

# Preparation of carbonated drink from cashew apple juice

■ A. SOBHANA\* AND JOSE MATHEW

Cashew Research Station (K.A.U.), Madakkathara, THRISSUR (KERALA) INDIA (Email: [sobhakau@yahoo.co.in](mailto:sobhakau@yahoo.co.in))

\*Author for Correspondence

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## SUMMARY :

Cashew is a major commercial crop of the country with an annual production of nearly 6.5 lakh tons of raw nuts and 50 – 60 lakh tons of cashew apple. Commercial exploitation of the cashew apple can significantly improve the profitability of cashew growing, as evidenced from the research results of Cashew Research Station, Madakkathara under Kerala Agricultural University. Being a nutritious fruit, the potential for economic utilization of cashew apple is immense as it provides refreshing and healthy drinks. In this context trial was conducted at Cashew Research Station, Madakkathara, for standardizing the preparation of carbonated drink (soda) from cashew apple juice. Cashew apples collected from the field were washed well and juice extracted using juice expeller. The juice was clarified using sago @ 5g/lit. and stored by adding KMS @ 2.5 g/lit. and citric acid @ 5g/lit. of juice. Cashew apple soda was prepared from cashew apple syrup. For making cashew apple syrup, one lit. of clarified juice, two kilograms of sugar and 15 g citric acid were used. Various quantities of the syrup were taken and chilled carbonated water was added to the syrup at different gas pressure. Organoleptic scoring revealed that the sample with 100 psi carbonation in 160 ml chilled water, added to 40 ml cashew apple syrup, thus constituting a total quantity of 200 ml cashew apple soda, was the most acceptable one. This is being filled and sold in 200 ml glass bottles. The carbonated drink has good acceptance among all the consumer segments and large scale production can generate substantial opportunities for income generation

**KEY WORDS :** Cashew apple, Astringency, Clarified juice, Carbonated drink, KMS

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Cashew is a very important foreign exchange earning, major commercial crop of the country with an annual production of nearly 6.5 lakh tons of raw nuts and 50 – 60 lakh tons of cashew apple. Cashew is mainly grown for its nut which is the only economic produce from the crop. Cashew apples, the pseudo fruit weighing about 8 – 10 times that of the nuts is an equally valuable produce from the crop of it is commercially exploited. Cashew apples are highly nutritious and comparable with many other tropical fruits. Vaidehi *et al.* (2000) observed the vitamin C content of cashew apples in different varieties as 100 - 400 mg per 100g of apple. Cashew apple can be utilized for the preparation of different non fermented and fermented products *viz.*, juice, syrup, jam, candy, chutney, pickle, wine, liquor, brandy, vinegar etc (Vijayakumar,

1991; Mathew, 2009; Mini and Mathew, 2007). The apples contain astringent principles due to the presence of tannin and anacardic acid which imparts an unpleasant sensation on tongue and throat when raw apple is consumed. This in fact limits the utilization of cashew apple as fresh fruit as well as raw material in the fruit processing industry (Attri, 2009; Narayanankutty and Augustine, 2009). Commercial exploitation of the cashew apple can significantly improve the profitability of cashew growing, as evidenced from the research results of Cashew Research Station, Madakkathara under Kerala Agricultural University. This, apart from making cashew juice products available year round, will equalize supply from one year to another and will improve earnings from cashew for the rural farmers. Large number of technologies has been

Ingredients	Sample I	Sample II	Sample III	Sample IV
Syrup	40 ml	40ml	50 ml	50 ml
CO <sub>2</sub> pressure	75 psi	100psi	75 psi	100 psi
Water	160 ml	160ml	150 ml	150 ml

developed by various research stations in India, more specifically Cashew Research Station, Madakkathara, for the economic utilization of cashew apple by processing it into various value added products like syrup, squash, RTS drink, candy, jam, pickle vinegar, etc. Being a nutritious fruit, the potential for economic utilization of cashew apple is immense as it provides refreshing and healthy drinks. Now a days carbonated drinks are more preferred either as club soda or mixed with fruit juices as it increases the flavour of the beverage. In this context, a trial was conducted at Cashew Research Station, Madakkathara, for standardizing the preparation of carbonated drink (soda) from cashew apple juice, which can be consumed as a natural refreshing drink.

## EXPERIMENTAL METHODS

Ripe cashew apples were collected from the field after falling on the ground and separated from the nuts. They were sorted out to get good quality plumpy apples without any bruises and damages and cleaned by washing thoroughly in water. Plastic buckets and barrels were used for dipping in water and further cleaning. Juice was extracted using juice expeller and strained through a muslin cloth and kept for clarification. The juice was clarified using sago @ 5g/lit. and stored by adding potassium meta-bisulphite (KMS) @ 2.5 g/lit. and citric acid @ 5g/lit. of juice (Mini and Mathew, 2008). The clarified juice was used for making syrup from which the carbonated drink was prepared.

For making cashew apple syrup, two kilograms of sugar 15 g citric acid were added to one lit. of clarified juice and heated till the sugar was dissolved. Carbonated cashew apple drink was prepared using syrup and carbonated chilled water (4°C) and filled into sterilized bottles. Various quantities of the syrup were taken and chilled carbonated water was added to the syrup at different gas pressure. The treatment details are

given below. The pressure of carbonation was standardized for better acceptability.

### Analysis of the samples :

Organoleptic analysis of the carbonated beverage was carried out among selected ten judges who were asked to give score for various parameters like appearance, colour, flavour, taste, sweetness and overall acceptability and the data were tabulated. Data collected from organoleptic studies were subjected to statistical analysis. Kendall's co-efficient of concordance was used to assess the degree of agreement among the 10 judges.

## EXPERIMENTAL FINDINGS AND ANALYSIS

Cashew apple contains 70-80 % juice and 10-11 % sugar. It is rich in ascorbic acid, thiamine, niacin and riboflavin and thrice as rich in vitamin C as sweet orange. Raw cashew apple juice has some medicinal value. It is taken as a cure for stomach disorders and sore throat infections. Cashew apple juice though sweet and nutritious, has astringency due to the presence of phenolic compounds, which makes it less palatable as reported by Attri, 2009 as well as Narayanankutty and Augustine, 2009. Cashew apple juice normally provides a refreshing drink and is sometimes prescribed during the convalescent periods for early recovery.

The process of dissolving carbon dioxide in water under pressure is called carbonation. Carbonated /aerated water is often consumed plain or mixed with fruit juices. Flavoured carbonated water differs from soda in that it contains flavours usually fruit flavours such as lemon, lime, cherry, orange, raspberry etc but no sweetener.

In this experiment the carbonation was done in cashew apple syrup and the data generated on the sensory scoring of the different samples of carbonated drink are presented below

Samples	Appearance	Colour	Flavour	Taste	Sweetness	Texture	Overall acceptability	Effect of carbonation
I	2.64	2.75	3.07	2.71	3.43	2.86	3.18	2.89
II	2.82	2.89	2.50	3.21	2.79	2.82	3.14	3.00
III	2.21	2.25	2.29	1.89	1.79	2.00	1.75	1.79
IV	2.32	2.11	2.14	2.18	2.00	2.32	1.93	2.32
Kendalls w (a)	0.102	0.206	0.152	0.279	0.477	0.175	0.504	0.252
Asymp. Sig	0.232	0.034	0.094	0.008	0.000	0.061	0.00	0.014
Significance	2.32	0.34	0.94	0.08	0.00	0.60	0.0	0.14

in Table 1.

The sensory scoring of the samples revealed that even though appearance and colour were good for sample 1, taste and overall acceptability were better for the sample-2 *i.e.* sample with 100 psi carbonation in 160 ml water added to 40 ml syrup. The carbonated drink is tastier with more shelf-life which can be stored for 6 months compared to normal RTS beverages. Carbonated drinks are often consumed as alternatives to soft drinks which are becoming more popular and are preferred by people especially by the young generation as evidenced from our day today life.

Many carbonated beverages are having artificial flavours which provide immediate refreshment only and need not be nutritious or healthy. Refreshing carbonated drink from a natural fruit juice like that of cashew apple is more relishing and nutritious. In this context, there is high relevance for the results of the trial for standardizing a carbonated drink from cashew apple. The cashew apple flavoured soda has good acceptance as proved by the results of the works done at Cashew Research Station, Madakkathara, Thrissur, Kerala. The cashew apple soda can be manufactured by any women groups like SHGs or *Kudumbasree* units and commercialized as an agribusiness enterprise. The enhanced income through cashew apple processing obtained from cashew plantations will indirectly help in the expansion of cashew growing area through out the country. Kubo *et al.*

(1993) worked on the anti tumor agents from the cashew apple juice. Garruti *et al.* (2006) worked on the assessment of aroma impact compounds in a cashew apple based alcoholic beverage. Osho (2005) studied on ethanol and sugar tolerance of wine yeasts isolated from fermenting cashew apple juice.

#### Conclusion :

The seasonal production, one of the limitations in cashew apple processing, is overcome through standardizing long term storage techniques. Technologies are also standardized for the removal of astringency from cashew apple before processing. Cashew apple processing is one of the prime areas of utilizing the indigenous fruit which opens up wider market possibilities and hence, tremendous scope for commercialization. Cashew apples are available in plenty at low cost and we have the technologies for the preparation of several value added products from cashew apple, including soda, which are not exploited on a large scale. The products are new and not available in the market at present. These cashew apple products are highly acceptable since they are natural products and consumers are becoming more and more health conscious. Hence economic utilization of cashew apple for the production of value added products can emerge as a lucrative enterprise paving way for enhanced income from cashew plantations.

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