PHYTOCHEMICAL SCREENING OF *Hylocereus polyrhizus* (RED DRAGON FRUIT) PEEL EXTRACT AND ITS POTENTIAL AS AN ANTIOXIDANT ADDITIVE IN A LIP BALM

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This Final Year Project Report entitled **"PHYTOCEHMICAL SCREENING OF *Hylocereus polyrhizus* (RED DRAGON FRUIT) PEEL EXTRACT AND ITS POTENTIAL AS AN ANTIOXIDANT ADDITIVE IN A LIP BALM"** was submitted by Nurul Syazulaikha bt Mohamad in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

PHYTOCEHMICAL SCREENING OF *Hylocereus polyrhizus* (RED DRAGON FRUIT) PEEL EXTRACT AND IT'S POTENTIAL AS AN ANTIOXIDANT ADDITIVE IN A LIP BALM

Hylocereus polyrhizus, also known as red dragon fruit, has been recognized for its potential health benefits. A lack of natural and sustainable lip balm options in the Malaysian market, combined with concerns about synthetic and petroleum-based ingredients, highlights the growing demand for eco-friendly alternatives to address the environmental and health issues associated with conventional lip balms. *Hylocereus polyrhizus* has revealed its various bioactive compounds, including antioxidants agents, which contribute to its nutraceutical properties. These compounds make red dragon fruit a promising candidate for the development of natural care product. In this study, the *Hylocereus polyrhizus* was extracted using maceration extraction and 21.5% extraction yield was obtained. This study aimed to explore the phytochemical composition of *Hylocereus Polyrhizus* peel extract for potential use as an antioxidant in lip balm. The peel extract revealed various phytochemicals such as alkaloids, flavonoids, phenols, terpenoids, saponins, and betanin, a natural colorant. UV-VIS spectroscopy confirmed betanin presence. The antioxidant activity of the extract was evaluated through *in vitro* assays, including the DPPH radical scavenging assays and Total Phenolic Content (TPC) determination, revealing its ability to scavenge free radicals when the value of IC_{50} equal to 7.78 ppm and total phenolic content which is 13.87 mg GAE/100g, indicative of potential health benefits. Furthermore, lip balm formulations were prepared incorporating *Hylocereus Polyrhizus* peel extract, and their organoleptic properties, spreadability, pH, and irritation potential were assessed. The formulations exhibited promising organoleptic properties and spreadability, with variations in characteristics based on the concentration of the peel extract. Higher concentrations resulted in more intense color, enhanced botanical scent, and thicker consistency, while maintaining good spreadability for efficient application. The results of this study demonstrate the potential of *Hylocereus Polyrhizus* peel extract as a valuable source of natural antioxidants for lip balm formulations. The study's findings also have significant implications for the cosmetic industry and environmental sustainability, aligning with government policies in promoting sustainable practices, natural resource utilization, and consumer safety.

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