Development of Wine from Jack Fruit (*Artocarpus Heterophyllus*): A Value Added Product from a Tropical Fruit Crop in Sri Lanka

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Introduction

Wine is an alcoholic beverage typically made from fermented grape juice or variety of fruits. Since fruits have natural sugar and natural acids, they provide all the required ingredients for making wine. The quality and the type fruit dictate the final quality of the fruit-based wine. Therefore, selection of correct fruit commodity is critical in wine making (Fithriadi *et al.*, 1996).

Jackfruit is an extensively grown and very important tree for the people of Sri Lanka. It is essentially a carbohydrate food and is useful as a source of energy. The perianth is rich in sugars, contains carotene, protein, fat, calcium, phosphorous, and iron in quantities similar to those found in other fruits which are used to manufacture wine (Pushpakumara *et al.*, 2007). Therefore, Jackfruit can be considered as a potential fruit crop in making wine. Wine is produced by fermenting crushed fruits using various types of yeasts. The majority of the yeast used in baking is *Saccharomyces cerevisiae,* which is the same species commonly used in alcoholic fermentation, and so is also called brewer's yeast (Pelcza *et al.*, 1977).

Therefore, this study was carried out to prepare wine from Jackfruit juice with the baker's yeast as a low cost method for wine making and to compare the sensory attributes and quality parameters with commercial red wine from grape.

Materials and methods

Completely ripened and undamaged jackfruits were collected from home gardens in Badulla area. The pulp of the jack fruit was crushed and juice was extracted. According to the pH and the Total Soluble Solid value (TSS), the most suitable pulp was selected for the fermentation. In order to prepare the suitable solution for the fermentation, the pulp was dissolved with distilled water according to 1:2 ratios until the brix value reaches to 20.

Three workable solutions were prepared with the pulp-water mixture and different amounts of sugar as follows.

Formulation (1) A = fruit juice 200 g and sugar 220 g, 400 mL of water.

Formulation (2) B = fruit juice 200 g and sugar 240 g, 400 mL of water.

Formulation (3) C = fruit juice 200 g and sugar 260 g, 400 mL of water.

Then all the mixtures were allowed for fermentation for four weeks, just after adding the starter culture, prepared with baker's yeast and sugar. Three replicates were maintained for each sample throughout the experiment. After four weeks, Sulfur dioxide bubbling was performed to stop the further fermentation and finally filtered using bacterial filters. Parameters such as pH level, Total Acidity (TA), TSS and alcohol content were measured in each sample. Sensory attributes such as taste, aroma, flavor, color/ appearance, and overall acceptability were evaluated using five point hedonic scale (where 1=dislike extremely and 5= like extremely) with thirty untrained panelist. Ranking test was applied to analyze the data obtained.

Result and discussion

According to the results obtained for the sensory evaluation, a significant difference ($p<0.05$) was obtained for all the attributes. (Figure.1)

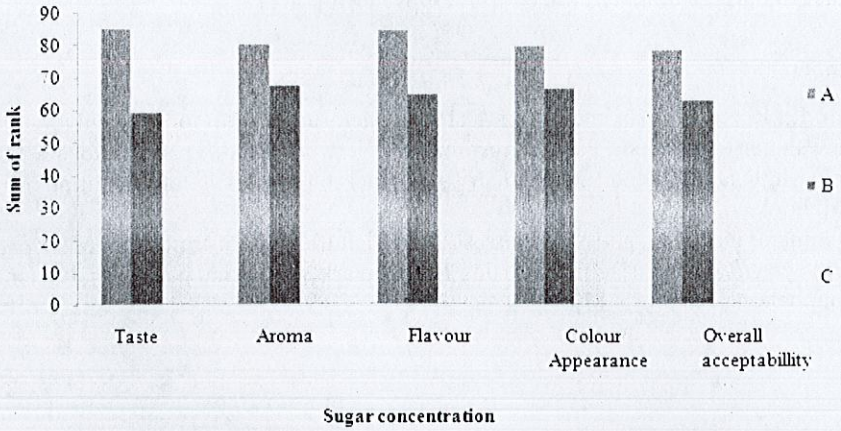

Figure 1: Preference for the wine sample series prepared using baker's yeast

Sample "A" had scored highest values for all the attributes compared with other samples (Table 1). According to the results, sensory attributes of sample B and C can be potentially improved. Considering all the sensory attributes and the quality parameters, sample A prepared with baker's yeast can be recommended as the most suitable product among the concentration series.

Table 1: comparison of wine sample A with red wine from grapes using Wilcoxon sign test

Objective measurement	Standard wine	Wine sample A		
		Estimated mean	P value	Decision
Alcohol content	14.5%	14.5%	p=0.371	Alcohol Content of the sample A = stranded red wine
pH	2.9 - 3.3	2.805	P=1.00	PH of the sample A = standard red wine
TSS	10	12	P=0.181	TSS of the sample A = standard red wine
TA	0.6-0.7%	0.6025%	P=1	TA of the = standard red wine

According to the above results there was no significant difference ($p<0.05$) between sample A and red wine sample from grapes.

Conclusions

Wine sample A has high sensory attributes, alcohol 14.5% and TA 0.60, pH 2.0, TSS 12^0. According to the results, alcohol percentage, pH, TSS, TA and sensory attributes of wine sample A (jackfruit 200 g, sugar 220 g, water 400 mL) can be recommended for the preference and usage of underutilized fruit crops in Sri Lanka.

References

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