Europ.J.Hort.Sci., **69** (4). S. 153–158, 2004, ISSN 1611-4426. © Verlag Eugen Ulmer GmbH & Co. Stuttgart

Promising Fig (*Ficus carica* L.) Genetic Resources from Birecik (Urfa) Region of Turkey

M. A. Koyuncu
(Süleyman Demirel University, Faculty of Agriculture, Department of Horticulture, Isparta, Turkey)

Summary

This study was aimed to select valuable genetic resources of fig in Birecik (Urfa) situated on the Southeast part of Turkey during 1998 and 1999. Populations consisting of native fig genotypes were examined in terms of fruit, leaf and tree characteristics, and 35 genotypes were selected for future breeding efforts. Their leaves and desirable fruit characteristics were determined by comparing with 'Bursa Siyahı', which has prime importance among table fig varieties in Turkey for fresh market. Some selections produced larger fruits than 'Bursa Siyahı'. All genotypes showed a range of 23 to 84 g in fruit weight, 36 to 56 mm in fruit width, 30 to 56 mm in fruit length and 0.08 to 0.2 mm in peel thickness. While total soluble solid contents ranged from 12 to 21.3 %, titratable acidity changed from 0.1 to 0.4 %. In addition, all types were investigated in terms of fruit shape index, skin colour, internal colour, peel thickness, skin cracks, ribs of peel, ease of peeling, number of leaves per shoot, leaf dimensions, lobes, hairs, venation, presence of teeth, growth habit of tree and seasonal shoot growth. Many genotypes were evaluated as promising for further breeding efforts.

Zusammenfassung

Vielversprechende genetische Resourcen der Feige aus der Birecik Region (Urfa) der Türkei. Ziel der Untersuchung in den Jahren 1998 und 1999 war, wertvolle Genotypen der Feige in Birecik (Urfa), dem Südosten der Türkei, zu selektieren. Die Populationen aus einheimischen Feigen-Genotypen wurden hinsichtlich Frucht-, Blatt- und Baumeigenschaften untersucht und daraus resultierend 35 Genotypen für weitere Züchtungsschritte ausgewählt. Als Vergleichssorte für wünschenswerte Blatt- und Fruchtmerkmale wurde 'Bursa Siyahı', die wichtigste Tafelfeigensorte auf dem türkischen Frischmarkt herangezogen. Einige Selektionen hatten größere Früchte als 'Bursa Siyahı'. Alle Genotypen wiesen beim Fruchtgewicht Werte zwischen 23 und 84 g, in der Fruchtbreite zwischen 36 und 56 mm, in der Fruchtlänge zwischen 30 und 56 mm und in der Schalendicke zwischen 0.08 und 0.2 mm auf. Der Gesamtanteil löslicher Trockensubstanz betrug 12–21.3 %, die titrierbare Säure 0.1–0.4 %. Alle Genotypen wurden hinsichtlich Fruchtformindex, Schalen- und Fruchtfleischfarbe, Schalendicke, -rissen, -rippen, Anzahl der Blätter pro Trieb, Blattgröße, -lappung, -behaarung, -nerven, -zahnung, Wuchseigenschaften des Baumes und saisonalem Triebwachstum untersucht. Viele Genotypen wurden als vielversprechend für weitere Züchtungsarbeit eingestuft.

Key words. fig – fruit characteristics – genetic resources – genotypes – morphological characteristics

Introduction

With rich genetic resources of fig, Turkey is among native spreading areas of this species (ÖZBEK 1978; AKSOY 1998; NALBANT et al. 1998). CONDIT (1947) reported that Anatolia is the native land of fig and wild figs and they spread from Anatolia to the Mediterranean, Syria, Iran, Iraq, Saudi Arabia, South Caucasia, and Crimea. Turkey is the first in the world with respect to the number of trees, dried fig production, and export. Today, fig production of Turkey is 260.000 tons and contributes to 54–60 % of total fig production of the world (ANONYMOUS 2001a, b). A great deal of this production is obtained from the Big and Small Meander Valleys in the Aegean region. These valleys produce almost all dried fig consisting of the cultivar 'Sarı lop' (ÖZBEK 1978; AKSOY 1983). Since table figs are not so demanding as dried figs in terms of climatic and soil conditions, they can also be economically grown in other regions of Turkey such as Mediterranean and Black Sea coasts, Southeast Anatolia and some parts of Central Anatolia (KÜDEN and TANRIVER 1995; ŞAHIN 1998). Especially, the shore of Mediterranean and Southeast Anatolia have suitable conditions for fresh fig production (KAŞKA et al. 1990). KÜDEN and TANRIVER (1998) reported that Southeast Anatolia is known as the main genetic resource of table figs. Because table figs are highly perishable compared to dried figs, their commercial production is not as old as dried figs. Recently, the fresh fig trade, which generally targeted the local markets, started to gain international importance (ŞAHIN 1998). Technological developments in postharvest processes such as handling, packing, cold storage, and transportation have produced a significant increase

in the demand for table figs during the last fifteen years in Turkey (ÖZEKER and İSFENDİYAROĞLU 1998).

In Turkey, there is a large number of native fig genotypes other than standard cultivars. Fig trees are generally found as single or border trees rather than on regular plantations except for orchards where 'Bursa Siyahı' cultivar is cultivated for export (ŞAHIN 1998). These genotypes still meet an important part of present table fig production. Therefore, the maintenance of fig genetic resources, which are nearly extinct and their identification in terms of genetic variability are very important for future breeding efforts. Many researchers studied native fig populations from different areas, and reported some promising genotypes that have different fruit, leaf, and tree characteristics (AKSOY et al. 1992; ILGIN 1995; KOYUNCU 1998; KOYUNCU et al. 1998). However, there have not been enough studies concerning genetic variability of figs in Turkey.

Despite the fact that 'Bursa Siyahı' cultivar is of prime importance for fresh market, there are many other cultivars for local fresh consumption. Being rich in genetic diversity, Turkey is also ranked first in the world in terms of table fig production and fruit quality (ANONYMOUS 2001b). Because larger sized fruits can be sold at higher price in both domestic and foreign markets, average fruit weight and fruit dimensions are taken into consideration for selecting table figs. Fruit index (width/length) is of great importance in packing and transportation (CONDIT 1941). On the other hand, leaf and tree traits are important for the identification of genotypes (HART 2001; KALLIOPI et al. 2002).

With its microclimatic structure properties, the research region (Urfa district) situated in Southeast Anatolia has rich genetic resources in native figs. Promising genotypes that will be selected in this district can be used for future breeding material for dry and hot regions. Almost all are not grafted, because of a lack of modern technical and cultural practices. Promising table fig genotypes were selected from Hilvan and Kahramanmaras districts located in this region and many of them had good fruit characteristics (ILGIN 1995; KOYUNCU 1998).

This study aimed at selection of native figs from Birecik (Urfa) district and their identification with respect to fruit, leaf and tree characteristics for future breeding efforts.

Materials and Methods

The study was conducted on the native fig population of Birecik (Urfa), a district situated on the Southeast part of Turkey, during 1998 and 1999. The whole population consisting of approximately 1700 native trees, which were at bearing age, was individually studied before the harvest season of the first year and a large number of trees were marked. The fig trees grew naturally without any cultural techniques such as irrigation, pruning, fertilization, etc. At harvest season, trees, which produced small fruits (minimum width: 35 mm, minimum length: 28 mm) were discarded according to fig descriptor (AKSOY et al. 1996) and only fruit samples from trees bearing better fruits were collected. Fruits were harvested from different sites of trees and immediately transported to the laboratory in iceboxes. Leaves were collected from medium part of branches of 1-year-old-shoots after fruit harvesting. Representing each tree, thirty fruits and leaves were randomly chosen for analyses. Genotypes were described with respect to fruit, leaf, and tree characteristics based on fig descriptor (AKSOY et al. 1996) with minor modifications. Some of these characteristics of selected genotypes were evaluated by comparing with the standard cultivar 'Bursa Siyahı'. The data were presented as the mean of three replicates with standard deviation (ANONYMOUS 1999). Table 1 and 2 show the traits surveyed in this study.

Table 1. The list of qualitative traits and their character states

Traits	Character measures and states								
Leaf characteristics									
Leaf lobes	Undivided (entire)	Three lobe	Five lobe	Seven lobe	More than seven lobe				
Leaf venation	Unapparent	Slightly apparent	Apparent						
Presence of teeth	Entire (No dentation)	Partially	L.S.C.D.						
Hairs on upper surface of leaf	None	Scarce	Numerous	Intense					
Hairs on lower surface of leaf	None	Scarce	Numerous	Intense					
Growth habit of tree	Erect	Semi-erect	Compact	Spreading	Weeping				
Tree vigour	Low	Intermediate	High						
Fruit characteristics									
Skin colour	P. black	Purple	Brown	L. Green	Green	D. Green	B. Green	L. Yellow	Yellow
Internal colour	White	Amber	Pink	Dark Pink	Red	Dark Red			
Skin cracks	Checked skin	S.L.C.	Minute cracks						
Ribs of peel	None	Intermediate	Prominent						
Ease of peeling	Easy	Medium	Difficult						

B. Green: Bluish Green, L. Green: Light Green, D. Green: Dark Green, L. Yellow: Light Yellow,
P. Black: Purplish Black
L.S.C.D.: Lobes sides completely dented, S.L.C. Scarce longitudinal cracks

Table 2. The list of quantitative traits and their character states

Traits	Character measures and states
Leaf characteristics	
Leaf number of per shoot	Counted all leaf on per shoot
Leaf width (cm)	Measured at the widest part of leaf
Leaf length (cm)	Measured from the base of the petiole to the tip of central lobe
Shoot length (cm)	From the base of 1-year-old shoot to tip of shoot
Fruit characteristics	
Fruit weight (g)	Weighing 30 fruit (0.01 g sensitivity digital balance)
Fruit width (mm)	Measured at the widest part of fruit; small: 28–38mm; medium: 35–49mm; large: 41–56mm; very large: >56mm
Fruit length (mm)	Measured between the most distant points along fruit axis; small: 29–46mm; medium: 28–54mm; large: 52–70mm; very large: >70mm
Fruit shape index	width/length
Peel thickness (mm)	Measured at the centre of the two sides of per fruit (digital micrometer)
Total soluble solid (%)	Measured with a digital refractometer (Atago PR 32 Japan)
Titratable acidity (%)	Measured by titration method as citric acid (AOAC 1995)

Results and Discussion

Some fruit and morphological characteristics of preselected genotypes are presented in Table 3 and 4. Genotypes had different values in terms of fruit weight, fruit width, fruit length and peel thickness. In preselected genotypes fruit weight varied between 22.94 and 84.06 g, fruit width between 36 and 56.1 mm, fruit length between 29.8 and 56.4 mm and peel thickness between 0.08 and 0.2 mm. In a similar study carried out by Koyuncu in 1998, these values (fruit weight, width and length) were found as 9–38.37 g, 24–43.6 mm, and 22–39.8 mm, respectively. AKSOY et al. (1992) had found fruit weights between 14.2 and 60.8 g, fruit width between 30.1 and 56 mm and fruit length between 25.3 and 60.2 mm in some standard fresh fig cultivars in Aegean region. Fruit weight is very important for fresh consumption in figs (AKSOY et al. 1992). In this study, four promising selections (63-BR-06, 63-BR-27, 63-BR-04, 63-BR-31) produced fruits with a weight of more than 70 g. These values were higher than the results of other studies carried out on 'Bursa Siyahı' cultivar (ANONYMOUS 2001b) and local figs (AKSOY et al. 1992; KOYUNCU 1998; KOYUNCU et al. 1998). Our results concerning fruit dimensions (width and length) are similar to the results obtained by AKSOY et al. (1992), KÜDEN and TANRIVER (1998) but higher than those of KOYUNCU (1998).

Leaf and tree traits such as growth habit, tree vigour, the number of leaves per shoot, the number of leaf lobes, leaf dimensions, leaf shape (venation, presence of teeth) are important for identification of fig cultivars. Moreover, these traits and some fruit characteristics such as fruit size, fruit shape, skin over colour, internal colour, peel thickness, skin cracks, skin ribs and ease of peeling are of economic interest and usually serve as target traits for selection by growers and breeders (KALLIOPI et al. 2002). As presented in Table 4, genotypes showed different results related to leaf characteristics. The genotypes had leaf width between 13.4 and 26.2 mm and leaf length between 10 and 25 mm. In the genotypes evaluated in this study, the number of lobes and the number of leaves per shoot changed from 3 to 5 and 5.8 to 14, respectively. ILGIN (1995) found that while the number of lobes changed from 3 to 7, the number of leaves per shoot varied between 4.3 and 20.5. Compared to KOYUNCU et al. (1998), although our findings concerning leaf width and length showed a wide variation, the number of lobes was in agreement with this study. In all types, except for 63-BR-29, venation of leaves was apparent. Seasonal shoot length of genotypes varied between 10 and 54.9 cm (Table 4).

In this study, total soluble solid contents, titratable acidity, and pH were 12–21.3 %, 0.1–0.4 % and 4.3–5.6, respectively, which were in agreement with other reports (AKSOY et al. 1992; KOYUNCU et al. 1998; MARS et al. 1998). Although soluble solid content was lower in the majority of genotypes in comparison with 'Bursa Siyahı' (19.5 %), it was higher than 19.5 % in four selections (63-BR-02, 63-BR-08, 63-BR-18 and 63-BR-19). On the other hand, all genotypes, except for 63-BR-01, 63-BR-11, 63-BR-25 and 63-BR-30, had lower acidity than 'Bursa Siyahı' (0.29%). Selected genotypes in this study revealed similar results to 'Bursa Siyahı' in terms of skin cracks, ribs of peel, and ease of peeling, which are important attractiveness for table figs (Table 3).

The fruit quality in figs may highly be affected due to insufficient cultural practices. Genotypes, except for 63-BR-01, 63-BR-02, 63-BR-11, 63-BR-30 and 63-BR-33 from this study, produced fruits, which weights varied from 30.75 to 84.06 g (Table 3) under cultivation practices lacking modern technical and cultural practices. Therefore, with better cultural practices it may be expected from these genotypes to produce larger fruits.

In conclusion, many promising genotypes from this research will gain importance with respect to local cultivar breeding efforts. The results also revealed that

Table 3. Some fruit characteristics of preselected fig genotypes (the average values of two years).

Genotypes	Fruit weight (g)	Fruit width (mm)	Fruit length (mm)	Total soluble solid (%)	Titratable acidity (%)	pH	Peel thickness (mm)	Skin colour	Internal colour	Fruit shape index	Skin cracks	Ribs of peel	Ease of peeling
63-BR-01	23.99±1.89	37.00±0.08	38.20±0.22	18.40±0.46	0.40±0.10	4.44±0.02	0.08±0.01	Yellow	Red	0.96	M. cracks	Intermediate	Easy
63-BR-02	27.05±2.13	36.00±0.41	31.80±0.43	20.00±0.19	0.27±0.04	4.49±0.10	0.09±0.02	Green	Dark red	1.13	M. cracks	Intermediate	Easy
63-BR-03	51.80±2.34	56.10±0.14	46.50±0.14	18.00±0.22	0.13±0.02	5.32±0.04	0.08±0.02	Light green	Pink	1.20	M. cracks	None	Medium
63-BR-04	77.96±1.71	52.30±0.12	41.00±0.09	17.30±0.38	0.26±0.01	5.08±0.06	0.14±0.03	Yellow	White	1.27	M. cracks	Intermediate	Easy
63-BR-05	43.51±2.16	47.20±0.26	41.80±0.07	12.00±0.14	0.17±0.02	4.99±0.08	0.11±0.02	Green	Red	1.12	M. cracks	Prominent	Easy
63-BR-06	84.06±1.90	54.60±0.35	46.61±0.13	15.00±0.29	0.14±0.04	5.12±0.12	0.13±0.02	Dark Green	Pink	1.17	M. cracks	Intermediate	Medium
63-BR-07	62.48±3.01	53.60±0.07	43.00±0.14	19.40±0.39	0.22±0.07	4.92±0.20	0.11±0.02	Green	Pink	1.24	M. cracks	Intermediate	Easy
63-BR-08	38.48±2.11	43.70±0.06	32.70±0.25	19.90±0.27	0.16±0.02	4.96±0.14	0.10±0.03	Yellow	Pink	1.33	M. cracks	Intermediate	Difficult
63-BR-09	36.00±1.15	43.50±0.10	33.00±0.08	15.50±0.21	0.13±0.04	5.02±0.03	0.09±0.04	P. black	Pink	1.31	M. cracks	Intermediate	Easy
63-BR-10	41.45±1.89	47.10±0.10	37.80±0.06	17.20±0.56	0.16±0.02	5.25±0.04	0.19±0.02	Yellow	Pink	1.24	M. cracks	Prominent	Easy
63-BR-11	26.48±1.08	39.00±0.20	32.80±0.03	15.10±0.39	0.40±0.02	4.29±0.04	0.09±0.01	Green	Dark red	1.18	M. cracks	Intermediate	Medium
63-BR-12	48.06±2.10	42.20±0.08	33.00±0.07	18.00±0.24	0.16±0.12	5.00±0.11	0.13±0.01	Light green	Dark red	1.27	M. cracks	Intermediate	Easy
63-BR-13	49.06±1.69	47.00±0.12	42.60±0.14	17.40±0.48	0.11±0.04	5.64±0.17	0.12±0.02	Yellow	Amber	1.10	M. cracks	Prominent	Easy
63-BR-14	44.71±1.75	45.30±0.10	34.60±0.11	19.40±0.27	0.27±0.15	4.93±0.14	0.11±0.01	Dark Green	Dark pink	1.30	M. cracks	Prominent	Difficult
63-BR-15	55.16±2.16	55.50±0.09	37.50±0.08	13.60±0.32	0.24±0.10	4.68±0.18	0.10±0.02	Dark Green	Amber	1.48	M. cracks	Intermediate	Medium
63-BR-16	48.19±1.81	50.00±0.07	34.60±0.26	17.20±0.52	0.13±0.12	4.92±0.16	0.10±0.03	Dark Green	Pink	1.44	M. cracks	Prominent	Medium
63-BR-17	50.46±1.08	53.50±0.07	34.00±0.04	15.50±0.50	0.12±0.14	5.29±0.13	0.11±0.03	Light green	Pink	1.52	M. cracks	Intermediate	Medium
63-BR-18	32.46±1.17	40.80±0.10	56.40±0.08	21.30±0.19	0.11±0.08	5.57±0.17	0.14±0.04	Dark Green	Pink	0.72	M. cracks	Prominent	Medium
63-BR-19	60.11±1.39	55.60±0.05	37.80±0.06	21.00±0.17	0.16±0.04	5.60±0.04	0.13±0.01	Yellow	White	1.47	M. cracks	Intermediate	Medium
63-BR-20	46.60±1.61	46.70±0.06	39.70±0.08	18.00±0.30	0.13±0.14	5.39±0.02	0.10±0.03	Green	Pink	1.17	M. cracks	Intermediate	Easy
63-BR-21	37.74±1.74	40.70±0.14	36.00±0.09	14.00±0.19	0.18±0.10	5.03±0.04	0.16±0.06	Yellow	Pink	1.13	M. cracks	Intermediate	Easy
63-BR-22	44.02±2.15	49.00±0.07	39.00±0.07	15.60±0.42	0.20±0.04	4.80±0.06	0.10±0.02	Light green	Pink	1.25	M. cracks	Intermediate	Medium
63-BR-23	38.96±2.01	46.70±0.11	39.80±0.06	15.60±0.19	0.13±0.06	5.44±0.08	0.20±0.01	Light green	Dark pink	1.17	M. cracks	Prominent	Medium
63-BR-24	35.06±3.16	44.40±0.13	35.20±0.10	17.00±0.33	0.10±0.02	5.27±0.07	0.10±0.01	Green	Amber	1.26	M. cracks	Prominent	Medium
63-BR-25	30.75±3.14	36.20±0.09	32.60±0.09	19.00±0.41	0.30±0.10	4.99±0.12	0.08±0.03	Purple	Dark pink	0.98	M. cracks	Prominent	Easy
63-BR-26	49.06±2.81	46.10±0.08	37.10±0.06	14.00±0.37	0.14±0.04	5.49±0.11	0.10±0.06	Green	White	1.24	M. cracks	None	Easy
63-BR-27	80.43±2.14	55.00±0.08	48.40±0.11	17.30±0.21	0.18±0.03	5.15±0.04	0.12±0.02	Dark Green	Red	1.13	M. cracks	Prominent	Medium
63-BR-28	46.85±1.17	46.60±0.06	38.80±0.11	17.30±0.27	0.16±0.02	4.95±0.02	0.10±0.01	Green	Pink	1.20	M. cracks	None	Difficult
63-BR-29	42.94±2.16	48.60±0.09	34.60±0.12	19.00±0.43	0.17±0.07	5.54±0.10	0.09±0.03	Light green	White	1.40	M. cracks	Prominent	Difficult
63-BR-30	24.44±2.71	41.20±0.10	29.80±0.14	17.20±0.37	0.31±0.06	4.87±0.10	0.08±0.04	P. black	Pink	1.38	M. cracks	None	Easy
63-BR-31	70.48±2.30	51.20±0.14	42.50±0.16	14.00±0.31	0.16±0.01	4.96±0.08	0.14±0.01	Light green	Amber	1.20	M. cracks	Prominent	Easy
63-BR-32	30.88±2.16	51.30±0.11	34.50±0.15	16.00±0.25	0.21±0.02	5.01±0.07	0.08±0.02	Yellow	Pink	1.48	M. cracks	None	Difficult
63-BR-33	22.94±1.71	38.70±0.12	32.70±0.14	19.00±0.24	0.19±0.03	4.90±0.08	0.08±0.03	Light yellow	Red	1.18	M. cracks	Intermediate	Easy
63-BR-34	57.50±1.69	49.60±0.07	35.30±0.12	19.20±0.24	0.12±0.04	5.49±0.14	0.11±0.01	Light green	White	1.40	M. cracks	Prominent	Medium
63-BR-35	41.90±1.70	47.10±0.06	33.61±0.09	15.20±0.33	0.21±0.06	5.06±0.11	0.13±0.04	Yellow	Pink	1.40	M. cracks	Prominent	Medium
'B. S.'	67.00	49.25	46.11	19.5	0.29	4.95	0.10	Purple	Dark red	1.06	M. cracks	Intermediate	Easy

P. black: Purplish black, M. cracks: Minute cracks, 'B. S.': 'Bursa Siyahı'
Promising genotypes for table fruit production were marked bold type

Table 4. Some morphological characteristics of preselected fig genotypes (the average values of two years).

Genotypes	Leaf						Hairs of leaf		Shoot growth	Growth descriptors	
	Number per shoot	Length	Width	Lobes	Venation	Presence of teeth	Upper surface	Lower surface	Length	Growth habit	Tree vigour
63-BR-01	6.0	12.70±0.75	13.50±0.47	3	Apparent	Partially	None	Scarce	18.40	Weeping	Low
63-BR-02	13.0	19.60±1.14	17.10±0.90	5	Apparent	L.S.C.D	None	Scarce	44.20	Weeping	High
63-BR-03	7.4	20.40±1.10	18.80±0.63	5	Apparent	Partially	Scarce	Numerous	17.10	Semi-erect	High
63-BR-04	6.0	17.40±0.45	16.00±1.16	5	Apparent	L.S.C.D	None	Numerous	12.00	Semi-erect	Low
63-BR-05	7.8	17.40±0.74	18.80±1.09	5	Apparent	Partially	None	None	26.00	Compact	Intermediate
63-BR-06	7.0	20.20±0.61	19.20±0.82	5	Apparent	Partially	None	Scarce	17.20	Semi-erect	Intermediate
63-BR-07	7.6	21.40±0.78	23.00±0.88	5	Apparent	Partially	None	Scarce	17.20	Compact	Intermediate
63-BR-08	14.0	16.80±1.16	20.40±0.61	3	Apparent	L.S.C.D	None	None	54.90	Semi-erect	Intermediate
63-BR-09	8.4	23.60±2.11	23.20±0.67	3	Apparent	Partially	None	Scarce	16.20	Semi-erect	Intermediate
63-BR-10	5.8	22.00±2.04	22.00±0.48	5	Apparent	Partially	None	Scarce	18.80	Weeping	Intermediate
63-BR-11	8.4	20.20±0.85	21.60±0.80	5	Apparent	Partially	None	None	23.60	Compact	Intermediate
63-BR-12	7.0	13.80±0.60	17.20±0.71	5	Apparent	Partially	None	Scarce	13.80	Compact	Intermediate
63-BR-13	6.8	20.20±0.41	19.80±1.61	5	Apparent	Partially	None	None	20.20	Semi-erect	Intermediate
63-BR-14	7.2	19.00±0.70	19.80±1.14	3	Apparent	Partially	None	Scarce	25.20	Semi-erect	High
63-BR-15	8.2	16.70±1.10	20.30±0.92	5	Apparent	Partially	None	Scarce	17.60	Compact	Intermediate
63-BR-16	6.4	17.30±0.48	18.20±0.78	5	Apparent	Partially	None	None	18.30	Compact	Intermediate
63-BR-17	7.2	21.20±0.73	22.40±0.44	3	Apparent	L.S.C.D	None	None	17.70	Compact	Intermediate
63-BR-18	7.4	24.60±2.12	26.20±0.83	5	Apparent	Partially	None	Numerous	24.00	Semi-erect	High
63-BR-19	6.8	19.80±1.15	23.20±0.71	5	Apparent	Entire	None	Scarce	18.20	Semi-erect	Intermediate
63-BR-20	8.2	20.42±0.70	20.00±1.18	5	Apparent	Entire	Numerous	Scarce	29.00	Compact	Intermediate
63-BR-21	6.6	15.00±1.50	14.20±0.54	5	Apparent	L.S.C.D	None	None	10.00	Compact	Intermediate
63-BR-22	5.8	22.20±1.15	22.00±0.47	5	Apparent	Partially	None	Scarce	15.00	Semi-erect	High
63-BR-23	8.0	20.40±0.70	20.60±0.83	5	Apparent	Partially	None	Scarce	16.40	Semi-erect	Intermediate
63-BR-24	8.2	21.40±0.58	22.40±1.52	5	Apparent	Partially	None	None	37.00	Semi-erect	High
63-BR-25	8.4	25.00±0.73	24.80±1.18	3	Apparent	L.S.C.D	None	Scarce	21.20	Semi-erect	High
63-BR-26	6.6	17.60±0.42	16.40±1.62	5	Apparent	Partially	None	Scarce	11.20	Semi-erect	Low
63-BR-27	7.6	20.80±0.30	21.00±1.41	5	Apparent	Partially	None	Scarce	21.20	Erect	Intermediate
63-BR-28	8.8	14.60±0.82	15.00±0.45	5	Apparent	Partially	None	Scarce	18.00	Weeping	High
63-BR-29	9.6	10.00±1.14	21.00±0.92	5	S. Apparent	L.S.C.D	None	None	23.80	Compact	High
63-BR-30	7.2	13.40±1.41	14.20±1.16	3	Apparent	Partially	None	Scarce	33.20	Compact	Intermediate
63-BR-31	9.0	14.40±0.39	13.40±0.92	5	Apparent	Partially	None	None	20.60	Weeping	Intermediate
63-BR-32	6.2	17.10±0.60	16.30±1.19	5	Apparent	Partially	Scarce	Scarce	17.20	Weeping	Intermediate
63-BR-33	8.4	14.50±0.58	15.20±1.70	3	Apparent	Partially	None	None	16.30	Compact	Intermediate
63-BR-34	9.1	21.20±0.49	20.10±1.90	5	Apparent	Partially	None	None	14.20	Compact	Intermediate
63-BR-35	8.5	20.40±2.20	20.80±2.10	5	Apparent	Partially	None	None	20.50	Semi-erect	Intermediate

L.S.C.D. : Lobes sides completely dented
Promising genotypes for table fruit production were marked bold type

there is a vast variation in fig genotypes grown in the Birecik region. Therefore, the number of studies concerning morphological and pomological characteristics of fig genotypes grown in different regions of Turkey should be increased and promising genotypes should be propagated.

References

AKSOY, U. 1983: Studies on fruit growth, ripening and storage of Akça, Göklop and Sarılop fig varieties. E.U.Z.F.D. **20/1**, 235–246.

AKSOY, U., G. SEFEROĞLU, A. MISIRLI, S. KARA, N. ŞAHIN, S. BÜLBÜL and M. DÜZBASTILAR 1992: Ege bölgesi koşullarına uygun sofralık incir çeşit seleksiyonu Cilt 1(Meyve). Türkiye 1. Ulusal Bahçe Bitkileri Kongresi, İzmir.

AKSOY, U., S. HEPAKSOY, C. CAN and Ö. TUNCAY 1996: Descriptor for fig (*Ficus carica* and related *Ficus* sp.). Ege Univ., Dep.of Hort., Faculty of Agr., İzmir, Turkey.

AKSOY, U. 1998: Why figs? An old taste a new perspective. Acta Horticulturae **480**, 25–26.

ANONYMOUS 1999: SPSS 10.0 for windows, statistical software, SPSS. Inc., USA.

ANONYMOUS 2001a: FAO agriculture statistics, Rome, Italy.

ANONYMOUS 2001b: İncir Çeşit Kataloğu. Tarım ve Köyişleri Bakanlığı, Tarımsal Üretim ve Geliştirme Genel Müdürlüğü, Ankara.

AOAC 1995: Official methods of analysis. Vol II, 16th ed. Association of Official Analytical Chemists, Washington, DC.

CONDIT, I.J. 1941: Fig characteristics useful in the identification of varieties. Hilgardia **14(1)**, 1–69.

CONDIT, I.J. 1947: The fig. Chronica Botanica Co., Waltham, Mass, USA.

HART, A. 2001: Problems identifying fig varieties. 9th Australian Conference on Trees and Nut Crops Perth, April 13–20, West Australia.

ILGIN, M. 1995: Kahramanmaraş Bölgesinde İncir Seleksiyonu ve Selekte Edilen Bazı Önemli Tiplerin Meyve Doğuşları ve Döllenme Biyolojileri Üzerine Çalışmalar. Basılmamış Doktora Tezi, Çukurova Üniversitesi Fen Bil. Enst. Bahçe Bitkileri Anabilim Dalı, Adana, Türkiye.

KALLIOPI, P., E. CONSTANTINOS, T. MARIA, K. PETROS, K. IOANNIS and Z. GEORGIOS 2002: Genetic relatedness among dioceous *Ficus carica* L. Cultivars by random amplified polymorphic DNA analysis, and evalution of agronomic and morphological characters. Genetica **114**, 183–194.

KAŞKA, N., A.B. KÜDEN, A. KÜDEN and S. ÇETINER 1990: Ege bölgesi incirleri ile Çukurova bölgesinden selekte edilen incirlerin Adana'ya adaptasyonu üzerine araştırmalar. Ç. Ü. Z. F. Dergisi **5(4)**, 77–86.

KOYUNCU, M.A. 1998: A study on some fruit characteristics in local fig cultivars grown in Hilvan (Urfa, Southern Turkey). Acta Horticulturae **480**, 83–85.

KOYUNCU, M.A., S.Z. BOSTAN, A. İSLAM and F. KOYUNCU 1998: Investigations on some physical and chemical characteristics in fig cultivars grown in Ordu. Acta Horticulturae **480**, 87–89.

KÜDEN, A.B. and E. TANRIVER 1995: Bazı incir çeşitlerinin meyvelerini olgunlaştırmaları için gereksinim duydukları 'Büyüme Derece Saatleri Toplamı' (BDST) üzerine araştırmalar. Türkiye II. Ulusal Bahçe Bitkileri Kongresi, Adana.

KÜDEN, A.B. and E. TANRIVER 1998: Plant genetic resources and selection studies on figs in the East Mediterranean and South East Anatolia Regions. Acta Horticulturae **480**, 49–54.

MARS, M., T. CHEBLI and M. MARRAKCHI 1998: Multivariate analysis on fig (*Ficus carica* L.) germplasm in Southern Tunisia. Acta Horticulturae **480**, 75–81.

NALBANT, M., N. ŞAHIN and Ş. AYDIN 1998: Fig genetic resources at the fig research institute (Aydın/Turkey). Acta Horticulturae **480**, 43–45.

ÖZBEK, S. 1978: ÖZEL MEYVECİLİK. Ç. Ü. Ziraat Fakültesi Yayınları No: 128, Adana.

ÖZEKER, E. and M. İSFENDİYAROĞLU 1998: Evaluation of table fig cultivars in Çeşme Peninsula. Acta Horticulturae **480**, 55–60.

ŞAHIN, N. 1998: Fig adaptation studies in Western Turkey. Acta Horticulturae **480**, 61–70.

Received July 24, 2003 / Accepted May 18, 2004

Addresses of authors: Mehmet Ali Koyuncu, Süleyman Demirel University, Faculty of Agriculture, Department of Horticulture, 32260 Isparta, Turkey, e-mail: mkoyuncu@ziraat.sdu.edu.tr