

Original Research Article

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Studies on Preparation and Preservation of Value Added- Herbal Product of Anonla Squash (*Emblca officinales G.*) cv. NA-7

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ABSTRACT

Keywords

Stevia, Browning colour, Squash, Lemongrass, Ascorbic acid, Cardamom.

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A study was carried out to detect the effect of different levels of herbals and quality attributes in anonla beverages during storage in Department of Horticulture SHUATS, Allahabad in the year 2016-2017. The experiment was laid out in Complete Randomized Design (CRD) with three replication and nine treatments. The concept of formulation of anonla beverages is with three levels of each stevia, cardamom and lemongrass as additives. All the herbal treatments were found better in respect of TSS, Ascorbic acid, pH, Browning Expect acidity content. Results showed that maximum TSS (47.89 °Brix), and pH (2.27) were observed in T₉, ascorbic acid (23.79%) T₆, Acidity (1.15%) in T₀ and browning (OD) (0.308) in T₃ on the barring storages period (5months).

Introduction

The Indian gooseberry or anonla belongs to family Euphorbiaceae and botanical Name *Emblca officinales G.* and is indigenous to India. The present area under anonla cultivation in India is about 55,000 hectares and Uttar Pradesh is the major growing state in the country. The fresh fruits of anonla are very rich source of Nutrient-Ascorbic acid (454.40mg/100g), calcium (14.91mg/100g), Iron (0.62mg/100g) and phosphorus (11.81mg/100g) Other-source of total sugar (7.53mg/100g), and has great potential for processing (Dachiya and Dhawan, 2001). The edible fruits tissue of Anonla contains about 3 times as much protein and 160 times as much vitamin "C" as apple (Barthakur and Arnold

1991). Anonla fruits are widely used in Unani and Ayurvedic system of the medicine Anonla fruits is the main ingredient in Chavanprash and is one of the three ingredients in Triphla used in the treatment of head cake, constipation liver and hence is preferred in the form of preserves, dried anonla, jam, juice, pickle and toffees and fruit bar. It is probably the most important natural source of vitamin C, which is easily absorbed by the digestive system (Singh and Kumar, 2000).

Anonla fruits are sour and astringent in taste. Anonla qualities are light and dry the post digestive effect is sweet its energy is cooling. Anonla is used to revitalizing potency and the

digestive system, treat constipation, reduce fever, purify the blood, reduce cough, benefit eyes, and stimulate hair growth.

Indian cardamom is used known in two main varieties: Malabar cardamom and Mysore Cardamom. The Mysore variety contains higher levels of cineol and limonene and hence is more aromatic. Cardamom is often included in Indian sweet dishes and drinks. Other uses are; in pickles, especially pickled herring; in punches and mulled wines; occasionally with meat, poultry and shellfish. Cardamom is used as a spice and as an ingredient in traditional medicine in systems of the traditional Chinese medicine in China, Japan, Korea and used in Ayurveda in India (Alvarez, 2008). Green cardamom powder is used as a spice for sweet dishes as well as traditional flavoring in coffee and tea.

Stevia (*Stevia rebaudiana*) also known as “Honey plant” or “calorie free plant” is a perennial herb belonging to the family Asteraceae. Originated from Paraguay the crop is widely distributed in USA Brazil, Japan, Korea and Taiwan. It is rich source of natural sweeter and alternative to cane sugar.

The leaves have been traditionally used for hundreds of year in both Brazil and Paraguay to sweeten local teas and medicine. Mainly use stevia Diabetes, Weight control, pancreatic cancer, Blood pressure (Shadap and Pariari, 2015).

Lemon grass (*Cymbopogon flexuosos*) a Perennial grass belongs to the family Graminae. It is native to India and found growing wild in tropical and subtropical parts. The plant produces aromatic oil with a characteristic lemon like odor (due to the presences of citral). The oil is mostly used for scenting of soaps, cosmetic and disinfectant. Citral is used as starting compounds for manufacturing ionone's and vitamin A (Shadap and Pariari, 2015).

Materials and Methods

Fully ripened, mature, fresh and sound aonla fruit were purchased from the orchard of the Department of Horticulture, Sam Higginbottom University Agriculture Technology and Sciences, Allahabad and the materials such as sodium benzoate was sourced from the P.G. laboratory, Department of Horticulture, SHUATS, Allahabad (Fig. 2). Commercial grade white crystalline cane sugar, big green cardamom and big size dried Lemongrass and stevia were also purchased from local market. After pricking fruits were dipped in 2% salt solution for 24 h., then washed with clean water and again dipped in 2% alum solution for 24 h., further washed with clean water and then blanched in boiling water for 10 minutes. Anola fruits were washed in tap water and then were peeled and divided into halves. Fruit juice was extracted in a citrus juice extractor. After juice extraction the juices were kept for 24 hours in refrigerator (4 - 2°C) for sedimentation (Table 1).

Then the clear juice was siphoned off and strained through muslin cloth. Aonla raw juice was heated at 96°C for two minute to inactivate enzymes. All prepared juices, sodium benzoate and sugar were blended in high speed blender at 8000 rpm for 2 min. Nine treatments combination were formulated with sugar and herbs (cardamom, lemongrass and stevie). Treated RTS samples are evaluated at 0, 30, and 60 days (30 days intervals) at 5 months storage for physiochemical analysis and sensory evaluation.

Results and Discussion

The present investigation was conducted in year 2016-2017, at the Post harvest lab, Department of Horticulture, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad.

Total soluble solids (%)

The average maximum total solids content (47.89%) was found in T₉, followed by T₈ (47.82%) whereas the minimum (46.82 %) was noticed in T₀ in 5 month of storage.

Ascorbic acid (%)

The average maximum ascorbic acid content (23.79%) was found in T₆, followed by T₈ (23.10%) whereas the minimum (21.41 %) was noticed in T₀ in 5 month of storage.

Table.1 Combination of herbs used in aonla squash treatments

Notation	Treatment combination
T ₀	Control
T ₁	(Stevia 0.5%)+Anola juice 25%+TSS 40%
T ₂	(Stevia 1.0%)+Anola juice 25%+TSS 40%
T ₃	(Stevia 1.5%)+Anola juice 25%+ TSS 40%
T ₄	(Cardamon 0.5%) +Anola juice 25%+ TSS 40%
T ₅	(Cardamon 1.0%)+Anola juice 25% + TSS 40%
T ₆	(Cardamon 1.5%)+Anola juice 25% +TSS 40%
T ₇	(Lemongrass 0.5%)+ Anola juice 25% + TSS 40%
T ₈	(Lemongrass 1.0%)+ Anola juice 25% +TSS 40 %
T ₉	(Lemon grass 1.5%) + Anola juice 25% + TSS 40%

Table.2 Effect of different treatments chemical analysis herbal product of aonla squash during 5 month storage period

Treatments	TSS (⁰ Brix)	Ascorbic acid (%)	Acidity (%)	Ph	Browning (OD)
T ₀	46.82	21.41	1.15	2.06	0.188
T ₁	47.06	21.71	1.14	2.10	0.248
T ₂	47.23	21.49	1.14	2.10	0.288
T ₃	47.36	22.15	1.13	2.20	0.308
T ₄	47.28	23.46	1.13	2.16	0.218
T ₅	47.45	23.58	1.12	2.20	0.228
T ₆	47.65	23.79	1.12	2.22	0.248
T ₇	47.71	22.70	1.12	2.23	0.108
T ₈	47.82	23.10	1.09	2.23	0.128
T ₉	47.89	23.29	1.11	2.27	0.158
Mean	47.43	22.67	1.13	2.27	0.212
F- test	S	S	S	S	S
S.Ed.	0.100	0.275	0.0124	0.002	0.005
C.D.at 5%	0.213	0.583	0.0263	0.005	0.011

Fig.1 Effect of different treatments chemical analysis herbal product of aonla squash during different storage period

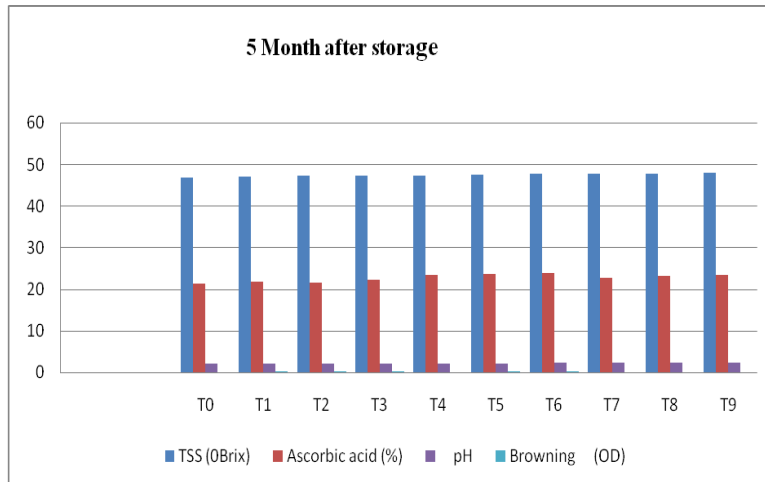


Fig.2 Anonla squash (*Emblica officinales G.*)



Acidity (%)

The average maximum Acidity content (1.15%) was found in T₀, followed by T₁ (1.14%) whereas the minimum (1.11 %) was noticed in T₉, in 5 month of storage.

pH

The average maximum pH content (2.27) was found in T₉, followed by T₈ (2.23) whereas the minimum (2.06) was noticed in T₀. In 5 month of storage.

Browning (OD)

The average maximum browning content (0.308) was found in T₃, followed by T₂ (0.288) whereas the minimum (0.108) was noticed in T₇ in 5 month of storage (Table 2 and Fig. 1).

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