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POMOLOGICAL TRAITS OF FIG (*Ficus carica* L.) GENOTYPES COLLECTED IN THE WEST MEDITERRANEAN REGION IN TURKEY

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ABSTRACT

Fig (*Ficus carica* L.) is one of the most important fresh and dried fruits for both consumers and food industry throughout world and is produced in a limited number of countries. As a leader producer in the world, Turkey has important fig genetic resources as well. However in most parts of the country, in particular coastal regions, local fig genotypes are continuously subjected to genetic erosion and therefore, it is necessary to determine, collect, describe and also to maintain them *in situ* and *ex situ*. This study we aimed to evaluate local fig germplasm in Alanya and Kemer districts in Mediterranean region of Turkey. The results showed that the investigated pomological traits of fig genotypes displayed significant differences within both districts. Fig samples collected from Alanya are more suitable for making marmalade and jam because they had relatively small fruits, while figs sampled from Kemer are generally considered good as fresh consumption due to their relatively big fruit size. These valuable fig genetic resources are under *in-situ* conservation to use in future breeding programmes.

Keywords*:* Fig, *Ficus carica*, pomological traits, diversity.

INTRODUCTION

Turkey is well known main origin and diversity centre of *Ficus carica* L. and in most parts of the country, fig trees differs each other for both tree and fruit characteristics. In particular, Mediterranean coast line, this diversity is more visible. Each fig growing location in this region has its own local germplasm that includes valuable fig genetic resources (Kuden et *al.*, 1995 and Aksoy, 1998).

Turkey dominated world fig production for a long time and is also the biggest exporter of fig in the world (FAO, 2009). Total fig production in the world is about 1,185,000 tons and Turkey alone produces about 245,000 tons (FAO, 2009). Turkey stands first in the trade of fresh or dried figs all over the world (Aksoy *et al*., 2003).

Fig is commonly consumed as fresh or dried. Although dried figs are available throughout the year, there is nothing like the unique taste and texture of fresh figs. They are lusciously sweet with a texture that combines the chewiness of their flesh, smoothness of their skin, and crunchiness of their seeds.

Fresh fig fruits rich in amino acids, proteins, carbohydrates, fibers, minerals etc. (Aksoy *et al*. 2001 and Wang *et al*. 2003). Fig fruit has also importance in the food industry since it is processed into several products such as preserved fruits, jam, juice, wine and powder. Fig also contains several medicinal products, i.e. flavone, rutin and quercetin used for cardiovascular disease (Wang *et al*. 2003).

Fig trees are native to Anatolia and originated from Caucasian and the Mediterranean basin including Turkey (Condit 1947; Aksoy *et al*., 1992 and Aksoy, 1995). East Mediterranean and Southeast Anatolia regions are known for the rich fresh fig genetic resources (Kuden and Tanriver, 1998; Caliskan and Polat, 2011).

Although several selection studies have been conducted on the different fig growing regions in Turkey (Cetiner, 1981; Eroglu, 1982; Aksoy *et al*., 1992; Sen *et al*., 1993; Kuden *et al*., 1995; Ilgin and Kuden, 1996; Ozkaya, 1997 and Simsek and Yildirim, 2010), no study on selection has been conducted in Alanya and Kemer districts in Mediterranean region. These two districts are very important tourism area in Turkey and thus, fig genetic resources in these two districts are under threat of tourism activities and genetic erosion is high. Due to continuous genetic erosion, it is necessary to collect, describe and also to maintain *in situ* and *ex situ* conservation of fig genetic resources in these areas.

Aim of this study was to determine promising fig genetic resources from Alanya and Kemer districts and evaluate them in terms of pomological properties and finally conserve as fig genetic resources for future breeding activities.

MATERIALS AND METHODS

Determination and collection of promising fig genotypes: Survey and selection studies carried out during 2002 and 2003 in Alanya and Kemer districts aimed to find fig genotypes which had high productivity capacity and better fruit characteristics. Finally 15

promising genotypes from Kemer and 16 promising genotypes from Alanya were selected and pomological measurements and analysis were done on a total 20 fruits per genotypes. The pomological traits viz., fruit weight (FW), fruit length (FL), fruit width (FWd), fruit shape index (FSI), neck length (NL), ostiol width (OW) were evaluated according to the fig descriptor developed by IPGR and CIHEAM (Anonymous, 2003).

Fruit weight was determined by using a digital balance with a sensitivity of 0.001 g. Linear dimensions, i.e. width, length of fruit, width of ostiol and length of fruit neck were measured by using a digital caliper with a sensitivity of 0.01 mm. Fruit shape index was determined as fruit width/fruit length. The sugar content (Fructose and glucose) was determined quantitatively by HPLC. The total soluble solid content (TSS), expressed as percentage were measured by using ATAGO (ATC-I, Japan) hand refractometer. Titratable acidity (TA) was measured by titration method and was calculated as percent citric acid (AOAC, 1995). Skin colour of the fruit samples was measured by a Minolta portable chromameter (model CR-200; Minolta, Kyoto, Japan). Use of the Minolta CR 200 colorimeter allowed determination of the colour index expressed as brightness (L*), hue angle ($Hue^o = \tan^{-1}$ (b*/a*) and chroma $C^* = (a^2+b^2)^{1/2}$. L* indicates lightness (from bright colours to dark colours); Hue angle indicates the pure spectrum colour (red, yellow, green, blue etc. and mixing of the colours) and chroma indicates saturation of the colour (from vivid colours to dull colours).

Data Analysis: Statistical data analysis was performed for Alanya and Kemer samples using the General linear Model Procedure (SAS, 1987). Similarly, correlations among traits were determined both districts separately by correlation analysis (SAS, 1987). Significant differences among the means were determined by least significant difference (LSD) comparison test at a level of $P < 0.05$.

RESULTS AND DISCUSSION

Pomological traits of fig genotypes sampled from Kemer and Alanya districts: The variance analysis revealed that there were statistically significant differences among genotypes for all traits ($P< 0.05$) within in both districts (Table 1, 2, 3, 5, 6, 7). There were visible differences among genotypes in terms of most of traits within Kemer and Alanya samples.

The fruit weight of fig genotypes from Alanya district varied from 13.8 to 48.5 g (Table 1) while fruit weight of fig genotypes from Kemer district ranged from 14.7 to 60.5 g (Table 5). Previously fruit weights of fig genotypes from Turkey and different countries showed great variability that varied from 9 to 134 g (Chessa and Nieddu, 1990; Aksoy *et al*., 1992; Ilgin, 1995; Kuden *et al*., 1995; Bostan *et al*., 1998; Koyuncu, (1998, 2004); Koyuncu et al., 1998; Aksoy *et al*., 2003; Ferrara and Papa, 2003 and Karadeniz, 2003). The results related to fruit weight of the study are in agreement with the findings of previous reports, except for (Ferrara and Papa, 2003; Karadeniz, 2003). These differences could be the results of growth conditions and genotypes used.

The fruit width was between 28.6 and 45.3 mm in Alanya district while it was found between 30.9 and 51.1 mm in Kemer (Table 1 and 5). As for the fruit length, it was recorded as 54.7 mm as the longest and 28.3 mm as the shortest in Kemer and Alanya, respectively. Our fruit length and width results are in agreement with the findings of previous reports (Aksoy *et al*., 1992; Kuden *et al*., 1995; Ilgin and Kuden, 1996; Ozkaya, 1997; Bostan *et al*., 1998; Koyuncu, (1998, 2004); Koyuncu *et al*., 1998; Kuden and Tanriver, 1998 and Ferrara and Papa, 2003). Fruit size was classified into small, medium and big. Aksoy *et al*., (1992) reported that the fruit size (width and length) and fruit weight were considered as an important trait in the fresh consumption group in fig. Small fruits are used for canning, whereas big ones are consumed as fresh in general, particularly Antalya region in Turkey.

In Alanya the fruit shape index was found between 0.78 and 1.14 (Table 1) and fruit shape varied from oblong to globous and oblate (Table 1). The fruit shape index of genotypes sampled from Kemer was found between 0.72 and 1.10 (Table 5) and the fruit shape was determined as oblate, spherical and oblong. Ferrara and Papa (2003) reported that the fruit shape ranged from a turbinate to a spherical in all the fig cultivars. Condit (1941) indicated that the fruit shape index is of great importance in packing and transportation. Except for two types (A24, K2), which had an oblate shape (Table 1 and 5), all the fig genotypes can be suitable for commercial production.

In Alanya and Kemer, the fruit neck length ranged between 1.97 and 16.9 mm and 5.67 and 17.4 mm, respectively. Short neck length is not preferred by growers because damages may occur due to difficulties in harvest (Ozeker and Isfendiyaroglu, 1998). With respect to neck length, four fig genotypes (A5, A64, K21 and K22) had higher neck length (Table 1 and 5). Aksoy *et al*. (2003) reported a range of neck length between 0.7 and 21.2 mm in fig.

In Alanya, the ostiolum width of the fruits varied from 2.56 to 7.43 mm (Table 1) while the ostiolum width of the fruits sampled from Kemer ranged from 2.25 and 8.93 mm (Table 5). Aksoy *et al*., (2003) reported ostiol width between 1.7 and 11.4 mm in fig genotypes. Our results are also in accordance with the previous studies (Chessa and Nieddu, 1990; Aksoy *et al*., 1992; Ilgin, 1995 and Ozkaya, 1997). On the other hand, findings in the study are not in agreement with the findings of Bostan *et al,* (1998) and Ozeker and Isfendiyaroglu (1998).

In Alanya, the fruit skin brightness and the chroma values were varied from 28.3 to 72.5 and 4.09 to 53.7, respectively (Table 2). L* values (brightness) varied from 27.7 to 81.6 and the chroma values varied between 5.04 and 54.4 in fruits in Kemer district (Table 6). Hue value varied from 56.84 and -82.12 in Alanya samples and 68.42 and -73.84 in Kemer samples (Table 2 and 6). According to these values, the fruit skin colour among the genotypes ranged from green-yellow to the dark blue (Data not shown). The most frequent colour of the skin was dark blue in the nineteen cultivars however, others had light green (Data not shown). Ercisli (2004) reported that there is great variability for skin colour in fig genotypes and cultivars. Similarly, a great variation for skin colour was found in this study.

In Alanya and Kemer, the titratable acidity was found between 0.10-0.51% and 0.09–0.44%, respectively (Table 3 and 7). The highest and the lowest total soluble solid content ratios in Alanya were 29.0 and 13.0% (Table 3) while it was between 20.7 and 12.0% in Kemer, respectively (Table 7). Results on titratable acidity and total soluble solid content were in conformity with those of Chessa and Nieddu (1990); Flores (1990); Kabasakal (1990); Aksoy *et al*. (1992); Pilando and Woolstad (1992); Ilgin (1995); Kuden *et al*. (1995); Melgarejo (1996), Bostan *et al*. (1998); Koyuncu (1998); Koyuncu *et al*. (1998); Ozeker and Isfendiyaroglu (1998); Aksoy *et al*. (2003); Ferrara and Papa (2003) and Sanchez *et al*. (2003).

Table 1.Some physical characteristics of fig genotypes collected from Alanya, Antalya

Type No	Fruit weight (g)	Fruit width (mm)	Fruit length (mm)	Fruit shape index	Neck length (mm)	Ostiol width (mm)
A4	46.7±2.9 ab	45.3±1.5 a	46.9±2.7 b	0.97±0.0 cd	11.4±2.0 bc	2.82±0.6 h
A5	48.5±3.1 a	45.0±1.0 a	51.9±1.7 a	0.87±0.0 e	13.4±1.1 b	5.00±0.4 c-e
A10	38.6±3.0 cd	41.6±1.1 b	40.3±2.8 d-f	1.06±0.1 ab	7.89±0.7 de	2.56±0.4 h
A24	41.8±3.2 b-d	44.3±1.2 ab	39.3±1.5 d-f	1.14±0.0 a	7.19±0.8 e	3.84±0.3 e-h
A28	45.1±1.3 a-c	45.2±0.7 a	44.7±1.2 bc	1.01±0.0 b-d	8.46±1.4 d	6.70±0.6 ab
A36	20.9±1.4 gh	33.6±0.9 e	34.8±0.8 g	0.97±0.0 cd	6.54±0.5 e	4.17±0.3 d-f
A61	25.4±2.0 g	37.0±1.2 cd	37.8±1.2 e-g	0.98±0.0 c	7.12±0.8 e	2.83±0.2 gh
A62	42.4±4.4 bc	42.5±2.0 b	43.6±1.4 b-d	0.97±0.0 cd	1.97±0.5 g	5.31±0.8 cd
A64	41.1±5.5 b-d	40.7±1.2 b	52.6±3.6 a	0.78±0.0 f	16.9±2.8 a	3.64±0.1 e-h
A67	31.4±3.8 ef	39.5±1.7 bc	41.1±2.2 c-e	0.96±0.0 c-e	10.3±0.8 cd	7.43±0.8 a
A74	13.8±1.0 j	28.6±0.9 f	28.3±0.9 h	1.01±0.0 b-d	6.01±0.3 ef	3.09±0.3 f-h
A90	16.3±1,0 ij	30.0±1.0 ef	34.8±0.9 g	0.86±0.0 ef	10.3±0.6 cd	3.44±0.3 e-h
A102	19.1±1.6 h-j	33.2±0.9 e	32.9±1.2 g	1.02±0.0 b-d	6.08±1.1 ef	4.10±0.4 d-f
A107	19.8±1.3 hi	33.2±0.8 **e**	40.0±1.0 de	0.84±0.0 ef	9.70±0.7 cd	3.21±0.2 f-h
A112	35.7±2.1 de	40.5±0.9 b	42.7±2.2 cd	0.96±0.0 c-e	10.8±1.8 c	5.79±0.7 bc
A137	26.3±0.8 fg	37.2±0.4 cd	36.8±0.7 fg	1.01±0.0 b-d	6.43±0.5 e	4.10±0.3 d-f
LSD	9.56**	2.41**	3.90**	0.08**	2.52**	1.21**

* and ** are statistically significant at 0.05 and 0.01, respectively.

Table 2. External fruit colour properties of fig genotypes collected from Alanya, Antalya

Type No	Lightness (L*)	Chroma (C*)	Hue ($H^{o)}$
A4	72.5±1.0 a	53.70±1.5 a	- 79.64±0.1 e
A5	35.40±1.7 gh	10.30±1.5 f	-3.78 ±0.5 bc
A10	52.10±1.9 e	23.1±2.1 e	-82.12±1.2 e
A24	64.40±1.7 c	47.6±4.3 bc	-70.59±0.3 e
A28	28.30±0.6 i	6.30±1.0 fg	-6.67±1.2 bc
A36	30.90±1.7 hi	5.78±1.6 fg	-17.76± 0.3 cd
A61	28.60±1.7 i	4.77±1.2 g	-19.95±1.6 cd
A62	30.60±0.9 i	4.09±1.2 g	-32.73±0.4 d
A64	66.80±2.2 bc	40.40±3.6 d	-65.31±0.5 e
A67	58.10±1.6 d	50.70±1.2 ab	-73.75± 2.1 e
A74	31.10±1.5 hi	4.760±1.3 g	-26.43±1.3 d
A90	43.80±0.6 f	22.00±2.6 e	56.84±0.5 a
A102	29.50±3.1 i	6.93±0.8 fg	5.86±2.1 b
A107	70.70±0.8 ab	49.70±0.4 ab	-77.31±0.1 e
A112	65.10±2.2 c	43.20±1.0 cd	-66.94±0.7 e
A137	37.80±0.6 g	5.46±0.2 fg	-3.93±1.3 bc
LSD values	4.69**	5.47**	18.83**

* and ** are statistically significant at 0.05 and 0.01, respectively.

Table 3. Some chemical characteristics of fig genotypes collected from Alanya, Antalya

Type No	Titratable acidity (%)	Total soluble solid (%)	Glucose (%)	Fructose (%)
A4	0.34±0.0 c-e	13.0±0.0 j	4.89±0.2 fg	5.58±0.3 ef
A5	0.28±0.0 f	19.7±0.3 f	8.36±0.4 d	6.01±0.1 ed
A10	0.23±0.0 g	27.1±0.1 b	8.23±0.5 d	9.53±0.2 b
A24	0.27±0.0 f	19.3±0.3 f	8.99±0.0 cd	8.25±0.1 c
A28	0.10±0.0 j	17.0±0.0 g	5.42±0.0 f	5.50±0.2 e-g
A36	0.21±0.0 h	27.0±0.0 b	10.20±0.3 ab	10.03±0.3 ab
A61	0.39±0.0 b	21.0±0.0 e	6.38±0.1 e	6.39±0.5 d
A62	0.29±0.0 f	19.3±0.3 f	5.09±0.6 fg	5.23±0.1 fg
A64	0.51±0.0 a	17.0±0.0 g	3.18±0.0 h	4.39±0.0 h
A67	0.34±0.0 cd	15.9±0.2 h	4.32±0.3 g	4.76±0.0 gh
A74	0.40±0.0 b	24.3±0.3 c	8.59±0.1 d	8.69±0.1 c
A90	0.32±0.0 e	21.9±0.1 d	6.89±0.0 e	8.09±0.0 c
A102	0.33±0.0 de	27.0±0.0 b	9.58±0.2 bc	9.91±0.5 ab
A107	0.51±0.0 a	29.0±0.0 a	10.70±0.4 a	10.30±0.5 a
A112	0.15±0.0 i	14.3±0.3 i	5.49±0.1 f	5.37±0.1 e-g
A137	0.35±0.0 c	17.0±0.0 g	6.29±0.2 e	6.05±0.3 ed
LSD values	0.02**	0.54**	0.80**	0.78**

* and ** are statistically significant at 0.05 and 0.01, respectively.

Table 4. Correlation coefficients among pomological traits in fig collected from Alanya, Antalya

Traits	FW	FL	FWd	FSI	NL	OW	TA	TSS	Glucose	Fructose	L*	Chroma
FL	0,76**											
FWd	0.96**	0.71**										
FSI	0.06	-0.56**	0.16									
NL	0.24**	0.64**	0.17	-0.65**								
OW	0.22*	0.19*	0.26**	-0.01	-0.07							
TA	0.27	0.03	-0.33*	-0.30*	0.33*	-0.39**						
TSS	-0.48**	-0.41**	-0.51**	0.02	-0.27	-0.23	0.19					
Glucose	-0.33*	-0.40**	-0.33*	0.19	0.30*	-0.17	-0.01	0.82**				
Fructose	-0.46**	-0.51**	-0.46**	0.18	-0.29*	-0.28	0.06	0.89**	0.90**			
L*	0.20	0.24	0.21	-0.08	0.40**	-0.15	0.24	-0.29*	-0.18	-0.11		
Chroma	0.23	0.25	0.22	-0.10	0.41**	-0.10	0.24	-0.32*	-0.21	-0.15	0.97**	
Hue^{o}	-0.35*	-0.23	0.38**	-0.13	-0.16	0.19	-0.15	0.17	0.14	-0.11	0.71**	-0.68**

* and ** are statistically significant at 0.05 and 0.01, respectively.

Table 5. Some physical characteristics of fig genotypes collected from Kemer, Antalya

Type No	Fruit weight (g)	Fruit width (mm)	Fruit length (mm)	Fruit shape index	Neck length (mm)	Ostiol width (mm)
K2	41.7±1.9 b-d	47.1±0.8 b	42.7±0.4 de	1.10±0.0 a	6.47±0.4 ef	4.64±0.7 bc
K6	40.8±7.4 b-d	42.1±2.3 cd	47.5±1.9 c	0.89±0.0 fg	7.66±0.7 c-f	3.16±0.3 c-e
K9	14.7±0.7 i	30.9±0.7 h	32.7±0.5 g	0.95±0.0 d-f	8.39±0.4 cd	3.40±0.2 c-e
K11	60.5±6.4 a	51.1±1.9 a	52.0±1.1 ab	0.98±0.0 cd	10.5±0.9 b	8.93±1.5 a
K12	37.1±3.4 b-e	43.6±1.5 bc	41.4±1.6 e	1.05±0.0 ab	5.67±0.5 f	4.19±0.6 bc
K14	22.3±1.9 hi	34.4±1.0 fg	37.1±1.5 f	0.93±0.0 d-f	7.36±0.7 d-f	2.55±0.3 de
K19	39.5±4.1 b-d	42.3±1.6 cd	44.5±1.8 cd	0.95±0.0 de	7.02±0.6 d-f	3.39±0.5 c-e
K21	29.3±5.6 e-h	36.0±2.5 ef	49.7±3.3 bc	0.73±0.0 i	16.7±2.1 a	2.51±0.3 de
K22	34.2±2.0 c-f	39.6±1.0 de	54.7±1.2 a	0.72±0.0 i	17.4±0.9 a	5.07±0.4 b
K29	42.3±4.0 bc	44.1±1.7 b	51.8±1.1 b	0.85±0.0 gh	10.8±0.6 b	2.25±0.2 e
K31	20.2±2.0 hi	32.6±0.6 gh	41.0±1.1 e	0.80±0.0 h	10.7±0.8 b	2.87±0.2 c-e
K32	31.3±3.6 e-h	38.4±1.8 ef	43.1±2.7 de	0.90±0.0 e-g	5.99±0.7 ef	2.94±0.5 c-e
K33	45.7±6.1 b	44.5±2.5 b	48.8±1.0 bc	0.91±0.0 fg	9.34±0.8 bc	3.57±0.6 c-e
K34	24.5±1.0 h	37.1±0.6 ef	39.5±0.7 ef	0.94±0.0 d-f	7.74±0.6 c-e	5.33±0.6 b
K35	27.1±1.5 f-h	38.9±0.9 de	37.9±1.1 f	1.03±0.0 bc	9.40±0.9 bc	3.54±0.2 c-e
LSD	8.77**	3.35**	3.37**	0.06**	1.95**	1.50**

* and ** are statistically significant at 0.05 and 0.01, respectively.

Table 6. External fruit colour values of fig genotypes collected from Kemer, Antalya

Type No	Lightness (L*)	Chroma (C*)	Hue ($H^{o)}$
K2	75.0±0.5 b	38.2±3.1 c	-67.17 ±0.2 e
K6	44.9±1.5 f	17.1±0.1 fg	36.85±0.5 a-c
K9	68.5±0.6 c	44.5±2.3 b	-68.70±0.11 e
K11	72.9±3.6 bc	54.4±1.3 a	-71.74±0.4 e
K12	81.6±2.4 a	43.8±1.2 b	-73.52±0.2 e
K14	35.7±0.8 g	6.12±0.4 i	-34.33±1.3 de
K19	67.9±1.0 c	43.8±1.5 b	-68.35±17 e
K21	37.2±1.2 g	11.4±0.7 h	11.70±0.5 bc
K22	71.5±0.9 bc	52.3±1.1 a	-73.84±1.1 e
K29	55.2±4.9 de	28.0±1.7 d	61.21± 0.3 a
K31	57.7±1.9 d	22.0±2.0 e	29.05±0.7 a-c
K32	49.6±4.1 ef	20.5±2.0 ef	65.57±0.2 a
K33	46.7±1.1 f	15.8±1.0 g	52.04±2.1 ab
K34	27.7±0.7 h	5.04±0.1 i	-4.66±2.1 cd
K35	53.9±0.8 de	16.8±0.6 fg	68.42±0.8 a
LSD values	6.32**	4.38**	45.58**

* and ** are statistically significant at 0.05 and 0.01, respectively.

Table 7. Some chemical characteristics of fig genotypes collected from Kemer, Antalya

Type No	Titratable acidity (%)	Total soluble solid (%)	Glucose (%)	Fructose (%)
K2	0.21±0.0 e	12.0±0.0 g	3.95±0.2 g	3.90±0.2 e
K6	0.09±0.0 k	15.0±0.0 e	6.72±0.3 a	5.86±0.1 b-d
K9	0.32±0.0 c	20.0±0.0 b	6.35±0.2 ab	7.00±0.1 a
K11	0.20±0.0 e	14.0±0.0 f	6.30±0.2 a-c	6.12±0.2 bc
K12	0.11±0.0 j	12.3±0.3 g	3.66±0.0 g	4.03±0.1 e
K14	0.35±0.0 b	17.0±0.0 d	5.63±0.3 b-e	5.31±0.2 d
K19	0.14±0.0 g	18.0±0.0 c	6.80±0.0 a	5.55±0.5 cd
K21	0.13±0.0 hi	17.0±0.0 d	5.18±0.1 ef	5.41±0.2 d
K22	0.13±0.0 gh	18.0±0.0 c	5.50±0.4 d-f	6.45±0.5 ab
K29	0.12±0.0 ij	17.7±0.3 d	4.94±0.0 ef	5.32±0.1 d
K31	0.17±0.0 f	20.7±0.3 a	5.94±0.1 b-d	6.15±0.2 bc
K32	0.11±0.0 j	18.3±0.3 c	6.79±0.1 a	6.93±0.0 a
K33	0.11±0.0 j	15.0±0.0 e	5.44±0.6 d-f	5.58±0.4 cd
K34	0.44±0.0 a	14.0±0.0 f	4.84±0.3 f	4.49±0.0 e
K35	0.22±0.0 d	20.0±0.0 b	5.58±0.3 c-e	7.07±0.1 a
LSD values	0.01**	0.50**	0.73**	0.69**

* and ** are statistically significant at 0.05 and 0.01, respectively.

Table 8. Correlation coefficients among pomological traits in fig collected from Kemer, Antalya

Traits	FW	FL	FWd	FSI	NL	OW	TA	TSS	Glucose	Fructose	L*	Chroma
FL	0,70**											
FWd	0.94**	0.62**										
FSI	0.21*	-0.49**	0.37**									
NL	0.02	0.61**	-0.05	-0.75**								
OW	0.42**	0.21*	-0.43**	0.21*	-0.08							
TA	-0.54**	-0.64**	-0.46**	0.24	-0.18	-0.32*						
TSS	-0.50**	-0.20	-0.64**	-0.45**	-0.27	-0.24	0.03					
Glucose	0.09	0.11	-0.12	-0.29	-0.02	-0.06	-0.09	0.55**				
Fructose	-0.29	-0.03	-0.36*	-0.35*	0.24	-0.05	-0.10	0.76**	0.73**			
L*	0.19	0.13	0.30*	0.18	0.05	0.03	-0.34*	-0.13	-0.16	-0.02		
Chroma	0.24	0.27	0.31*	0.03	0.20	0.17	-0.27	-0.10	0.01	0.06	0.91**	
Hue^{o}	-0.03	0.06	-0.09	-0.17	-0.07	-0.32*	-0.23	0.28	0.17	0.30*	-0.54**	-0.64**

* and ** are statistically significant at 0.05 and 0.01, respectively.

Highest glucose and fructose contents in figs from Alanya were 10.70% and 10.30%, respectively (Table 3). In Kemer, it was found as 6.80% and 7.07% (Table 7). Differences in sugar content of fruits and vegetables were dependent upon cultivar, maturity, storage conditions and crop year. Aksoy (1997) indicated that glucose content of fig is always greater than the fructose. Their high natural sugar content makes them especially desirable food for children (Tyler, 1997). In fruits, most of the dry matter is in a soluble form which is largely composed of sugars. The organic acid composition of fig fruit is dominated by citric acid and acidity together with sugars made up the taste (Aksoy, 1997). But preferences in flavour change according to the consumers' demand. Cultivars, which have high sugar concentrations, are in demand in domestic and Middle Eastern markets. On the contrary, cultivars low in sugar concentrations are requested in the European markets (Ozeker and Isfendiyaroglu, 1998).

Correlation coefficients among traits: In present study we found that in Alanya samples, fruit weight was statistically significant positive correlated with fruit length (r= 0.76**), fruit width (r=0.96**) and neck length (r=0.24**). The fruit length was related with fruit width (r= 0.71**) and neck length (r=-0.64**). The fruit width was correlated with ostiolium width (r=0.26**) and Hue color value (r=-0.38**). Total soluble solid was correlated with glucose (r=0.82**), fructose (r=0.89**). The correlation between chroma and L* value was r=0.97** and Hue and L* was r=0.71** (Table 4).

In Kemer samples, fruit weight was statistically significant correlated with fruit length (r= 0.70**), fruit width (r=0.94**) and ostiolium width (r=0.42**). The fruit length was related with fruit width (r= 0.62**) and neck length (r=-0.61**). The fruit width was correlated with fruit shape index (r=0.37**). Total soluble solid was correlated with glucose (r=0.55**), fructose (r=0.76**). The correlation between chroma and L value was r=0.91** (Table 8). We can say that in both regions there is clear relationships between fruit weight and fruit dimensions. In another word, increased fruit weight increased fruit dimensions.

Conclusions: In this study fruit size ranged from small and medium to large and very large. The six promising genotypes (A36, A74, A90, A102, A107 and K2) are preferred to use in chocolate and confectionary industry due to its small fruits.

While K2 and K12 fig genotypes had low sugar content, the A10, A36, A102 and A107 fig genotypes had high sugar content. The genotypes with low sugar content may be used in diet for diabetics. A5 and K11 fig genotypes had large fruit and K9 and A74 fig genotypes may be recommend as table figs in both domestic and foreign markets.

There is a great variability for pomological traits investigated in fig genotypes within both districts. As a result, length of fruit, width of fruit, and weight of fruit of Kemer seems were relatively higher than these of fruits sampled from Alanya. These differences could be the result of genotypic and environmental conditions. These fig genetic resources are under *in-situ* conservation to use in breeding programmes and thus they will be conserved from genetic erosion in these areas.

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