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Evaluation of Exotic Fig (*Ficus carica*. L) Cultivars for Pomological Characters

Manasa Jyothi[1], Aneesa Rani M.S.[2*], Kavino M.[3] and Djanaguiraman M.[4]

[1]PG Scholar, Department of Fruit Science, HC & RI, TNAU, Coimbatore (Tamil Nadu), India.
[2]Professor & Head, Vegetable Research Station, Palur, Cuddalore (Tamil Nadu), India.
[3]Assistant Professor, Department of Fruit Science, HC & RI, TNAU, Coimbatore (Tamil Nadu), India.
[4]Assistant Professor, Department of Crop Physiology, AC & RI, TNAU, Coimbatore (Tamil Nadu), India.

(Corresponding author: Aneesa Rani M.S.)*
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ABSTRACT: Fig (*Ficus carica* L) is a typical subtropical fruit crop which is generating commercial importance in the recent past. In Tamil Nadu, the scope of fig cultivation is increasing because of introduction of exotic cultivars *viz.*, Afghan fig, Brown Turkey, Brownswick, Deannaover traditional varieties *viz.*, Tinda fig. In this study, three introduced fig cultivars (Afghan, Brown Turkey and Deanna) were evaluated on the basis of pomological and agronomical characteristics with the aim to find best performing cultivar for commercial exploitation. Among the cultivars studied, canopy spread, volume, fruit size and weight, Brown Turkey had the heaviest fruit (46.28 g), whereas Deanna had the lightest fruit (39.64g). Brown Turkey had the highest fruit quality in terms of TSS (16.23 °B) and acidity (0.28%). Based on the preliminary investigations, it is recommended that Brown Turkey may be exploited for commercial exploitation.

Keywords: *Ficus carica*. L, ripe fig, fruit quality, tree characters.

INTRODUCTION

Fig (*Ficus carica* L.) is one of the oldest fruits known to mankind. The domestication of the fruit started in eastern Mediterranean and from there, selected forms were brought to other regions (Falistocco, 2020). Domestication brought a considerable increase in the size of the fruit and its sugar content, as well as a characteristic shift to vegetative propagation (Zohary and Spiegel-Roy 1975). The main fig-growing countries are Egypt, Turkey, Iran and Spain. In India, the commercial cultivation of common fig is mostly confined to western parts of Maharashtra, Gujarat, Uttar Pradesh (Lucknow & Saharanpur), Karnataka (Bellary, Chitradurga & Srirangapatna) and Tamil Nadu (Coimbatore) (Dalal *et al.,* 2017; Ghosh *et al.,* 2017). The total area under cultivation of figs in India is 5600 hectares with a production of 13802 thousand tonnes and a productivity of 12.32 tonnes/hectare (FAO, 2020).

Thereis an increased interest in exotic fruits from world market (Aksoy *et al*., 1992). Fig is one of the emerging fruit crops in Tamil Nadu because of its nutritional importance and market demand. There is a good scope for fig cultivation in this region due to the warm, humid tropical climate with suitable sandy loam soil. Some farmers are growing unknown local cultivars, resulting in very poor productivity and quality besides market price (Çalişkan and Polat 2008). The main reasons for poor productivity are the lack of proper characterization of the available cultivars and proper canopy management guidelines through proper training and pruning for the farmers. In the light of forgoing, the present study is undertaken to know suitability of exotic cultivars of fig.

MATERIALS AND METHODS

The present study was conducted at Arid Zone Fruit Block, Horticulture College and Research Institute, Tamil Nadu Agriculture University, Coimbatore, India during 2021–2022. In 2020, three exotic fig cultivars (Afghan, Brown Turkey and Deanna) were planted at a spacing of 5m × 4m. The field's pH was 8.4 and the soil was sandy loam. A measuring tape was used to determine the height and spread of the trees. The fruit quality of the fig varieties is determined. With 4 replications and 5 fruits from each replication, a total of 20 fruits were randomly collected from each fig tree and immediately transferred to the refrigerator for further analysis. Fruit length and width were measured with a Vernier's Caliper and fruit weight was measured

with a scale sensitive to 0.001g. Canopy volume was measured by the method given by Westwood, 1988. Titration with sodium hydroxide and phenolphthalein as an indicator to determine total soluble solids. The experiment was set up using a Randomized Block Design and the data was subjected to analysis of variance at a 5% probability level, with critical differences calculated for all of the characters in the Tables.

RESULTS AND DISCUSSION

According to the results of the analysis of variance, there were statistically significant for all features (CD @ 0.05%) between samples. As shown in Table 1, mean values of parameters differed among the fig cultivars. The study's findings clearly showed that the amount of germplasm heterogeneity in terms of plant growth and fruit quality (Nandi *et al.*, 2017).

Table 1: Fruit characteristics of the selected fig cultivars.

Cultivars	Number of fruits/tree	Fruit length(cm)	Fruit diameter (cm)	Fruit weight(g)	TSS (°Brix)	Acidity (%)
Afghan	265.00 [b*]	4.69 [c]	4.74[c]	39.71 [ab]	11.04 [b]	0.17 [b*]
Brown Turkey	286.30 [a]	5.90[a]	5.02 [a]	46.28 [a]	15.59[a]	0.28[a]
Deanna	261.90 [b*]	5.14 [b]	4.92 [b]	39.64 [b]	11.78 [c]	0.18 [b*]
CD @ 0.05%	**	0.107	6.34	3.280	0.622	0.12

*Means with the same letter (a, b and c) are not significantly different. (Duncan's grouping)

The number of fruits per plant produced were the highest throughout the year in Brown Turkey (286.30), and Deanna (261.90) was the lowest. The fact that Brown Turkey had the lowest plant growth yet the greatest number of fruit-bearing branches may help to attain its higher fruit production (Nandi *et al.*, 2017). Fruit lengths varied from 4.69 to 5.90 cm. The Afghan (4.69 cm) had the shortest fruit length, while the Brown Turkey had the longest (5.90 cm). The fruit diameter varied from 5.02 cm in Brown Turkey, the largest, to 4.74 cm in Afghan, the smallest. The measurements of fruit length and fruit diameter are consistent with earlier research (Kuden and Tanriver 1997; Ferrara and Papa 2001; Koyuncu, 2004; Rattanpal *et al.*, 2015). Fruit weight comes in the order of Brown Turkey, Afghan and Deanna. According to Aksoy *et al.* (1992), fruit weight and size (diameter and length) were regarded as significant characteristics in the fresh consumption group. Bigger fruits are typically eaten fresh, whereas smaller fruits are typically used to make jam. Afghan fruit had the smallest size and weight (4.69 cm × 4.74 cm) and Brown Turkey fruit had the largest (5.90 cm × 5.02 cm). Although the findings on fruit weight are consistent with those of other studies (Bostan *et al*., 1997; Aksoy *et al*., 2001; Koyuncu, 2004; Küden *et al*., 2008; Polat and Ozkaya 2005; Rattanpal *et al.*, 2015), these changes in fruit weight may be due to genetic variances and environmental factors. The order of TSS was Deanna (11.78 °B), Afghan (11.04 °B), and Brown Turkey (15.59 °B). Brown Turkey had the most acidity of ripe fruits at 0.28 percent, while Afghan had the lowest at 0.17 percent. The findings on titrable acidity and total soluble solid contents, however, were comparable to those of earlier investigations (Özeker and Isfendiyaroglu 1998; Aksoy *et al*., 2001; Ferrara and Papa 2001; Koka, 2001; Sanchez *et al*., 2003; Simsek, 2009; Rattanpal *et al.*, 2015) (Table 1).

Table 2: Growth and productivity characteristics of the selected fig cultivars.

Cultivars	Plant height (m)	Plant spread N-S (m)	Plant spread E-W (m)	Canopy volume (m^3)
Afghan	3.08 [a]	1.38 [a*]	2.48 [a]	10.24 [a]
Brown Turkey	2.05 [c]	1.35 [a*]	1.82 [b]	5.61 [b]
Deanna	2.39 [b]	1.28 [ab*]	1.66 [c]	5.14 [c]
CD @ 0.05%	0.217	0.063	0.072	0.904

The cultivar Afghan (3.08 m) was taller compared to all the others and Brown Turkey (2.05 m) the smallest, which was not in accordance with previous studies (Özeker and Isfendiyaroglu 1998; Aksoy *et al.*, 2001; Ferrara and Papa 2001; Koka, 2001; Sanchez *et al*., 2003; Simsek, 2009; Rattanpal *et al.*, 2015). This limited vegetative growth of Brown Turkey may be due to environmental conditions. The plant spread was also discovered to be greatest in Afghan and least in Brown Turkey. Canopy volume was also highest in Afghan ($10.24\ m^3$), followed by Brown Turkey, and lowest in Deanna ($5.14\ m^3$) (Table 2).

CONCLUSION

Among the three cultivars, Brown Turkey was found to be superior to the other two cultivars, Afghan and Deanna in terms of yield and quality of fruits, while plant growth was more for Afghan. The number of fruits per tree was higher for Afghan, followed by Brown Turkey, but the fruit weight was more for Brown Turkey, followed by Deanna which is

intermediate in all the characteristics. Thus, the variety Brown Turkey is suitable for both fresh and dry consumption under local conditions. From this comparison of results, it can be concluded that Brown Turkey may be exploited for commercial planting.

FUTURE SCOPE

On the basis of the present study, which cultivar is giving potential fruit yield and quality is found. Further studies need to be carried out in order to study the effects of different levels of pruning on the yield and quality attributes of fig cultivars.

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Conflict of Interest. None.

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