

Characterization of Potential Cellulose from *Hylocereus Polyrhizus* (Dragon Fruit) peel: A Study on Physicochemical and Thermal Properties

ABSTRACT

The strict environmental regulations to overcome the drawbacks of consumption and disposal of non-renewable synthetic materials have motivated this investigation. The physical, chemical, morphological, and thermal properties of *Hylocereus Polyrhizus* peel (HPP) powder obtained from the raw materials were examined in this study. The physical properties analyzes of *Hylocereus Polyrhizus* peel (HPP) powder discovered that the moisture content, density, and water holding capacity were 9.70%, 0.45 g/cm³, and 98.60%, respectively. Meanwhile, the chemical composition analysis of *Hylocereus Polyrhizus* peel (HPP) powder revealed that the powder was significantly high in cellulose contents (34.35%) from other bio-peel wastes. The crystallinity index of *Hylocereus Polyrhizus* peel (HPP) powder was 32.76%, according to further X-ray diffraction (XRD) analysis. The thermal stability of *Hylocereus Polyrhizus* peel (HPP) powder was examined using thermogravimetric analysis (TGA) and found thermally stable at 204°C. The morphological study via scanning electron microscopy (SEM) showed a shriveled and irregular geometry surface. *Hylocereus Polyrhizus* peel (HPP) powder demonstrated the peak in the range representing the major functional groups responsible for pectin's properties. Thus, the findings revealed that the *Hylocereus Polyrhizus* peel (HPP) powder has the potential for the development of biodegradable and renewable materials.