



ASSESSMENT OF PHYSICOCHEMICAL AND FUNCTIONAL PROPERTIES OF SRI LANKAN FINGER MILLET (*Eleusine coracana*) FLOUR

De Silva A.B.G.C.J.* , Jayawardana S.A.S., Samarasekera J.K.R.R. and Gooneratne J.

Industrial Technology Institute, Sri Lanka

gayathri_de_silva@yahoo.com

ABSTRACT

The properties of starch in plants are affected by its two major constituents; amylose and amylopectin which determine the physicochemical and functional properties of starch. The ratio of amylose and amylopectin in starch varies from one variety to another. Physicochemical and functional properties of finger millet (*Eleusine coracana*) flour were investigated with the objective of understanding its applications in formulating flour based food products. Whole grains of Sri Lankan finger millet varieties namely, Ravi, Rawana and Oshadha were dehulled and flour was prepared using a Fritsch Mill with a 0.5 mm sieve and used in determining the particle size distribution (PSD), amylose content, swelling power (SP), solubility index (SI), rheological properties (RP) and thermal properties, using Differential Scanning Calorimetry (DSC) and X-Ray Diffractograms (XRD). Amylose contents of three finger millet varieties ranged from 11.99 ± 1.57 to 13.85 ± 1.04 % with no significant differences ($p > 0.05$) recorded. Significant differences ($p < 0.05$) were observed in SP and SI which ranged from 14.05 ± 0.12 to 17.73 ± 0.29 and 22.02 ± 0.30 to 24.83 ± 0.68 respectively. SP of all three varieties positively correlated (0.997) with SI while negatively correlated (-0.900) with amylose content. There was a significant difference ($P < 0.05$) in maximum viscosities which ranged from 505.0 ± 0.7 to 602.5 ± 1.1 Brabender Units. The patterns of X ray diffractograms of all three varieties were more similar to X ray diffractograms of A type cereal starches. Crystallinity patterns of all three varieties changed with the gelatinization. The results of DSC reveal, the temperature range of gelatinization of Ravi, Rawana and Oshadha were ranged from 53.46 to 84.73, 59.76 to 80.86 and 63.63 to 83.99 °C respectively. The results revealed the gelatinization information to determine time, temperature and flour: water ratio in developing finger millet flour based products. High viscosity indicated the potential of using flour in preparation of food products such as desserts. Low viscosities point out the suitability for using the flour in bakery products and as thickening agents in preparation of porridges and soups.

Keywords: Finger millet, gelatinization, XRD, DSC