

## **Exploring the potential use of *Hylocereus polyrhizus* peels as a source of cosmeceutical sunscreen agent for its antioxidant and photoprotective properties**

### **ABSTRACT**

Currently, consumers' demand for sunscreens derived from natural sources that provide photoprotection from ultraviolet (UV) radiation is pushing the cosmetic industry to develop breakthrough formulations of sun protection products by incorporating plant antioxidants as their active ingredients. In this context, the present study was initiated to evaluate the antioxidant and photoprotective properties of the underutilized *Hylocereus polyrhizus* peel extract (HPPE) using in vitro spectrophotometric techniques. The phytochemical screenings of HPPE conducted via high-performance liquid chromatography (HPLC) and ultra-high-performance liquid chromatography-quadrupole time-of-flight mass spectrometry (UPLC-QTOF/MS) revealed the presence of phenolic acids and flavonoids as the major secondary metabolites in HPPE. The antioxidant potentials evaluated based on 2, 2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical and total antioxidant capacity assays were in the range of  $22.16 \pm 0.24\%$ – $84.67 \pm 0.03\%$  with 50% inhibitory concentration (IC<sub>50</sub>) of  $36.39 \pm 0.04 \mu\text{g/mL}$  and  $23.76 \pm 0.14\%$ – $31.87 \pm 0.26\%$  (IC<sub>50</sub> =  $21.93 \pm 0.07 \mu\text{g/mL}$ ), respectively. For the photoprotective evaluation, the results showed that HPPE had significantly high absorbance values (3.1–3.6) at 290–320 nm with an exceptional sun protection factor (SPF) value of  $35.02 \pm 0.39$  at 1.00 mg/mL. HPPE also possessed a broad-spectrum shielding power against both UVA and UVB radiations. Hence, in terms of practical implications, our findings would offer an exciting avenue to develop a photoprotective formulation incorporating the ethanolic extract of *Hylocereus polyrhizus* peels as a synergistic active ingredient for its excellent UV absorption properties and the strong antioxidant activities.