy'); fertility of basal buds (buds 1-3) of the shoot (OIV 155) (except 'Khan uzumu'); shape of the bunch (OIV 208); number of wings of the primary bunch (OIV 209) (except 'Shahani'); intensity of flesh anthocyanin coloration of the berry (OIV 231); particular flavor of the berry (OIV 236) (except 'Mahmudu'); formation of seeds of the berry (OIV 241) (except 'Sabza'); time of bud burst (OIV 301) (except 'Ag Khalily'); total acidity of must (OIV 506). Concerning the other studied descriptors, the varieties differ considerably. The size of bunches and berries, the plant productivity and the grape quality of the studied cultivars are typical for table grape varieties. As an example, the length of the berries (OIV 220) is distinguished by large and very large sizes. One of the studied varieties ('Sabza') is seedless, however the berry length is much higher than the one expected in raisin grape cultivars. The varieties also differ for berry shapes. Productivity and sugar contents of all the varieties (except 'Ag meleyi') are high and very high. Generally the cultivars are characterized by a high vigor.

The studied genotypes differ from each other by the morphological features of leaves; the shape, size and structure of clusters; the shape, color and flavor of berries; the productivity indices; the resistance to pests and diseases; the phenological characteristics; the sugar and acid contents; and the number of seeds per berry (Table).

Biomorphological and technological characteristics of the local and introduced grape varieties collected in the

Azerbaijani Scientific Research Institute of Viticulture and Wine-making have been studied and presented in this paper. The ampelographic descriptions will be useful to select material for specific purposes. The most suitable training systems could also be recommended for production based on cultivar characteristics.

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