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Varietal performance in physico-chemical properties of peach (*Prunus persica*) grown in Uttarakhand, India

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ABSTRACT

In this study, the varietal performance in respect of the quality and good yield in Kumaun region at the time of growing areas were evaluated. The varieties are F-16-23, Florida king, Nectarine, Red June. The results were pertaining to their highest fruit length (68.50 mm), fruit breadth (71.38 mm), fruit weight (186.11 g) found in T4 Red June and fruit firmness (8.74 lb/in²) found in T3-Nectarine. The acidity (1.66 %), ascorbic acid (440 mg/100 g), reducing sugar (19.77 %) and total sugar (51.73 %) found in T4- Red June, T-2 Florida King, T-3 Nectarine. The study revealed that the size and yield good in Red June and the nutritional value was higher in Florida King and Nectarine peach.

Key words: Bio-chemical, Characters, Fresh fruit, Peach, Physical characters.

The peach fruit varieties have gained enormous popularity in the past four decades in many countries of the world. The peach fruit cultivation in Kumaun hills are increasing rapidly and has a great potential to become these attractive fruits possessing captitative taste, aroma, nutritional value and a source of livelihood for the people of region. The varieties of peach (cv. Red June, Nectarine, F-16-23, Florida King) are most important gaining popularity in mid to high hill temperate zones. The identification of nutritional value for fruit specific and which would produce fruit of high quality is therefore, of paramount importance. The studies reported here evaluated the various qualitative methods to determine the specific nutritional value according to variety.

The fruits of different varieties were harvested at physiological maturity, *i.e.* colour break stage from orchard block of Central Institute of Temperate Horticulture-Regional Station, Mukteshwar situated at 2200 m amsl in Nainital district of Uttarakhand.

Treatments: The total treatments were four with five replications in each. The fruits of different varieties were selected for biochemical analysis. The treatments were (T1-F-16-23, T2- Florida King, T3-Nectarine, T4-Red June).

Physical characters: The length, breadth, weight of the fruit and fruit halves were recorded/measured by vernier callipers and electronic balance respectively following standard methods (Ranganna 1997). The fruit firmness was measured with the help of a penetrometer (Model FT-327, Italy) using 8 mm stainless steel probe and results were expressed as lb/in².

Bio-chemical characters: The total soluble solids (TSS) of the extracted fruit juice were recorded with a hand refractometer (Erma, Japan) corrected at 20°C, acidity (%) by titrating a known volume of aliquot against N/10 NaOH using phenolphthalein as indicator as described by Ranganna (1997). The reducing and total sugars (%) of the juice were estimated as per the methods of AOAC (1990). The ascorbic acid contents (mg/100g) were recorded by titrating a known volume of juice with metaphosphoric acid against 2, 6 dicholophenol indophenol dye (Ranganna 1997) and were expressed as mg/100g juice.

Statistical analysis: The experiment was undertaken in completely randomized block design (CRBD) replicated four times. The data on physical and bio-chemical characteristics of different grades of peach recorded were analyzed as per the methods given by Panse and Sukhatme (2000).

The data presented in Table 1 revealed that physical characteristics like size of fruit (length and breadth), weight of fruit, firmness (lb/ in²), were significantly influenced with various fruit crops.

The data revealed in Table 1, that fruit length found average highest in T4- (68.56 mm) followed by T3- (51.56 mm), T2-(51.50 mm). The minimum fruit length found in T1 (46.76 mm). The fruit breadth found average highest in T4- (71.38 mm) followed by T2- (53.30 mm), T3-(53.21 mm). The minimum fruit breadth found in T1 (52.40 mm).The fruit weight found average highest in T4- (186.11 g) followed by T3- (83.23 g), T1-(70.50 g). The minimum fruit weight found in T2- (69.06 g). Moisture content is important in determining the keeping quality and

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TABLE 1: The physical properties of peach varieties

S. No.	Fruit length (mm)	Fruit width (mm)	Fruit weight (g)	Pressure (lb/in ²)
T1 F-16-23	46.76	52.40	70.50	3.64
T2 Florida King	51.50	53.30	69.06	3.41
T3 Nectarine	51.65	53.21	83.23	8.74
T4 Red June	68.56	71.38	186.11	7.61
Mean	54.64	57.59	102.22	5.85
Sem	1.52	1.01	5.56	0.55
CD 5 %	4.68	3.13	17.14	1.72
CV	6.22	3.95	12.17	21.32

TABLE 2: The biochemical properties of peach varieties

S. No.	Acidity %	Ascorbic Acid mg/100g	Reducing sugar %	Total sugar %
T1 F-16-23	1.34	120.00	5.00	6.66
T2 Florida King	1.06	440.00	8.33	13.33
T3 Nectarine	1.60	310.00	2.50	8.00
T4 Red June	1.66	140.00	3.33	10.00
Mean	1.42	252.5	4.79	9.49
Sem	0.11	8.66	0.35	0.50
CD 5%	0.37	29.93	1.02	2.70
CV	13.14	5.94	7.23	10.25

an indicator of freshness of any food commodity. The fruit firmness pressure found average highest in T3- (8.74 lb/in²) followed by T4- (7.61 lb/in²), T1-(3.64 lb/in²). The minimum fruit firmness pressure found in T2 (3.41 lb/in²). This inconsistency in firmness may be because of environmental variations (i.e. temperature, chilling hours).

The fruit acidity found average highest in T4- (1.66%) followed by T3- (1.60 %), T1-(1.34 %). The minimum fruit acidity found in T2 (1.06 %). Acid content of fruits is important quality parameters and a key determinant of fruit taste. Acids also serve as food constituents and required by the body in minute quantities. Their is basic role to maintain acid base balance in the body fluid systems (Hasib *et al.*, 2002). Titrable acidity indicates the concentration of organic acids present in the fruit. The overall range of titrable acidity found in our findings was closely related to the results reported by Hasciferogullari *et al.* (2007). The lower level of titratable acidity in Florida king peach compares to nectarine fruit at harvest (Table 2) may be due to an alternation in some aspect of malic acid (the major organic acid in peaches and nectarines) synthesis, metabolism, or vacuolar compartmentalization (Yen, 1987; Campbell and Koch, 1989;).

The fruit ascorbic acid found was highest in T2 (440.0 mg/100g) followed by T3 (310 mg/100g), T4- (140.0 mg/100g). The minimum fruit ascorbic acid was found in T1-(120.0 mg/100g). Among different quality attributes of fruits, ascorbic acid is one of great importance due to its numerous roles in the body. It is reorganized as an important antioxidant and a quality indicator of post harvest self life. Fruits and vegetables contribute 91% of ascorbic acid to the human diet. After Florida King, the

Nectarine was found as good source of available ascorbic acid having 310.00 mg/100g on fresh weight basis. These results were agreement with that of reported by Akin *et al.* (2008).

The fruit reducing sugar found was highest in T3 (19.77 %) followed by T4- (14.69 %), T1-(10.50 %). The minimum fruit reducing sugar was found in T2 (5.68 %). The fruit total sugar was found highest in T3 (51.73 %) followed by T1- (32.70 %), T2-(27.98 %). The minimum fruit total sugar was found in T4 (20.34 %). Sugars are important food constituents and instant source of energy for the body activities. A higher sugar level of a fruit also serves as an index of maturity. Apricot contains significant amount of sugars when ripe and concentrate further during storage or drying and dehydration. The results of the current study were in agreement with the previous study of Aubert and Chaforan (2007).

CONCLUSION

It was concluded from the present study that the different varieties of peach fruit is rich in nutritional and antioxidant composition i.e. sugars, ascorbic acid, carotenoids, acidity, and antioxidant activity. Reducing sugars T-3 (19.77 %) were found significantly higher in Nectarine. The highest average acidity T-4 (1.66%), T-2 vitamin C (440.00 mg/100g) and total sugars T-3 (51.73 %) found in Red June, Florida king, nectarine respectively. Florida king have more vitamin C than the other varieties, has the good antioxidant activity due to presence of vitamin C. This study also provides basic nutritional information on peach's varieties and will be helpful in the development of post harvest management system and small industrialization of in temperate region.

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