RESEARCH ARTICLE

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Determination of fruit characteristics of some fig genotypes (*Ficus carica* L.) obtained by selection breeding in the eastern Mediterranean region

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Abstract
Fig (*Ficus carica* L.) is a fruit species whose cultural history is old, what is making it related to the *Ficus* genus of the *Moraceae* (Mulberry) family. The study was conducted in Kahramanmaras and Osmaniye, that are located in the Eastern Mediterranean Region, in 2016-2022. Fig cultivation is extensive in that area and at the same time in the natural fig plantation regions. Pomological and phenological analyzes were carried out on 20 fig genotypes determined in the research. The fruit weight of the fig genotypes varied between 80.79 - 40.37 g, and the average peel thickness was between 3.79-2.28 mm. The highest soluble solids value is in the genotypes 46-OS-1 at 25%, whereas the lowest soluble solids value is in the genotypes 46-TR-9 and 80-DZ-2 at 17%, and the highest acidity value is 46-OS-3 at 0.37%. The Figs genotypes were divided into two main groups in terms of fruit shape: flattened spherical and round. All genotypes were either short or moderately necked apart from one genotype. The majority of genotypes were found in yellow tones, some in purple tones, and the color of the fruit flesh was mostly in amber tones in terms of the color of the fruit skin. As a result of the study, it was revealed that Kahramanmaras and Osmaniye provinces in the Eastern Mediterranean Region have fig natural distribution areas and new varieties can be developed by selection breeding in these localities.
Keywords: *Ficus carica* L., Fig, Mediterranean region, Selection

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INTRODUCTION

The figs belong to the species *Ficus carica* of Moraceae family of the Urticales order, and, what is more, there are many wildlife and cultivated subspecies (Çaliskan and Polat, 2012a). *F.carica* L., also known as the Anatolian Fig, is the species that is most commonly used in fruit cultivation, and abundant in natural plantations (Hepaksoy et al. 2004). The native land of figs is considered to be Anatolia (Kuden et al. 2005).

Fig, known as a subtropical-climate plant, is a major source of food for wild animals (Watson and Dallwitz, 2004) and can be found over a wide geographical area serving as the migratory routes for wild animals from the Mediterranean basin to Iran and the North Caucasus (Özbek, 1978). For this reason, it is believed that it has spread worldwide from this particular area. Although the fig is a subtropical climate plant, it requires cooling (Şahin and Ürel, 1992).

As was mentioned before, the native land of figs is Anatolia, where this fruit has cultivated in the early periods of human history, and played a particularly significant role among other fruit species. In this respect, Turkey is a major producer of table as well as dried figs (Çalışkan, 2012b). Turkey accounts for 320,000 tons of the world's fig production which is representing only 1,318,588

tonnes of production alone. 85.500 tons (58%) of dried fig production, which was 148.000 tons in 2021, were produced by Turkey, 25.000 tons (17%) by Iran, 10.000 tons (7%) by Spain (FAO, 2023).

Most of Turkey's fig production is composed of dried varieties which are produced primarily in the Aegean Region. Table figs production is mainly in the Marmara region located in the Eastern Mediterranean and Central Black Sea regions (Çalışkan and Polat, 2008).

In the regions where fig production is placed, it is naturally abundant on land and roadsides, apart from cultivated fig areas. Moreover, figs are favored by the local people who even sometimes growing it in their area. The figs also usually receiving local names, for instance, the name of the region or the owner of the area where it was grown. It is possible to develop new fig varieties from these wild genotypes with different fruit flavor characteristics (Çalışkan and Polat, 2012b).

The Eastern Transitional Region Agricultural Research Institute conducted the study in 2016-2022 years. The trees that were growing on the sides of the fields and roads and in front of the houses would have original characteristics according to the selection criteria that were mentioned in the study.

MATERIAL AND METHOD

Material

The survey and selection studies were carried out in Kahramanmaraş and Osmaniye provinces, and the coordinates data of the selected fig genotypes was recorded (Table 2). 9 fig genotypes were selected from Kahramanmaraş Onikisubat district, 2 fig genotypes from Pazarcık district and 2 fig genotypes from Türkoğlu district. In Osmaniye, 7 genotypes of figs, 2 Bahçe, 3 Düziçi, and 2 Hasanbeyli were included in the research (Table 2). In total, 20 genotypes from both regions were chosen and analyzed in the selection study (Table 2).

Method

Survey and selection studies were implemented in Kahramanmaras and Osmaniye provinces in 2016-2022. Fruit weight, ostiole width, fruit skin thickness, fruit acidity, and fruit color were examined during the research. It was determined that 9 genotypes from Kahramanmaras and 4 genotypes from Osmaniye showed promising characteristics after applying weighted grading to selected fig types in the study (Table 1).

The fruit shape index (fruit size/fruit length) and ostiole width were measured at 0.001 mm in precision digital balance. Measurements were made on 10 fruit samples from each genotype with a precision digital caliper. The selected fig genotypes were divided into three groups of oblate, spherical (global), and long (pyriform) fruits. Fruit shape indices were obtained by dividing fruit size by fruit length. According to these measurements, fruits with an index value of 1.1 were considered flat fruit, fruits with an index value between 0.9-1.1 were considered spherical, and fruits smaller than 0.9 were considered as long-oval fruits (Aksoy et al. 1992; Upov, 2003). The number of soluble solids (% SS) was measured with a hand refractometer.

Table 1. Local information and coordinates of selected fig genotypes.

No	Genotype	General Information About Genotype			
		Province	District	Location	Coordinate
1	46-OS-1	Kahramanmaras	Onikisubat	Karadere	36°37'11"N – 36°39'28" E
2	46-PZ-2	Kahramanmaras	Pazarcik	Kizkapanlı	37°22'28"N – 37°17'38" E
3	46-OS-3	Kahramanmaras	Onikisubat	Sir	37°28'51"N – 36°38'48" E
4	46-OS-4	Kahramanmaras	Onikisubat	Yenicekale	36°35'58"N – 36°28'21" E
5	46-OS-5	Kahramanmaras	Onikisubat	Dongele	37°33'45"N – 36°38'30" E
6	46-PZ-6	Kahramanmaras	Pazarcik	Yumaklicerit	37°34'27"N – 37°32'17" E
7	46-TR-7	Kahramanmaras	Turkoglu	Beyoglu	37°17'31"N – 36°46'47" E
8	46-OS-8	Kahramanmaras	Onikisubat	Derekoy	37°35'27"N – 37°01'34" E
9	46-TR-9	Kahramanmaras	Turkoglu	Beyoglu	37°17'14"N – 36°45'21" E
10	46-OS-10	Kahramanmaras	Onikisubat	Sucati	37°46'05"N – 36°38'23" E
11	46-OS-11	Kahramanmaras	Onikisubat	Suleymanlı	37°52'56"N – 36°49'39" E
12	46-OS-12	Kahramanmaras	Onikisubat	Suleymanlı	37°52'46"N – 36°49'44" E
13	46-OS-13	Kahramanmaras	Onikisubat	Suleymanlı	36°37'31"N – 36°49'46" E
14	80-BH-1	Osmaniye	Bahce	Yesilyurt	37°12'23"N – 36°10'23" E
15	80-DZ-2	Osmaniye	Duzici	Karsıyaka	37°14'14"N – 36°27'27" E
16	80-DZ-3	Osmaniye	Duzici	Yenice	37°16'17"N – 36°28'28" E
17	80-DZ-4	Osmaniye	Duzici	Tasoğlu	37°14'38"N – 36°27'02" E
18	80-BH-5	Osmaniye	Bahce	Bekdemir	37°14'26"N – 36°34'48" E
19	80-HS-6	Osmaniye	Hasanbeyli	Kaypak	37°09'56"N – 36°27'15" E
20	80-HS-7	Osmaniye	Hasanbeyli	Kaypak	37°09'51"N – 36°27'44" E

Table 2. The pointing system applied according to the weighted grading method in selected fig genotypes (Aksoy et al., 2003; Caliskan and polat, 2008; Upov, 2003)

Chracter	Weighting Factor	Classification			Point
			2021	2022	
Fruit Size (g)	30	Biggest	71.37-82,31	70.07-79.29	15
		Big	60.39-71.36	60.82-70.06	25
		Medium	49.41-60.38	51,56-60.81	20
		Small	38.43-49.40	42.31-51,55	10
Thickness of peel (mm)	10	Thin	2.00-2.45	2.01-2.88	8
		Medium	2.46-2.91	2.89-3.76	10
		Thick	2.92-3.37	3.77-4.62	6
Ostiole Width (mm)	20	More open	2.45-4.51	3.25-4.68	10
		Open	4.52-6.58	4.69-6.12	15
		Close	6.59-8.65	6.13-7.54	20
Acidity (%)	15	Low	0.27-0.31	0.26-0.29	10
		Medium	0.32-0.36	0.30-0.33	15
		High	0.37-0.40	0.34-0.37	5
Total Soluble Solids (%)	25	Low	16.00-18.66	17.00-20.00	5
		Medium	18.67-21.33	20.01-23.01	10
		High	21.34-24.00	23.02-26.00	15
Total	**100**				

RESULTS

The first fruit-bearing was distributed between the 4th week of March and the 3rd week of April. It was determined that the earliest first fruit-bearing was observed in the 80-DZ-2 genotype, and the latest first fruit-bearing was observed in 7 genotypes, all from Kahramanmaras region. Similarly, in the second fruit bearing, genotypes from the Kahramanmaras region were found to give bearing later (Table 3).

Average fruit weight for both years ranged from 80.79-40.37 g. The average fruit weight was determined to be 50.04 g. The table indicates that the highest average fruit weight is in genotype 46-TR-7, followed by the genotypes 70.79 g with 46-OS-8 and 68.32 g with 46-OS-3. The lowest fruit weight was found in genotype 46-PZ-2 with 40.37 g. In the weighted grading tests using fruit weight, We can seen that five genotypes obtained 25 points, only one of the genotypes belonging to Osmaniye the province obtained 25 points and two of them obtained 20 points. There were no significant differences in the standard deviations of the in fruit weight for years and annual averages for years.

Fruit sizes ranged from 54.93 to 35.77 mm and the highest fruit size were found in the genotypes 46-TR-8 (54.93 mm), 46-TR-9 (54.16 mm), and 46-TR-7 (52.86 mm). Average fruit size was observed to be 42.73 g and the lowest for genotype 80-BH-1. In the study where fruit length varied from70.92-39.19 mm, the average fruit length was found to be 45.14 mm. The highest fruit length were observed in genotypes 46-TR-7 and 46-OS-8, with values of 70.92 and 51.73 mm, respectively. When the fruit indices are examined in general, it is seen that the index values of the fig genotypes are close to 1 and show a global structure with these data. However, in some genotypes, the value may be said to be slightly greater than 1 and these may be assessed as flatter. It can be mentioned that the fruit structure of all genotypes was slightly-flat and round (Table 4).

The fruit acid values obtained according to the titration method and the resulting weighted rating scores are shown in the table below. Table-4. As of 2021, it was understood that the average fruit acidity in terms of citric acid varied between 0.40-0.27 in selected fig genotypes, and the average acidity was 0.32. As of 2022, it was seen that the average fruit acidity in terms of citric acid vary between 0.37-0.26 in selected fig genotypes and the average acidity is 0.32. According to the table, no change was found in the average fruit acidity values of 2021 and 2022 (Table 5).

Fruit ostiole width were separately for 2021 and 2022 and the averages of two years were seen in the selected fig genotypes, While the average fruit ostiole width in 2021 is 5.18 mm, it was seen that the fruit ostiole width in 2022 is 4.87 mm. In the mean of both years, as seen in the table, the ostiole width varied between 8.10-3.01 mm. The mean ostiole width of both years was 5.02 mm. The highest ostiole width was found to be 8.10 mm, 7.41 mm, and 7.35 mm in fig genotypes coded 46-PZ-2, 46-TR-7, and 46-OS-8, respectively. The lowest ostiole width values were in 46-OS-11 (3.01 mm) and 46-OS-12 (3.13 mm) fig genotypes (Table 5).

The fruit soluble solids values of the selected fig genotypes for the year 2021-2022 (Table 11). Fruit soluble solids varied between 17-25% and the highest fruit soluble solids were found in the genotypes 46-OS-1 (25%), 46-OS-3 (24%), and 46-OS-4 (23%). It was

Table 3. Average bearing dates of selected fig genotypes for the years 2021-2022

No	Genotype	Bearing		Maturity period
		Firts Bearing	Second Bearing	
1	46-OS-1	3rd week of April	3rd week of June	20-30 August
2	46-PZ-2	2nd week of April	2nd week of June	15-25 August
3	46-OS-3	3rd week of April	3rd week of June	20-30 August
4	46-OS-4	3rd week of April	3rd week of June	20-30 August
5	46-OS-5	2nd week of April	3rd week of June	20-30 August
6	46-PZ-6	2nd week of April	2nd week of June	15-25 August
7	46-TR-7	1st week of April	2nd week of June	15-25 August
8	46-OS-8	2nd week of April	2nd week of June	15-25 August
9	46-TR-9	2nd week of April	1st week of June	10-20 August
10	46-OS-10	3rd week of April	3rd week of June	20-30 August
11	46-OS-11	3rd week of April	3rd week of June	20-30 August
12	46-OS-12	3rd week of April	3rd week of June	20-30 August
13	46-OS-13	3rd week of April	2nd week of June	15-25 August
14	80-BH-1	2nd week of April	2nd week of June	15-25 August
15	80-DZ-2	4th week of April	1st week of June	10-20 August
16	80-DZ-3	1st week of April	1st week of June	10-20 August
17	80-DZ-4	1st week of April	1st week of June	10-20 August
18	80-BH-5	2nd week of April	2nd week of June	15-25 August
19	80-HS-6	2nd week of April	2nd week of June	15-25 August
20	80-HS-7	2nd week of April	3rd week of June	20-30 August

Table 4. Fruit size and shape of selected fig genotypes (2021-2022)

No	Genotype	Fruit Weight (g)	Fruit Size (mm)	Fruit Lenght (mm)	Fruit Index (with/ lenght)	Fruit Shape
1	46-OS-1	45,73	37,25	45,81	0,81	long-oval
2	46-PZ-2	40,37	37,29	48,68	0,77	long-oval
3	46-OS-3	68,32	50,55	47,08	1,07	spherical
4	46-OS-4	61,59	42,84	46,11	0,93	spherical
5	46-OS-5	52,75	51,21	43,78	1,17	long
6	46-PZ-6	60,11	36,21	39,55	0,92	spherical
7	46-TR-7	80,79	52,86	70,92	0,75	long-oval
8	46-OS-8	70,79	54,93	51,73	1,06	spherical
9	46-TR-9	65,91	54,16	41,18	1,32	long
10	46-OS-10	56,76	41,74	45,23	0,92	spherical
11	46-OS-11	59,07	40,70	43,60	0,93	spherical
12	46-OS-12	55,70	41,35	44,03	0,94	spherical
13	46-OS-13	65,79	39,26	41,63	0,94	spherical
14	80-BH-1	59,84	35,77	40,31	0,89	spherical
15	80-DZ-2	78,55	42,93	45,76	0,94	spherical
16	80-DZ-3	45,74	40,27	40,70	0,99	spherical
17	80-DZ-4	67,57	40,85	43,79	0,93	spherical
18	80-BH-5	47,56	37,84	41,10	0,92	spherical
19	80-HS-6	45,01	36,05	39,19	0,92	spherical
20	80-HS-7	53,37	40,53	42,68	0,95	spherical
Highest		**80.79**	**54,93**	**70,92**	**1,32**	-
Lowest		**40.37**	**35,77**	**39,19**	**0,75**	-
Mean		**59,04**	**42,73**	**45,14**	**0,95**	-
SD		±10,90	±6,20	±6,68	±0,13	-

Table 5. Fruit quality values of selected fig genotypes

No	Genotype	Acidity (%)	Ostiole Width (mm)	Total Soluble Solids (%)	Peel Thickness (mm)	Peel Color	Flesh Color
1	46-OS-1	0,36	5,06	25,00	2,53	Yellow	Dark amber
2	46-PZ-2	0,33	8,10	22,50	2,63	Yellow-green	Red
3	46-OS-3	0,37	4,19	24,00	2,95	Yeşil	Amber
4	46-OS-4	0,37	4,36	23,50	2,70	Yellow-green	Amber
5	46-OS-5	0,34	5,03	20,50	2,86	Yellow	Amber
6	46-PZ-6	0,30	3,33	18,00	2,30	Yellow-green	Kırmızı
7	46-TR-7	0,28	7,41	18,00	3,79	Yellow-green	Kırmızı
8	46-OS-8	0,35	7,35	21,00	3,22	Yellow	Light amber
9	46-TR-9	0,31	6,31	17,00	2,85	Yellow	Amber
10	46-OS-10	0,34	4,52	22,50	2,64	Purple	Amber
11	46-OS-11	0,32	3,01	19,50	2,56	Yellow-green	Amber
12	46-OS-12	0,32	3,13	20,50	2,59	Light yellow	Light amber
13	46-OS-13	0,35	6,22	22,00	2,45	Purple	Light amber
14	80-BH-1	0,33	4,34	21,50	2,31	Yellow	Light amber
15	80-DZ-2	0,28	5,98	17,00	2,69	Yellow-green	Dark amber
16	80-DZ-3	0,28	3,38	18,50	2,45	Yellow	Dark amber
17	80-DZ-4	0,33	4,19	21,50	2,57	Lihgt purple	Red
18	80-BH-5	0,31	4,67	18,00	2,40	Yellow	Dark yellow
19	80-HS-6	0,28	4,83	17,50	2,28	Yellow	Red
20	80-HS-7	0,27	5,10	17,50	2,52	Yellow	Red
Highest		**0,37**	**8,10**	**25,00**	**3,79**	-	-
Lowest		**0,27**	**3,01**	**17,00**	**2,28**	-	-
Mean		**0,32**	**5,02**	**20,28**	**2,66**	-	-
SD		±0,03	±1,42	±2,44	±0,34	-	-

Table 6. Average scores (% citric acid) obtained as a result of weighted grading evaluations for all pomological properties of 2021 and 2022.

No	Genotype	Criteria and Genotypes Scores					
		Fruit Weight	Peel Thickness	Ostiole Width	Acidity	Soluble Solids	Total Score
1	46-OS-1	300	80	300	75	375	1.130
2	46-PZ-2	300	80	200	225	375	1.180
3	46-OS-3	750	100	400	75	375	1.700
4	46-OS-4	750	80	400	75	375	1.680
5	46-OS-5	600	100	300	75	250	1.325
6	46-PZ-6	600	80	400	150	125	1.355
7	46-TR-7	450	60	200	150	125	985
8	46-OS-8	450	100	200	75	250	1.075
9	46-TR-9	750	100	300	225	125	1.500
10	46-OS-10	600	80	300	75	375	1.430
11	46-OS-11	600	80	400	225	125	1.430
12	46-OS-12	600	80	400	225	250	1.555
13	46-OS-13	750	80	300	75	250	1.455
14	80-BH-1	600	80	400	225	250	1.555
15	80-DZ-2	450	80	300	150	125	1.105
16	80-DZ-3	300	80	400	150	125	1.055
17	80-DZ-4	750	80	400	225	250	1.705
18	80-BH-5	300	80	300	225	125	1.030
19	80-HS-6	300	80	300	150	125	955
20	80-HS-7	600	80	300	150	125	1.255
Highest		**750**	**100**	**400**	**225**	**375**	**1.705**
Lowest		**300**	**60**	**200**	**75**	**125**	**955**
Mean		**540**	**83**	**325**	**150**	**225**	**1.323**

Table 7. Quality situations of selected fig genotypes according to weighted grading scores

No	Genotype	Quality Situation
1	46-OS-1	Poor
2	46-PZ-2	Medium
3	46-OS-3	High Quality
4	46-OS-4	High Quality
5	46-OS-5	Medium
6	46-PZ-6	Medium
7	46-TR-7	Poor
8	46-OS-8	Poor
9	46-TR-9	Quality
10	46-OS-10	Quality
11	46-OS-11	Quality
12	46-OS-12	High Quality
13	46-OS-13	Quality
14	80-BH-1	High Quality
15	80-DZ-2	Poor
16	80-DZ-3	Poor
17	80-DZ-4	High Quality
18	80-BH-5	Poor
19	80-HS-6	Poor
20	80-HS-7	Medium
High Quality		**5 genotype**
Quality		**4 genotype**
Medium		**4 genotype**
Poor		**7 genotype**

observed that the soluble solids were 20.28% and the lowest fruit soluble solids were in the genotype 80-DZ 2. In the weighted grading tests, it was determined that 5 genotypes obtained 15 points, and the lowest number of genotypes was 9 in Kahramanmaraş and Osmaniye. However, when we look at the table in general, it was seen that the majority of the fruit soluble solids ratios in the selected fig genotypes are above 20%. When the standard deviations in the fruit soluble solids values were taken into account, it is observed that a small amount of standard deviation difference occurs every year in the fig genotypes. It was concluded that the shell thickness of the selected genotypes were not significantly difference over the years (Table 5).

Peel thickness varied between 3.79-2.28 mm, and the highest peel thickness were found in 46-TR-7 (3.79 mm), 46-OS-3 (2.95 mm), and 46-TR-9 (2.85 mm) genotypes. It was observed that the average peel thickness was 2.66 mm and the lowest peel thickness value was in the genotype 80-HS-6. In the weighted grading tests performed according to the peel thickness, it was agreed that 4 genotypes obtained 10 points, and all other genotypes belonging to Kahramanmaraş and Osmaniye provinces obtained 8 points except 46-TR-7. It was observed that a small amount of standard deviation difference occurs each year in the standard deviations of the crust thickness of the years and annual averages. This situation led to the conclusion that the peel thickness values for the selected genotypes did not differ dramatically from year to years (Table 5).

By the study method, the scores obtained by the fig genotypes selected according to these characteristics after the weighted grading of the pomological characteristics and the total weighted grading score were shown in Table 2. When the scores of each fig genotype in the features that are weighted according to the ratios in the table of relative values in Table 2. The 80-DZ-4 (1.705), 46-OS-3 (1.700), and 46-OS-4 (1.680) genotypes received the highest weighted rating scores. The lowest scores were 955 and 985 points in the 80-HS-6 and 46-TR-7 fig genotypes, respectively (Table 6).

It was concluded that 9 genotypes were promising, 4 genotypes were of medium quality, and 7 genotypes were not of the expected quality in the study (Table 7).

DISCUSSION

August and continued until the first month of September. In many studies conducted in previous years, it has been stated that the beginning of maturation in figs differs according to ecologies and genotypes. Sen et al. (1993) stated that it ranged from 20-31 July to 1-15 August in Antalya conditions, while Ilgin (1995) reported that it varied between 20-31 July and 15-31 August in Kahramanmaraş conditions. Aksoy et al., (2003), determined that it varies between 1-15 August and 15-31 August in Erbeyli (Aydın) ecology, while Caliskan (2003) observed that it changes between 1-15 August and 15-

31 August in Dörtyol conditions. Simsek (2008) stated that this change occurred between 20-30 July and 15-31 August in Diyarbakır conditions, and Caliskan (2010) stated that this change occurred between 1-15 August and 15-31 August in Hatay central location conditions. As part of the project, the periods of intense ripening of the fig variety were determined as 15-30 July and 1-30 August, and it was seen that they are among the dates reported by other researchers. In a study conducted by Ilgin (1995), it was reported that the harvest time in fig genotypes in Kahramanmaraş was short in 36 genotypes, long in 14 genotypes and very long in two genotypes. Caliskan (2003) reported that in Dörtyol conditions it was short in 2 genotypes, medium in 23 genotypes, and long in 5 genotypes. Simsek (2008) determined that 28 genotypes were medium in Diyarbakir region, long in 11 genotypes and very long in three genotypes. Caliskan and Polat (2012) reported that the harvest period in fig genotypes in Hatay ecology was short in 3 genotypes, very long in 3 genotypes and medium in others. Simsek (2019) stated that the fig genotypes they selected in Tarsus ecology were short in 1 genotype, medium in 4 genotypes and long in 19 genotypes.We find that the harvest times for the fig genotypes in this study are similar to those identified by other researchers.

It was determined that the fruit weight values of the selected fig genotypes ranged from 80.79 to 40.37 gr based on the data obtained in the study. The average fruit weight values for the years 2021-2022 are 59.04 gr. was found to be. Aksoy et al., (1992), in their study, determined that the highest value in terms of average fruit weight was 708 Darpak with 76.00 g, and the lowest value was 31.50 g with 1119 Fethiye Kaya-2 variety.

Küden et al. (1998), in their study to determine some fig varieties that can be recommended to the Çukurova Region, determined the average fruit weight as 117.89 g in the Bursa Siyah variety and 36.69 g in the Bird fig variety. Caliskan (2003) indicated that the fruit weights for the selected fig genotypes ranged from 19.369 to 61.76 g (2001) and 20.45-56.90 g (2002), in his study conducted in Dörtyol. Gozlekci et al., (2004) determined the fruit weight of 7, 85-88, 18 g in 169 fig genotypes they selected from the Western Mediterranean Region. Alper (2006), in his research in Şanlıurfa, found that the fruit weight of the fig genotypes was 20.34-72.60 g, while Simsek (2008) determined that the fruit weight of the fig genotypes selected in Diyarbakır was 31.29-76,859 g (2006).) and 23.66-75.77 g (2007) were found. Caliskan (2010) found the fruit weight of the fig genotypes between 14.92-115.22 g (2008) and 9.66-93.06 g (2009) and Çalışkan and Polat (2012a) found the fruit weight between 12.29-98.38 g in figs in Hatay ecology. Şimşek (2019) stated that fruit weight values in fig genotypes selected in Tarsus ecology vary between 22.37 g (garbage figs) and 90.16 g (Black Figs). Aljane et al. (2007) determined the fruit weight of 10 local fig cultivars in Southern Tunisia between 24.5-106.7 g. Messaoudi and Haddadi (2008) found fruit weight between 27.0-87.5 g in 14 local fig genotypes in Morocco. Gaaliche et al. (2012) stated that the fruit weight of 17 local fig genotypes they selected from Northern Tunisia was 34.54-96.45 g. In our study, the 2-year average fruit weight values for selected fig genotypes between 40.37-80.79 g and an average of 59.04 g were found to be relatively high compared to previous studies.

It is undesirable in female figs because the ostiole width is wide, allowing many diseases and harmful factors, especially fruit internal rot, to enter the fruit (Can 1993; Çalışkan and Polat, 2012). It was determined that the ostiole width of the selected fig genotypes ranged between 3.01 mm and 8.10 mm, and the mean ostiole width was 5.02 mm. Gozlekci (2011) determined that the genotypes selected from the Western Mediterranean Region between 0.02-19.80 mm. Alper (2006) reported that the genotypes they selected from Şanlıurfa varied between 0.12-7.25 mm. Şimşek (2008) found the ostiole width between 1.30-7.62 mm in the genotypes he selected from Diyarbakır. Çalışkan and Polat (2012a) reported that fig genotypes in Hatay varied between 0.60-21.01 mm.

Although the fruit size of figs varies according to their genetic characteristics, they can be affected by appropriate climatic and care conditions. In our study, it was determined that the average fruit size values for the years 2021-2022 varied between 54.93 mm and 34.77 mm, and the average fruit size value was 42.73 mm. Bostan and Islam (1999), in their study, found that the average fruit size varies between 45.20 cm and 55.10 cm. The fruit length values obtained from our study ranged from 70-92 mm to 39.19 mm. Koyuncu (1998), in his research, stated that the average fruit size varies between 22.00 mm and 39.80 mm. Fruit size is a genotype and variety and can be affected by suitable climatic and care conditions (Polat and calikan 2008).

CONCLUSION

Anatolia is the homeland of figs and has very rich plant diversity. Twenty fig genotypes were determined and recorded at the end of the study. As a result of the examination and analysis, it was obtained that 13 of 20 fig genotypes were promising in terms of fruit characteristics and it was concluded that it would be appropriate to include them in the selection II stage. It has been thought that it is too early to put the results obtained from 13 promising local fig genotypes, which are the most important output of the project, into practice as of this stage of the project. After this step, a second selection breeding should be carried out and these 13 genotypes selected fig genotypes should be compared with standard varieties of figs. It will be possible to transfer the results to achieve and develop new varieties of alternative figs after this study is completed.

COMPLIANCE WITH ETHICAL STANDARDS

Peer-review

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Declaration of interests

The authors have no conflict of interest to declare.

Author contribution

The contribution of the authors to the present study is equal. All the authors read and approved the final manuscript. All the authors verify that the Text, Figures, and Tables are original and that they have not been published before.

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Ethics committee approval is not required. This article does not contain any studies with human participants or animals performed by any of the authors.

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