Development of a Jelly Product Using *Kesi-pissan (Cyclea burmanni)* Leaf Extract

H.M.C.N. Herath
Uva Wellassa University, Badulla, Sri Lanka
S.Ekanayake
Food Research Unit, Gannoruwa, Peradeniya
and
M.G.P.P. Mahindarathne
Uva Wellassa University, Badulla, Sri Lanka

Introduction

Kesi-pissan, *Cyclea burmanni* (syn. *Clypea burmannii*) is a vine belongs to family Menispermaceae, and its leaf extracts has the ability to produce an edible gel. Kesi-pissan vine is distributed in Indian sub-continent. In Sri Lanka, this vine can be found in the wet zone (Jayaweera, 1982). The edible gel produced by Kesi-pissan leaf extract has been traditionally used by local people as a food. This plant has many important medicinal properties. In indigenous medicine, this gel is used specifically to treat gastritis and also to give coolness to the body. This plant has expectorant properties, anti-infertility properties, ability to promote the production of sperms and breast milk and is used as a diuretic (Wijesinghe, 1994).

Jelly is a product prepared from a suitable ingredient and practically free from suspended fruit particles; mixed with a carbohydrate sweetener and processed to a semi solid consistency (Ranganna, 1986). Four substances such as pectin, acid, sugar and water are necessary for the preparation of jelly.

In this research, a jelly product was developed using *Kesi-pissan* leaf extract and fruit pieces were incorporated to the jelly.

Methodology

Kesi-pissan leaves were cleaned, crushed and obtained the leaf extract. Sugar powder, citric acid and pectin solution was added to the leaf extract. The leaf extract was filtered and left for 2-3 min. Fruits were cleaned and cut into small pieces and when the leaf extract started to form a gel, it was poured into the jars while incorporating fruit pieces. Lids were closed and left for about an hour for proper gel formation.

Sugar level, acid level and way of incorporating the fruit pieces were changed in preparing the sample for sensory evaluation. As treatments, 300g samples were prepared with sugar amount high (225g) and low (150g), acid level high (0.6g) and low (0.36g), and fruit type; fresh fruit pieces and sugar coated fruit pieces. Then prepared Jelly samples were evaluated for sensory characteristics considering the parameters such as color, taste, aroma, mouth feel and overall acceptability. Sensory data were analyzing using Friedman test.

Keeping quality of the product was evaluated in which the comparison of refrigerated jelly product and the product stored at ambient temperature was done by measuring the pH values (electronic pH meter Syber Scan 2000), Brix values (hand held refractometer ATAGO N-1E 0~32), moisture percentages, ascorbic acid contents and total plate counts in day 1, 3, 5, 7, 9 from the product development. Further the Pectin percentage of *Kesi-pissan* leaf extract and the jelly product was measured.

Results and Discussion

Table 1 shows the results of the sensory evaluation. Friedman test results revealed that there is a significant difference among the treatment for the sensory factors considered. According to Table 1, T520 is the best treatment which has the highest mean values for sensory parameters such as color, taste, aroma and overall acceptability.

Table1. Results of Sensory Evaluation

Sensory Parameter	Jelly Treatment								p-Value
	T100	T130	T201	T304	T320	T450	T520	T600	
Color	3.000	3.033	3.067	2.900	3.033	2.833	3.233	3.033	0.145
Taste	0.679	3.167	2.733	2.700	3.233	3.567	3.733	2.533	0.000
Aroma	0.877	3.100	3.733	3.567	3.167	3.833	3.833	3.233	0.000
Mouth feel	0.819	3.000	3.400	3.333	3.000	3.700	3.367	3.200	0.004
Overall acceptability	0.814	2.967	2.567	2.600	2.833	3.433	3.567	2.333	0.000

Results given in Table 2 indicate that there was a significant difference between the refrigerated product and the product stored at ambient temperature, with regarding to the properties such as pH value, Brix value, moisture percentage and total plate count ($p<0.05$).

Table 2: Comparison of Refrigerated Product and the Product Stored at Ambient Temperature

Property	p-Value
pH	0.036
Total Soluble Solids (Brix Value)	0.049
Moisture Percentage	0.033
Total Plate Count	0.049

Table 3: Total Plate Count at the Storage Period (CFU g^{-1})

Sample Type	Total Plate Count (CFU g^{-1})				
	Day 1	Day 3	Day 5	Day 7	Day 9
Refrigerated sample	0	2.033	5000	8333	17333
Sample at ambient temperature	0	33000	43333	53333	80333

SLSI standards limit for the total plate count for untreated food is 10^4 CFU g^{-1}. According to Table 3, shelf life of the jelly product stored under refrigerated conditions is 7 days ($TPC<10^4$).

Table 4: Changes in Physicochemical Properties of the Refrigerated Product during Storage Period

Property	p-Value
pH	0.066
Total Soluble Solids (Brix)	0.074
Moisture Percentage	0.427

As the results indicated in the Table 4, there was no significant difference in the physicochemical properties of the refrigerated product during storage period ($p>0.05$).

According to the proximity analysis 300 g 0f this jelly product contains 44.33^0 of Brix value, 80% of moisture percentage, 10.2 % of pectin percentage and 3.94 mg of Ascorbic acid (vitamin C) content.

According to the analysis of physicochemical properties this product has a pH value of 3.1.

Conclusions

The jelly product containing 150g of sugar, 0.36g of citric acid and fresh fruit pieces in total weight of 300g jelly product (T520 treatment) can be recommended as a food product which is suitable for preference and current trends towards the usage of underutilized plants in Sri Lanka. This jelly product contains high sensory attributes, pH value of 3.1, 44.33° of Brix value, 3.94mg of ascorbic acid (vitamin C) content and 80% moisture content. Refrigerated jelly product has a shelf-life of one week period.

Acknowledgements

The authors acknowledge Food Research Unit, Gannoruwa and Uva Wellassa University, Badulla for providing facilities to conduct this research.

References

Jayaweera, D.M.A. 1982. Medicinal plants (indigenous Exotic) used in Ceylon, part iv. The National Science council of Sri Lanka. p73.

Ranganna, S. 1986. Handbook of Analysis and Quality Control for Fruit and Vegetable Products. Tata McGraw-Hill Education. p925.

Wijesinghe, K. 1994. Kahipittan. Osuthuru Visithuru, Vol.2.Department of Ayurveda, Sri Lanka. p121-126.