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Ampelographic Characteristics of Grape Varieties Cultivated in Aksaray Province

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HIGHLIGHTS

- The ampelographic identification of local cvs. Aşeri and Emir was made for the first time and protected as a genetic resource.
- Cv. Parmak Üzümü was identified as an ecotype distinct from its previously identified counterparts.

Abstract

In this study, eight cultivars, all of which are *Vitis vinifera* L., are grown in Aksaray province were determined. Identification material was selected approximately 20 years old, own roots vines in the producer vineyards. Ampelographic characteristics are defined by 123 descriptive characters in the OIV (The International Organization of Vine and Wine) list of grape and grapevine rootstock varieties identification criteria. With the numerical codes of the OIV identification criteria, similarity analysis was made in the IBM SPSS Statistics software (SPSS) package program, and the similarity relationships of the cultivars were visualized with a dendrogram. Aşeri and Mor Üzüm varieties defined in Aksaray province are not registered in the European Catalogue, but all varieties are Vitis vinifera L. Subsp. vinifera is registered as Turkey varieties. All the cultivar excluding Aşeri, and Emir names defined here are included in the Turkey grapevine genetic resources list, and several cultivars containing the same name or synonyms have been defined in different studies. The ampelographic descriptions of Aşeri and Emir grape varieties were made for the first time. The ampelographic definitions of Ak Dimrit, Çavuş, Kalecik Karası, Mor Üzüm, Parmak Üzümü and Sergi Karası cvs were confirmed with previous descriptions made in different provinces. The similarities and differences of the varieties we identified were reflected in the similarity dendrogram. Six of the eight grape varieties are hermaphrodite, and two of them (Çavuş and Sergi Karası) are functional female flowers. In the international variety catalogue records, the most common Aksaray variety on a global scale is Çavuş variety originating from Turkey. The cv. Parmak Üzümü was a separate ecotype due to its differences from previous identification records. It would be appropriate to protect the Aşeri, Emir, and Parmak Üzümü varieties, which we described for the first time, in the grapevine genetic resources of Turkey.

Keywords: Aksaray, Grape, Vitis Vinifera Linné Subsp. Vinifera, Identification, Similarity Analysis

1. Introduction

Turkey's vineyard area is 400998 ha and grape production is 4208908 tons (FAOSTAT 2022). Viticulture is one of the most important sociocultural sectors. Although the exact records about the grape varieties in our vineyards area have not been reached, the diversity of the field studies is remarkable. Although studies on the

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identification and protection of our grapevine genetic potential started before the republican period, the most active conservation and identification work is carried out under the leadership of Tekirdağ Viticulture Research Institute. With the introduction of the identifiers (OIV 1983) created by method standardization studies, created under the leadership of the method union OIV (The International Organization of Vine and Wine) in the identification of grape varieties, they were accepted and used by all researchers and these descriptors were constantly renewed in the process.

Ampelographic and molecular descriptions of grape varieties in different viticulture regions (Sabir et al 2009; Ates et al 2011; Kılıç et al 2011; Kara et al 2016; Çelik et al 2018; Esmek et al 2018; Kara et al 2018; Akram et al 2019; Bahar et al 2019; Kupe 2020; Koç et al 2021; Ünal & Cuma 2022) and in different countries (Mandić et al 2018; Popescu & Crespan 2018; Volynkin et al 2018; Biniari & Stavrakaki 2019; Bounab & Laiadi 2019; El Oualkadi & Hajjaj 2019; Maraš 2019; Margaryan et al 2019; Milovanov et al 2019; Mirela et al 2019; Novikova & Naumova 2019; Petcov et al 2019; Rustioni et al 2019; Bibi et al 2020; Crespan et al 2020; Dallakyan et al 2020; Grigoriou et al 2020; Hameed et al 2020; Iliescu et al 2020; Jiménez-Cantizano et al 2020; Maistrenko et al 2020; Papapetrou et al 2020; Pastore et al 2020; Simeonov 2020; Stavrakaki et al 2020; Theuma 2020; Crespan et al 2021; Fedosov et al 2021; Fanelli et al 2021; Fatehi et al 2021; Gutiérrez-Gamboa et al 2021; Hmimsa et al 2021; Ilnitskaya et al 2021; Margaryan et al 2021; Milišić et al 2021; Zombardo et al 2021; Bardales et al 2022; Chehade et al 2022; Cıchı et al 2022; Dumitru et al 2022; Gago et al 2022; Gisbert et al 2022; Gonçalves & Martins 2022; Mouniane et al 2022; Pszczólkowski et al 2022; Roychev & Keranova 2022) were studied.

Ampelographic and molecular descriptions of grape varieties were made in different vineyard regions and in different countries. OIV (2009) was used as the ampelographic descriptor in the studies. Various molecular descriptors have been used for molecular characterization. Similarity analyses of cultivars were performed according to ampelographic descriptions and/or molecular identifiers.

In previous studies, synonyms of grape varieties were determined, similarities were examined by comparing them with national and international variety catalogues, and the records of those not included in these catalogues were completed. National and international cultivar records were created for the cultivars identified for the first time in local identification studies. Conservation measures were taken for the cultivars or genotypes that were not in the conservation collections. In this study, grape varieties still grown in Aksaray province were defined.

2. Materials and Methods

In the province of Aksaray, 10100 tons of grapes were produced in the vineyard area of 16280 da in 2021 (TÜİK 2022). This study was carried out in the 2019 and 2020 vegetation periods in the producer vineyards of the Kara Ören village of the center of Aksaray province and the villages that are actively engaged in viticulture with other vineyards.

The cultivars studied were healthy, about 20-year-old vines at yielding age and on their own roots. The plant material was Ak Dimrit, Aşeri, Çavuş, Emir, Kalecik Karası, Mor Üzüm (Bulut Üzümü), Parmak Üzümü and Sergi Karası grape varieties. A total of 123 traits included in the OIV grape and vine rootstock varieties identification criteria list (OIV 2009) were used in the identification of grape varieties. Similarity analysis was performed in the IBM SPSS Statistics software 23 (SPSS) with the numerical codes of the OIV strains, and the similarity relationships of the eight cultivars were visualized with a dendrogram. The identified characteristics of the cultivars and similarity analysis results were compared with the previous identification records, and similarities and differences were evaluated.

3. Results

3.1. Ampelographic definitions

The shoot tip type of the young shoot showed the characteristics of Vitis vinifera cultivars in all varieties and was closed. Differences were determined in terms of the distribution of anthocyanin coloration on the prostrate hairs at the shoot tip, the intensity of anthocyanin coloration on the prostrate hairs at the shoot tip, the density of the prostrate hairs at the shoot tip, and the density of erect hairs at the shoot tip (Table 1).

Significant differences were noted between cultivars in terms of shoot definitions, except that since all cultivars were Vitis vinifera cultivars, successive tendrils coded OIV 016 were intermittent.

In terms of young leaf definitions, cultivars generally differentiate between 4-6. young leaf upper surface colour (OIV 051-2) detected in leaves was similar in all cultivars. On the other hand, only the Çavuş cultivar differed from the others in terms of hair types and densities coded OIV 053, OIV 054, OIV 055 and OIV 056, which were detected on the 4th leaf from the shoot tip.

One of the definitions of mature leaves coded, OIV 070 (Anthocyanin coloration area on the main veins on the upper surface of the mature leaf blade), OIV 070-1 (Anthocyanin coloration on the main veins on the upper surface of the mature leaf blade), OIV 071 (Mature leaf blade, anthocyanin coloration area on the main veins on the lower surface of the mature leaf blade), OIV 077 (Tooth size associated with mature leaf blade size), OIV 081-1 (Presence of teeth in mature petiole sinus), OIV 081-2 (Mature petiole sinus is limited by veins), OIV 082 (Mature leaf upper side sinus degree of openness / overlap), OIV 083-1 (Base shape of mature leaf upper sinus), OIV 083-2 (Mature leaf teeth in upper side sinus), and OIV 084 (Density of erect hairs between the main veins of mature leaves on the lower surface of the blade), all cultivars were in the same group.

In terms of lignified shoot definitions, the differences were very limited according to the cultivars. The ten identification characters examined were included in the same identification codes for all cultivars.

In our study, inflorescences were identified with 4 features, of which only 8 cultivars with the code OIV 153 were included in the same group in terms of the number of clusters per shoot.

Grape clusters were identified with 8 features, the varieties identified differed in terms of OIV 202 coded Cluster Length (excluding stem), OIV 203 coded Cluster width and OIV 204 coded Cluster density.

17 characteristic features of the berry were determined, Aksaray cultivars differed in terms of only 3 features (OIV 220 code berry length, OIV 225 code berry skin colour, and OIV 231 code the intensity of anthocyanin coloration in berry pulp).

The 4 features related to seeds (OIV 241 coded the formation of seed in berry, OIV 242 coded the length of seed, the OIV 243 coded weight of seed, and OIV 244 coded transverse protrusions on the dorsal side of seed) were similar in the 8 cultivars identified.

Phenological features were determined with 6 characters, of which only OIV 306 coded autumn colour of leaves was similar in 8 cultivars examined.

Fruit set and berry quality characteristics were defined with three characters, of which OIV 501 coded Fruit setting rate differed according to the varieties, while OIV 505 coded the sugar content of must, and OIV 508 coded the pH of fruit juice were in the same group in all cultivars.

Mature leaf ampelometric measures were identified by sixteen characters, the traits with which the cultivars most differentiated. Among these characteristics, OIV 601 coded Mature leaf N1 vein length, OIV 602 coded Mature leaf N2 vein length, and OIV 603 coded Mature leaf N3 vein length was similar while cultivars differed in other characters.

Table 1. Ampelographic descriptors and definitions

OIV Code	Descriptive	Emir	Dimrit	Çavuş	Kalecik K.	Sergi K	Aşeri	Mor	Parmak
OIV 001	Young shoot: Shoot tip type	1	1	1	1	1	1	1	1
OIV 002	Young shoot: Distribution of anthocyanin coloration on the prostrate hairs at the shoot tip	2	3	3	2	3	1	1	1
OIV 003	Young shoot: Intensity of anthocyanin coloration on the prostrate hairs at the shoot tip	7	7	7	3	9	1	3	3
OIV 004	Young shoot: Density of erect hairs at the shoot tip	3	3	9	3	9	1	3	7
OIV 005	Young shoot: Density of erect hairs at the shoot tip	5	5	9	5	9	1	1	7
OIV 006	Shoot: Habitus (before tying)	3	3	7	5	5	3	5	3
OIV 007	Shoot: Colour of the dorsal side of the internodes	1	1	2	1	3	2	2	2
OIV 008	Shoot: Colour of the ventral side of the internodes	1	2	1	1	2	2	2	1
OIV 009	Shoot: Colour of the dorsal side of the nodes	1	2	2	1	3	2	2	2
OIV 010	Shoot: Colour of the ventral side of the nodes	1	2	2	2	2	2	2	2
OIV 011	Shoot: Erect hair density on nodes	1	1	5	5	5	1	1	1
OIV 012	Shoot: Erect hair density between nodes	1	1	1	3	3	1	1	3
OIV 013	Shoot: Prostrate hair density on the nodes	1	1	5	5	3	1	1	1
OIV 014	Shoot: Prostrate hair density between the nodes	1	1	5	3	3	1	1	1
OIV 015-1	Shoot: Distribution of anthocyanin coloration on winter buds	1	9	9	5	9	5	1	9
OIV 015-2	Shoot: Intensity of anthocyanin coloration on winter buds	1	5	3	5	5	5	1	5
OIV 016	Shoot: Number of consecutive tendrils	1	1	1	1	1	1	1	1
OIV 017	Shoot: Length of tendrils	5	3	7	7	7	7	7	5
OIV 051	Young leaf: The colour of the upper surface of the blade (4th leaf)	1	1	5	1	1	1	1	1
OIV 051-2	Young leaf: Upper surface colour (4-6th leaves)	1	1	1	1	1	1	1	1
OIV 053	Young leaf: Density of prostrate hairs between the main veins on the lower surface of the leaf (4th leaf)	3	3	9	3	3	3	3	3
OIV 054	Young leaf: Density of erect hairs between the main veins on the lower surface of the leaf (4th leaf)	3	3	9	3	3	3	3	3
OIV 055	Young leaf: Density of prostrate hairs between the main veins on the lower surface of the leaf (4th leaf)	3	3	9	3	3	3	3	3
OIV 056	Young leaf: Density of erect hairs on the main veins on the lower surface of the leaf (4th leaf)	3	3	7	3	3	3	3	3
OIV 065	Mature leaf: The size of the blade	7	5	7	5	5	7	5	5
OIV 067	Mature leaf: Shape of the blade	2	4	5	5	5	4	4	1
OIV 068	Mature leaf: Number of lobs	3	3	3	4	5	4	3	3
OIV 069	Mature leaf: Upper surface colour to blade	6	6	7	6	7	6	6	6
OIV 070	Mature leaf: Anthocyanin coloration area on the main veins on the upper surface of the blade	1	1	1	1	1	1	1	1
OIV 070-1	Mature leaf: Anthocyanin coloration on the main veins on the upper surface of the blade	1	1	1	1	1	1	1	1
OIV 071	Mature leaf: Anthocyanin coloration area on the main veins on the under surface of the blade	4	4	4	4	4	4	4	4
OIV 072	Mature leaf: Shrinkage on the blade	1	1	1	1	5	5	5	1
OIV 073	Mature leaf: Undulation between main and lateral veins on blade	1	1	1	9	9	9	1	9
OIV 074	Mature leaf: Profile of the cross section of the blade	4	1	2	2	4	4	3	2
OIV 075	Mature leaf: Blistering on the upper surface of the blade	7	1	5	1	1	1	1	1
OIV 076	Mature leaf: The shape of the tooth	7	1	5	1	1	1	1	1
OIV 077	Mature leaf: Tooth size associated with blade size	5	5	5	5	5	5	5	5
OIV 078	Mature leaf: Ratio of tooth length to width	5	5	5	7	5	5	3	5
OIV 079	Mature leaf: Opening/overlap condition of petiole sinus	5	5	5	7	5	5	3	5
OIV 080	Mature leaf: Shape of petiole sinus	7	2	2	5	5	5	2	2
OIV 081-1	Mature leaf: Tooth in the petiole sinus	2	2	2	2	2	2	2	2
OIV 081-2	Mature leaf: Bordering by veins in the petiole sinus	1	1	1	1	1	1	2	1
OIV 082	Mature leaf: Degree of openness/overlap of upper side sinus	1	1	1	1	1	1	1	1
OIV 083-1	Mature leaf: Base shape of upper sinus	3	3	3	3	3	3	3	3
OIV 083-2	Mature leaf: Teeth in upper side sinus	9	9	9	9	9	9	9	9
OIV 084	Mature leaf: Density of prostrate hairs between the main veins (on the lower surface of the blade)	1	1	1	1	1	1	1	1
OIV 085	Mature leaf: Density of erect hairs between the main veins on the lower surface of the blade	3	3	9	3	3	3	3	3
OIV 086	Mature leaf: Density of prostrate hairs on the main veins on the under surface of the blade	3	3	9	3	3	3	3	3
OIV 087	Mature leaf: Density of erect hairs on the main veins (on the lower surface of the blade)	3	3	9	3	3	3	3	3
OIV 088	Mature leaf: Prostrate hairs on the main veins on the upper surface of the blade	3	3	9	3	3	3	3	3
OIV 089	Mature leaf: Erect hairs on the main veins on the upper surface of the blade	1	1	9	1	1	1	1	1
OIV 090	Mature leaf: Density of prostrate hairs on petiole	1	1	9	1	1	1	1	1
OIV 091	Mature leaf: Density of erect hairs on petiole	1	1	5	1	1	1	1	1
OIV 093	Mature leaf: Ratio of stem length to main vein length	3	1	1	3	3	3	5	3
OIV 094	Mature leaf: Depth of upper side sinus	5	3	3	7	7	7	7	7
OIV 101	Woody shoot: Cross section	2	2	2	2	2	2	2	2
OIV 102	Woody shoot: Structure of the surface	1	1	1	1	1	1	1	1
OIV 103	Woody shoot: Main colour	2	2	2	2	2	2	2	2
OIV 104	Woody shoot: Lenticels	1	1	1	1	1	1	1	1

Table 1 (continued).Ampelographic descriptors and definitions

OIV 105	Woody shoot: Erect hairs on the nodes	1	1	1	1	1	1	1	1
OIV 106	Woody shoot: Erect hairs between the nodes	1	1	1	1	1	1	1	1
OIV 351	Woody shoot: Shoot vigour	5	5	5	5	5	5	5	5
OIV 352	Woody shoot: Growth of lateral shoots	5	5	5	5	5	5	5	5
OIV 353	Woody shoot: Length of internodes	5	5	5	5	5	5	5	5
OIV 354	Woody shoot: Thickness of internodes	3	3	3	3	3	3	3	3
OIV 151	Flower: Sex organs	3	3	4	3	4	3	3	3
OIV 152	Inflorescence: The node from which the 1st inflorescence comes	2	2	1	2	2	2	2	2
OIV 153	Inflorescences: Number of clusters per shoot	2	2	2	2	2	3	2	2
OIV 155	Inflorescence shoot: Fertility of lower buds (1st-3rd buds)	5	1	1	5	5	5	9	5
OIV 202	Cluster: Length (Excluding stem)	5	5	7	5	5	5	7	5
OIV 203	Cluster: Width	3	3	3	3	3	3	3	5
OIV 204	Cluster: Density	5	7	5	7	7	5	7	5
OIV 206	Cluster: The stem length of the bunch on the main shoot	1	1	1	1	1	1	1	1
OIV 207	Cluster: Lignification of the stem	1	1	1	1	1	1	1	1
OIV 208	Cluster: Shape	1	2	2	2	2	2	3	2
OIV 209	Cluster: Number of wings of the first bunch	2	2	2	2	2	2	2	2
OIV 502	Cluster: Single cluster weight	5	5	5	5	5	5	5	5
OIV 220	Berry: Length	5	3	3	5	5	5	5	5
OIV 221	Berry: Width	5	3	5	5	5	5	5	5
OIV 222	Berry: Uniformity of size	1	1	1	1	1	1	1	1
OIV 223	Berry: Shape	8	8	8	8	8	8	8	8
OIV 225	Berry: Skin colour	1	1	1	3	1	1	5	1
OIV 226	Berry: Uniformity of skin colour	1	1	1	1	1	1	1	1
OIV 227	Berry: Wax layer	1	1	1	1	1	1	1	1
OIV 228	Berry: Skin thickness	7	5	5	5	5	5	5	5
OIV 229	Berry: Hilum	1	1	1	1	1	1	1	1
OIV 231	Berry: Intensity of anthocyanin colouring in berry flesh	1	1	1	1	1	1	5	1
OIV 232	Berry: Juiciness of berry flesh	2	2	2	2	2	2	2	2
OIV 233	Berry: Must yield	5	5	5	5	5	5	5	5
OIV 235	Berry: Flesh firmness	2	2	2	2	2	2	2	2
OIV 236	Berry: Special aroma	1	1	1	1	1	1	1	1
OIV 238	Berry: Stalk length	3	3	3	3	3	3	3	3
OIV 240	Berry: Stalk break resistance	3	3	3	3	3	3	3	3
OIV 503	Berry: Single berry weight	3	3	3	3	3	3	3	3
OIV 241	Berry: Formation of seeds	3	3	3	3	3	3	3	3
OIV 242	Berry: Length of seeds	5	5	5	5	5	5	5	5
OIV 243	Berry: Weight of seeds	1	1	1	1	1	1	1	1
OIV 244	Berry: Transverse projections on the dorsal side of the seeds	2	2	2	2	2	2	2	2
OIV 301	Phenology: Time of bud burst	5	5	3	5	3	3	5	5
OIV 302	Phenology: Time to full bloom	7	5	5	7	1	3	9	9
OIV 303	Phenology: The time when the berries start to mature (veraison)	5	5	5	8	1	3	5	7
OIV 304	Phenology: Time of full physiological maturation of berries	7	7	5	7	1	3	7	7
OIV 305	Phenology: The time when shoots begin to lignify	7	7	5	7	1	3	7	7
OIV 306	Phenology: Autumn colour of leaves	2	2	2	2	2	2	2	2
OIV 501	Berry setting and berry quality: Fruit setting rate	3	3	3	5	3	3	5	3
OIV 505	Berry setting and berry quality: Sugar content of must	7	7	7	7	7	7	7	7
OIV 508	Berry setting and berry quality: pH in juice	7	7	7	7	7	7	7	7
OIV 601	Mature leaf: N1 vein length (cm)	7	7	7	7	7	7	7	7
OIV 602	Mature leaf: N2 vein length (cm)	7	5	7	5	5	5	5	5
OIV 603	Mature leaf: N3 vein length (cm)	7	7	7	7	7	7	7	7
OIV 604	Mature leaf: N4 vein length (cm)	7	7	9	3	9	9	9	9
OIV 605	Mature leaf: Distance from petiole sinus to upper side sinus (cm)	5	3	1	3	5	1	5	1
OIV 606	Mature leaf: Distance from petiole sinus to lower side sinus (cm)	4	8	3	8	6	5	5	7
OIV 607	Mature leaf: Measure of angle between N1 and N2 veins, measurement from first branching point	3	1	5	3	1	1	3	1
OIV 608	Mature leaf: Measure of angle between N2 and N3 veins, measurement from first branching point	7	1	3	5	3	5	7	3
OIV 609	Mature leaf: Measure of angle between N3 and N4 veins, measurement from first branching point	1	1	3	1	1	1	1	1
OIV 610	Mature leaf: Measure of the tangential angle to the tooth at the stem attachment point with N3 and the tip of N5	5	5	3	5	5	3	3	1
OIV 612	Mature leaf: Tooth length of N2 (cm)	3	3	5	7	1	9	3	1
OIV 613	Mature leaf: Tooth width of N2 (cm)	7	3	3	3	5	5	5	5
OIV 614	Mature leaf: Tooth length of N4 (cm)	7	9	1	7	5	3	1	7
OIV 615	Mature leaf: Tooth width of N4 (cm)	9	7	9	7	7	7	5	5
OIV 616	Mature leaf: Between the tooth at the tip of N2 and the tooth at the tip of the first branch off from N2 Number of teeth, including those at the margins	3	5	7	5	3	7	5	3
OIV 617	Mature leaf: Distance between the tooth at the tip of N2 and the tooth at the tip of the first branch leaving N2 (cm)	5	9	7	7	5	5	5	5

3.2. Similarity analysis

In the similarity analysis, 8 grape varieties defined in Aksaray province formed a double cluster. On one side of this structure, there was a single Çavuş grape variety, while the other 7 varieties were divided into two branches on the other side (Figure 1). In one of these branches, Mor Üzüm and Emir varieties took place together. The other branch was again divided into two sub-branches, one double and the other triple. While Aşeri and Sergi Karası were in the double arm, Kalecik Karası, Parmak Üzümü and Dimrit took place in the triple arm.

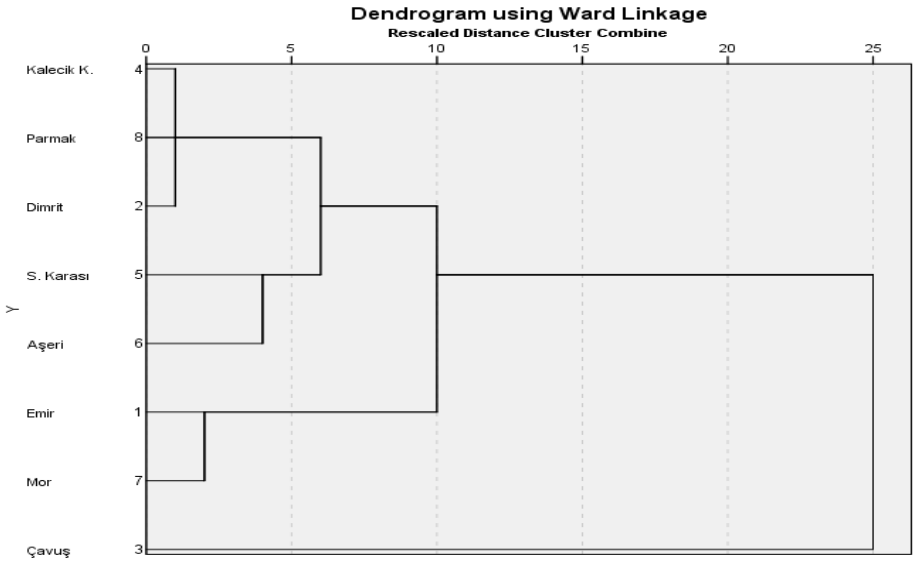

Figure 1. Clustering dendrogram of grape varieties according to 123 ampelographic identification OIV (2009)

Ak Dimrit, in the Turkey grapevine genetic resources list (Boz et al 2012), in the European Catalogue, in the International variety catalogue Vitis vinifera Linné Subsp. vinifera Variety number VIVC 673 and 3573, there are two records as a white Turkey variety. In these records, it is seeded, its usage area is for table and drying and it is flower type hermaphrodite. Synonyms registered in the international variety catalogue are Ak Üzüm, Beyaz Dimrit, Dimrit Ak Üzüm, Irızgı Kaleburcu, Irızkı. The owner of the variety is the Aegean Region Agricultural Research Institute with the code TUR001, the Çukurova University Faculty of Agriculture with the code TUR020 and the Manisa Viticulture Research Institute with the code TUR041. In previous studies, ampelographic and genetic characterization of this cultivar was performed by Vouillamoz et al (2006) and Sabir et al (2009).

Aşeri, is not registered in the Turkish grapevine genetic resources list (Boz et al. 2012) and in the European Catalogue. In the international variety catalogue, Vitis vinifera Linné Subsp. vinifera was recorded as Variety number VIVC 5319 and white coloured Turkey variety. In these records, it is seeded, its usage area is for table and drying and it is flower type hermaphrodite. The synonyms registered in the international variety catalogue are Ahmetbey, Hasandede, Hasandede Beyazı, Hasandede Gelber and Sungurlu. The owner of the variety is the Aegean Region Agricultural Research Institute with the code TUR001 and the Tekirdağ Viticulture Research Institute with the code TUR035. In previous studies, the genetic characterization of this variety was defined by Selli et al (2007).

Çavuş, Turkey grape vine genetic resources list (Boz et al 2012), the European Catalogue and the International variety catalogue Vitis vinifera Linné Subsp. vinifera Variety number VIVC 10196 is registered as a white Turkey variety. According to these records, the variety is seeded, the usage area is table, and the flower type is female. 82 synonyms are given in the international variety catalogue. Some of the synonyms are Ak Çavuş, Çavuşoğlu Ak Çavuş, Çavuşoğlu, Chouch Blanc, Rosaki, Çoban, Rosaki D'Anatolie. The beneficiary

of the variety is Çukurova University Faculty of Agriculture with the code TUR020, Directorate of Atatürk Horticultural Research Institute with the code TUR028, Tekirdağ Viticulture Research Institute Directorate with the code TUR035 and Manisa Viticulture Research Institute with the code TUR041. In addition, 32 institutions from different countries were registered as variety owners. In previous studies, ampelographic description of this variety, Kara (1990), genetic characterization, Adam-Blondon et al (2001), Ghaffari et al (2014), Laucou et al (2018) and genetic association mapping was done by Snoussi et al (2004).

Emir, Turkey grapevine genetic resources list (Boz et al 2012), Vitis vinifera Linné Susp. vinifera Variety number VIVC 13621 is registered as a white Turkey variety. In these records, it is seeded, its usage area is for wine, its flower type is hermaphrodite, and its synonym is White Grape. The owner of the variety is the Tekirdağ Viticulture Research Institute with the code TUR035. In previous studies, the genetic characterization of this variety was performed by Vouillamoz et al (2006) and Arroyo-García et al (2006).

Kalecik Karası, Turkey grapevine genetic resources list (Boz et al 2012), Vitis vinifera Linné Subsp. vinifera Variety number VIVC 5936 is registered as a black coloured Turkey variety. In these records, it is seeded, the usage area is wine, and the flower type is hermaphrodite. Synonyms are given as Ada Karası, Çal Karası, Hasandede, Horozkarası, Kara Kalecik and Papazkarası. The beneficiary of the variety is Çukurova University Faculty of Agriculture with the code TUR020, Tekirdağ Viticulture Research Institute with the code TUR035, and Manisa Viticulture Research Institute with the code TUR041. In a previous study, Sabir et al (2009) made the ampelographic and molecular description of this variety in Adana.

Mor Üzüm, is registered as Mor Büzgülü in the Turkey grape vine genetic resources list (Boz et al. 2012), but not in the European Catalogue. This variety is included in the encyclopaedic dictionary of grape varieties and synonyms (Galet & Grisard 2015). In the international variety catalogue, Vitis vinifera Linné Subsp. vinifera Variety number VIVC 1812 is registered as a crimson-pink, purple coloured Turkey variety. The usage area of this seeded variety is for wine and table, and the flower type is hermaphrodite. Synonyms are given as Bulut Üzümü, Buludi and Mor Üzüm. The beneficiary of the variety is the Aegean Region Agricultural Research Institute with the code TUR001, the Tekirdağ Viticulture Research Institute with the code TUR035 and the Manisa Viticulture Research Institute with the code TUR041. In a previous study, Kara (1990) made the ampelographic description of this variety in Tokat.

Parmak Üzümü, Turkey grape vine genetic resources list (Boz et al 2012), in the European Catalogue and the International variety catalogue Vitis vinifera Linné Subsp. vinifera Variety number VIVC 1286 is registered as a white Turkey variety. The use of this seeded variety is for table and drying and the flower type is hermaphrodite. Synonyms are Adıyaman Üzümü, Ağ Besni, Agbesni, Bandırma, Beyaz Bamba, Besni, Besni Beyazı, Peygamber and Zeyni. The beneficiary of the variety is the Aegean Region Agricultural Research Institute with the code TUR001, the Çukurova University Faculty of Agriculture with the code TUR020, the Atatürk Horticultural Research Institute with the code TUR028, the Tekirdağ Viticulture Research Institute with the code TUR035, and the Manisa Viticulture Research Institute with the code TUR041. In a previous study, Kara (1990) gave the ampelographic description of this variety, and its genetic characterization was done by Karatas et al (2019). The variety we describe is considered as table grape in the region.

Sergi Karası, Turkey grapevine genetic resources list (Boz et al 2012), the European Catalogue and the International variety catalogue Vitis vinifera Linné Subsp. vinifera Variety number VIVC 11508 is registered as a white colour Turkey variety. The use of this seeded variety is wine grapes, table grapes and dried grapes, and the flower type is female. 17 synonyms have been reported in the international variety catalogue and some of them are Antep Karası, İri Kara, Kara Sergi, Lanlan Karası, Mikeri, Mikeri Siyahı, Oğlak Karası, Orak Karası, Sergi Kara, Sergi Karası, Siyah Karnur and Tahannebi Siyahı. The beneficiary of the variety is Çukurova University Faculty of Agriculture with the code TUR020, Tekirdağ Viticulture Research Institute Directorate with the code TUR035 and Manisa Viticulture Research Institute with the code TUR041. In previous studies,

ampelographic and genetic characterization of this variety was performed by Sabir et al (2009) and Karatas et al (2019)

4. Discussion

Of the grape varieties produced in Aksaray, Aşeri and Mor Üzüm are not registered in the European Catalogue, but all varieties are listed in the international variety catalogue as Vitis vinifera Linné Subsp. vinifera are registered as Turkey varieties with different numbers. These grape varieties are included in the Turkey National Collection Vineyard variety list. The ampelographic and molecular descriptions of Ak Dimrit, Kalecik Karası and Sergi Karası cultivars were made by Sabir et al (2009) in Adana, and Kara (1990) ampelographic descriptions of Çavuş, Mor Üzüm and Parmak Üzümü varieties were made in Tokat.

Aşeri and Emir varieties were defined ampelographically for the first time. Although Ak Dimrit and Aşeri varieties are given synonymously in the international variety catalogue, significant differences were noted in our study. This difference is also reflected in the similarity dendrogram. The flower type of six of the eight grape varieties is hermaphrodite, and two of them (Çavuş and Sergi Karası) are functional females. According to the records of the international cultivar catalogue, the most common Aksaray cultivar on a global scale is Çavuş cultivar originating in Turkey, 70 synonyms of this cultivar and available in 36 institutions in 23 countries.

The flower types included in the previous records and descriptions of the cultivars we described were confirmed by field observations. In the Turkey Vine Genetic Resources list, many Parmak Üzümü genotypes (eg Gelin Parmağı, Kadın Paramağı, Hatun Parmağı) were mentioned. However, full ampelographic diagnoses of Parmak Üzümü types could not be reached. It was confirmed by field observations that the ecotype described in this study was grown around Aksaray, Nevşehir and Kayseri provinces.

It would be appropriate to protect the Aşeri, Emir and Parmak Üzümü varieties, which we described for the first time, in the grapevine genetic resources of Turkey.

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