



# Some physical and chemical properties of new sweet cherry Davraz

## Yeni Kiraz Çeşidi Davraz®'ın Bazı Fiziksel ve Kimyasal Özellikleri

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### To cite this article:

Sarıs, H.C., Demirtaş, İ., Aksu, M. & Altındal, M. (2019). Some physical and chemical properties of new sweet cherry Davraz. Harran Tarım ve Gıda Bilimleri Dergisi, 23(4): 391-399.

DOI: 10.29050/harranziraat.536829

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**Received Date:**  
07.03.2019

**Accepted Date:**  
17.09.2019

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### ABSTRACT

The Davraz® new sweet cherry cultivar having similar quality properties with '0900 Ziraat' is expected to provide advantages in earlier season supply to sweet cherry markets with the production in warm regions of Turkey. In this study, it was aimed to determine the differences between the fruit quality characteristics and some mineral contents between 'Davraz' and '0900 Ziraat' grafted on semi dwarf and Gisela 6 sweet cherry rootstock. In this study conducted in 2014-2015 at the Fruit Research Institute (Eğirdir-Isparta-Turkey), the Davraz fruit on the Gisela 6 was larger than '0900 Ziraat' and its fruit stalks longer and heavier than 0900 Ziraat fruit stalks advantageous for export and storage. Other fruit quality characteristics were similar to '0900 Ziraat' fruit. There were no significant differences between fruit firmness, chemical properties and colour values in cultivars. As an alternative to '0900 Ziraat', the 'Davraz' is very promising for both domestic and foreign markets with handling time, and it is concluded that it is important both for the producer and the national economy when it is grown with precious rootstock, especially Gisela 6.

**Key Words:** Cracking, Fruit colour, Fruit quality, Mineral content, *Prunus avium* L.

### ÖZ

Türkiye'de 'Davraz' ismi ile tescillendirilmiş yeni kiraz çeşidinin 0900 Ziraat ile aynı kalitede olması, özellikle Türkiye'nin sıcak bölgelerinde yetiştirilmesi, erkenci üretim için oldukça büyük bir avantaj kazandıracağı düşünülmektedir. Bu sebeple, bu çalışmada 'Davraz' çeşidi ile yarı bodur ve üzerindeki çeşidi erken meyveye dönüştürme özellikleri ile önemli olan Gisela 6 kiraz anacı ile yetiştirilmiş 'Davraz' ve '0900 Ziraat' kiraz çeşitleri arasındaki meyve kalite özellikleri ile bazı mineral madde içerikleri arasındaki farklılıkları belirlemek amaçlanmıştır. 2014-2015 yılları arasında Meyvecilik Araştırma Enstitüsü'nde (Eğirdir-Isparta-Turkey) yapılan bu çalışma ile Gisela 6 anacı üzerindeki Davraz çeşidi, 0900 Ziraat çeşidine göre daha iri meyveler oluşturmuş olup, sap uzunluğu ve kalınlığı 0900 Ziraat çeşidine göre daha fazladır ki bu da yola dayanıklılık, raf ömrünün uzaması ve muhafazası için ve dolayısıyla ihracat söz konusu olduğunda daha avantajlı bir çeşit olarak karşımıza çıkmıştır. Diğer meyve kalite özellikleri 0900 Ziraat kiraz meyvelerinin özellikleri ile benzer gerçekleşmiştir. Çeşitler arasında renk, kimyasal meyve özellikleri ve meyve sertliği gibi parametrelerde istatistiksel önemli farklılık bulunmamıştır. Çalışma ile 0900 Ziraat çeşidine alternatif olarak 'Davraz' çeşidinin hem iç hem de dış pazar için oldukça ümitvar bir çeşit olduğu ve özellikle Gisela 6 anacı gibi daha erkenci bir anaç ile yetiştirildiğinde de hem üretici hem de milli ekonomi açısından önemli olduğu sonucuna varılmıştır.

**Anahtar Kelimeler:** Çatlama, Meyve rengi, Meyve kalitesi, Mineral içerik, *Prunus avium* L.

### Introduction

Although a small portion of fruit production in Turkey subject to the export, it varies with fruit

species. In these fruit species, sweet cherry has taken an opportunity in foreign markets of Turkey and it has become an important export species. Although it has a wide span in the world, climate

is an important limiting factor for sweet cherry production. Both climatic suitability to be origin and lower supply of the world's sweet cherries than the demand, it is a great advantage for Turkey in the sweet cherry industry. Turkey has become the market leader in sweet cherry production using this advantage and even in the European Union market (Burak et al., 2002), today the concept of 'Turkish Sweet Cherry' has been formed (Kaska, 2001). Even though there are about 100 varieties in the world production of cherries, one of the most prominent export varieties is 0900 Ziraat called as 'Turkish Sweet Cherry' (Kunter et al., 2009). Sweet cherry cultivation has been carried out in Kemalpaşa (İzmir), Honaz (Denizli), Salihli (Manisa), Uluborlu (Isparta), Sultandağı (Afyon) and Akşehir (Konya) for many years. The sweet cherries grown and exported in these regions are named as 0900 Ziraat, Salihli, Uluborlu, Akşehir Napoleon and Dalbastı. These sweet cherries, which are very close to each other in terms of fruit characteristics, have been mentioned in different names, suggesting that they are the same or different varieties. In order to eliminate the name or cultivar confusion, the selection of these cherries was carried out by Fruit Research Institute (in Egirdir / Turkey) in the years 1996-2009. As a result of the study, it was revealed that 0900 Ziraat and similar cherries were not all the same and those who were superior in terms of yield and quality were selected. In the evaluations made, the genotypes 4218 and 4223 were selected as 5-6 days earliness, 4203 and 4206 types were selected as high yield efficiency and 3202 were chosen for their superior quality characteristics. (Demirtas et al., 2006). From this study, the genotype 4218 were presented to registration with the regular flowering and fruiting and being earlier handling time than the 0900 Ziraat and it was registered as 'Davraz' in 2011. It is inevitable that the cultivation of Davraz especially in the warm regions of Turkey will give a great advantage for early production. For this reason, many studies have been carried out and continued with Davraz. In this study, it was aimed

to determine the quality of fruit and some mineral contents differences between 'Davraz' and '0900 Ziraat' on Gisela 6 rootstock, which is important with the characteristics of semi-dwarf and precious. Within the scope of this aim, it has been hypothesized to determine whether the Davraz will produce fruit of different quality than 0900 Ziraat on semi-dwarf rootstock.

## Materials and Methods

### *Plant material*

In this study, Davraz and 0900 Ziraat (*Prunus avium* L.) trees grafted on Gisela 6 which were planted with 5x3 m distances in 2011 were selected as plant material. The study was carried out with 4 replications and one tree per replication in randomized block design at the Fruit Research Institute, Egirdir, Turkey in 2014-2015. In trial area, there were Regina, Starks Gold, Prime Giant etc. cultivars as pollinizer. All cultural practices (pruning, irrigation, fertilization, etc.) have been carried out in common applications.

### *Fruit quality*

In determining the fruit quality; fruit width (mm), fruit length (mm), fruit weight (g), fruit stalk weight (g), fruit stalk length (mm), fruit firmness (N), fruit colour ( $L^*$ ,  $a^*$ ,  $b^*$ ,  $C^*$  and  $H^\circ$ ), soluble solids (%), pH and titratable acidity (%) were measured. The measurements were made in each replicate with 20 fruit. Fruit flesh firmness (N) was measured by pricking with a tip having a diameter of 6 mm up to a depth of 8 mm at a speed of 10 cm/min. In the measurement, a texture analyzer (Guss FTA Type GS14 Fruit-Texture Analyser Model, Strand, South Africa) was used. Total soluble solids (%) and titratable acidity (g/100 mL) were measured by digital refractometer (model, country) and digital buret and digital pH meter (Hanna pH 330 model, WTW, Germany), respectively, after squeezing. For measuring fruit skin colour, a Minolta CR-400 (Konika Minolta Inc., Japan) chroma meter was used. In the evaluation of fruit skin color, the values of illumination ( $L^*$ ), red-green ( $a^*$ ) and

yellow-blue ( $b^*$ ), hue angle ( $h^\circ$ ), and chroma ( $C^*$ ) were taken into consideration.

#### Fruit cracking

In order to determine cracking index, water uptake and fruit quality characteristics, care was taken to pick fruit that were representative of the trees average fruit size and maturity. The fruits were harvested between 8:00-10:00 AM and were immediately transported to the laboratory.

The susceptibility to fruit cracking was assessed in the laboratory by immersion of 50 fruit in distilled water at  $20 \pm 1^\circ\text{C}$  for 6 h; the numbers of cracked fruit were counted every two hour. The cracking index was calculated according to the method developed by Verner (1957) and modified by Christensen (1972). Fruit cracking index was calculated by the following formula:  $CI = [(5a+3b+c).100]/250$ ; where: a-the number of cracked fruits after 2 hours, b-the number of cracked fruits after 4 hours, c-the number of cracked fruits after 6 hours (Stojanović et al., 2013). In addition to cracking index, total cracking (%) on tree in harvest time was determined.

#### Mineral analysis

To determine the mineral contents, sweet cherry fruits washed again with detergent and then rinsed them with tap and deionized water to eliminate surface contamination. Fruits were dry ashed following the method of Pinta and DeWele (1975), and then phosphorus, potassium, calcium, magnesium, iron, copper, manganese, zinc and boron (P, K, Ca, Mg, Fe, Cu, Mn, Zn, B) concentrations were determined by Inductively Coupled Plasma Atomic Emission spectrometry (Perkin Elmer Optima, Germany) method. Nitrogen was determined by the Kjeldahl

(Rerhardt, Berlin, Germany) procedure (Kacar and Inal, 2008). The resulting data were expressed as a percentage of dry tissue (%) for N, P, K, Ca, Mg, whereas Fe, Cu, Mn, Zn, and B were recorded as milligrams per kilogram of dry fruit.

#### Statistical analysis

Data obtained from the tests were subjected to variance analysis, using the JMP statistical package. Differences between the sweet cherry varieties were grouped according to the LSD multiple comparison tests ( $P \leq 0.05$ ;  $P \leq 0.01$ ).

#### Results

The fruit size the differences between 0900 Ziraat and Davraz sweet cherry varieties on Gisela 6 were statistically significant ( $P < 0.05$ ). In both years, fruit diameter, length and weight were found to be higher in Davraz than in 0900 Ziraat (Table 1). It was determined that the fruit sizes in both varieties were statistically significant when the differences between the years were considered ( $P < 0.05$ ). Davraz with this feature was found to be in the foreground (Figure 1). In terms of fruit stalk length and weight (Table 2), the differences between the two varieties were statistically significant in both years ( $P < 0.05$ ). The length of the fruit stalk of the Davraz variety was approximately 65 mm as the average of two years and was higher than the 0900 Ziraat variety (average  $\sim 48$  mm). This difference in the length of the stalk was also parallel to the stalk thickness (Table 2). In Figure 2, it can be seen that the differences between the stalk length and weight in mean two years are statistically significant ( $P < 0.05$ ) and the Davraz has bigger stalks.

Table 1. Fruit sizes of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 1. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve boyutları

Cultivars Çeşitler	Fruit diameter (mm) Meyve çapı (mm)		Fruit length (mm) Meyve boyu (mm)		Fruit mass (g) Meyve ağırlığı (g)	
	First year 1. yıl	Second year 2. yıl	First year 1.yıl	Second year 2. yıl	First year 1. yıl	Second year 2.yıl
0900 Ziraat	24.94b*	25.17b*	23.01b*	23.66b*	8.53b*	8.69b*
Davraz	26.25a	28.40a	23.97a	26.81a	9.62a	9.39a
P Value P değeri	0.007	0.039	0.024	0.006	0.011	0.012

\* Means followed by the different letters are statistically significant (LSD,  $P < 0.05$ ).

Table 2. Stalk length and Stalk weight of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 2. 0900 Ziraat ve Davraz kiraz çeşitlerinin sap uzunluğu ve kalınlığı

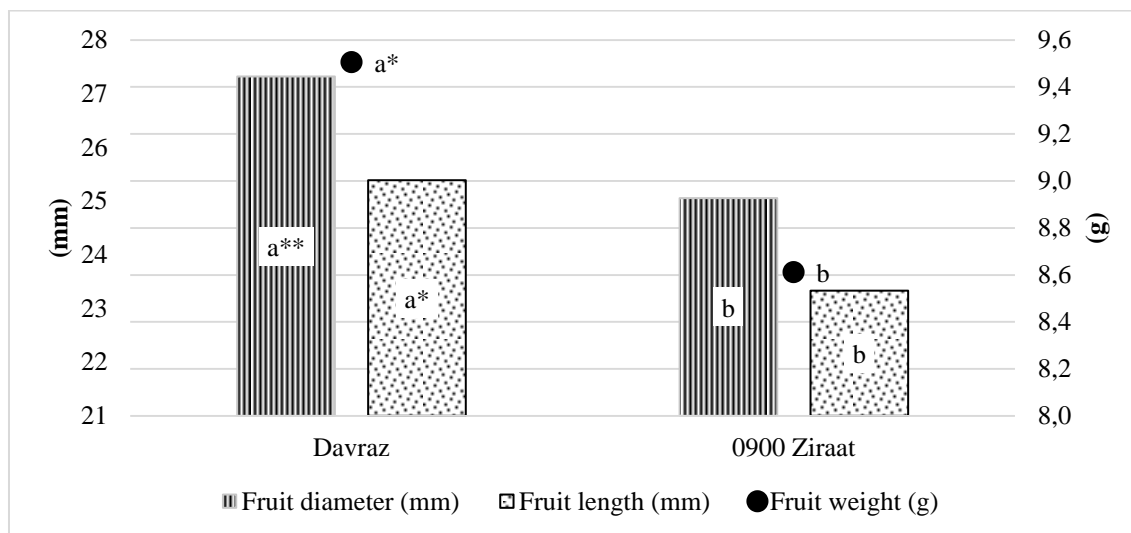
Cultivars Çeşitler	Stalk length (mm) Sap uzunluğu (mm)		Stalk mass (g) Sap kalınlığı (g)	
	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl
	0900 Ziraat	48.16b*	46.99b*	0.14b*
Davraz	63.20a	66.46a	0.20a	0.22a
P Value	0.028	0.007	0.038	0.009
P değeri				

\* Means followed by the different letters are statistically significant (LSD, P&lt;0.05).

0900 Ziraat and Davraz showed similar results in fruit firmness in both years, the differences were statistically insignificant (P<0.05) (Table 3).

In the results of analysis of variance, the number of fruits cracking on the tree of 0900 Ziraat and Davraz tree was not statistically significant in the first year, but insignificant in the second year (P<0.05). The differences between the cracking index were statistically significant in both years (P<0.05) (Table 4). The number of

cracked fruit on the tree in Davraz was higher than 0900 Ziraat. In the first year, 0900 Ziraat cracking index was more than Davraz, and in the second year was the opposite (Table 4). When the average of cracked fruit on the tree and the index of cracking was evaluated; the differences in it were statistically significant (P<0.05) and the cracking index was insignificant. The number of cracked sweet cherries and the cracking index were found to be lower in the 0900 Ziraat (Figure 3).



\* Means followed by the different letters are statistically significant (LSD, P&lt;0.05).

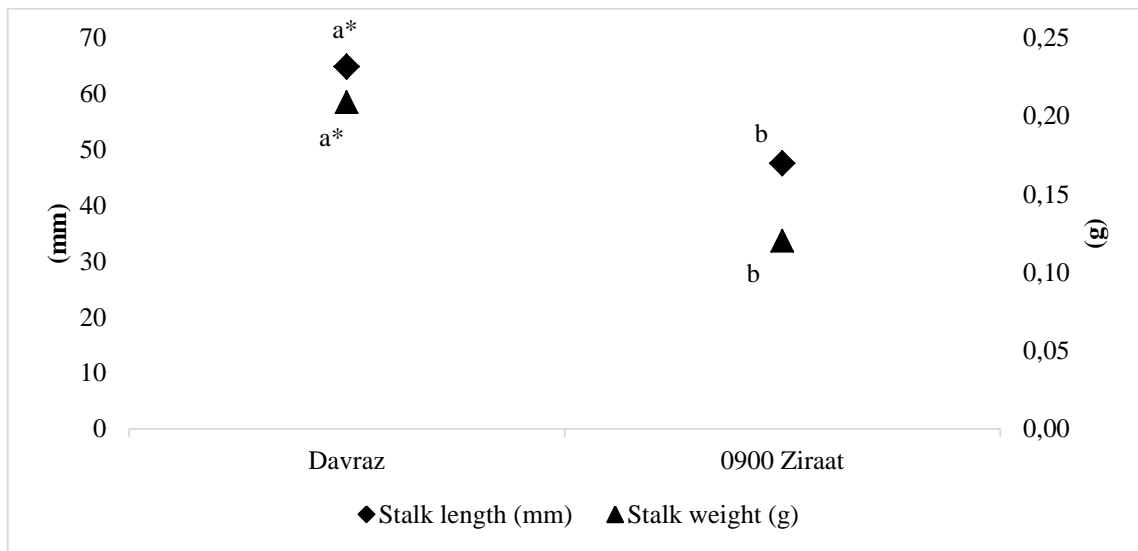
Figure 1. Fruit sizes of 0900 Ziraat and Davraz sweet cherry cultivars (means of years).

Şekil 1. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve boyutları (yılların ortalaması).

Table 3. Fresh fruit firmness of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 3. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve et sertliği

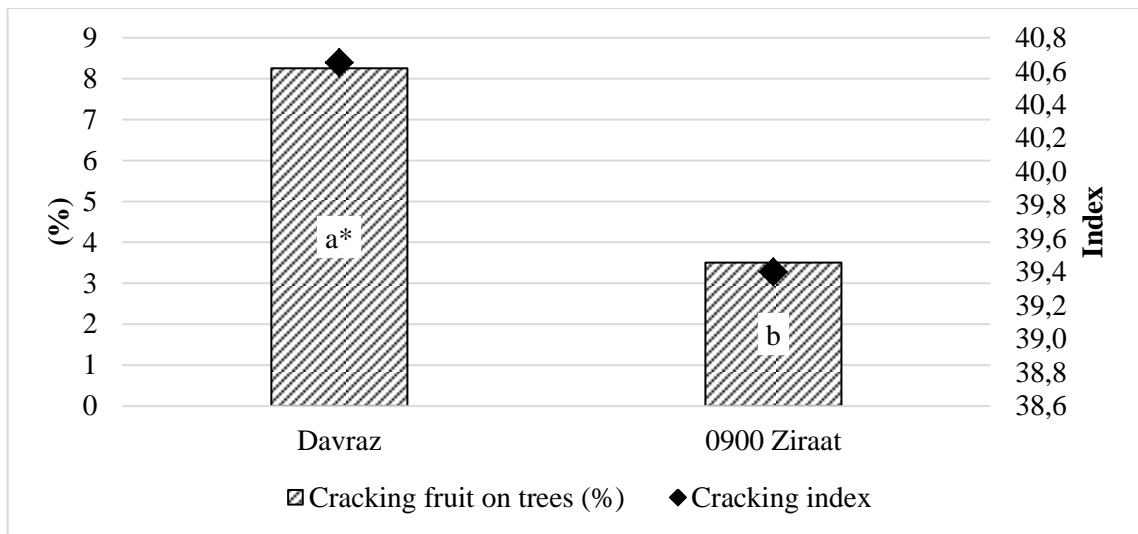
Cultivars Çeşitler	Fresh fruit firmness (N) Meyve eti sertliği (N)	
	First year 1. yıl	First year 2. yıl
	0900 Ziraat	13.49
Davraz	13.64	13.95
P Values	0.764	0.558
P Değeri		



\* Means followed by the different letters are statistically significant (LSD, P<0.05).

Figure 2. Stalk length and stalk weight of 0900 Ziraat and Davraz sweet cherry cultivars (means of years).

Şekil 2. 0900 Ziraat ve Davraz kiraz çeşitlerinin sap uzunlukları ve sap ağırlıkları (yılların ortalaması).



\* Means followed by the different letters are statistically significant (LSD, P<0.05).

Figure 3. Cracking fruit on trees and cracking index of 0900 Ziraat and Davraz sweet cherry cultivars (means of years).

Şekil 3. 0900 Ziraat ve Davraz kiraz çeşitlerinin ağaçtaki çatlamış meyve sayısı ve çatlama indeksi (yılların ortalaması).

Table 4. Cracking on tree and cracking index of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 4. 0900 Ziraat ve Davraz kiraz çeşitlerinin ağaçtaki çatlamış meyve sayısı ve çatlama indeksi

Cultivars Çeşitler	Total cracking on tree (%) Ağaç üzerindeki çatlamış meyve (%)		Cracking index (%) Çatlama indeksi (%)	
	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl
	0900 Ziraat	4.50	2.50b*	43.80a*
Davraz	5.25	11.25a	26.30b	55.00a
P Value	0.729	0.006	0.039	0.029
P değeri				

\* Means followed by the different letters are statistically significant (LSD, P<0.05).

The differences between the soluble solids content (SSC) in the fruit juices of varieties on the Gisela 6 rootstock were statistically significant in the first year (P<0.05) and it was insignificant in second year. In terms of titratable acidity (TA) and pH, the results of the second year were statistically significant (P<0.05) and the first year differences were insignificant. The maturity index

(SSC/TA), it was found that the differences between these varieties were important in terms of statistics in both years (P<0.05) (Table 5). Although the SSC, TA and pH in both varieties varied in years, we observed that the maturity index of 0900 Ziraat was more than the Davraz and changed in the same course in both years (Table 5).

Table 5. Fruit chemical composition of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 5. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve kimyasal içerikleri

Cultivars Çeşitler	SSC (%) ŞÇKM (%)		TA (%) TA (%)		Maturity index SSC/TA (%) Olgunluk indeksi		pH (%)	
	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl
	0900 Ziraat	16.25a*	15.84	0.68	0.45b*	23.84a*	35.56a*	3.33
Davraz	14.91b	18.45	0.75	0.69a	20.14b	26.91b	3.32	3.62a
P Value P değeri	0.042	0.098	0.189	0.032	0.044	0.013	0.951	0.022

\* Means followed by the different letters are statistically significant (LSD, P&lt;0.05).

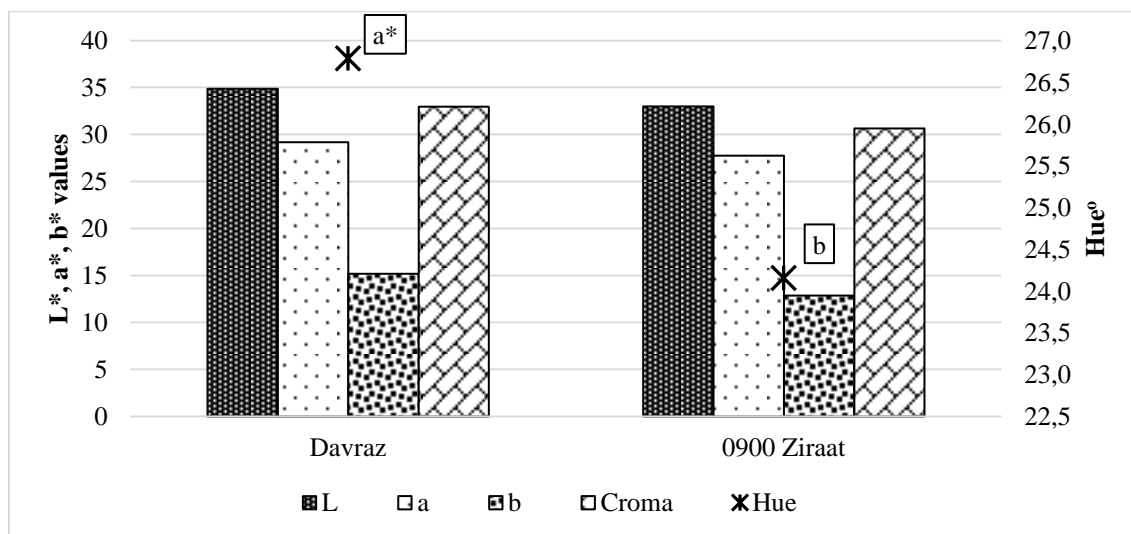
When the results on the colour values of the fruits were evaluated statistically; insignificant differences were found in both years, and it was found that the difference between the two varieties was significant only in the first year in terms of hue ° (P<0.05) (Table 6-7). L\*, a\*, b\*, C\*

and h° showed similar results in two cultivars. In the first year, Davraz was found to be higher in h° value (27.02), compared to 0900 Ziraat (23.63) (Table 6). We found that the difference between hue values was statistically significant in the mean of years (P<0.05) (Figure 4).

Table 6. Fruit color (L\*, a\*, b\*, C\*, Hue°) of 0900 Ziraat and Davraz sweet cherry cultivars (first year)

Çizelge 6. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve rengi (L\*, a\*, b\*, C\*, Hue°) (1. Yıl)

Cultivars Çeşitler	L*	a*	b*	C*	Hue°
0900 Ziraat	32.67	27.11	12.16	29.74	23.63b*
Davraz	35.33	30.41	15.95	34.39	27.02a
P value P değeri	0.087	0.198	0.093	0.158	0.040



\* Means followed by the different letters are statistically significant (LSD, P&lt;0.05).

Figure 4. Fruit color (L\*, a\*, b\*, C\*, H°) of 0900 Ziraat and Davraz sweet cherry cultivars (means of years)

Şekil 4. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve rengi (L\*, a\*, b\*, C\*, H°) (yılların ortalaması).

According to the analysis of variance on macro minerals of 0900 Ziraat and Davraz sweet cherry cultivars grafted on Gisela 6 rootstocks, N (Table 8), Ca and Mg contents (Table 9) of fruit were found to be statistically significant in only second year (P<0.05). The N content of fruit was higher in Davraz, and Ca and Mg contents were higher in 0900 Ziraat. P and K contents were found to be

similar between both two cultivars (Table 8, Table 9). The differences between the micro elements Cu, Mn, Zn and B of the two varieties were found significant in only the 2nd year (P<0.05). These elements contents of Davraz sweet cherry was lower (Table 10, Table 11). No differences were found between Fe contents of the sweet cherries (Table 10).

Table 7. Fruit color (L\*, a\*, b\* C\*, Hue°) of 0900 Ziraat and Davraz sweet cherry cultivars (second year)

Çizelge 7. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve rengi (L\*, a\*, b\* C\*, Hue°) (2. Yıl)

Cultivars Çeşitler	L*	a*	b*	C*	Hue°
0900 Ziraat	33.39	28.53	13.75	31.75	24.79
Davraz	34.44	27.99	14.47	31.57	26.55
P value P değeri	0.191	0.796	0.647	0.942	0.118

Table 8. Fruit macro mineral element (N, P, K) contents of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 8. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve makro elementleri (N, P, K)

Cultivars Çeşitler	N (%)		P (%)		K (%)	
	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl
0900 Ziraat	0.71	0.57b*	0.15	0.12	1.10	0.98
Davraz	0.74	0.73a	0.13	0.12	1.09	1.00
P Value P Değeri	0.857	0.010	0.123	0.557	0.811	0.191

\* Means followed by the different letters are statistically significant (LSD, P&lt;0.05).

Table 9. Fruit macro mineral element (Ca, Mg) contents of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 9. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve makro elementleri (Ca, Mg)

Cultivars Çeşitler	Ca (%)		Mg (%)	
	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl
0900 Ziraat	0.08	0.08a*	0.06	0.06a*
Davraz	0.08	0.05b	0.06	0.05b
P Value P Değeri	0.165	0.018	0.333	0.041

\* Means followed by the different letters are statistically significant (LSD, P&lt;0.05).

Table 10. Fruit micro mineral element (Fe, Cu, Mn) contents of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 10. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve mikro elementleri (Fe, Cu, Mn)

Cultivars Çeşitler	Fe (ppm)		Cu (ppm)		Mn (ppm)	
	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl
0900 Ziraat	8.17	21.38	1.62	5.18a*	1.14	2.80a*
Davraz	8.99	18.70	0.67	3.65b	1.03	1.26b
P Values P Değeri	0.475	0.254	0.324	0.037	0.607	0.008

\* Means followed by the different letters are statistically significant (LSD, P&lt;0.05).

Table 11. Fruit micro mineral element (Zn, B) contents of 0900 Ziraat and Davraz sweet cherry cultivars

Çizelge 11. 0900 Ziraat ve Davraz kiraz çeşitlerinin meyve makro elementleri (Zn, B)

Cultivars Çeşitler	Zn (ppm)		B (ppm)	
	First year 1. yıl	Second year 2. yıl	First year 1. yıl	Second year 2. yıl
0900 Ziraat	3.18	4.22a*	23.95	27.40a*
Davraz	2.08	2.84b	21.66	18.79b
P Values P Değeri	0.079	0.008*	0.455	0.006*

\* Means followed by the different letters are statistically significant (LSD, P&lt;0.05).

## Discussion and Conclusions

One of the most important criteria in the export of sweet cherries is fruit size. In our study, the Davraz on the Gisela 6 rootstock had larger fruits than the 0900 Ziraat. Larger than 26 mm fruit are concerned in sweet cherry export and

Davraz fruit on the Gisela 6 rootstock exceed this limit. In a different study, it was reported that the fruit size of Davraz on Gisela 5 and mazzard seedlings was larger than 0900 Ziraat (Sarısı and Demirtaş, 2015).

Sweet cherry species usually has a short harvest and marketing time. However, due to the

increase in the amount of cherry production and trade in the world, preservation of quality and time in the market during storage and marketing are of great importance. One of the important factors in the protection of quality is the fruit stalk mass. Sweet cherry fruit stalk length is related to road resistance and shelf life. In our study, the fruit stalk length and weight of Davraz were more than 0900 Ziraat, this is a more advantageous feature when it comes to durability, prolongation and preservation of shelf life in export.

In our study, the number of cracked fruit was higher in Davraz than the other. In sweet cherry cultivation, cracking of fruits is a serious problem due to precipitation at pre-harvest. The most obvious view of the occurrence of cracking is that rainwater is formed by entering the fruit peel. However, many factors such as variety, fruit maturity, SSC, water temperature, stoma size and frequency, respiratory rate have been reported to have a significant role in cracking (Demirsoy and Bilginer, 2000).

In our study, there were no significant differences between fruit firmness, chemical properties and colour values in fruits of cultivars. In our study, the pomological results obtained from Davraz and 0900 Ziraat were close to reported the previous studies (Şevik et al., 2004; Demirtaş et al., 2009; Sarısu et al., 2016; Sarısu and Demirtaş, 2015).

In terms of macro and micro elements, there were similar results in the first year between 0900 Ziraat and Davraz varieties, while in the second year of study differences in N, Ca, Mg, Cu, Mn, Zn and B were statistically significant. In the second year, N content of Davraz fruits was higher than 0900 Ziraat, while Ca, Mg, Cu, Mn, Zn and B contents were lower in Davraz. Although not much work has been done on this subject; K content of cherries is approximately 260 mg/100 g, the content of Ca 13-20 mg/100 g, P content 15-18 mg 100 g<sup>-1</sup>, Mg content is reported to be between 8-13 mg 100 g<sup>-1</sup> (Garcia et al., 2017).

In summary; sweet cherry rootstocks used in the world and in Turkey until recent years was

mostly mazzard (*Prunus avium* L.) and mahaleb (*Prunus mahaleb* L.) seedlings. These rootstocks, which restrict the intensive production, are eliminated in recent years with rootstocks which have different characteristics. Gisela 6 rootstock, which is considered as a dwarf, precocious and efficient rootstock obtained as a result of breeding activities, is mentioned as a promising rootstock in terms of its properties. However, the fruits of our varieties grown on this dwarf rootstock have less size and firmness than those grown in mazzard, and this causes disadvantage in exports (Akçay and Burak, 2007). Low quality sweet cherries (i.e. softer, colour and taste-flavour variability, low soluble solids, small fruit, etc.) are not required in the international markets because it has a short shelf life and has a low shelf life. In this sense, diameter of 'Davraz' fruit on Gisela 6, which is more important quality parameters in sweet cherry, is to be created on the larger and better quality has been demonstrated in this study.

As an alternative to 0900 Ziraat, Davraz is quite hopeful for both domestic and foreign market and it is believed that it will provide benefit in terms of both producer and national economy especially when grown with a precocious rootstock such as Gisela 6.

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