

Industrial Potential of Mango (*Mangifera indica* L.) Peel and Seed

R.C.N. Thilakarathna¹, B.G.K. Madhavi², J.M.L.R. Bandara¹, D.C.K. Illeperuma², A. Navaratne³ and C.V.L. Jayasinghe¹

¹*Department of Food Science and Technology, Wayamba University of Sri Lanka, Gonawila, Sri Lanka.*

²*Department of Food Science and Technology, University of Peradeniya, Peradeniya, Sri Lanka.*

³*Department of Chemistry, University of Peradeniya, Peradeniya, Sri Lanka.*

The present study was undertaken to investigate the optimum conditions for extracting carotenoids from mango peel to identify the most abundant pigment in the extract and to evaluate the proximate composition, total phenolic, flavonoid and antioxidant capacities of mango peel and seed. Box-Benken design of Response Surface Methodology (RSM) was employed to determine the optimum extraction conditions. Fifteen experimental runs with different combinations of ethanol level (50.0, 72.5 and 95.0%), temperature (25, 50 and 75°C) and time (30, 60 and 90 min) were performed on mango peel for extracting carotenoids. Extracting with 50.0% ethanol at 25°C for 90 min resulted in the highest yield (82%) of carotenoids. To identify the major carotenoid in the extract, the extracted carotenoids were subjected to Thin Layer Chromatography after separating from 10% NaCl followed by distilled water. The most abundant carotenoid in mango peel was found to be β -cryptoxanthin as indicated by an R_f value of 0.53. Proximate analyses of mango peel and seed revealed presence of 3.10 and 5.94% of crude protein, 4.43 and 8.10% of crude fat and 18.78 and 13.04% of crude fibre, respectively. Total phenolic content of 8.64 and 9.47 GAE g⁻¹, flavonoid content of 12.64 and 21.82 RUE g⁻¹ and total antioxidant content of 25.54 and 20.27 AAE g⁻¹ were evident in mango peel and seed, respectively. The antioxidant capacity of 1.66 and 0.53 ppm were reported in mango peel and seed from the DPPH free radical scavenging assay. These findings revealed the potential of mango peel and seed, which are discarded from fruit processing industries, for possible use in nutraceutical and functional foods.

Keywords: Antioxidant activity, Box-Behnken design, Carotenoids, Mango peel, Mango seed