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SHORT COMMUNICATION

Screening of bael (*Aegle marmelos* Correa) cultivars for preparation of candy

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Bael (*Aegle marmelos* Correa) is an importance indigenous fruit of rutaceae family. The tree is very hardy in nature and can withstand against various biotic and abiotic stresses. The importance of bael is enumerated in ancient Indian and Buddhist literature. The fruits of bael is known for its curative properties and nutritive value. The fruit pulp contains fair amount of vitamin A, C and high amount of riboflavin (Gopalan *et al.*, 1985 and Saroj *et.al.*, 2006). The fruit pulp contains marmelosin, which is laxative, diuretic, astringent, digestive, stomachic and also posses anti-amoebic and hypoglycemic properties.

Bael fruits are mostly utilized in form of beverages so far. Moreover, candy is another product of dry in nature and becoming popular among consumers. However, the quality of candy not only depends upon the recipe but the also the cultivar by which it has been prepared. In the last decade, several varieties of bael has been released for commercial cultivation under tropical, subtropical and arid conditions. The information on suitability of cultivar for preparation of candy is essentially required for processing industries. Therefore, present study was panned to screen the suitable cultivar for preparation of candy.

The investigation on "Screening of bael (*Aegle marmelos* Correa) cultivars for preparation of candy" was carried out in the Post Harvest Laboratory, Department of Horticulture, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (UP) during 2004-05. The fruits of five cultivars of bael viz., NB-4, NB-5, NB-7, NB-9 and NB-17 were taken in the month of April from the main Experimental Station, which were grown under uniform management conditions. Before preparation of candy, physico-chemical parameters of all cultivars including fruit length, fruit diameter, fruit weight, skull thickness, pulp, seed, fibre and mucilage content, TSS, acidity, reducing and non-reducing sugars, Vitamin-C, carotene and protein content were recorded. The chemical estimation was done as per AOAC (1970). The experiment was laid out in the complete randomized block design with five treatments having five replications.

For preparation of candy, 2 Kg of mature fruit of each cultivar was taken. The fruits were washed and sliced into pieces of 2.0-2.50 cm with the help of saw. Thereafter, the hard skull and seeds with mucilage were removed with the help of knife. The pieces were pricked from both sides by hand operated pricking machine. The pricked slices of different cultivars were dipped separately in 2 per cent lime solution for 24 hours. Thereafter, the slices were washed thoroughly with water and blanched in boiling water for 5 minutes. The blanched pieces were steeped in syrup solution of 55 per cent TSS for 24 hours followed by 70 per cent for 4 days. The drying was done at 50 0C for 12 hours. The quality of candy was evaluated by the organoleptic test by the panel of 10 judges on a 9 point hedonic scale.

Physical parameters

The appearance of fruit in form of shape, size, skin colour etc. also play important role in marketing and processing of fruits for various purposes. However, the pulp colour can only be seen after cutting of the fruits and natural pulp colour gives direct impact on processed product. In the present investigation (Table 1), the fruit shape of NB-4 and NB-5 was round while NB-9 and NB-17 was ovate. The flattened round shape was observed in case of NB-7 only. The skin and pulp colour were varied from green to yellowish green and yellow to deep yellow respectively.

The weight of fruits varied significantly and maximum fruit weight was recorded in NB-7 (3.55 Kg) followed by NB-9 (2.09 Kg) and minimum in NB-4(0.75 Kg). Regarding skull thickness, except NB-5, all the cultivars having thick skin with maximum in NB-17 (3.00 mm) and minimum in NB-5 (1.44 mm). The per cent fibre content was also minimum in NB-7 (4.45 %) and maximum in NB-9 (7.07%). The mucilage content varied from 9.05

Table 1. Physical characteristics of bael fruits.

Parameters	Cultivars					CD (p=0.05)
	NB-4	NB-5	NB-7	NB-9	NB-17	
Shape	Round	Round	Flattened round	Ovate	Ovate	-
Skull colour	Yellowish green	Greenish yellow	Green	Greenish yellow	Slight green	-
Pulp colour	Yellow	Deep yellow	Pale yellow	Yellow	Deep yellow	-
Fruit weight (kg)	0.75	1.05	3.55	2.09	1.45	1.12
Skull thickness (mm)	2.40	1.44	2.60	2.20	3.00	0.94
Fibre content (%)	5.03	4.96	4.45	7.07	4.85	1.80
Mucilage content (%)	10.05	13.05	9.05	11.00	9.67	1.20
Pulp content (%)	69.05	68.13	70.05	71.40	68.90	NS
Seed content (%)	2.70	2.33	2.40	2.67	2.20	NS

Table 2. Chemical characteristics of bael fruits.

Parameters	Cultivars					CD (p=0.05)
	NB-4	NB-5	NB-7	NB-9	NB-17	
TSS (0B)	28.00	30.00	26.00	33.00	30.00	3.60
Acidity (%)	0.29	0.20	0.32	0.23	0.20	NS
Reducing sugar (%)	3.75	3.90	2.90	3.85	3.96	NS
Non-reducing sugar (%)	14.25	12.25	8.14	14.25	12.54	2.30
Total sugar (%)	14.00	16.50	11.00	18.10	16.50	2.40
Vitamin-C / 100g pulp	14.40	24.60	16.49	19.06	26.00	2.80
Carotene (IU)/ 100g pulp	15.00	16.00	17.00	18.00	16.00	NS
Protein(mg)/ 100g pulp	1.40	1.50	1.80	1.90	1.60	NS

Table 3. Organoleptic quality of different cultivars of bael candy.

Cultivars	Organoleptic quality	
	Average Score	Rating
NB-4	5.9	Like slightly
NB-5	6.8	Like moderately
NB-7	7.8	Like very much
NB-9	8.8	Like extremely
NB-17	6.7	Like moderately
CD (p=0.05)	0.08	-

per cent (NB-7) to 13.05 per cent (NB-5). Moreover, the per cent pulp and seed content were non-significant among different cultivars. In fact, these variations are inherited characteristics of an individual cultivar. Similar observations were made by Roy and Singh (1978) about physico-chemical parameters of different bael cultivars.

Chemical parameters

The data on chemical compositions of different bael cultivars are given in table 2 indicate that the TSS varied significantly among different cultivars. The highest TSS was recorded in NB-9 (33.0 %) while minimum in NB-7(26.0 %). The NB-5 and NB-17 having same level of TSS (30.0%). The acidity and reducing sugar did not vary significantly, however non-reducing sugar varied significantly. The total sugar was highest in NB-9 (18.10 %) followed by NB-5 and NB-17 (16.50%) while minimum in NB-4 (14.0%). The Vitamin-C content was extremely high in NB-17 (26.0 mg/100 g) and lowest in NB-4 (14.40 mg/ 100g). Whereas, non-significant variations were observed in case of carotene and protein content among different cultivars but highest value was observed in NB-9. Such quality variations were also reported by Singh *et al.* (2003). These quality attributes ultimately reflect the quality and acceptability of processed products.

Organoleptic rating

The simplest method for judging acceptability of any new products is organoleptic evaluation by the panel of experts. The data given in table 3 indicate that the candy prepared by NB-9 was judged as best by scoring 8.8 value on 9 point scale followed by NB-7 (7.8). Whereas, the candy prepared by NB-5 and NB-17 were liked moderately but the candy prepared by NB-4 scored lowest value (5.9). The relative organoleptic rating indicate that the cultivar NB-9 is most suitable for candy preparation. The fruits of this variety are big in size, attractive pulp colour, high TSS and acid blend as well as fairly good amount of carotene and protein; probably responsible for quality candy prepared by cultivar NB-9. Thu, any bael cultivar with these parameters may be selected for preparation of quality candy. Ram and Singh (2003) had already advocated that NB-9 is a good variety for processing.

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