Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 2611-2613
Received: 04-01-2018
Accepted: 05-02-2018

Kale AS
M.Sc. Student, VNMKV, Parbhani. Maharashtra, India

Patil MB
M.B. Officer Incharge, Sweet Orange Research Station, Badnapur, Maharashtra, India

Patil SG
Asstt. Horticulturist, Fruit Research Station, Himayatbagh Aurangabad, Maharashtra, India

Correspondence
Patil SG
Asstt. Horticulturist, Fruit Research Station, Himayatbagh Aurangabad, Maharashtra, India

Studies on performance of nucellar and sathgudi varieties of sweet orange (*Citrus sinensis* Osbeck) under Jalna condition

Kale AS, Patil MB and Patil SG

Abstract
Citrus are one of the commercially most important fruits in the world. Citrus fruit have good nutritive values which are regarded as a high source of Vit. 'C' and also contain vitamin A and B along source with Minerals coupled with high amount of sugar. The demand of these varieties increasing day by day in the market, hence it was very necessary to study the feasibility and suitability for the cultivation of these varieties in the Jalna region. present study was undertaken with the view to compare different physical characters viz. Height of the trees, spread of the trees, Number of days required for harvest from fruit set, Number of fruits per tree, Average fruit weight, Average fruit length, Average fruit breadth, Average peel weight of fruit, Average peel thickness of fruit, Average pomace weight of fruit, Average number of seeds of fruit, Average number of segments of fruit, Average juice weight of fruit and Average peel to juice ratio of fruit. It was clear that the physical and yield parameters of Nucellar was more than Sathgudi hence it is concluded that the Nucellar cultivar is better than Sathgudi in Jalna district.

Keywords: *Citrus sinensis*, performance of nucellar and sathgudi varieties

1. Introduction
Citrus Fruits are one of the most delicious Fruits, Belonging to the family Rutaceae. All commercially important species belong to genus citrus including sweet orange, mandarin, lemon, Sweet lime, Grape Fruit, tangerine etc.
Citrus are one of the commercially most important fruits in the world. They are widely grown in sub-tropical and many tropical belts. It is the preferential of the country. Their Wholesome nature, Multifold Notional and medicinal values have made them so Important
Citrus Fruits have good nutritive value which are regarded as a high source of Vitamin 'C' (Ascorbic Acid) and also Contains vitamin 'A and B' along source with minerals coupled with high amount of sugar content citrus fruits are liked by all for their excellent taste, flavor attractive Colour and deep pleasing odour. They are consumed as fresh fruit, fruit juice frozen juice concentrate. Many preserved products like jelly, marmalades, squash, Syrup and cordials can be prepared. The peel Contain Essential oil which is used in food flavour, baking and food Products in Citrus, Sweet orange is the second most important fruits next to mandarian. The Major Sweet producing States in Indiaare Andhra Pardesh, Assam, bihar, Gujarat, Himachal Pardesh Jammu and Kashmir, Madhya Pradesh, Maharashtra, Orrisa, Tamilnadu, Uttar Pardesh, Punjab, Hariyana and Karnataka in India About 1.26 lakh ha area under sweet orange cultivation with production of 12.1 lakh tones of Fruits (Anonymous, 2007).

2 Material and Method
The experiment conducted in Jalna District during the year 2013-14. The experiment was laid out in Complete Randomized Design and consisted of 2 treatment replicated 15 times. The following observations were recorded in the experiment.
The Height of the tree was measured with the help of measuring tape. The Spread of the tree was measured in both the direction i.e. North-South and East-West and their mean recorded. Number of days required for harvest from fruit set was calculated in days numerically required by each tree individually. Ten Fruits were randomly selected from the tree of Sathgudi and Nucellar to study the detailed physical Characters. A Composit Sample of 10 fruits each from Sathgudi and Nuceller Mosambi was analyzed at maturity stage The Weight of Individual Fruit was recorded with the help of electrically Appeared top pan balance The size of Fruit was measured in terms of length and breadth in cm. with the Help of Vernier Caliper. The Length was taken as the distance between two farthest ends while the breadth was measured as the distance between peduncle to Blossom and while the breadth was measured as the distance

between two farthest ends perpendicular to the longitudinal axis of fruit. The weight of the peel individual fruit was recorded with the help of electrically operated top pan balance. The thickness of peel was measured with the help of Vernier Caliper at two different places and its mean was recorded and expressed in terms of millimeter.

2.1 Location

The experiments entitled "studies on performance of Nucellar and Sathgudi varieties of Sweet Orange (Citrus sinensis Osbeck) under Jalna condition was conducted at the field of Jalna district during the year 2013-2014.

2.2 Climate

The experimental site falls under Jalna districts and categorized as semi arid tropics. However various seasons have caused it to categorize as sub-humid to humid in monsoon, semi arid in winter and arid in summer. The average annual precipitation of the district is 687.57 mm and the region has been categorized as an assured rainfall agro-climatic Zone. The daily mean minimum temperature ranges between 13-24 0C and daily mean maximum temperature varies between 29-43 0 c between the month of December and May. The mean and maximum relative humidity vary from 24.78 and 84.21 percent respectively.

2.3 Plant Material

The field consisted of 400 plants of Nucellar and 300 plants of Sathgudi, planted in 2000 at the spacing of 6x6 m. Fifteen uniform and healthy trees were selected each from Nucellar and Sathgudi for investigations. Ten fruits from a single tree were selected to study the chemical composition of both varieties.

2.4 Experimental Soil

The jalna area is dominated by black soils formed from basalt rock originating through volcanic eruptions. The soils are dominant in montmorillonite followed by moderate amount of kaolinite and traces of illite.

The soil is characterized by black colour dominated by montmorillonite clay with high coefficient of expansion when wet and shrinkage in summer leading to deep cracking the soils are alkaline in reaction with high base saturation.

3. Result and Discussion

3.1 Height of the trees (m)

The height of trees of Nucellar and Sathgudi is presented in table 1 indicated that there was significant difference in respective of height among two varieties that is Nucellar and Sathgudi The average mean height of 3.83 m and 3.54 m was measured in Nucellar and Sathgudi respectively.

The trees of the sweet orange varieties viz., Nucellar and Sathgudi exhibits wide variation in height. The trees of both these varieties were found vigorous have made excellent growth. Bajwa *et al*. (1972) [1] noticed the differents in height of Hamlin, Blood Red, Mosambi, Valencia and Jaffa.

3.2 Spread of the Trees (m)

The data recorded in respect of spread of the varieties presented in Table 1. Both the varieties showed significant differences. The average mean spread was found to be maximum in Nucellar (2.94 m), whereas it was 2. 48 m in Sathgudi, showing higher spread of Nucellar when compared with Sathgudi.

In Nucellar variety of sweet orange, the maximum tree spread has been noticed. The differences between spread of individual trees of Nucellar and Sathgudi were signiticant. Bajwa *et a1*. (1972) [1] have reported the highest spread of 3.36 m in Hamlin. Patil (2004) [6] recorded the highest spread in Nucellar is. 2.99 m as compared to Sathgudi.

3.3 Number of days required for harvest from fruit set (days)

The data recorded in respect of number of days required for harvest from fruit set by both the varieties in table 1, indicated that there was significant differences in respect of days required from fruit set to harvesting among two varieties i.e. Nucellar and Sathgudi**.** The mean period required from fruit set to harvesting was 245.00 and 236.46 by Nucellar and Sathgudi respectively.

3.4 Number of fruits per tree

The highest mean yield per tree was recorded in Nucellar i.e. 253.53 fruits and 204.80 fruits in Sathgudi. Significant differences have been observed in yields of both the varieties. Rao *et al*. (1971) have reported highest fruit yield (205 fruits) from Sathgudi. Kalra *et al*. (1989) [4] reported highest fruit yield (248 fruits) from Jaffa sweet orange. The range of fruits/tree was observed from 218 to 317 and 161 to 232 in Nucellar and Sathgudi, respectively. It is clearly indicated that due to maximum height and spread, the number of fruits were more on Nueellar. Sathgudi was a moderate bearer of fruits with good eating quality, as reported by Rao *et al*. (1971). Patil (2004) [6] noticed highest mean yield per tree for Nucellar (249.9 fruits) and in Sathgudi it was (201.30 fruits).

3.5 Average fruit weight (g)

The perusal of data presented in Table 1 showed the significant variation in fruit weight of 10 fruits/tree was evidenced within the varieties. The fruits of Nucellar had more weight than the Sathgudi. The average mean fruit weight of Nucellar was recorded as 192.44 and it was 177.04 in Sathgudi. Sharma *et al*. (1985) [7] reported that the maximum average fruit weight of 175 g in Sathgudi under West Bengal conditions. Rao *et a1*. (1971) have further recorded the maximum fruit weight of 204 g in Sathgudi.

Patil (2004) [6] noticed the highest fruit weight of 10 fruits per two weighed upto 238.19 g in Nueellar, whereas, 203.78 g in Sathgudi under Parbhani conditions of Maharashtra.

3.6 Average fruit length (cm)

The data presented in Table 1 revealed that the average fruit length ranged from 7.5 to 8.7 in Nucellar, while it was 7.20 to 8.40 in Sathgudi The average mean length of Nucellar and Sathgudi fruit was measured as 8.07 and 7.83 respectivelly.

Significant variation was observed with respect to fruit length in both the varieties. It is indicated that the shape of Nucellar and Sathgudi fruits was more or less oval or round. Patil (2004) [6] recorded maximum length of fruit in Nucellar (7.9 cm) and in Sathgudi it was 7.6 cm. The maximum length of 7.5 cm in Vanilla Malta has been reported by Dubey (2000) [2] and 7.20 cm in Blood Red variety of sweet orange reported by Lal and Sharma (1984) [5].

3.7 Average fruit breadth (cm)

It is seen from Table 1 shows that the significant differences were observed in the average breadth of both the varieties i.e. Nucellar and Sathgudi. The breadth of Nucellar fruits were

found more than the Sathgudi. The average breadth of Nucellar fruits ranged between 8.40 to 9.40 and in Sathgudi it was between 7.70 to 8. The slgnificant difference in breadth of both the varieties were observed. Patil (2004) [6] recorded the highest breadth of 8.4 cm in Nucellar and 8.0 cm in Sathgudi. Dubey (2000) [2] measured breadth of Majurica Malta and Vanilla Malta which was 8.80 cm and 8.05 cm, respectively.

3.8 Average peel weight of fruit (g)

The peel weight of Nucellar was found more than Sathgudi The average mean peel weight of Nucellar and Sathgudi fruits was 65.44 and 56.86 respectively.

Between Nucellar and Sathgudi varieties of sweet orange, the fruits of Sathgudi had significantly lowest average peel weight (45.01 g) of ten fruits, however, the peel weight of Nucellar was 51.99 g, suggesting that the Nucellar fruits have thicker peel than Sathgudi. Patil (2004) [6] recorded the lowest average peel weight of 31.7 g in Sathgudi of ten fruits and in Nucellar it was 42.51 g. Kalra *et al*. (1989) [4] have recorded the peel percentage between 22.6 to 33.4 from sweet orange cultivars namely Jaffa, Blood Red, Pineapple, Hamlin, Mosambi and Valencia Late.

3.9 Average peel thickness of fruit (mm)

The data presented in Table 1 showed the significantly superior average thickness of the peel (6.64) in Nucellar and in Sathgudi it was 5.4 mm. Jawanda *et al*. (1973) in sweet orange obtained similar results. The maximum peel thickness has been reported in Malta (9.20 mm), Vanilla Malta (7.80 mm) and Rubi Malta (7.10 mm), however, minimum peel thickness (5.60 mm) was noticed in Whittwar malta reported by Dubey (2002) [2]

3.10 Average number of seeds of fruit

The Nucellar cultivar fruit was found more number of seeds per fruit than Sathgudi. In Nucellar, the average number of seed were recorded 20.49 whereas in Sathgudi it was 18.13.

The significant difference in number of seeds per fruit during comparative study of Nucellar and Sathgudi under Parbhani condition were observed by Patil (2004) [6]. Dubey (2000) [2] reported significant differences in seed number of seeds per unit during comparative study of different cultivars of sweet orange. Whittawar Malta had highest of 13.20 seeds per fruit, followed by Valencia Novel (12.30) seeds and Ruby Malta (12.00) seeds. In present investigation, Nucellar had 27.10 seeds, followed by 21.90 in Sathgudi fruits. Mathur and Godara (1990) in sweet orange cuttivars pineapple, reported 13 seeds per fruit.

Table 1: Comparative performance of growth parameter of Nucellar and Sathgudi variety of Sweet Orange

Name of Variety	Height of the trees (m)	Spread of the tree (m)	Number of days required for harvest	Number of fruits / tree	Average fruit weight (g)	Average fruit length (cm)	Average fruit breadth (cm)	Average peel weight of fruit (g)	Average peel thickness of fruit (mm)	Average Number of Seeds of fruit
Necellar	3.83	2.94	245.00	253.53	192.44	8.07	8.97	65.44	6.64	20.49
Satgudi	3.54	2.48	236.46	204.80	177.04	7.83	8.30	56.86	5.54	18.13
SE±	0.099	0.06	1.36	6.38	4.35	0.081	0.07	1.92	0.16	0.78
CD at 5%	0.28	0.18	3.95	18.47	12.59	0.23	0.258	5.56	0.48	2.26

4. References

1. Bajwa MS, Gupta MR, Sharma JR. A varietal trial on sweet orange (*Citrus sinensis* Osbeck) in Punjab. Punjab Horti J. 1972; 22(1-2);5-47
2. Dubey AK. Comparative performance of certain sweet orange (*Cirtus Sinensis*) cultivars at foot hils situation of Arunachal Pradesh. Prog. Horticulture. 2000; 32:153-156
3. Jawanda JS, Arora JS, Sharma JN. Fruit quality and maturity studies of Kinnow mandarin at Abhor Punjab. Punjab J of Hort. 1973; 22(3-4):131-135.
4. Kalra SK, Sharma JN, Chohan GS. Tree growth yield and fruit quality of six orange cultivar under arid irrigated regions of Punjab. Indian J of Hort. 1989; 46(1);14-18
5. Lal H, Sharma RM, Performance of sweet orange cultivars under Pithoragarh conditions. Punjab Hort. 1984; 24(1-4):37-38.
6. Patil RF. Comparative study of Nucellar and Sathgudi Mosambi (*Citrus Sinesis* Osbek) under Parbhani (Maharashtra) conditions. M.Sc. Dissertation submitted to MAU, Parbhani, 2004.
7. Sharma DD, Roy BN, Samaddar HN. Prospect of sweet orange (*Citrus sinens*is L.) cultivars in West Bengal. Indian Agriculturist. 1985; 29(3):203-207.