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COMPARATIVE STUDY ON VITAMIN PROFILE, MINERAL PROFILE, ANTIOXIDANT PROPERTIES AND TOTAL PHENOLIC CONTENT OF PALMYRAH (BORASSUS FLABELLIFER) SAP AND SAP BASED PRODUCTS

[1]A.Mithursha, [2]J.W.A. Sajiwanie, [3]B.Anuluxshy, [4]A.Kirushanthi, [5]S.Srivijeindran

[1,2]Department of Food Science and Technology, Faculty of Applied Sciences, Sabaragamuwa University, [3,4,5]Palmyrah Research Institute, Sri Lanka

[1]amithursha@std.appsc.sab.ac.lk, [2]amanda@appsc.sab.ac.lk, [3]anu2november@gmail.com, [4]kirushvel23@gmail.com, [5]srthyln@yahoo.com

ABSTRACT

Palmyrah (Borassus flabellifer) sap and sap based products (SASBP) are enriched with health benefits. This study focused on comparing the abundance of vitamins, antioxidants, total phenolic content (TPC), total flavonoid content (TFC) and minerals and to select the best product among palmyrah SASBP, namely sap, palm sugar, treacle and jaggery. HPLC (reversed-phase) was used to determine the water and fat-soluble vitamins. Quantitative analysis of water-soluble vitamins was performed with analytical method validation. Antioxidant was determined by DPPH and ABTS radical scavenging assays and ferric reducing antioxidant power (FRAP). Statistical analysis was done using one-way ANOVA and Tukey comparison. The findings showed significant differences ($p<0.05$) in all tested parameters between samples. The vitamins of SASBP ranged from (2.81±0.83 to 35.16±6.72) mg/100g for thiamine, (4.35±0.46 to 45.03±3.23) mg/100g for niacin, (4.44±0.17 to 87.16±3.94) mg/100g for pyridoxine and (5.42±0.39 to 52.52±3.83) mg/100g for ascorbic acid. Accuracy ranged from (98.43 ± 5.28 to 100.64 ± 4.48) %, LOD ranged from (0.357 to 1.152) ppm, and LOQ ranged from (1.081 to 13.573) ppm. Treacle had the highest DPPH and ABTS radical scavenging activity with an IC50 value of (2.40±0.36) and (6.16±0.43) mg/ml respectively, and the highest FRAP [(23591.8±88.5) mmol Fe (Ⅱ)/100g] and TFC [(9.43±0.21) µg/ml]. TPC was the highest in jaggery [(196.30±3.21) GAE mg/100g] among SASBP. Ca, Mg, P, Fe, Na and K were higher in jaggery and sugar than treacle. Sugar showed the highest Fe content [(59.94±2.63) mg/100g]. The best sample sequence was in the order of treacle> sugar > jaggery> sap

Keywords: Palmyrah, HPLC, antioxidant, vitamins, flavonoids