

Original Research Article

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Biochemical Studies in Different Cultivars of Guava under Eastern Uttar Pradesh Condition

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ABSTRACT

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A study was conducted to evaluate the different guava cultivars for their biochemical composition at Post-Harvest laboratory, Department of Horticulture, Institute of Agricultural sciences, Banaras Hindu University, Varanasi during the year 2013-2014. Mature and ripe fruit of eight recognized cultivars (Lucknow-49, Allahabad Safeda, Lalit, Shweta, Apple Colour, Chittidar, Banarasi Surkha and Gorakh Bilas Pasand) were selected for investigation. The data on biochemical composition revealed that TSS (13.58 °Brix), Sugar (11.36%), Reducing sugar (7.28%), Pectin (2.01%) and vitamin-C content (319.60 mg/ 100 g pulp) were found to be higher in Lucknow-49 when compared to the other cultivars. Acidity (0.836%) highest in Banarasi Surkha while pH (5.89) comparatively highest in Shweta among cultivars.

Introduction

The guava (*Psidium guajava* L.) is the member of the family Myrtaceae and it is one of the most important commercial fruits of India. Due to its high nutritive value, wide adaptability in diverse agro-climatic condition, early and prolific bearing with a good return, the crop has been gaining popularity in all corners of Uttar Pradesh. It has earned the popularity as 'Poorman's apple' available in plenty to every person at very low price during

the season. It fruit has fair source of Vitamin A and good source of Vitamin C (300mg/100gm) which is highest among table fruit. It is also an excellent source of beta carotene, lycopene, potassium and soluble fiber. Guavas are very rich in antioxidants which can act against the free radicals that damage cells and cause cancer, diabetes and coronary diseases. Guava possesses antiseptic, astringent and anthelmintic properties, useful to cure many diseases and ailments. Guava can be consumed fresh or can be processed

into juice, nectar, pulp, jam, jelly, and slices in syrup, fruit bar or dehydrated products, as well as being used as an additive to other fruit juices or pulps (Anonymous, 2014). These products have good potential for internal as well as external trade. The utilization of guava for preparation of beverages and intermediates moisture products has not been explored much. Guava pulp can be used as base for the preparation of these products. In the food industry, knowledge of the biochemical properties of food is fundamental in analysing the unit operations. They influence the treatment received during the processing and good indicators of other properties as well as the qualities of food. Therefore, the prime objective of present investigation was to find out a cultivar of better biochemical attributes which is qualitatively superior to other cultivars growing under eastern Uttar Pradesh condition.

Materials and Methods

The experiment was conducted during 2013-14 at Post-Harvest laboratory, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, on eight cultivars of guava *viz.*, Lucknow-49,

Allahabad Safeda, Lalit, Shweta, Apple Colour, Chittidar, Banarasi Surkha and Gorakh Bilas pasand. Following complete randomized design (Panse and Sukhatme, 1985) with three replication and eight fruits as a unit in each replication, fruits of the promising and demanding five different varieties of guava were collected from Raghuvanshi Farm, Babiyan-village, Chhapra, District-Varanasi, U.P. Mature fruits having greenish yellow colour were randomly plucked from ten trees of each cultivar.

The trees were of uniform size and vigor and were kept under uniform laboratory condition during the experimental period. Eight fruits were taken of each cultivar and used for physical and chemical studies. The total soluble solids, reducing sugar, non-reducing sugar, total sugars, Acidity, pH, Pectin and vitamin C were determined using the method of AOAC (1984).

Results and Discussion

The findings (Table 1) pertaining to biochemical attributes of fruit of guava cultivars are discussed below.

Table.1 Biochemical attributes of different guava cultivars under eastern U.P. condition

Treatments	TSS (⁰ Brix)	Ascorbic acid (mg/100 g pulp)	Acidity (%) anhydrous citric acid	Pectin (%)	pH	Reducing sugar (%)	Non reducing sugar (%)	Total sugar (%)
T ₁	13.58	319.60	0.164	2.01	5.58	7.28	4.07	11.36
T ₂	11.50	196.00	0.455	1.93	5.71	4.98	3.41	8.40
T ₃	12.40	236.00	0.583	1.68	5.89	6.32	3.26	9.58
T ₄	13.19	302.00	0.513	1.86	5.61	6.63	4.26	10.90
T ₅	11.30	210.00	0.630	1.10	5.52	5.06	3.13	8.20
T ₆	13.00	290.00	0.700	1.56	4.74	6.22	4.07	10.29
T ₇	11.20	248.02	0.638	1.67	4.94	5.30	3.49	8.79
T ₈	12.50	240.04	0.836	0.98	4.59	5.54	3.66	9.29
CD at 5%	0.05	0.20	0.015	0.21	0.02	0.15	0.16	0.05

Total soluble solids (⁰Brix)

The highest total soluble solids (13.58 °Brix) was recorded in fruits of cv. L-49, during winter season followed by cv. Allahabad Safeda (13.19 °Brix), Chittidar (13 °Brix) and cv. Banarasi Surkha (12.5 °Brix). Minimum total soluble solids was observed in cv. Apple colour (11.2 °Brix) followed by Gorakh Bilas Pasand (11.3 °Brix). This was in agreement with the conclusion of Athani *et al.*, (2007) and Marak and Mukunda (2007).

Titrateable acidity (%)

A highly significant difference in Acid content of fruit was recorded among various cultivars during winter season. The highest acidity was found in cv. Banarasi Surkha (0.836 %) followed by Chittidar (0.700 %), Apple Colour (0.638 %) and Gorakh Bilas Pasand (0.630 %). The minimum acidity was found in cv. L-49 (0.164 %) during the winter season. This result was in conformity with the findings of Aulakh (2005), Babu *et al.*, (2007) and Singh *et al.*, (2013)

Ascorbic acid (mg/100g pulp)

The present findings revealed that among all the cultivars under study, the highest ascorbic acid was found in cv. L-49 (319.60mg /100g pulp) followed by cv. Allahabad Safeda (302mg/100g pulp), Gorakh Bilas Pasand (290mg/100g pulp) and Apple colour (248.02/100g pulp). The minimum ascorbic acid content was recorded in cv. Lalit (196mg/100g pulp). These results are in concurrence with the findings of Islam *et al.*, (2008).

Pectin (%)

The pectin content of fruit was estimated, maximum in the cv. L-49 (2.01 %) in winter season fruits, closely followed by Lalit (1.93 %), Allahabad Safeda (1.86 %), Shweta (1.68 %) and Apple Colour (1.67 %). The pectin

level basically reveals the firmness of fruit. The minimum pectin content was found in Banarasi Surkha (0.98 %). The variation in pectin content among the guava cultivars were also reported by Singh (1998).

pH

The highest pH (5.89) was recorded in fruits of cv. Shweta followed by Lalit (5.71), Allahabad Safeda (5.61) and L-49 (5.58). The lowest pH was observed in cv. Banarasi Surkha (4.59). The same result was connoted by Biradar and Mukunda (2007) and also by Raghav and Tiwari (2008).

Reducing sugar (%), Non-reducing sugar (%) and total sugar (%)

The reducing sugar in fruit was estimated to be maximum (7.28 %) in L-49 followed by cv. Allahabad Safeda (6.63 %) and Shweta (6.32 %). The lowest reducing sugar was observed in Lalit (4.98 %).

Maximum non- reducing sugar was recorded in Allahabad Safeda (4.26 %) followed by Chittidar, L-49(4.07 %) and Banarasi Surkha (3.66 %). The lowest Non-reducing sugar was observed in cv. Gorakh Bilas Pasand.

The total sugar content of fruit was found maximum in L-49 (11.36 %) followed by Allahabad Safeda (10.90 %) and Chittidar (10.29 %), while the minimum percentage of total sugar was noted in cv. Gorakh Bilas Pasand (8.20 %). The increase in the content of reducing sugar, non-reducing sugar and total sugar might have been owing to low temperature prevailing during winter season.

The higher sugar content in guava cv. L-49 followed by Allahabad Safeda and Chittidar was reported by Singh and Singh (2000) and Kumar *et al.*, (2006). The highest level of sugar in winter season guava fruit was also

reported by Ojha *et al.*, (1987) and Dwivedi *et al.*, (1991).

In conclusion, on the basis of foregoing findings, it was concluded that 'Lucknow-49' was superior in most of character studied and might be one of the promising cultivars for quality fruits under eastern Uttar Pradesh.

References

- Anonymous. (1984). Method of Analysis of the Association of Official Agricultural Chemist, Washington, D.C., USA.
- Anonymous. <http://nhb.gov.in/area-pro/Indian,Horticulture,2013-14>.
- Athani, S. I., Patil, P. B., Swamy, G. S. K., Sabarad, A. I. and Gorabal, K. R. (2007). Studies on growth parameters and fruit characters in guava cultivars. *Acta Hort.*, 735: 271-275.
- Aulakh, P. S. (2005). Performance of different guava cultivars under the arid irrigated conditions of Punjab. *Prog. Hort.*, 37(2): 328-330.
- Dwivedi, R., Pathak, R. K. and Pandey, S. D. (1991). Effect of season on the vegetative and reproductive attributes on guava fruits Cv. Sardar. *Indian J. Hort.* 48(2): 100-104
- Islam, F., Islam, A., Mansur, M.A. and Rahim, M.A. (2008). Shelf life and quality of guava cv. kazi as affected by stages of ripening, storage temperature and wrapping materials. *Prog. Agric. J.*, 19(2): 1-12.
- Kumar, S., Kumar S. and Shukla R. (2006). Physico-chemical characteristics of some guava (*Psidium guajava* L.) cultivars. *The Hort. J.*, 19(1): 5-7.
- Marak, J. K. and Mukunda, G. K. (2007). Studies on the performance of open pollinated seedling progenies of guava cv. Apple Colour. *Acta Hort.*, 735: 79-84.
- Ojha, A.P., Tiwari J.P. and Mishra, K.K. (1987). A note on seasonal variation in the physic-chemical composition of guava (*Psidium guajava* L.) cultivars Sardar and Allahabad Safeda under tarai conditions of U.P. *Haryana. J. Hort. Sci.* 16(1-2): 90-91.
- Panase, V.G. and Sukhmate, P.V. (1985). Statistical Methods for Agricultural Workers, 4th Edn. ICAR, New Delhi
- Raghav, M. and Tiwari, J. P. (2008). Genetic variability and correlation analysis in guava. *Indian J. Hort.*, 65 (3): 263-270.
- Singh, M. (1998). Performance of some cv. of guava (*Psidium guajava* L.) with special reference to their commercial significance in the Central Genetic Plains. *Punjab Hort. J.* 28: 50-55.
- Singh, A. and Singh, S.P. (2000). Evaluation of varieties for quality. *Progressive Hort.* 32(2): 190-196.
- Singh, S., Singh S.P. and Singh, J.N. (2013). Evaluation of guava (*Psidium guajava* L.) cultivars under eastern U.P. conditions. *Annals of Hort.*, 6(2): 392-394.

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