Development of a Fruit Nectar from Ambarella (*Spondias dulcis*): A Value Added Product from an Underutilized Fruit Crop in Sri Lanka

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Introduction

The underutilized fruit crops are the plant species that are traditionally used for their food, fiber, fodder, oil or medicinal properties. Wide range of underutilized fruit species are grown in tropical and subtropical regions and some of them are utilized for food purposes; as fresh fruits, curries, salads and as homely prepared processed foods (Pushpakumara *et al.*, 2000).

Ambarella (*Spondias dulcis*) is one of the underutilized and seasonal fruit crops in Sri Lanka. Ambarella is widely utilized as a curry and chutney in Sri Lanka, however, the majority of the fruit production is wasted without utilizing during the seasonal periods. Nectar is a popular and widely consuming beverage manufactured basically from fruits worldwide. These fruits contain a number of natural materials that contribute to the overall flavor and consistency of the nectar including water, sugars, organic acids, and flavor compounds that are important to our diet. Besides water and sugar, it is an excellent source of vitamin C, potassium and folic acid, which are recommended for women who are pregnant or may become pregnant (Gunasena *et al.*, 2003). Therefore, manufacturing of fruit nectar from Ambarella as a ready to serve value added product to the Sri Lankan food and beverage industry will be a good solution for the enormous wastage of local Ambarella fruits.

Materials and methods

Immature, mature and completely ripen Ambarella fruits were selected for the sample preparation. The pulp of the each samples were extracted by removing the peel of the fruit and filtered through a sieve to separate coarse particles. Adequate quantity of pulp was mixed with the syrup, prepared using water and adequate amount of sugar. Sodium Metabisulphite (SMS) was added to the mixture as a chemical preservative. Then the pH and Total Soluble Solid (TSS) levels were measured and pulp percentage levels were determined as basic quality parameters.

In order to determine the sensory qualities, three samples were coded as;

123 - Nectar prepared from unripe fruits obtained from the market.

456 - Nectar prepared from Matured fruits selected before ripening on trees.

789 - Nectar prepared from completely matured fruits selected after initiating the ripening on trees.

Three samples were sensory evaluated using five point hedonic scale with the participation of 25 untrained panelists. Collected data were statistically analyzed using Friedman test with the confidence level of 95% in MINITAB version 14 statistical software. Chemical and microbiological analyses were performed for the selected best sample according to the results. Further, proximate analysis and shelf life analysis were also performed by comparing the variation of pH values and soluble solid value in the period of 84 days.

Result and discussion

Pulp percentages of selected three samples varied between 38% - 60%. Juice content of completely ripen fruits was considerably high compared with pulp obtained from immature fruits. Sample prepared with fruits at the stage of completely matured and ripening initiated on the trees was selected as the best sample by the pair wise comparison using the critical difference value. TSS values and pH values didn't show much variation with the time and the values were in slandered levels. According to the Friedman statistical analysis, three samples were found significantly different for all sensory attributes. Therefore, sample 789 was considered as the best sample considering all the sensory attributes.

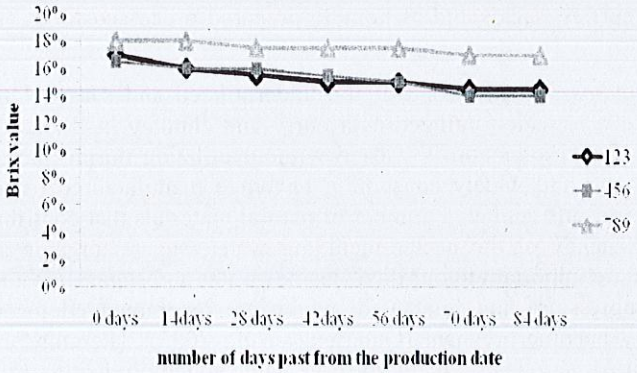

Figure 1: The graph of Brix value vs time

According to the obtained results, the Brix value variation was low in 789 sample compared with other two samples.

According to the proximate analysis, nutritional level of Ambarella nectar is as follows; Energy 69.12 K Cal/ 100 g, Carbohydrate 16.65%, Protein 0.45%, Fat 0.08%, Sodium 3018 mg/ Kg, Pottasium 344 mg/ Kg, Calcium 94.7 mg/ Kg. The total cost for the production of Ambarella nectar was calculated and it was 190.00 Rs per one liter.

Conclusions

Ambarella can be recommended as a fruit source for fruit nectar production and the best maturity stage for the nectar production is the stage of fruits completely matured and ripening initiated on trees.

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