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Studies on physico-chemical characteristics of nucellar and sathgudi varieties of sweet orange (*Citrus sinensis* osbeck)

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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. Present study was undertaken with the view to compare different physico-chemical characters of sweet orange such as Average acidity of fruit juice, Average total soluble solid of fruit, Average pH of fruit juice, Average ascorbic acid content of fruit juice. Acidity range of Nucellar and Sathgudi was between 1.17 to 1.52 and 1.29 to 1.52 respectively. Range of Vit. 'C' content was 46.08 to 59.31mg/100g, pH of Nucellar was 5.28 and 5.26 in Sathgudi. The juice content, acidity of juice and vit. 'C' content of sathgudi was more than Nucellar.

Keywords: PH, TSS, nucellar, sathgudi, physico-chemical.

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.

In Maharashtra sweet orange is cultivated on an area of 35,500 ha with a production of 5.18 lakh tonnes of fruit. The highest productivity is in Maharashtra and lowest is in Himachal Pradesh.

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, banking and food Products. In Citrus, Sweet orange is the second most important fruits next to mandarian. The Major Sweet producing States in India Andhra Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Maharashtra, Orrisa, Tamilnadu, Uttar Pradesh, Punjab, Haryana and Karnataka. in India About 1.26 lakh ha area under sweet orange cultivation with production of 12.1 lakh tones of Fruits. In Jalna district, Nucellar, Sathgudi, Rajapimpri, Mosambi and local are the major cultivars of sweet orange. Sathgudi is famous variety which is largely cultivated in Andhra Pradesh and Karnataka. The area under sathgudi cultivar is increasing in Maharashtra particularly in the pockets of Nucellar Mosambi. In Marathwada region, districts like Jalna, Aurangabad, Parbhani and Nanded, the area under Sathgudi is considerably increasing day by day due to the good demand for the fruits in the market. The juice content of sathgudi is high as compared to other variety of sweet orange. The excellent natural sugar acid ratio of juice in the fruits attracts the consumers hence, fruit fetches good price in the market.

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. Following characters were studied in order to study the chemical composition of fruits viz.

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Average acidity of fruit juice, Average pH of fruit juice, Average ascorbic acid content of fruit juice and Average total soluble solids of fruit. The same juice which was extracted from each ten fruits individually was used for chemical analysis.

The total soluble solids of freshly extracted juice were ascertained by "Hand refractometer" (0-28 °Bx) at room temperature.

For determination of acidity, 25 ml of juice was diluted to 250 ml with the help of distilled water. The known volume of the juice was then titrated against N/10 NaOH solution using phenol-thalian as an indicator.

The freshly extracted juice of a composite sample of single fruit was taken into a beaker and its pH was recorded with the help of electrically operated pH meter. The pH meter was calibrated before recording the pH values with the help of buffer tablets.

Ascorbic acid content (Vitamin 'C') was – analysed by 2, 6 Dichlorophenol Indophenol visual titration method. The 2, 6 dichlorophenol indophenol die was titrated against the sample juice by using 3% metaphosphoric acid as a stabilizing agent.

2.1 Location

The experiments entitled "studies on physico-chemical characters 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. Average acidity of fruit juice (%).

The data pertaining to average acidity of 10 fruits/tree are presented in Table 1. The comparative studies of acidity

revealed that there is non-significant difference in acidity was observed in both the varieties.

The results of acidity of both the varieties were non-significant. The acidity of both the varieties ranged between 1.17 to 1.52 per cent. The mean acidity of Nucellar was 1.45 and it was 1.47 per cent in Sathgudi. Patil (2004) ^[3] observed the highest acidity of 1.38 per cent in Sathgudi whereas the lowest acidity of 1.09 was observed in Nucellar.

Table 1: Physico-chemical performance of nucellar and Satgudi varieties of sweet orange.

Name of variety	Average total soluble solids of fruit(°bx)	Average acidity of fruit juice (%)	Average pH of fruit juice	Average ascorbic acid content of fruit juice (mg/100 g)
Nucellar	11.50	1.45	5.28	54.63
Satgudi	11.42	1.47	5.26	56.04
SE±	0.06	0.013	0.02	0.56
CD at 5 %	0.18	NS	NS	NS

3.2. Average pH of fruit juice

The data recorded in respect of average pH of fruit juice of 10 fruits per tree of both varieties i.e. Nucellar and Sathgudi is represented in Table1. The comparative studies of pH of juice of both the varieties showed non-significant differences.

The pH of the juice of both the varieties viz, Nucellar and Sathgudi was non-significant in which there were very less differences in respect of pH. The pH ranged between 5.02 to 5.40. Similar results were also obtained by Patil (2004) ^[3] in Nucellar and Sathgudi fruits, where reported the pH ranged between 4.39 to 4.58.

3.3. Average ascorbic acid content of fruit juice (mg/100 g)

The data recorded in respect of average ascorbic acid content of 10 fruits/tree of both the varieties viz, Nucellar and Sathgudi is presented in Table 1 the comparative studies of average ascorbic acid content of both the varieties showed non-significant differences.

The average highest ascorbic acid content of 59.33 mg per

100 g juice was observed in Sathgudi fruits, whereas, it was 59.31 mg per 100 g juice of Nucellar. Patil (2004) ^[3] recorded the non-significant difference in ascorbic acid content of Nucellar and Sathgudi fruits with mean of 43.80 and 53.31 mg per 100 ml of juice, respectively. Ghosh and Chattopadhyay (1998) ^[2] have recorded highest ascorbic acid content in Ruby and lowest in Jaffa from West Bengal.

3.4. Average total soluble solids of fruit (°bx)

The data pertaining average TSS of 10 fruits/tree are presented in Table 1 the comparative studies of both varieties revealed that there were non-significant differences in average TSS of fruit juice.

The significant difference between the fruit juice of Nucellar and Sathgudi were observed in present investigation. The highest TSS content of Nucellar was 11.90 and lowest was 10.90. Whereas, in Sathgudi, the highest TSS content was 11.70 and lowest was 10.90. The mean TSS content recorded in Nucellar was 11.50 and in Sathgudi it was 11.42. Patil

(2004) [3] recorded the mean TSS in Nucellar was 10.73 and in Sathgudi it was 10.43. Chohan *et al.* (1964) [1] reported the highest TSS of 12.5 in Honey sweet orange. Sharma *et al.* (1985) [2] recorded the lowest TSS of 8.0 in Sathgudi.

4 Summery

4.1 Total soluble solids (%bx)

The highest average TSS of Nucellar and Sathgudi were 11.90 and 11.70 respectively. The average mean TSS of Nucellar and Sathgudi was measured as 11.50 and 11.42 respectively, indicating that the TSS of both the varieties were almost closer.

4.2 Acidity (%)

The acidity range of Nucellar was in between 1.17 to 1.52, whereas in sathgudi it was in between 1.29 and 1.52. The average mean acidity of Nucellar and Sathgudi was 1.45 and 1.47 respectively indicating that Sathgudi fruits were somewhat acidic than Nucellar fruits.

4.3 Ascorbic acid content (mg/100g)

In Nucellar, the range of Vitamin 'C' content was 46.08 to 59.31 mg/100g of juice with an average of 54.63mg/100g of juice. Whereas in Sathgudi, the range of 53.09 to 59.33 with an average mean of 56.04. Sathgudi was found to be higher in ascorbic acid content than Nucellar and is one of the most considerable characters of Sathgudi.

4.4 pH of juice

The average mean pH of Nucellar was 5.28 and that of Sathgudi was 5.26. The pH of juice of both the varieties are nearly similar and hence no marked differences were observed in the pH of both the varieties.

5 References

1. Chohan GS, JP, Nauriyal, JC Bakshi. Studies on the performance of some promising citrus varieties at Abhor (Punjab) Punjab J of Hort. 1964; 5:56-61.
2. Ghosh SNA, Chattopadhyay. Performance of sweet orange cultivars under semiarid region of west Bengal. Haryana J of Hort. 1998; 27(3):152-156.
3. Patil RF. Comparative study of Nucellar and Sathgudi Mosambi (*Citrus sinensis* Osbek) under Parbhani (Maharashtra) conditions. M.Sc. Dissertation submitted to MAU, Parbhani, 2004.
4. Sharma DD, BN Roy, HN Samaddar, Prospect of sweet Orange (*Citrus sinensis* L.) cultivars in West Bengal. Indian Agriculturist. 1985; 29(3):203-207.