Determination of Phytochemical Properties in Genetic Materials Collected from Grapevines (*Vitis* spp.) Found in Natural Flora of Ganos Mountains

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Natural flora of Ganos Mountains in the Thrace region has an old and well-established viticulture and is a spreading area of natural hybrids. This research was performed to determine properties of grape and cluster and phytochemical properties of berries of 103 grapevine genetic materials (*Vitis* spp.*)* adapted to natural flora of Ganos Mountains in Thrace region of Turkey during the 2014 growing season. But physical measurement and chemical analysis were performed only in grapes from 31 grapevines that carried clusters during their maturity periods. Results revealed that 29,04% of grapevines examined had table grape properties (Vv43, Vv52, Vv54, Vv56, Vv57, Vv61, Vv62, Vv83, Vv100) and 70,96% of grapevines examined had wine grape properties (Vv6, Vv18, Vv23, Vv24, Vv27, Vv44, Vv45, Vv51, Vv55, Vv59, Vv63, Vv65, Vv66, Vv74, Vv75, Vv84, Vv87, Vv88, Vv91, Vv92, Vv98, Vv101). In terms of phytochemical properties of grapes from examined grapevines, while the highest total phenolic compounds content and total anthocyanin content in grapes were respectively 5609,44 mg/kg for Vv88 number of grapevine and 2602,56 mg/kg for Vv74 number of grapevine; the highest total tannin content in grapes was recorded for Vv18 number of grapevine as 5557,10 mg/kg. Since the natural flora of Ganos Mountains in Thrace region is a place where the viticulture has been conducted intensely for many years; identification of phytochemical properties in grapes of genetic materials obtained from this region is of importance in terms of future studies.

Key Words: *Vitis* spp., forgotten grape varieties, mountain, natural flora, phytochemical properties

Ganos Dağları Doğal Florasında Bulunan Asmalardan (*Vitis* spp.) Toplanan Genetik Materyallerde Fitokimyasal Özelliklerin Belirlenmesi

Trakya bölgesinde yer alan Ganos Dağları doğal florası eski ve köklü bir bağcılık kültürüne sahip olup, burası doğal melezlerin yayılım alanıdır. Bu araştırma 2014 yılı vejetasyon döneminde Türkiye'nin Trakya bölgesi Ganos Dağları doğal florasına adapte olan 103 adet asma genetik materyalinin (*Vitis* spp.) tane ve salkım özellikleri ile meyvelerin fitokimyasal özelliklerini belirlemek amacıyla gerçekleştirilmiştir. Ancak fiziksel ve kimyasal analizler olgunluk dönemlerinde üzerinde salkımları bulunan 31 adet asmanın meyvelerinde yapılmıştır. Araştırma sonuçlarına göre, incelenen asmalardan %29,04'nün meyvelerinin sofralık üzüm özelliği (Vv43, Vv52, Vv54, Vv56, Vv57, Vv61, Vv62, Vv83, Vv100) ve %70,96'nın ise şaraplık üzüm özelliği (Vv6, Vv18, Vv23, Vv24, Vv27, Vv44, Vv45, Vv51, Vv55, Vv59, Vv63, Vv65, Vv66, Vv74, Vv75, Vv84, Vv87, Vv88, Vv91, Vv92, Vv98, Vv101) taşıdığı görülmüştür. İncelenen asmalarda meyvelerin fitokimyasal özelliklerine bakıldığında; en yüksek toplam fenolik bileşik ve toplam antosyanin miktarlarının 5609,44 mg/kg ve 2602,56 mg/kg değerleri ile sırasıyla Vv88 ve Vv74 no'lu asmaların meyvelerinden; en yüksek toplam tanen miktarının ise 5557,10 mg/kg değeri ile Vv18 no'lu asmanın meyvelerinden elde edildiği tespit edilmiştir. Trakya bölgesinde yer alan Ganos dağları doğal florası bağcılığın uzun yıllardır yapıldığı bir yer olduğu için, bu bölgeden elde edilen genetik materyallerin meyvelerinde fitokimyasal özelliklerin belirlenmesi gelecekte yapılacak çalışmalar açısından önem taşımaktadır.

Anahtar Kelimeler: *Vitis* spp., unutulmuş üzüm çeşitleri, dağ, doğal flora, fitokimyasal özellikler

Introduction

Turkey being located at the junction of two primary plant gene centers has a very old and rich grapevine germplasm comprising over 1500 varieties (Ergül et al., 2006; Şelli et al., 2007). Turkey is composed of nine different viticulture regions and each region has local varieties that are different in color, taste, grape shape (Ergül et al., 2006).

Among the viticulture regions of Turkey, Marmara Region is a major one that produces 153.613 tons/year of fresh grape in 13.922 ha (Söylemezoğlu et al., 2015).

Different ecological conditions existing in Marmara Region allow the cultivation of early and late maturing grape varieties possible. While wine grape varieties are generally grown in the coastal belt of Marmara Region known as Trakya (sub-region), mid-season table grape varieties are grown in the inner parts of region and late-season table grape varieties are grown in the eastern part of the region (Çelik, 2011).

Major grape growing provinces of Marmara Region are in order of Tekirdağ, Kırklareli, Edirne, Çanakkale, Kocaeli and Istanbul (Çelik et al., 1998; Çelik, 2011). Among these provinces, viticulture has long been performed in Tekirdağ.

The Ganos Mountains are located within the boundaries of Tekirdağ province that have an important place in terms of viticulture and many of forgotten grape varieties have been successfully cultivated in the area.

The phytochemicals have considerable roles on fruit quality characteristics and grapes contain a variety of phytochemicals (Yang and Xiao, 2013). The phenolic compounds are broadly distributed in different parts of plants (Antoniolli, 2015). There are approximately 8.000 different phenolic compounds which, according to their chemical structure, are divided in classes, including phenolic acids, flavonoids, stilbenes and tannins (Balasundram et al., 2006).

The phytochemical composition of grapes is influenced by different factors such as variety, ecological factors and viticulture practices (Yang and Xiao, 2013; Kok et al., 2010; Kok, 2011; Kok et al., 2013; Kok, 2016).

The main purpose of current study was to determine phytochemical properties of grapes from previously identified grapevines in natural flora of Ganos Mountains, Turkey.

Materials and Methods

Research site and identification of grapevine genetic materials

This study was carried out during the growing season of 2014 in natural flora of Ganos Mountains in Tekirdağ, Turkey.

In the research, firstly, natural flora of Ganos Mountains within boundaries of Tekirdağ province was carefully surveyed and a total of 103 grapevines were identified. Grape samples were collected from grapevines found in seven different locations that were Karaevlialtı, Kumbağ, Naip-Işıklar, Mermer-Yeniköy, Uçmakdere, Gaziköy, Hoşköy-Mürefte-Şarköy, representing research region. In these 103 identified genetic materials, only 34 grapevines were found to be carrying flower clusters and these were immediately marked. But, clusters of some grapevines subsequently disappeared by fungal diseases and bird damages towards harvest times in 2014 growing season. Consequently, number of grapevines carried grape clusters decreased to 31 at the harvest time and all measurements and chemical analysis were conducted for these 31 grapevines. Among the grapevines, 14 grapevines had white grapes including Vv6, Vv18, Vv43, Vv45, Vv51, Vv52, Vv63, Vv65, Vv66, Vv83, Vv84, Vv92, Vv98 and Vv100. On the other hand, 17 grapevines had colored grapes (Vv23, Vv24, Vv27, Vv44, Vv54, Vv55, Vv56, Vv57, Vv59, Vv61, Vv62, Vv74, Vv75, Vv87, Vv88, Vv91 and Vv101). When the grapes reached at their maturity periods, grape samples were collected and physical measurement and chemical analysis were performed in laboratory conditions.

Physical measurements and chemical analysis

In present study, cluster length, cluster width, cluster weight, berry length, berry width, berry weight and berry firmness were determined and grouped according to descriptor list of OIV (International Organization of Vine and Wine). Classification of grape for utilization was determined according to Rolle et al. (2015) (Table 2) and Melo et al. (2014) (Table 3).

Total soluble solids content, total acid content and pH of grape must; total phenolic compounds content, total anthocyanin content and total tannin content of berry and berry skin color were determined.

Determination of total phenolic compounds content, total anthocyanin content and total tannin content were performed according to spectrophotometric methods informed by Singleton et al. (1978), Di Stefano and Cravero (1991) and Anonymous (1990), respectively.

Measurements of skin colors of berry samples was performed by Hunter-Lab colorimeter (Hunter Lab DP-9000 color, Virginia, USA). Color was expressed in Hunter Lab Units L* (lightness) and chromaticity parameters b* (yellow-blue) and a* (red-green) according to CIELab color system.

Berry firmness of table grapes was measured with an analog penetrometer (FT 02, Wagner Instruments, Riverside, USA) and measurement results were expressed as g/mm.

Descriptor list of OIV (International Organization of Vine and Wine) presented in Table 1 was used for assessing of cluster size, grape size and must properties (Anonymous, 2009).

Classification of grape for utilization was done according to Rolle et al. (2015) (Table 2) and Melo et al. (2014) (Table 3).

Table 1**.** OIV's descriptor list for properties of cluster, berry and must

Çizelge 1. Salkım, tane ve şıra özellikleri için OIV tanımlama listesi

Descriptor and code	Note				
	1	3	5	7	9
Cluster length, 202	Very short	Short	Medium	Long	Very long
	(8 cm)	(12 cm)	(16 cm)	(20 cm)	(24cm)
Cluster width, 203	Very	Narrow	Medium	Wide	Very wide
	(4 cm)	(8 cm)	(12 cm)	(16 cm)	(24cm)
Cluster weight, 502	Very low	Low	Medium	High	Very high
	(100 g)	(300 g)	(500 g)	(700 g)	(900 g)
Berry length, 220	Very short	Short	Medium	Long	Very long
	(8 mm)	(13 mm)	(18 mm)	(23 mm)	(28 mm)
Berry width, 221	Very	Narrow	Medium	Wide	Very wide
	(8 mm)	(13 mm)	(18 mm)	(23 mm)	(28 mm)
Berry weight, 503	Very low	Low	Medium	High	Very high
	(1 g)	(3 g)	(5 g)	(7 g)	(9 g)
Total soluble solids, 505	Very low	Low	Medium	High	Very High
	(%12)	(%15)	(% 18)	(% 21)	(%24)
Total acid, 506	Very low	Low	Medium	High	Very high
	(<3 g/L))	(6 g/L)	(9 g/L)	(12 g/L)	(>15 g/L)

Table 2. Classification table of berry sizes for table grapes (Rolle et al., 2015)

Çizelge 2**.** Sofralık üzümler için tane büyüklüklerinin sınıflandırılması (Rolle et al., 2015)

Table grape	Berry width (mm)		
	16-17	18-19	20-21
	(Small)	(Medium)	(High)

Table 3. Classification table of berry sizes for wine grapes (Melo et al., 2014)

Çizelge 3. Şaraplık üzümler için tane büyüklüklerinin sınıflandırılması (Melo et al., 2014)

Wine grape	Berry width (mm)		
	<13	13-14	>14
	(Small)	(Medium)	(High)

Results and Discussion

Physical properties

Cluster size is crucial for acceptance of table grapes and cluster attributes of grapes are influenced by numerous factors (Hanoock, 2008). But in this study, cluster characteristics of examined grapevines were adversely affected by prevailing factors in research areas such as bird damages and fungal diseases. Therefore, cluster characteristics were not considered according to OIV's descriptors.

The highest mean of cluster length was 29,00 cm for Vv66 number of grapevine, while the lowest mean was 5,80 cm for Vv88 number of grapevine.

As shown in Table 4, cluster width means varied from 3,45 (Vv88 number of grapevine) to 10,75 cm (Vv56 number of grapevine with regard to cluster weight displayed in Table 4, while the highest mean of cluster weight was 235,00 g for Vv66 number of grapevine, the lowest mean was obtained from Vv6 number of grapevine (1,99 g).

One of the major factors determining table grape quality is berry size (Strydom, 2014). As to berry length represented in Table 4, the highest mean of berry length was 21,34 mm for Vv62 number of grapevine and the lowest mean was obtained from Vv91 number of grapevine (9,69 mm). According to OIV's descriptor code 220; 19,35% of grapes examined was in very short berry length, 54,83% was in short berry length and 25,82% was in medium berry length group (Table 1).

The highest mean of berry width was 18,36 mm for Vv56 number of grapevine and the lowest mean was 9,03 mm for Vv91 number of grapevine (Table 4). According to OIV's descriptor code 221 (Table 1); in terms of berry width it was determined that 25,81% of grapes had very narrow, 61,29 % had narrow and 12,90% had medium width berries.

Regarding berry weight illustrated in Table 4, while the highest mean of berry weight was 4,75 g for Vv62 number of grapevine, the lowest mean was 0,57 g for Vv91 number of grapevine. According to OIV's descriptor code 503 (Table 1); 70,96% of grapes examined had berries fall into very low weight class and 29,04% had berries fall into low weight class.

Concerning berry firmness, the highest mean of berry firmness was 896,00 g/mm for Vv57 number of grapevine, the lowest mean was obtained from Vv87 number of grapevine (155,00 g/mm) (Table 4).

According to classification of berry sizes for table grapes (Rolle et al., 2015) and wine grapes (Melo et al., 2014) presented in Table 2 and 3, it was determined that 29,04% of grapes examined had table grape properties (Vv43, Vv52, Vv54, Vv56, Vv57, Vv61, Vv62, Vv83, Vv100) and 70,96% of grapes examined had wine grape properties (Vv6, Vv18, Vv23, Vv24, Vv27, Vv44, Vv45, Vv51, Vv55, Vv59, Vv63, Vv65, Vv66, Vv74, Vv75, Vv84, Vv87, Vv88, Vv91, Vv92, Vv98, Vv101 (Table 4).

With regard to berry sizes, it was observed that 55,55% of grapes examined were in small size group and 44,45% were in medium size group (Table 4). On the other hand, among the wine grapes, the percentage of wine grapes with small size berries (13mm) was 36,36% while percentage of those with medium size berries (13-14mm) was 9,09%. And 54,55% of wine grapes had berries wider than 14 mm (Table 4).

Chemical properties

The organic acids together with sugars in the grape's composition contribute to the formation of characteristic flavor and fragrance of grape. As displayed in Table 4, the highest mean of total soluble solids content was 25,30% for Vv44 number of grapevine and the lowest mean was 9,80% for Vv100 number of grapevine. According to OIV's descriptor code 505 (Table 1); 16,10% of examined grape must had very low total soluble solids content, 16,12% had low total soluble solids content, 35,48% had medium total soluble solids content, 41,93% had high total soluble solids content and 6,45% had very high total soluble solids content.

In the study, the highest mean of total acid content was measured for Vv92 number of grapevine (48,00 g/L) and the lowest means were obtained from Vv23 and Vv24 number of grapevine (3,38 g/L) (Table 4). According to OIV's descriptor code 506 (Table 1), the corresponding percentages for low, medium, high and very high total acid content in must were 16,13%, 32,26% 19,35% and 32,26%, respectively.

While the highest mean of pH in grape must was 3,69 for Vv100 number of grapevine, the lowest mean was recorded for Vv91 number of grapevine (2,16) (Table 4).

Table 4. Assessing of physical and chemical properties of grapes from grapevines found in natural flora of Ganos Mountains according to OIV's descriptor list
Çizelge 4. Ganos dağları doğal florasında bulunan asmalardan elde edilen üzümlerin fiziksel ve kimyasal özelliklerininin OIV'nin tanımlama listesine göre değerlendirilmesi

Properties	**Accessions**									
	#Vv6	**#Vv18**	**#Vv23**	**#Vv24**	**#Vv27**	**#Vv43**	**#Vv44**	**#Vv45**	**#Vv51**	**#Vv52**
Cluster length (cm)	8,15	14,65	14,55	14,15	8,40	25,30	16,30	16,10	14,80	19,80
Cluster width (cm)	5,35	5,65	6,35	4,00	4,55	5,90	8,60	8,60	8,95	10,20
Cluster weight (g)	1,99	11,47	4,23	2,40	17,23	50,38	50,67	116,67	153,53	115,50
Berry length (mm)	15,71	16,98	15,28	14,78	18,15	20,42	18,24	15,48	16,02	17,78
Berry width (mm)	13,90	15,02	12,43	12,63	14,18	18,32	15,28	13,91	15,28	16,01
Berry weight (g)	2,23	3,04	2,18	2,56	3,03	4,46	2,93	2,00	2,52	2,97
Berry firmness (g/mm)	280,00	280,00	330,00	203,00	540,00	540,00	492,00	390,00	415,00	441,00
Total soluble solids content (%)	20,10	19,80	20,10	21,70	18,60	14,20	25,30	18,20	16,90	18,20
Total acid content (g/L)	7,43	5,25	3,38	3,38	4,50	17,25	13,50	12,00	13,50	7,50
pH	3,38	3,28	3,35	3,31	3,29	2,83	3,30	2,85	2,72	3,11
Total phenolic compounds content (mg/kg)	1093,72	2857,19	2145,04	1510,09	2495,00	2471,51	3107,38	659,87	1427,71	1427,71
Total anthocyanin content (mg/kg)	--	--	7,54	71,29	288,04	--	1788,63	--	--	--
Total tannin content (mg/kg)	4533,29	5557,10	4300,51	4606,87	3234,89	2476,82	2608,30	2959,83	3017,53	3115,47
a* value of berry skin	3,12	0,79	5,50	4,54	2,22	-2,70	1,04	-1,54	-1,51	-1,04
b* value of berry skin	14,47	8,33	8,06	8,90	-1,39	12,70	0,33	10,97	8,49	8,70
L* value of berry skin	35,54	36,17	34,88	35,20	27,63	39,60	24,18	35,92	35,33	35,42

Table 4. Assessing of physical and chemical properties of grapes from grapevines found in natural flora of Ganos Mountains according to OIV's descriptor list (continued)
Çizelge 4. Ganos dağları doğal florasında bulunan asmalardan elde edilen üzümlerin fiziksel ve kimyasal özelliklerininin OIV'nin tanımlama listesine göre değerlendirilmesi (devamı)

Properties	**Accessions**									
	#Vv54	**#Vv55**	**#Vv56**	**#Vv57**	**#Vv59**	**#Vv61**	**#Vv62**	**#Vv63**	**#Vv65**	**#Vv66**
Cluster length (cm)	12,10	11,85	9,50	12,60	13,00	16,10	16,80	11,90	14,95	29,00
Cluster width (cm)	8,45	8,30	10,75	9,40	9,05	9,65	8,60	7,20	7,90	10,20
Cluster weight (g)	63,06	75,99	78,79	67,64	58,63	188,22	177,84	74,90	120,75	235,00
Berry length (mm)	16,40	13,86	18,08	17,32	14,68	17,29	21,34	16,11	14,88	11,26
Berry width (mm)	16,56	14,32	18,36	17,63	15,39	17,50	18,25	14,48	14,64	12,10
Berry weight (g)	2,87	2,01	4,11	3,65	2,57	3,91	4,75	2,84	2,53	1,17
Berry firmness (g/mm)	777,00	632,00	655,00	896,00	682,00	495,00	502,50	478,75	315,00	240,00
Total soluble solids content (%)	16,20	17,20	17,00	15,90	15,40	19,40	18,90	14,70	18,40	20,20
Total acid content (g/L)	7,50	6,75	9,75	15,75	9,75	6,75	8,25	9,00	5,25	7,50
pH	3,02	2,93	2,78	2,67	2,94	3,17	2,94	3,24	3,64	2,99
Total phenolic compounds content (mg/kg)	2003,60	2543,49	3335,33	1703,66	3011,40	2903,42	2147,57	2495,49	1415,72	2435,51
Total anthocyanin content (mg/kg)	223,00	394,89	1983,76	385,60	288,04	1324,05	74,33	--	--	--
Total tannin content (mg/kg)	2247,38	2052,83	1979,04	2417,78	2239,33	1968,30	2468,76	4025,70	2582,81	2440,59
a* value of berry skin	0,71	1,46	1,15	0,86	1,20	0,47	6,41	-0,60	5,10	3,27
b* value of berry skin	-1,00	-0,93	0,06	-0,75	-0,95	0,16	2,59	27,36	15,20	14,66
L* value of berry skin	27,81	29,56	26,55	27,40	28,40	25,19	31,10	39,96	43,34	37,62

Table 4. Assessing of physical and chemical properties of grapes from grapevines found in natural flora of Ganos Mountains according to OIV's descriptor list (continued)
Çizelge 4. Ganos dağları doğal florasında bulunan asmalardan elde edilen üzümlerin fiziksel ve kimyasal özelliklerininin OIV'nin tanımlama listesine göre değerlendirilmesi (devamı)

Properties	**Accessions**										
	#Vv74	**#Vv75**	**#Vv83**	**#Vv84**	**#Vv87**	**#Vv88**	**#Vv91**	**#Vv92**	**#Vv98**	**#Vv100**	**#Vv101**
Cluster length (cm)	7,40	9,70	12,10	12,10	8,95	5,80	9,75	7,95	17,80	18,50	13,10
Cluster width (cm)	4,15	4,90	7,35	6,10	5,30	3,45	6,90	5,25	7,30	9,85	8,05
Cluster weight (g)	4,40	6,68	118,63	71,44	4,12	7,38	2,83	3,59	170,39	152,41	100,81
Berry length (mm)	11,03	15,91	18,51	16,38	10,78	10,44	9,69	9,79	18,92	19,59	15,18
Berry width (mm)	10,10	15,04	16,74	14,38	10,56	10,54	9,03	10,00	14,63	18,22	14,98
Berry weight (g)	0,77	2,49	3,40	2,37	0,92	0,89	0,57	0,75	2,97	4,73	2,21
Berry firmness (g/mm)	312,50	580,00	512,50	477,50	155,00	187,50	225,00	695,00	451,25	432,50	360,00
Total soluble solids content (%)	19,10	18,00	18,20	20,90	15,80	17,00	14,00	12,00	17,20	9,80	15,80
Total acid content (g/L)	9,75	15,75	6,75	6,75	21,00	24,00	38,25	48,00	11,25	9,75	22,50
pH	2,74	2,35	3,07	3,02	2,21	2,57	2,16	2,31	2,68	3,69	2,57
Total phenolic compounds content (mg/kg)	4788,09	2664,46	2027,59	2243,55	5372,25	5609,44	1655,67	1523,70	1103,78	1235,75	2963,41
Total anthocyanin content (mg/kg)	2602,56	146,50	--	--	640,08	682,21	74,33	--	--	--	232,29
Total tannin content (mg/kg)	2883,57	2780,49	2915,56	2617,70	3624,84	3514,79	2574,76	3021,55	2445,96	2421,80	1906,58
a* value of berry skin	6,38	10,56	-1,20	-0,85	0,98	1,98	8,03	5,87	-0,04	7,35	4,93
b* value of berry skin	5,70	7,45	9,71	14,61	-1,83	0,97	6,73	13,77	9,43	9,29	2,06
L* value of berry skin	28,44	30,10	34,91	39,67	29,40	24,44	31,35	40,47	36,15	35,19	28,03

Grape quality is influenced by juice pH in terms of color and taste (Çelik, 2011).

In this study, the highest mean of total phenolic compounds content was 5609,44 mg/kg for Vv88 number of grapevine and the lowest mean was obtained from Vv45 number of grapevine (659,87 mg/kg) (Table 4). According to results, 70,96% of grapes examined in the study had a phenolic compound within the stated ranges in terms of phenolic compounds content. In grape cultivars, contents of phenolic compounds vary from 1670 to 9870 mg/kg (Souquet, 1996). Grapevine species and cultivars are the richest species among the plants in terms of phenolic compounds (Gao and Mazza, 1995; Kok and Bal, 2017). Phenolic compounds contents in grapes can vary depend on not only grape varieties but also maturity degree of variety, environmental factors such as climate, soil and cultural practices (Ribereau-Gayon et al., 2000).

The highest mean of total anthocyanin content was 2602,56 mg/kg for Vv74 number of grapevine and the lowest mean was recorded for Vv23 number of grapevine (7,54 mg/kg) (Table 4). It was found that 64,70% of colored grapes had total anthocyanin content below 500 mg/kg whereas in 35,30% of colored grapes, the mean was found to be between 500 and 3000 mg/kg. The largest and most important group of phenolic compounds found in grapes is anthocyanins responsible for skin color (Cemeroğlu et al., 2001). It is stated that contents of anthocyanin in grape cultivars of *V. vinifera* L. are between 500 and 3000 mg/kg (Blouin and Guimberteau, 2000).

In current research, the highest mean of total tannin content was obtained from 5557,10 mg/kg for Vv18 number of grapevine, the lowest mean was obtained from Vv101 number of grapevine (1906,58 mg/kg) (Table 4). Tannins are complex structures composed of esters of sugars with phenolic compounds founds in grape skins, pedicels and seeds (Harbertson et al., 2002).

Regarding a* and b* value of berry skin displayed in Table 4, it was determined that a* values varied from -2,70 (Vv43 number of grapevine) to 10,56 (Vv75 number of grapevine) and b* values changed from -1,83 (Vv87 number of grapevine) to 27,36 (Vv63 number of grapevine). In terms of L* value of berry skin, the highest mean was 43,34 for Vv65 number of grapevine and the lowest mean was recorded for Vv44 number of grapevine (24,18).

Conclusions

In present study, it was determined that 29,04% of grapevines found in natural flora of Ganos Mountains had grapes with table properties (Vv43, Vv52, Vv54, Vv56, Vv57, Vv61, Vv62, Vv83, Vv100). However, 70,96% of grapevines had grapes with wine properties (Vv6, Vv18, Vv23, Vv24, Vv27, Vv44, Vv45, Vv51, Vv55, Vv59, Vv63, Vv65, Vv66, Vv74, Vv75, Vv84, Vv87, Vv88, Vv91, Vv92, Vv98, Vv101).

Phytochemical properties, which are considered to be important quality elements for grapes, have three important components including phenolic compounds, anthocyanins and tannins. In terms of these three criteria, the highest total phenolic compounds in grape was recorded for Vv88 number of grapevine. While the highest total anthocyanin content was determined for Vv74 number of grapevine, the highest total tannin content was obtained from Vv18 number of grapevine. However, it should not be noted that actual berry sizes, cluster sizes and properties of phytochemical in grapes obtained from grapevines will show themselves after these grapevines are cultivated.

This study presents results to establish a background for further studies concerning the natural flora of Ganos Mountains in Thrace region where the viticulture has been conducted intensely for many years. Identification of phytochemical properties in grapes of genetic materials obtained from this region is of importance in terms of future studies.

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