ABSTRACT

The purple rice (*Chakhao Poireiton*) is very popular for its nutritional value in Manipur, India. Purple rice is of great interest due to its colour, scent and distinctive flavour. The dark purple colour of this rice is due to the presence of high anthocyanin content in the bran. Extraction of anthocyanin from the rice bran was done by ethanol extraction method and Amberlite XAD 16N resin column chromatography. The total monomeric anthocyanin content of the anthocyanin extracts from coloured rice bran (AECB) was 1.38 mg/g of rice bran. In this study, anthocyanin cyanidin-3-glucoside was detected by HPLC. DPPH scavenging activity and FRAP reducing power of the extracts was 71.93% and 22.95 µmol ascorbic acid equivalents (AAE)/g bran respectively. The stability of anthocyanin was checked in various pH buffers (1-5) for 2 h at 60, 70 and 80°C. In degradation kinetics study, the half lives ($t_{1/2}$) of the anthocyanin were highest (24.24 h) in pH 1 buffer at 60°C and were lowest (3.14 h) in pH 5 buffer at 80°C. The thermal degradation of the AECB extracts followed the first order reaction kinetics model, with a good regression coefficient ($0.9706<R^2<0.9962$). The activation energy (E_a) was the highest (75.53 kJ/mol) in pH 1 buffer and was the lowest (35.49 kJ/mol) in pH 2 buffer. Two feed mixtures, viz. one comprising of maltodextrine and anthocyanin and the other mixture of maltodextrine, protein and anthocyanin, were spray dried to obtain anthocyanin encapsulated powders EP1 and EP2 respectively. The encapsulation efficiency of EP1 and EP2 was 96 and 100% respectively. Lemon juice was fortified with encapsulated powders of EP1 and EP2 at 1% level to obtain the juices S2 and S3 respectively. The total anthocyanin content (TAC) of S2 and S3 was estimated as 0.33mg/L and 0.27 mg/L respectively. The sample S2 contained higher value of L* (57.11), a* (12.38), b* (11.72) and C* (17.05), respectively than that of the sample S3. Sensory evaluation revealed that the juice S2 which contained more antioxidant had acceptable sensory qualities. Anthocyanins from *Chakhao Poireiton* can be recovered as a byproduct from its bran to develop anthocyanin rich products.

Keywords: anthocyanin, purple rice, HPLC, Amberlite XAD 16 N resin, DPPH, FRAP, encapsulation, degradation kinetics