

Properties of Instant Beverage Developed by Unfermented Coconut Sap Collected through a Novel Sap Collection Method

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Coconut (*Cocos nucifera*) sap is a nutritive liquid which oozes from the phloem vessels of coconut inflorescence. A novel sap collection (NSC) method provides a seal and cooler environment to retard the fermentation process of coconut sap. The aim of this research is the development of instant beverage from unfermented coconut sap collected using a novel sap collection device and evaluation of physico-chemical, nutritional, and sensory properties of the developed product. The sap was mixed with maltodextrin (DE-10) (Treatment 1: 3%, Treatment 2: 4%, Treatment 3: 5% and Treatment 4: 6%) and solution was fed to a spray dryer (L-8 NO 7084). The powder of sap was packed in a triple laminated aluminum pouch and stored at 4±2 °C. The physico-chemical, nutritional and sensory analysis (five-point hedonic scale) of dehydrated sap powder was analyzed. The data was analyzed through Minitab 16 software. The recovery percentage of powder was 17.05±2.45 % and it showed good quality parameters for moisture (0.80±0.20 %), bulk density (0.51±0.00 g/ml), tapped density (0.68±0.00 g/ml), hygroscopicity (19.05±0.34 %), solubility (96.72±0.87 %), 13.53±0.00 of the browning index, 1.54±0.05 of hue angle and 86.75±2.17 of lightness. Scanning electron microscopic (SEM) view showed an even distribution of particles. Dilution ratio (D1:8 %, D2: 10 %, D3: 12 %) of powder was analyzed through sensory evaluation. Appearance and odor of beverage were not affected significantly ($p>0.05$) with the level of dilution. The analysis showed that it contained protein (1.44 ±0.11%), ash (0.99±0.01%), minerals (Na: 1.54±0.13 mg/100g, K: 36.94±0.87 mg/100g, Ca: 4.68±0.89 mg/ 100g, Mg: 0.77±0.52 mg/100g), crude fiber (0.08±0.01 %), total sugar (90.67±2.66 %), maltodextrin (24.40±2.55 %), sucrose (31.47±2.77%), glucose (16.04±0.23%), fructose (18.76±1.25%) and total phenol (138.69±0.17 mg GAE/ 100 g). One cup (100 mL) of sap contains higher content of sugar natural minerals and it is one of the alternatives for the instant beverage market to achieve a higher consumer demand.

Keywords: Instant powder, Novel sap collection, Unfermented coconut sap