



907/B

Nutritive and physico-chemical properties of unfermented coconut (*Cocos nucifera* L.) sap by a novel sap collection method

H.P.D.T. Hewa Pathirana^{1*}, I. Wijesekara², L.L.W.C. Yalegama¹ and M.A. Jayasinghe²

¹Coconut Processing Research Division, Coconut Research Institute, Bandirippuwa Estate, Lunuwila, Sri Lanka

²Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

Coconut (*Cocos nucifera* L.) sap is a natural phloem juice obtained by tapping of immature coconut inflorescence. The nutritive coconut juice is utilized by wild microbes and its natural quality is affected during harvesting. To protect the quality attributes of coconut sap, several preventive measures are used such as coating of lime ($\text{Ca}(\text{OH})_2$), adding bark of Hal tree (*Vateria copallifera*), Mangosteen (*Garcinia mangostana* L.) or Kahata (*Careya arborea roxb.*) into the burned clay pots which also affect to the quality of fresh sap. The novel sap collecting device is a recent innovation by Coconut Research Institute, Sri Lanka to collect coconut sap with its natural quality. Therefore, the objective of this research was to evaluate the nutritional and physicochemical properties of unfermented coconut sap collected by two methods; namely, adding Hal bark to the clay pots of 4 L (TM) and novel sap collection method (NSCM) which is comprised of a cooling compartment. Samples were collected from twelve coconut palms (Dwarf variety, 45 years old) during 12 hour intervals (from 6 pm to 6 am). The sap was filtered to remove debris and was stored at $-18\text{ }^\circ\text{C}$. Volume, pH, total soluble solids, alcohol content, total acidity, colour (organoleptic and CIELAB), sugar profile (High-Performance Liquid Chromatography), total phenols, EC50 (DPPH assay), ascorbic acid equivalent antioxidant capacity (AEAC), ascorbic acid content, and mineral content were determined. Data were analyzed by t-test and ANOVA using Minitab software. The results revealed that coconut sap collected from NSCM has a significantly high pH (5.99), moisture (83.20%), sucrose (13.71%), and total sugar (19.99%) compared to the sap collected from TM. In contrast, the sap of TM was significantly rich with total phenolic (65.90 mg GAE/100 mL), EC50 (143.03 mg/mL), AEAC (0.2568 mg ascorbic acid in 1 g sample), browning index (6.76) and yellowing index (15.92). Moreover, Ca (39.3 mg/L), Fe (3.08 mg/L), Mn (0.96 mg/L), Sr (0.14 mg/L), and Ba (0.33 mg/L) were significantly high in sap from TM mainly due to Hal bark. Hence, the novel sap collection method is a better approach for collecting high-quality unfermented coconut sap with its natural quality for coconut sap-based products.

Keywords: Coconut sap, sap collection, sugar profile, *Vateria copallifera*

Email: dilthihewa@gmail.com