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Studies on physical parameters of guava (*Psidium guajava* L.) Genotypes under Lucknow condition

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Abstract
The present investigation was conducted during 2018 is collection of different varieties of guava from CISH, Lucknow and then carried out in the laboratory of the Department of Horticulture, School of Agricultural Sciences & Technology, Babasaheb Bhimrao Ambedkar University (A Central University) Lucknow (U.P). To find out the response of combined ‘‘Studies on physical parameters of guava (*Psidium guajava* L.) genotypes under Lucknow condition”. The results clearly revealed that physical characters were significantly. The maximum fruit length (7.45 cm) T_4, fruit width (7.48 cm) T_6, pulp percent (98.06%) T_4, pulp thickness (1.80 cm) T_4, pulp colour, peel colour, number of seeds per fruit (148) T_5, specific gravity (1.03) T_4, fruit weight (235.16g) T_4 were observed under the various treatments combination can be considered as best treatment for enhancing physical characters in guava fruit under Lucknow conditions.

Keywords: Guava, varieties, physical parameters

Introduction
The genus Psidium of family Myrtaceae comprises about 150 species of small shrubs and trees (Hayes, 1970). About 20 species have edible fruits of which the most commonly cultivated is the common guava (*Psidium guajava* L.) was introduced in India in the 17th century by Portuguese from Latin America. At present, guava is the fifth most important fruit crop in India after banana, mango, citrus and papaya with annual production of 4054 thousand MT (4.2% of total fruit production) from 265 thousand hectare (3.6% of total fruit area). India is leading producer of guava followed by China and other major countries are Thailand, Brazil, Mexico, Indonesia, Malaysia, Venezuela, Australia, Pakistan etc. In India Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Maharashtra, Gujarat, Chhattisgarh etc. are the major growing states. Uttar Pradesh is become first in both area and production.

Guava has important place among the tropical fruits but grown widely in sub-tropical region and also in some parts of arid region. It bears flowers and fruits more than once in a year mainly three; Mrig bahar, Haste bahar, Ambe bahar. Under eastern Indian conditions main produce is obtained during rainy season but are inferior in many aspects as compared to winter harvest (Aulakh, 2004 and Singh, 1998) [1]. So, that fruit yield was maximum during the rainy season, while fruit quality characteristics were higher during winter as compared to the rainy season. Selection of varieties suited to a specific climate condition on the basis of growth, flowering, fruiting and yield is very important to make guava cultivation economically viable. Research work carried out at CISH, Lucknow (U.P) on evolution of newly developed guava cultivars and selection showed that Lalit, Shweta and Pant Prabhat were high yielders with moderate quality whereas; Hissar Surkha recorded maximum quality attributes.

Guava is considered as one of the exquisite and nutritionally valuable fruit. It formed an outstanding source of antioxidants such as vitamin-C (ascorbic acid), carotenoids, and polyphenols. The fruit comprises three to fourfold higher amount of vitamin-C as a single orange. Vitamin-C is essential for immune system stimulation, connective tissue formation as well as to reduce the incidence of degenerative diseases such as arthritis, arteriosclerosis, and cancer. In addition, antioxidants are known to retard aging as well as preventing or delaying oxidative damage of lipids, proteins, and nucleic acids caused by reactive oxygen species. The fruit can be eaten as raw and is usually sliced and used in salads or desserts. Various processed products are also made from guava *viz*. jam, jelly, cheese, canned fruit, ready to serve drink, nectar, squash, dried powder, ice-cream, highly concentrated puree, candy, toffees, syrup, juice, and concentrate. The processing of guava fruits for value addition minimizes post-harvest losses enhances its economic and nutritive value by fortification and to increase the availability over an extended period.

Materials and Methods

The present investigation was the collection of eight varieties/ genotypes varieties of guava from Central Institute for Subtropical Horticulture, Lucknow (U.P). The Collection of ten (10) healthy, uniform sized fruits that are free from pests, diseases and brushes randomly selected from the trees of each cultivars from each direction. When the fruits are nearly matured, then it was picked up and taken for evaluation during the month of December-January at the laboratory of the Department of Horticulture, School of Agricultural Sciences & Technology, Babasaheb Bhimrao Ambedkar University (A Central University) Vidya Vihar, Rae Bareli Road, Lucknow (U.P). Geographically Lucknow is situated at 80° 57′ 0″ E longitude and 26° 51′ 0″ N latitude and an elevation of approximately 123 meters (404 ft.) above mean sea level (MSL). The experiment was laid out in Completely Randomized Design (CRD) with eight treatments. The present study involved evaluation of eight (8) genotypes of guava like T_1 G-31, T_2 Dhawal, T_3 Lalit, T_4 L-49, T_5 Allahabad Safeda, T_6 Shweta, T_7 Apple colour and T_8 Red fleshed. Observations recorded to be fruit length (cm), fruit width (cm), pulp amount (%), pulp thickness (cm), pulp colour, peel colour, number of seeds per fruit, specific gravity, fruit weight (g). The data so obtained were analysed statically.

Table 1: Studies on physical parameters of guava (*Psidium guajava* L.) genotypes under Lucknow condition.

Varieties / Genotypes	Fruit Length (cm)	Fruit width (cm)	Pulp (%)	Pulp Thickness (cm)	Pulp Colour	Peel Colour	Fruit weight (g)	Specific gravity	Number of seeds/ fruit
G-31	6.237	6.490	95.430	1.497	white	Light yellow	165.353	1.008	131.223
Dhawal (G-35)	6.890	7.183	97.280	1.610	white	Light green	188.487	1.019	138.837
Lalit	6.547	6.713	96.877	1.523	pink	Saffron yellow	172.940	1.022	125.407
Sardar(L-49)	7.457	7.127	98.063	1.807	white	Primrose yellow	235.463	1.032	139.343
Allahabad Safeda	6.980	7.300	97.917	1.723	white	Straw yellow	220.697	1.026	148.140
Shweta	7.177	7.487	97.327	1.700	white	Yellowish green	226.410	1.025	138.573
Apple Colour	6.100	6.333	95.187	1.500	white	Reddish	141.437	1.025	129.213
Red Fleshed	6.513	6.367	96.387	1.520	Pink-reddish	yellowish	168.646	1.021	135.567
S.E m. ±	0.099	0.091	0.249	0.030	-	-	1.342	0.003	2.527
C.D. at 5%	0.300	0.275	0.754	0.090	-	-	4.059	0.009	7.642

(T_1 -G-31, T_2 -Dhawal, T_3 -Lalit, T_4 -L-49, T_5- Allahabad Safeda, T_6- Shweta, T_7- Apple colour and T_8 -Red fleshed)

Results and discussion:

The data presented in Table 1 clearly revealed that the fruit length ranged from 6.10 to 7.45 cm and the maximum fruit length was recorded in T-4 (7.45 cm) followed by T-6 (7.17 cm) and T-5 (6.98 cm) respectively while minimum fruit length was recorded in T-7 (6.10 cm). Varietal variations for physical attributes have also been reported by Kumar *et al*. (2006) [4] and Sahay *et al*. (2007) [7]. The fruit width ranged from 6.33 to 7.48 cm but the maximum fruit width was noted in T-6 (7.48 cm) followed by T-5 (7.30 cm) and T-4 (7.12 cm) respectively while the minimum fruit width was recorded in T-7 (6.33 cm). Different variations for physical parameters have also been reported by Singh *et al*. (2008) [8], Haji *et al*. (2012) [2], Jana *et al*. (2014) [3], Verma and Singh (2015) [10] and Mehta *et al*. (2016) [5]. The pulp percentage of different genotypes ranged from 95.18 to 98.06 where genotype T-4 (98.06%) had higher pulp percentage followed by T-5 (97.91%) whereas, lower pulp percentage was recorded in T-7 (95.18%). The higher content of pulp was due to the more pulp area or larger size of fruits, similar findings were also reported by Thonte and Chakrawar (1982) [9]. The pulp thickness of different genotypes ranged from 1.49 to 1.80 and the maximum pulp thickness was recorded with T-4 (1.80) and T-5 (1.72) followed by T-6, T-2 and T-3 whereas, minimum pulp thickness was recorded in T-1 (1.49), T-7 (1.50) and T-8 (1.52). Out of 8 genotypes, it was observed that 6 genotypes had white pulp colour and 2 genotypes had reddish-pink pulp colour and that the colour of peel are mainly light yellow, light green, saffron yellow, primrose yellow, straw yellow, yellowish green, reddish and yellowish in different genotypes of guava. The maximum number of seeds per fruit was found in genotype T-5 (148) followed by T-4 (139) and T-2 (138) respectively while the minimum seed per fruit was found in T-3 (125). Mitra *et al*. (1983) [6] recognized the relation of large size of fruit of Allahabad Safeda with the number of seeds; this relation is confirmed in seedless variety which has less number of seed and smaller size of fruit. The average fruit weight ranged from 141.43 to 235.46. The maximum average fruit weight was found under T-4 (235.46) followed by T-6 (226.41) and T-5 (220.69) respectively whereas, the minimum fruit weight found in genotype T-7 (141.43). The highest fruit weight was observed in cv. L-49 (235.50 g) followed by Allahabad Safeda (210 g) as reported by Kumar *et al*. (2006) [4]. Haji *et al*. (2012) [2] also reported that the fruits during winter season showed significantly higher fruit weight as compared to the rainy season fruits. The specific gravity ranges from 1.008 to 1.032. The maximum specific gravity is observed in T-4 (1.032) followed by T-5, T-6, and T-7 while the minimum specific gravity is observed in T-1 (1.008).

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