High methoxyl pectin from dragon fruit (Hylocereus polyrhizus) peel

ABSTRACT

Pectin from different fractions of dragon fruit (Hylocereus polyrhizus) peel was extracted using 1% citric acid and the physico-chemical characteristics of the pectin were studied. The highest pectin yield (26.38% on dry weight basis) was obtained from fresh inner layer of the peel when extraction was carried out at temperature: 73 °C, time: 67 min, pH: 2.03, and sample to citric acid ratio: 1:4 (w/v). The pectin also demonstrated the highest degree of esterification (63.74%) when compared with pectin from other fractions of the dragon fruit peel investigated in this study. The calculated degree of esterification confirmed that the extracted pectin is a high methoxyl pectin. The molecular weight of the pectin determined using size exclusion chromatography was 0.88 × 105 Da. Monosaccharide composition determined using high performance liquid chromatography revealed that the pectin was predominantly constituted of galacturonic acid (39.11%), followed by moderate concentrations of mannose, rhamnose, galactose, glucose and minor amounts of xylose and arabinose. The pectin exhibited Newtonian behaviour at concentrations of 0.5% and 1.0%, and pseudoplastic behaviour at concentrations of 2.0% and 3.0%. Although the viscosity of the dragon fruit peel pectin was lower than that of commercial apple and citrus pectins, it can be used as a functional and health ingredient in low viscous foods and beverages.

Keyword: Extraction; Physico-chemical; Characterisation; Dragon fruit peel; High methoxyl pectin