PECTIN EXTRACTION FROM PEELS OF WHITE DRAGON FRUIT (HYLOCEREUS UNDATUS) AND RED DRAGON FRUIT (HYLOCEREUS POLYRHIZUS) OPTIMIZED BY RESPONSE SURFACE METHODOLOGY

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Abstract

The diversion of waste biomass from landfills has the potential to make significant contributions to sustainable practices in the agricultural and food processing industries. For example, dragon fruit (Hylocereus spp.) peels have been industrially exploited to generate functional and healthy products with high economic values. This study concerns the valorisation of fruit waste, as a natural source of pectin that would have applications in food processing. The initial objective was to optimise yield and quality of the pectin by applying the Response Surface Methodology to the conventional extraction of white-flesh (Hylocereus Undatus) and red-flesh (Hylocereus Polyrhizus) dragon fruits. The physicochemical properties of the pectin obtained were assessed using a suite of analytical techniques. The extraction process resulted in yields ranging from 5.81% to 13.11% for the white-flesh dragon fruit peel (DFP) and are from 8.99% to 15.12% for the red-flesh DFP. The results show that the extraction temperature and the type of peels have significant influences on both yield and degree of esterification (DE). The DE of pectin obtained from the two types of peels were higher than 50%, indicating high-methoxyl pectin. These high ester pectins jellify predominantly by the sugar-acid gelling mechanism to be used as gelling agents in food products. The structural assessment by Fourier Transform Infrared spectroscopy evidenced that our pectin was very similar to commercially available citrus pectin. These preliminary results suggest that the dragon fruit peels represent a valuable source of high-grade pectin.

Keywords: Pectin Extraction, Dragon Fruit Peels, Optimization.