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Morphological characterization of active germoplasm bank fig tree accessions

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Abstract- Fig tree (*Ficus carica* L.) is a fruit of great importance worldwide, being able to be implanted as new source of agricultural variability. The aim of the present work was to characterize the active germplasm bank of fig trees by means of morphological descriptors of 45 fig accessions at the Faculty of Agrarian and Technological Sciences, Campus of Dracena, FCAT / UNESP aiming at the recognition of the quality and genetic variability potential of the species. Thus, their biometric characteristics were evaluated by qualitative and quantitative descriptors of leaves and fruits. Fig tree accessions were characterized by means of the morphological characteristics of leaves and fruits, identifying AGB with high phenotypic variability and well adapted to the region and, by the analysis of the qualitative and quantitative characteristics, it was concluded that the most divergent accessions presented characteristics of agronomic interest, allowing the selection of features in order to subsidize conservation works, genetic improvement and crop production.
Index terms: *Ficus carica* L., *ex situ* conservation, genetic resources, biometrics.

Caracterização morfológica de acessos de banco ativo de germoplasma de figueira

Resumo- A figueira (*Ficus carica* L.) é uma frutífera de grande importância mundial, podendo ser implantada como fonte de variabilidade agrícola. Diante disso, o objetivo do presente trabalho foi realizar a caracterização do banco ativo de germoplasma da cultura da figueira por meio de descritores morfológicos de 45 acessos de figo, na Faculdade de Ciências Agrárias e Tecnológicas, Câmpus de Dracena, FCAT/UNESP, visando ao reconhecimento da qualidade e da potencialidade da variação genética da espécie. Assim, foram avaliadas características biométricas por descritores qualitativos e quantitativos de folhas e de frutos. Foi possível caracterizar os acessos de figueira por meio das características morfológicas de folhas e de frutos, identificando um BAG com alta variabilidade fenotípica e bem adaptado à região e, pela análise dos caracteres qualitativos e quantitativos, conclui-se que os acessos mais divergentes apresentaram características de interesse agronômico, possibilitando a seleção de caracteres a fim de subsidiar trabalhos de conservação, de melhoramento genético e de produção da cultura.
Termos para indexaçao: *Ficus carica* L., conservação *ex situ*, recursos genéticos, biometria.

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Introduction

Fig (*Ficus carica* L.) is among the twenty main fruits exported by Brazil and has maintained third position in the ranking of marketed volume among temperate climate fruits, with production of approximately 26 thousand tonnes per year in 2,600 hectares of planted area, ranking ninth in terms of world production (FAOSTAT, 2019).

However, in Brazil, there is predominance of a single fig-tree cultivar, 'Roxo-de-Valinhos', resulting in serious problems related to pests and diseases, which compromise cultivation and damage fruits, reducing profits, hampering plant development and demanding high expenses with inputs and cultural treatments (FERRAZ, 2017).

Thus, studies aimed at finding solutions to some of these problems would make an enormous contribution for the development of the fig tree crop, being variety diversification, with the use of resistant cultivars and adapted to different environments, an important strategy for the development of the fig culture.

According to Frankham (2005), genetic diversity has become the key to species survival and adaptation to changes in the environment, and the elucidation of the mechanisms of origin and maintenance of this variation is essential (PLATT et al., 2010; HUANG et al., 2014).

He et al. (2016) emphasize the importance of maintaining accessions available in Active Germplasm Banks (AGBs) for the crop, as well as measures for their conservation, which should be implemented in different populations according to their potential to adapt to future climate and environmental changes induced by man.

According to Ramalho et al. (2012), in addition to its conservation and maintenance, the correct characterization of existing AGBs is essential, allowing the recognition of the quality and potentiality of germplasm under the most varied aspects, since they play a fundamental role in the preservation of the genetic variability.

The availability of plant genetic resources necessarily involves the morphological characterization of accessions registered in germplasm banks through the knowledge of a series of data aiming to describe them by means of characteristics of interest, including culture attributes or traits, establishing an identity for each component (VALOIS et al., 2001).

In view of the above, the aim of the present work was to perform the morphological characterization of leaves and fruits of 45 fig tree accessions (*Ficus carica* L.) of the Active Germplasm Bank introduced at the Faculty of Agrarian and Technological Sciences, Campus of Dracena, FCAT / UNESP, through quantitative and qualitative descriptors.

Material and methods

The genetic material was composed of 45 *Ficus* sp. accessions belonging to the one-year-old Active Germplasm Bank of the Agricultural Sector of the Faculty of Agrarian and Technological Sciences FCAT / UNESP, Campus of Dracena-SP.

The experimental design was randomized blocks, consisting of 45 treatments, each accession being considered a treatment, with two blocks and three plants per plot, totaling 270 plants, grown in 1.5 m x 1.5 m spacing. Treatments evaluated, with their respective accessions and places of origin, are presented in Table 1.

Fertilization was performed according to soil analysis and recommendations of Raij et al. (1997), in the projection of fig tree canopies, with soil lacking mulch.

Phytosanitary treatment was carried out with biweekly applications of Bordeaux mixture (1%) and Mancozeb (200 g p.c./100 liters of water) for the control mainly of fig leaf rust (*Cerotelium fici* Cast.), alternately applied.

Whenever necessary, weed control was performed by weeding, and irrigation by drip tape three times a week with average precipitation of 2.0 mm / h and a 50 cm wide strip in the planting line.

For the morphological characterization of leaves, branches from the median region of plants were selected and three axillary leaves close to the first fruit were photo-documented, and the following evaluations were performed:

a) Number of lobes per leaf;

b) Length and width of the leaf blade, in centimeters;

c) Petiole length, in centimeters.

For fruit characterization, four fruits at the beginning of maturation from each plant of the experiment were used for the following evaluations:

a) Shape of each fruit: elongate, pyriform oblong or oval;

b) Length and diameter of the median region of each fruit, in centimeter, with the aid of a pachymeter;

c) Length of the peduncle, in centimeter, from its insertion in the stem to the support of syicons.

d) Open or closed ostiole, considering the possibility of visualizing or not the inside of the fruit.

e) The pulp color of each fruit: red, pink or amber.

From the biometric results obtained, statistical analysis of all accessions was performed, grouping the averages obtained by the Scott-Knott test at 5% probability level. Statistical analyses were performed using the Sisvar software: a computer statistical analysis system, version 5.6 (FERREIRA, 2014).

Results and discussion

Morphological Characterization of Leaves

Biometric markers have an extreme ecological value, helping to determine the variability of the species and making it possible to differentiate phenotypic parameters among individuals of a given population, which is one of the most important sources of variability available for plant breeding (PALACE et al. 2016, STOJANOVIĆ et al., 2016).

Leaf biometric markers exhibit drastic shape variation within the same species, reflecting both the heteroblastic development of the apical meristem from which they are derived and the ontogeny of individual leaves as they expand alometrically (CHITWOOD et al., 2016).

Figure 1 shows that most accessions followed the pattern of the 'Roxo-de-Valinhos' cultivar (Figure 2-D), with differentiation in the pronunciation of the 2 secondary lobes. According to Medeiros (2002), the 'Roxo-de-Valinhos' cultivar is characterized by presenting large leaves with five large and two smaller lobes; dark green color; compact texture, somewhat rigid; creased margin; petiole sinus in the form of lyre and long petiole.

However, a large variation in the number of lobes among certain fig tree accessions was observed, varying from 3 little pronounced large lobes, as occurs in the 'Troyano' variety (Accession 17), represented in Figure 2-A; 3 well pronounced large lobes added of 2 little pronounced lobes, observed in 'Nazaret' cultivar (Access 24), represented in Figure 2-B.

Up to 7 large well-defined lobes added of two small well-pronounced lobes were also found, as on the case of 'Preto de Piracicaba Fig' accession (Accession 44), Figure 2-E.

There is large variation in the number of leaf lobes among AGB fig tree accessions and differences regarding how pronounced these lobes were presented. As for the length and width of leaves, accessions 5, 28, 25, 6, 16 and 45 stood out. Accession 45 (Turco Fig) presented the highest length and width values (25.7 cm and 23.3 cm, respectively) of leaves (Figure 2-C), being statistically superior to the other accessions (Table 2).

Accessions with the lowest length and width values were 20, 15, 26, 24, 23, 1, 21, 3 and 27, which, in principle, would lead plants to have smaller photosynthetic area, and, consequently, lower growth and development, as is the case of accessions 20, 23, 24 and 26, which stood out for the lowest effective height values.

According to Chitwood and Otoni (2017), working with leaf morphology in *Passiflora* species, leaf shape diversity is considered a profound change in differentiation that causes the development of the primary vasculature pattern and laminar expansion.

Each of the aspects of leaf morphology provides different points of view about its pattern, and the number of lobes is a highly relevant factor for the differentiation of "toothed" plants, as is also the case with the fig tree, which proved to be promising feature of selection of leaf morphology among the features evaluated by Rodrigues et al. (2017), because it presents high heritability and high genetic correlation, being little influenced by the environment.

Plants present different responses regarding tolerance to shading, reflecting on growth and development (PAEZ et al., 2000). Luminosity is one of the limiting factors for plant development, since the edaphoclimatic conditions of the environment are reflected in the growth and in the different forms of adaptation (Andrade et al., 2004).

Thus, growth efficiency may be related to the ability of plants to adapt to light conditions, and the satisfactory growth of some species in low or high luminosity environments is attributed to their ability to rapidly adjust their biomass allocation model and physiological behavior (DIAS-FILHO 1997).

Thus, for the other accessions that presented small leaves, this deficiency in the photosynthetic area, individually, may have been supplied by the greater number of active leaves in plants, since, in addition to individual leaf area, the number and angle of leaves alter the light distribution within the plant and, consequently, influence the self-shading inside the canopy (FALSTER and WESTOBY, 2003, SARLIKIOTI et al., 2011, CHEN et al., 2014).

Table 2 shows the leaf length and width values of all accessions, together with their statistical analysis, which obtained average of 17.0 cm for length and 14.9 cm for width, with variation coefficient VC (%) of 15.87 and 15.02, respectively.

According to Perez et al. (1988), the efficiency with which plant intercepts solar radiation also depends on other architectural features involved in the three-dimensional (3-D) arrangement of leaves, such as internode length (DAUZAT et al., 2008; Silva et al., 2014; CHEN et al., 2014), petiole length (TAKENAKA, 1994; CHENU et al., 2005) and branch patterns (NIINEMETS, 2007; SILVA et al., 2014).

However, for leaf petiole length, in spite of a great variation among accessions, from 4.2 cm to 10.0 cm, except for accession 45 (Turco Fig), which presented larger petiole and both length and width statistically higher than the other accessions, its length had no relation to the length and width of leaves, which can be observed in Table 2, with mean of 6.8 cm and variation coefficient VC (%) of 19.5.

Morphological Characterization of Fruits

The shape of fruits of the 45 *Ficus* sp. accessions were varied, from elongated to oval, which were already expected; however, the flattened shape of fruits was also observed. In this case, fruits with diameter significantly larger than their length were considered flattened, with abrupt ostiole area, such as, for example, accessions 8 and 9, which represent the 'White Genova' cultivar (Figure 3-D) of different regions, with mean length and width values, respectively, of 32.5-38.8 mm and 32.0-37.1 mm.

Among accessions considered flattened, accessions 28, 29, 30, 31, 32, 35 and 36 were still at an immature stage of development, not reaching their full physiological development, being discolored, with shape and density different from a mature fruit, weighting three times less than the mature fig (VENDRUSCOLO, 1988). The physiological maturity point depends on the species, as it is affected by genetic factors and also by environmental factors such as temperature and relative humidity, and the knowledge of the maturation process is important for the establishment of the ideal harvesting point (SILVA, 2009).

Oval shape (Figure -A) was observed in 'Bonato', 'Smyrna', and 'Pingo de Mel' cultivars, considered as characteristic of parthenocarpic fruits. In the case of 'Smyrna' cultivar in particular, its shape tends to change due to the caprification process, indispensable for the normal development of fruits of this pomological class (ARADHYA, DIANNE VELASCO and KOEHMSTEDT, 2010), which does not occur in Brazil.

Still with respect to the shape of fruits, length and diameter measures, simultaneously, define this parameter. For the length of fruits, the highest values were observed for accessions 4, 8, 19, 22, 23 and 37. For diameter, accessions 4, 8, 9 and 22 stood out, with the production of fruits already at the beginning of the maturation stage.

In the specific case of accession 19 - Plant 440 and 23 - Plant 301, elongated shape was observed, which is in agreement with descriptions of Rodrigues et al. (2012). An elongated fruit shape is defined as a fruit with its length significantly larger than its diameter; in this case, with mean values of 34.3 mm and 28.5 mm, respectively, which can be observed in Figure 3-B.

Rodrigues et al. (2012), working with selection of mutants in fig plants formed by stakes irradiated with gamma rays, observed that the main commercial cultivar, 'Roxo-de-Valinhos' (Accession 4), 'White Genova' and Accession 22, which represents Plant 214 of that experiment, presented the same characteristics observed in the present work.

'Roxo-de-Valinhos' cultivar has predominance of fruits with oblong-pyriform shape (Figure 3-C), with short and thick neck, almost without limit of separation with body from the receptacle, as described by Rigitano (1955). This shape was the one that prevailed among AGB fig tree fruits under study, as can be observed in Figure 4, which demonstrates the distinction among fruits of accessions that compose *Ficus* sp. AGB.

The distribution of accessions, according to the length and diameter of fruits, is described in Table 3. The average values obtained were 28.4 mm for length and 28.3 mm for width with variation coefficient VC (%) of 11.3 and 11.4, respectively. The highest fruit length was observed for 'Roxo-de-Valinhos' cultivar (Accession 4), with 35.3 mm and the highest width for accessions 8 and 9 (White Genova), with 37.1 and 38.8 mm.

Still in Table 3, accession 16 (Palestino) presented the largest peduncle (4.0 mm). Large peduncle in fruits is an interesting agronomic characteristic for *Ficus* sp. production, because it facilitates harvest (SONG et al., 2016), and increases the shelf life of fruits. According to Carvalho et al. (2008), large peduncle is related to genotype, and presents high heritability index in the restricted sense, being a characteristic of early selection.

In the specific case of the fig tree crop, a very important aspect to determine the quality of fruits, in addition to the size of fruits, is the small ostiole opening (ALJANE and NAHDI, 2018), which reduces the incidence of pests and avoids the depreciation of fruits with possible peel cracks. The ostiole is characterized as the opening for the entrance of the *Blastophaga psene* wasp so that inflorescence pollination within the siconium can occur for the development of fig fruits (LAMAS et al., 2009). However, in addition to the fact that this wasp does not occur in Brazil due to climatic reasons, the fig fly (*Zaprionus indianus* Gupta, 1970) uses this hole for feeding and laying eggs (RAGA, 2002; RAGA and SOUZA FILHO, 2003), which causes fruit depreciation during production and marketing due to very severe damage.

One of the ways to prevent the entry of this pest within siconium is the selection of fig plants showing ostiole opening the less pronounced as possible (Figure 5), as is the case of accession 2 (Nobile), 3 (Genovesco), 6 (Adriatic White), 7 (Bonato), 11 (Smyrna), 14 (Pingo de Mel), 16 (Palestino), 17 (Troyano), 18 (Vermelho de Piracicaba Fig), 21 (Plant 189), 25 (Cuello Negro), 40 (Caprifig) and 43 (Mini Fig), as can be seen in Figure 6, which demonstrates the distribution of AGB fig accessions according to the opening of this hole. In the case of accession 21, which represents Plant 189, it maintained the characteristic of null ostiole opening, as observed by Rodrigues et al. (2012).

The other accessions that were considered with closed ostiole and that were not considered, presented white color of the internal siconium cavity (Figure 8-A), which characterizes fruit immaturity due to late maturation.

Regarding fruit coloration evaluation, the majority of accessions maintained the common reddish-pink coloration, as can be observed in Figure 7. However, amber (Figure 8-B) and intense red colorations (Figure 8-C) were verified in some accessions, such as accessions 18 (Vermelho de Piracicaba Fig) and 23 (Plant 301), identified with more reddish coloration than the fruits of the other accessions.

The amber coloration was observed in accessions 2 (Nobile), 5 (Stanford), 6 (Adriático Branco), 10 and 11 (Smyrna), 14 (Pingo de Mel) and 40 (Caprifig), and unlike Nóbile, Adriatico Branco and Pingo-de-Mel, which present this characteristic coloration, need pollination to develop their fruits.

Table 1. Active Germplasm Bank Fig tree accessions of the Faculty of Agricultural and Technological Sciences (FCAT / UNESP). Dracena / SP, 2017.

Tratament	Acession	Place of Origin
1	Calimyrna	São José do Rio Preto
2	Nobile	IAC[1]
3	Genovesco	IAC[1]
4	Roxo-de-Valinhos A	São Sebastião do Paraíso
5	Stanford	IAC[1]
6	White Adriatic	IAC[1]
7	Bonato	IAC[1]
8	White Genova A	São José do Rio Preto
9	White Genova B	IAC[1]
10	Smyrna A	IAC[1]
11	Smyrna B	São José do Rio Preto
12	Brunswich	IAC[1]
13	Caprifig A	IAC[1]
14	Pingo de Mel	Ilha Solteira
15	Roxo-de-Valinhos Gigante	Ilha Solteira
16	Palestino	Campinas
17	Troyano	IAC[1]
18	Vermelho	Piracicaba
19	PI 440	Ilha Solteira
20	PI 433	Ilha Solteira
21	PI 189	Ilha Solteira
22	PI 214	Ilha Solteira
23	PI 301 (trat6)	Ilha Solteira
24	Nazaret	Espanha
25	Cuello Negro	Espanha
26	Roxo-de-Valinhos B	Ilha Solteira
27	Acesso 27	Monte Alto
28	Acesso 28	Monte Alto
29	Acesso 29	Monte Alto
30	Acesso 30	Monte Alto
31	Acesso 31	Monte Alto
32	Acesso 32	Monte Alto
33	Acesso 33	Monte Alto
34	Acesso 34	Monte Alto
35	Acesso 35	Monte Alto
36	Acesso 36	Monte Alto
37	Acesso 47	Bahia
38	Acesso 44	Piracicaba
39	Acesso 46	Piracicaba
40	Caprifig B	Ilha Solteira
41	Acesso 41	Monte Alto
42	Acesso 42	Monte Alto
43	Mini Figo	IAC[1]
44	Preto	Piracicaba
45	Turco	Campinas

[1]IAC = Agronomic Research Institute, APTA Fruit Center, Jundiaí / SP.

Table 2- Petiole length (CP), length (CF) and width (LF) of leaves of Active Germplasm Bank fig accessions of the Faculty of Agricultural and Technological Sciences (FCAT / UNESP). Dracena / SP, 2017

Tratament	CP (cm)	CF (cm)	LF (cm)
1	5,42 C	12,58 E	12,17 D
2	7,50 B	15,58 D	14,42 D
3	7,17 B	13,00 E	12,33 D
4	7,42 B	18,00 C	16,08 C
5	5,75 C	21,00 B	19,92 B
6	6,83 B	22,92 B	19,58 B
7	4,88 D	17,42 C	16,55 C
8	7,92 B	18,38 C	17,72 C
9	7,92 B	18,75 C	16,58 C
10	7,55 B	18,08 C	15,97 C
11	7,22 B	15,83 D	15,22 C
12	5,83 C	17,50 C	15,67 C
13	5,67 C	18,58 C	16,92 C
14	6,17 C	16,63 D	15,42 C
15	4,27 D	12,00 E	12,27 D
16	7,33 B	23,52 B	18,17 B
17	6,13 C	20,25 C	17,50 C
18	7,67 B	16,92 D	14,08 D
19	6,17 C	15,50 D	12,75 D
20	7,00 B	11,00 E	11,50 D
21	4,50 D	13,00 E	12,50 D
22	7,50 B	15,00 D	13,00 D
23	7,00 B	12,50 E	12,00 D
24	6,00 C	12,00 E	10,50 D
25	7,00 B	22,00 B	15,00 C
26	5,00 D	12,00 E	9,00 D
27	6,42 C	13,17 E	12,33 D
28	8,75 A	21,58 B	18,92 B
29	7,80 B	19,17 C	15,88 C
30	9,00 A	18,75 C	17,00 C
31	9,67 A	19,83 C	17,00 C
32	7,38 B	16,08 D	14,75 C
33	7,25 B	19,83 C	16,50 C
34	5,08 D	15,00 D	11,50 D
35	8,67 A	19,33 C	16,25 C
36	6,75 B	15,25 D	14,92 C
37	7,83 B	19,00 C	16,33 C
38	7,00 B	15,67 D	13,25 D
39	5,83 C	14,58 D	11,17 D
40	4,75 D	18,83 C	15,75 C
41	6,77 B	14,50 D	12,00 D
42	7,83 B	17,00 D	14,92 C
43	4,42 D	15,25 D	13,83 D
44	6,50 C	16,50 D	13,92 D
45	10,00 A	25,77 A	23,27 A
V.C. (%)	19,50	15,87	15,02
General mean	6,81	17,00	14,94

* Equal letters between lines do not differ by the Scott-Knott test at 5% probability.

Table 3. Peduncle length (CPE), length (CFR) and width (LFR) of fruits of Active Germplasm Bank fig accessions of the Faculty of Agricultural and Technological Sciences (FCAT / UNESP). Dracena / SP, 2017.

Tratament	CPE (cm)	CFR (cm)	LFR (cm)
1	7.97 D	28.55 C	22.83 E
2	11.13 D	30.53 B	25.47 D
3	9.03 D	29.73 B	28.55 D
4	9.60 D	35.28 A	34.85 B
5	10.38 D	24.80 D	25.95 D
6	3.37 E	23.53 D	27.72 D
7	9.17 D	25.33 D	22.62 E
8	14.70 C	32.55 A	38.77 A
9	15.48 C	32.02 B	37.07 A
10	14.85 C	29.30 B	28.97 C
11	15.98 C	25.58 D	22.72 E
13	5.78 E	22.47 D	25.58 D
14	17.67 B	28.30 C	26.18 D
15	13.05 C	23.63 D	23.13 E
16	30.97 A	32.30 B	29.80 C
17	21.08 A	29.65 B	28.03 D
18	14.72 C	31.12 B	26.85 D
19	16.42 C	34.33 A	28.48 D
21	14.62 C	30.50 B	29.37 C
22	14.38 C	32.97 A	33.57 B
23	9.00 D	33.73 A	32.97 C
25	12.07 C	27.37 C	20.17 E
26	8.00 D	32.00 B	31.20 C
27	3.70 E	24.72 D	26.48 D
28	6.65 E	27.33 C	30.35 C
29	6.73 E	25.80 D	30.58 C
30	5.92 E	25.38 D	27.07 D
31	7.63 D	27.00 C	29.93 C
32	6.18 E	24.30 D	27.70 D
35	7.17 E	25.75 D	29.18 C
36	5.78 E	27.40 C	28.38 D
37	6.63 E	35.10 A	32.33 C
38	8.57 D	29.80 B	29.00 C
39	6.75 E	31.58 B	30.78 C
40	11.77 D	27.87 C	25.23 D
41	6.93 E	27.23 C	26.57 D
42	7.22 E	24.47 D	27.98 D
43	3.90 E	22.42 D	20.17 E
44	4.13 E	21.67 D	24.70 D
45	5.90 E	31.13 B	32.50 C
V.C. (%)	28.89	11.29	11.42
General mean	10.27	28.36	28.28

* Equal letters between lines do not differ by the Scott-Knott test at 5% probability.

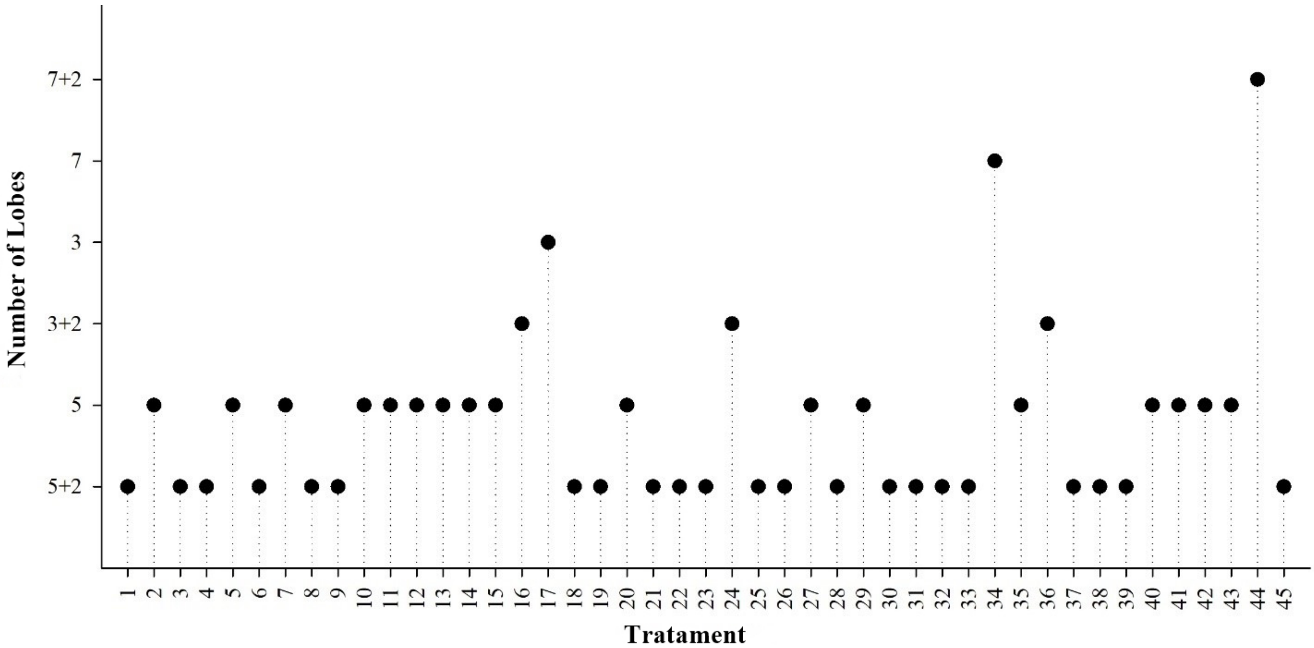

Figure 1. Number of lobes of Active Germplasm Bank fig accessions of the Faculty of Agricultural and Technological Sciences (FCAT / UNESP). Dracena / SP, 2017.

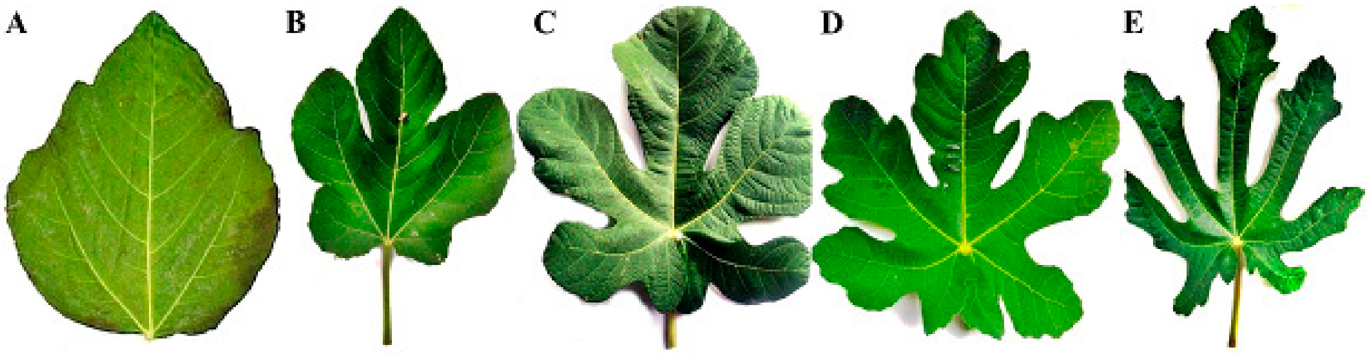

Figure 2. Leaves of accessions 17 (Troyano) (A), accessions 24 (Nazaret) (B), accessions 45 (Turco Fig) (C), accession 4 (Roxo-de-Valinhos) (D) and accession 44 (Preto de Piracicaba Fig) (E) characterizing respectively leaves with 3, 3 + 2, 5 + 2, 7 and 7 + 2 lobes. Dracena - SP, 2017.

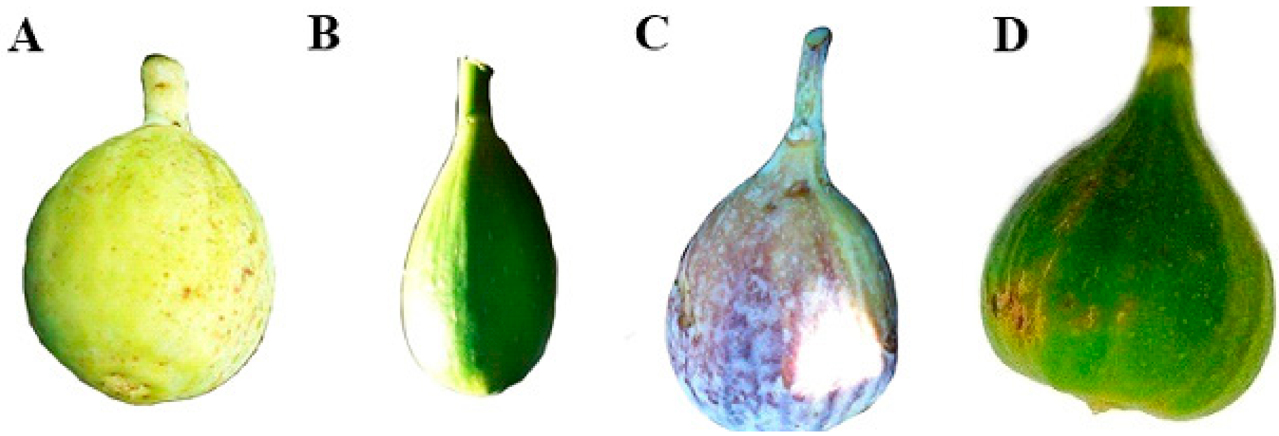

Figure 3. Fruit of accession 14 (Pingo-de-Mel) (A), accession 19 (Irradiated Plant 440) (B), accession 4 (Roxo-de-Valinhos) (C) and accession 8 (White Genova) (D) characterizing, respectively, oval, elongated, oblong pyriform and flattened fig fruits. Dracena - SP, 2017.

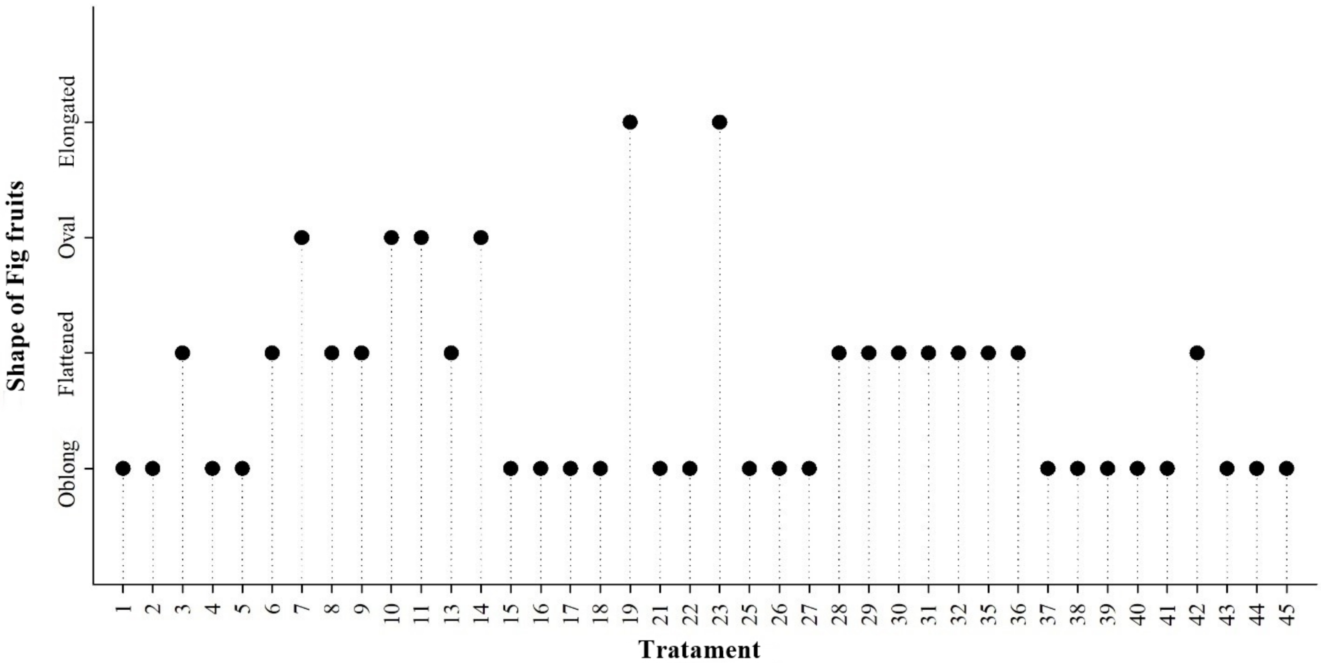

Figure 4. Shape of Fig fruits accessions. Dracena - SP, 2017.

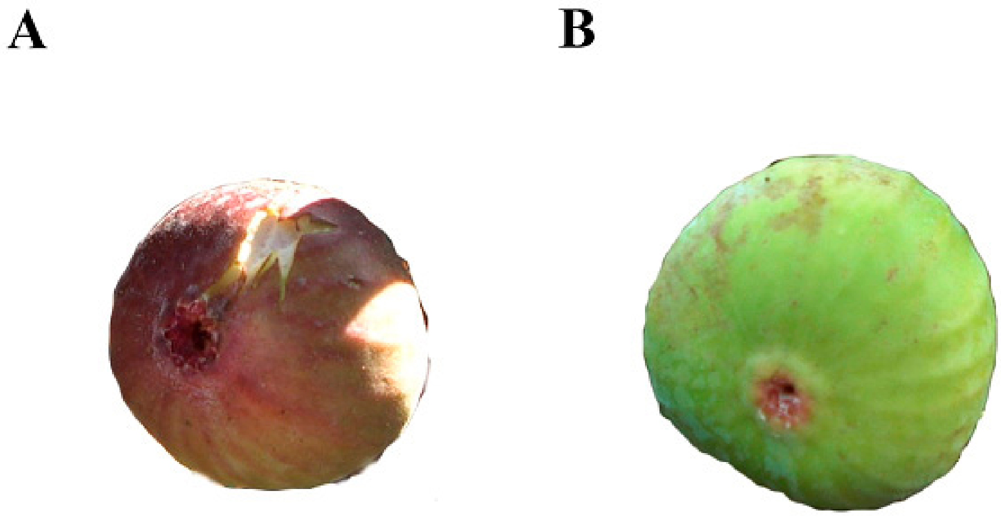

Figure 5. Fruit of accession 4 (Roxo-de-Valinhos) (A) and accession 14 (Pingo de Mel) (B) characterizing, respectively, open and closed fig tree ostiole. Dracena - SP, 2017.

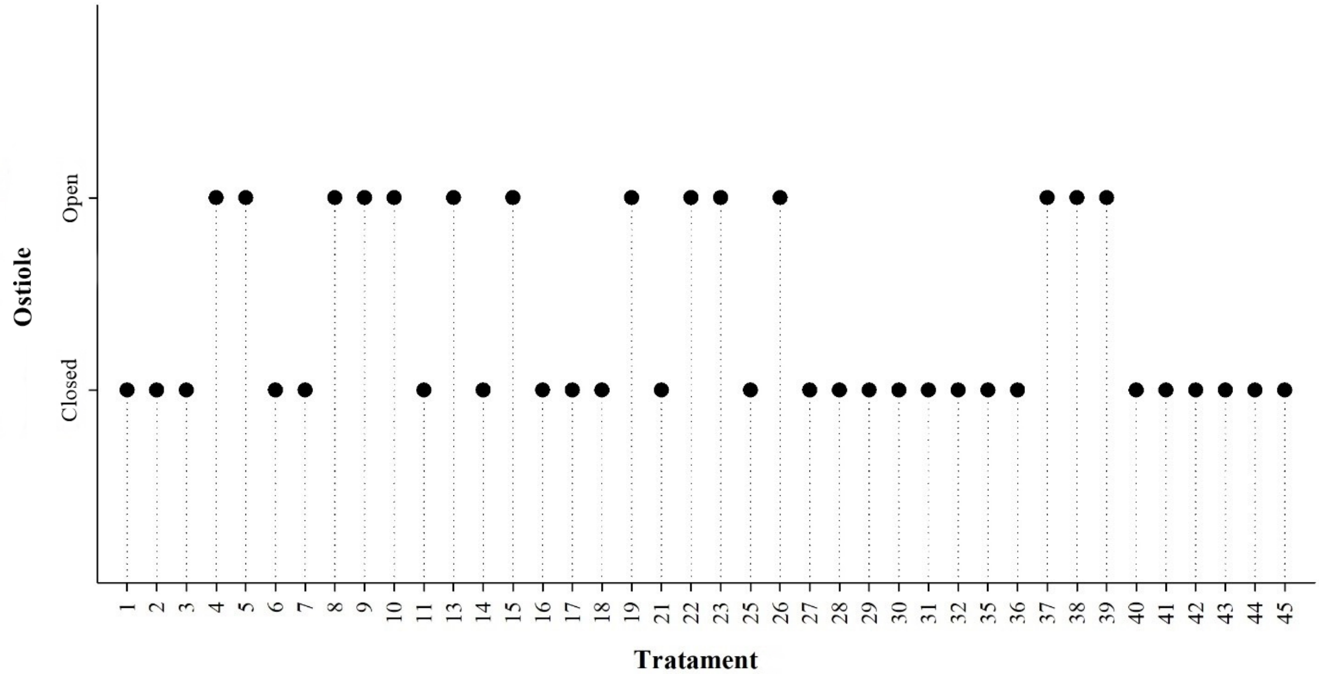

Figure 6. Characteristic of the ostiole of fruits from Fig tree accessions. Dracena - SP, 2017.

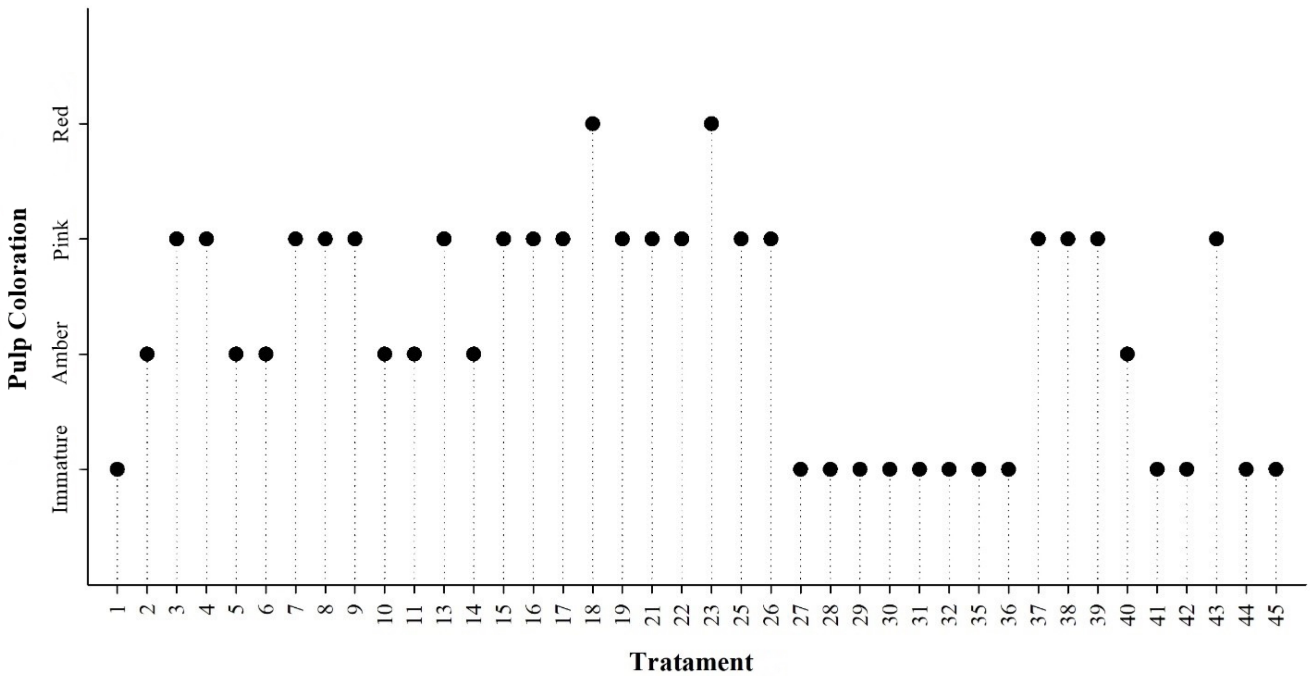

Figure 7. Pulp coloration of fruits from Fig tree accessions. Dracena - SP, 2017.

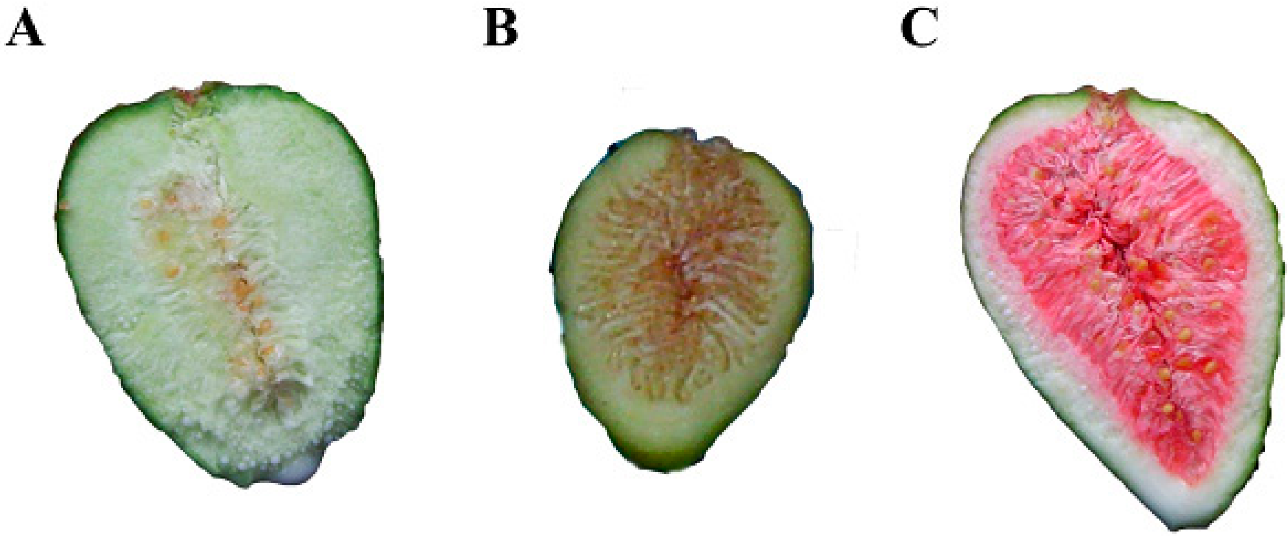

Figure 8. Fruit of accession 10 (Smyrna) (A), 14 (Pingo-de-Mel) (B) and accession 18 (Vermelho de Piracicaba Fig) (C) characterizing, respectively, immature fruit, amber and intense pink pulp fruit. Dracena - SP, 2017.

Conclusion

It was concluded that it was possible to characterize fig tree accessions through the morphological characteristics of leaves and fruits, identifying AGB with good adaptation to the region and, through the analysis of qualitative and quantitative features, it could be concluded that the most divergent accessions are 16 (Palestino), 17 (Troyano), 18 (Vermelho de Piracicaba Fig), 19 (Irradiated Plant 440), 21 (Irradiated Plant 189), 22 (Irradiated Plant 214), 23 (Irradiated Plant 301), 24 (Nazaret), 44 (Preto de Piracicaba Fig) and 45 (Turco Fig), with characteristics of agronomic interest, allowing the selection of features in order to subsidize conservation works, genetic improvement and crop production.

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