PLANT POLYSACHARIDES BASED FABRICS: A REVIEW

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BANCHELOR OF SCIENCE (Hons.)

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This Final Year Project Report entitled **"Plant Polysaccharides Based on Fabrics"** was submitted by Siti Aisyah Aqilah Binti Mohd Azny in partial fulfillment of the requirement 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

This review aims to role of the plant-derived polysaccharides. It focuses on the various kinds of plant polysaccharides that are used to make fabric from their properties. It delves into the processes involved in the synthesis and characterization of polysaccharides from sources like cellulose, starch, pectin, guar gum, and alginate which distinguish them from other natural and synthetic fibers. This review provides an overview of the efficiency of extraction techniques for plant polysaccharides that are used. The extraction methods of plant polysaccharides include acid-base extraction, enzymatic extraction, hot water extraction alcohol precipitation and microwave assisted extraction. The method extraction of plant polysaccharides has been suggested due to their own advantages and disadvantages. It mentions that the greatest extraction yield recorded is 48.7% by enzymatic extraction. Due to its mild reaction conditions and high reaction rate, is the most suitable technique for preserving bioactive compounds. Microwave-assisted extraction, with a yield of 41.91%, was also identified as a promising method due to its rapid processing and environmental benefits, although prolonged heating could lead to polysaccharide degradation. Hot water extraction, despite being widely used and easy to operate, had the lowest yield (8.37%) and was limited in dissolving certain polysaccharides. Acid-base extraction, with a yield of 33.9%, enhanced bioactivity but posed a risk of glycoside bond degradation. The most prevalent plant polysaccharide, cellulose, has great promise as a fabric agent because it is non-toxic, biodegradable, and biocompatible. Also, in order to improve performance of the polysaccharide fabrics, methods such as cellulose-based fiber spinning with ionic liquids (ILs) and screen-printed microfibrillated cellulose (MFC) have been studied. The contribution of this review lies in promoting the functional benefits of plant polysaccharides in textiles, balancing the benefits of biodegradability with practical considerations, and advancing the development of eco-friendly materials in the textile industry.