International Journal of Home Science 2016; 2(1): 141-143

International Journal of Home Science

ISSN: 2395-7476
IJHS 2016; 2(1): 141-143

www.homesciencejournal.com
Received: 01-12-2015
Accepted: 02-01-2016

Dr. Simmi Jain
Assistant Professor,
School of Food Science MOP Vaishnav College for Women (Autonomous), Chennai-600034, Tamil Nadu, India.

Chandraprabha Tambe
II Msc Food Technology and Management, School of Food Science MOP Vaishnav College for Women (Autonomous), Chennai-600034, Tamil Nadu, India.

Anchal Tulsian
II Msc Food Technology and Management, School of Food Science MOP Vaishnav College for Women (Autonomous), Chennai-600034, Tamil Nadu, India.

Correspondence
Dr. Simmi Jain
Assistant Professor,
School of Food Science MOP Vaishnav College for Women (Autonomous), Chennai-600034, Tamil Nadu, India.

Formulation and quality assessment of coconut water beverage incorporated with cooked cereal water

Dr. Simmi Jain, Chandraprabha Tambe, Anchal Tulsian

Abstract
Coconut water, with many applications, is one of the world's most versatile natural products. This refreshing beverage is consumed worldwide as it is nutritious and beneficial for health. During summer season it is the best thirst quenching beverage. The objective of the present work was to formulate a beverage with coconut water by incorporating cooked cereal water. Variations were prepared using barley water (V1) and rice water (V2). The beverages were analyzed for physicochemical (titratable acidity, vitamin C, reducing sugar & total soluble solids) and sensory attributes (flavor, aroma, color, mouth feel, after taste and overall acceptability). The physicochemical tests of both the variations fell in acceptable range. Sensory evaluation carried out by 25 semi trained panelists, revealed V1, i.e. the coconut water incorporated with barley water, as a better accepted beverage over the rice water incorporated variation i.e. V2.

Keywords: Cereal Water Beverage, Coconut Water Based Beverage, Oral Rehydration Beverage, RTS Beverage.

1. Introduction
Coconut plant has long been recognized as a valuable source of various commodities for a human life. The water of tender coconut is technically the liquid endosperm, is the most nutritious wholesome beverage that the nature provided [6]. Within the vast variety of tropical fruit, coconut water is well known for its great nutritional significant owning to is physicochemical nature [1, 6]. In conditions like dehydration coconut water has been used as an oral rehydration, to replace fluid loss from gastrointestinal track [6].
Barley and rice has the abundant source of energy. Also it contains other beneficial minerals in good amount that makes cooked water of these cereals suitable for conditions like dehydration. In the whole kernel of barley, the minerals present in greatest amount are phosphorus, potassium and magnesium, which have been reported at level of 2.97, 4.39 & 1.29 grams per Kg. respectively. Calcium and sodium found in much lower level but significant quantities of iron, zinc and albumin are present 28, 23 & 10 micrograms per Kg, respectively [7]. Calcium, iron, potassium, sodium, silicon, magnesium, sulfur and phosphorus are found in rice ash. Potassium and phosphorus are the most abundant mineral elements in rice [8]. Thus the incorporation of these in coconut water serves effectively to enhance its oral rehydration qualities.
The interest that consumers all over the world are currently showing in healthy and natural habits is the main factor to formulate a beverage based on coconut water. The basic idea of incorporating cooked cereal water into coconut water was to enhance nutrition value of the beverage; especially calorie content as the cereals is abundant source of energy [1].
Formulation of the product involved processing of cereal, which involved cooking it in high water content, grinding and filtering. The product development also involved the addition of sucrose, salt and citric acid to meet standard quality requirement.
The objective of the present research was to evaluate physicochemical characteristics of the formulated beverage. Also, the current study was done to analyze the acceptability of the formulated beverage by the consumer.

2. Methodology
2.1. Extraction of cereal water: This is a common procedure for both the cereals

Take one cup of cereal in a vessel
↓
Add 3 cups of water in it
↓
Boil the water until cereals starts to cook and softens
↓
Cool cereal water to room temperature
↓
Grind the cereal water to get homogenized consistency
↓
Filter the water through muslin cloth for clear extraction

2.2. Preparation of beverage

Ingredients	Variation 1(V1)	Variation 2 (V2)
Coconut water	50ml	50ml
Barley water	50ml	-
Rice water	-	50ml
Lemon juice	10ml	10ml
Sugar	25g	25g
Salt	2.5g	2.5g
Citric acid	Pinch	Pinch

2.3. Variation 1

Coconut water + barley water
↓
Addition of lemon juice
↓
Addition of salt and sugar
↓
Boil till temperature reached to 75 °C
↓
Cool till it reaches to room temperature
↓
Add citric acid (as preservative)
↓
Store in clean and sterilized plastic bottle

2.4. Variation 2

Coconut water + rice water
↓
Addition of lemon juice
↓
Addition of salt and sugar
↓
Boil till temperature reached to 75 °C
↓
Cool till it reaches to room temperature
↓
Add citric acid (as preservative)
↓
Store in clean and sterilized plastic bottle

3. Quality Analysis

3.1. Titratable acidity

10ml of beverage sample was titrated with 0.1N NaOH using a few drops of 1% phenolphthalein solution as indicator. The titre value was noted and calculated as per cent anhydrous citric acid.

Calculation

$$\%\ \text{Total acid} \rightarrow \frac{\text{Titer (X) Normality of alkali (X) Volume made up * (X) Equivalent Wt of acid (X) 100}}{\text{Volume of sample taken for estimation* (X) Wt or volume of sample taken (X) 1000}}$$

3.2. Vitamin C

a) Preparation of sample: 10–20 ml of sample was made up to 100 ml with 3% HPO3 and filtered.

b) Assay of extract: An aliquot (5 ml) of the HPO3 extract of the sample was then titrated with the standard dye to a pink end point which persisted for at least 15 seconds before the reading was taken.

3.3. Reducing sugar

a) Preparation of sample: 2.5-5g of sample was weighed, and transferred to 250ml beaker. 50ml water was added and boiled, cooled and transferred to a 250ml volumetric flask. Lead acetate was added, shaken and kept for 10min. The excess of lead using necessary amount of Potassium Oxalate solution (22% in water) was precipitated. Volume was made up to 250 ml and solution was filtered by filter paper.

b) Procedure: 5ml solution containing 0.5-2.5mg dextrose was pippet out into 25x200 mm test-tube. 5ml of Shaffer-Somogyi reagent was added and mixed well by swirling. The blank using 5ml of water and 5ml of Shaffer-Somogyi reagent was prepared. Test-tube were capped by funnel and kept in boiling water bath for 15 min. Tubes were removed carefully without disturbing and cooled in running water for 4mins. Funnels were removed and 2ml of Iodide-oxalate solution and then 3ml of 2N H2so4 was added down the side of each tube without agitating the solutions. Solution was mixed thoroughly and allowed to stand in cold water bath for 5min, mixing twice during that time. Titration was done with 0.005N Thiosulphate solution using starch as indicator. The titer value of test solution was subtracted from blank and the amount of dextrose was determined in 5ml of solution.

3.4. Total soluble solids: It was measured with the help of refractometer.

3.5. Sensory evaluation: Sensory attributes were evaluated using 9point hedonic scale by 25 semi trained panelists.

4. Result and Discussion

4.1. Physicochemical Analysis

The physicochemical characteristics of the formulated beverage (V1 and V2) are shown in Table 1. Titratable acidity was evaluated to determine the total acidity of the beverage. Commercially available citrus RTS beverages have acidity approximately 3.5-4.0, which is higher than the formulated beverage. The presence of citric acid in the citrus fruit and added citric acid as preservative in the commercial beverage accounted for the higher acidity [11].

Table 1: Physicochemical Analysis of V1 and V2

	Titratable acidity	Vitamin C	Reducing sugar	Sugar (^{0}brix)
Variation 1 (V1)	2.55%	10%	30.12%	11.15
Variation 2 (V2)	2.98%	16%	17.152%	9.9

Vitamin C content of the formulated beverage was found to be 10% and 16% for variation 1 and 2 respectively. Brix% is used as indicator for total soluble solid%. The brix for variation 1 was found to be 11.15% which was higher than the 2nd variable with 9.9% brix. Also, reducing sugar of the variation 1 is higher than the variation 2; i.e. 30.12% and 17.152% respectively.

4.2 Sensory Evaluation

The results of sensory evaluation revealed that the formulated RTS beverages were positively accepted by the semi trained panelists. Variation 2 formulated with rice water had comparatively better flavor and mouth feel (Figure 1) but both the variations were almost equally accepted by the panelists.

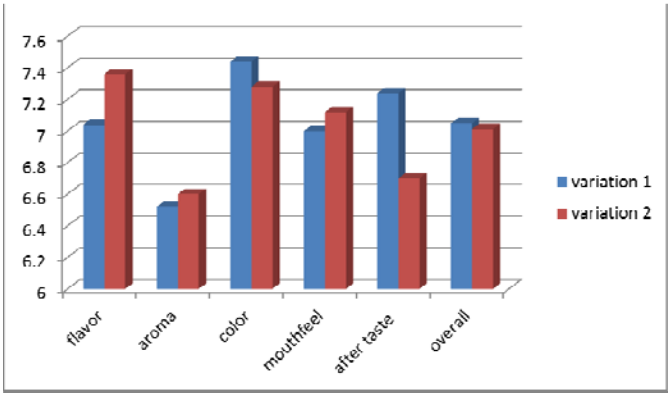

Fig 1: Sensory Evaluation of V1and V2

5. Conclusion

On the basis of above results revealed in the present study it may be concluded that the formulation of Coconut Water Beverage Incorporated with Cooked Cereal Water would possibly satisfy consumer taste and preferences. Knowing its micro nutrient content it can be used as rehydrating drink. An individual will get all the benefits related to health issues apart from nourishing and rehydration of the severely dehydrated tissues. These properties make it as good oral rehydration RTS beverage.

6. Reference

1. De Souza MA, Geraldo AM, Change in Flavor Quality of Pineapple Juice during Processing. Journal of Food Processing & Preservation. 2008; 34(3):508-519.
2. Crotti L. Stability id Vitamin C- Fortified Yerba Mate & Sensory Evaluation of the Drink. Journal of Food Processing & Preservation. 2007; 32(2):306-318.
3. Kailaku SI. Carbohydrate-Electrolyte Characteristics of Coconut Water from Different Verities and Potential Natural Isotonic Drink. International Journal of Advanced Science Engineering Information Technology. 2008; 5(3):23-26.
4. Handayani AP. Antioxidant Properties, Degradation Kinetics and Storage Stability Prepared from the Cooking Water of Pigmented Rice. Advance Journal of Food Science and Technology. 2014; 6(5):668-679.
5. Jean WH. The Chemical Composition and Biological Properties of Coconut Water, Molecules, 2009; 14:5114-5164.
6. Khan MN, Khan KW. A Study of Chemical Composition of Cocos Nucifera L. (Coconut Water) & Its Usefulness as Rehydration Fluid. Pak. J. Bot. 2003; 35:925-930.
7. Mats SA. Barley: The Chemistry and Technology of Cereal as Food and Feed, 2nd edition, 2004, 135-167.
8. Mats SA. Rice, The Chemistry and Technology of Cereal as Food and Feed, 2nd edition, 2004, 215-258.
9. Ranganna S. Vitamins: Handbook of analysis and quality control for fruits and vegetable products, 2nd edition, 2010, 105-118.
10. Harsha H, Aarti S. Quality Evaluation of Herbal Juice Development from Traditional Indian Medicinal Plant Using Citrus Lemitta as a Base, Journal of Nutrition and Food Science. 2015; 5:2-5.
11. Tenuta LMA. Titratable Acidity of Beverages Influences Salivary pH Recovery, 2015, 29(2).