

Coconut Water-Based Isotonic Beverage Development and Physicochemical Evaluation

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During exercises, athletes expend considerable energy, electrolytes, and water through sweat resulting in their performance reduction. Water, carbohydrates, and electrolytes that have been lost can be restored with the aid of an appropriate beverage. To suit this requirement isotonic sports beverage has occupied a significant role in sports nutrition through its primary attribute being rehydration. The objective of this research is to develop new isotonic beverage formulations that are economically and commercially viable by using natural ingredients that are underutilized. Two natural formulas based on coconut water were developed, one with bee honey and another with artificial sweetener in combination with other ingredients. Through a series of trials for osmolality and sensory evaluation, derived final samples were examined for mineral content and physicochemical properties. Final formulas were in the required ranges of osmolality and sodium content as per the international guidelines (osmolality between 270-330 mOsmol/kg, sodium levels between 460-1,150 mg/L, and at least 75% of its calories from carbohydrates). Natural formula with artificial sweetener and natural formula with bee honey were detected an osmolality of 317 ± 1 , 305 ± 1 (mOsmol/kg) respectively. Sodium, potassium, magnesium and calcium contents were 723.7 ± 14.8 : 715.5 ± 43.5 , 633.3 ± 11.6 : 740.0 ± 0 , 39.0 ± 5.3 : 37.8 ± 6.9 , 213.5 ± 8.0 : 189.9 ± 3.8 (mg/L) and pH, Brix (B°), color (PCU), titratable acidity (%) were 2.4 ± 0.0 : 2.6 ± 0.0 , 5.1 ± 0.0 : 5.0 ± 0.1 , 413.0 ± 15.3 : 356.0 ± 20.8 , 6.0 ± 0.0 : 6.0 ± 0.0 and significant different ($\alpha < 0.05$); no significant different ($\alpha > 0.05$) observed among treatments at each sensory test for the natural formula with artificial sweetener and natural formula with bee honey respectively. All data were analysed using SPSS software. As conclusions, developed formulas adhere to the requirements of an isotonic beverage and there is a high potential to use coconut water and bee honey in Sri Lanka, as rich mineral and energy sources to formulate isotonic beverages.

Keywords: Dehydration, Electrolytes, Energy, Underutilized

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