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DEVELOPMENT OF SEMI-PERMEABLE MEMBRANE FROM BANANA STACK AND COCONUT COIR AS AN AGENT FOR WATER PURIFICATION USING REVERSE OSMOSIS

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ABSTRACT

Water is a renewable resource that is indispensable for sustaining life and promoting the well-being of all life forms, food production, economic development, and overall well-being. Humans require clean drinking water. However, rapid industrialization has led to escalating water pollution globally, resulting in the formation of different water contaminants that harm the environment and, especially, people's health. In response to this pressing issue, water filters have emerged as vital technologies to ensure access to clean drinking water. The study focuses on addressing water quality challenges by exploring sustainable and eco-friendly filtration methods using a developed semi-permeable membrane from banana stalk and coconut coir as natural materials. Results demonstrated that both banana stalk and coconut coir membranes exhibit promising filtration capabilities, resulting in significant improvements in water quality parameters. The membranes demonstrate the ability to enhance pH levels, reduce TDS concentrations, lower

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turbidity, and eliminate color-causing compounds promising filtration capabilities of banana stalk and coconut coir membranes, offering cost-effective and eco-friendly alternatives for water purification. These materials not only exhibit natural filtration properties but also mitigate environmental impact through biodegradability. Moreover, their accessibility makes them suitable for resource-constrained areas, emphasizing their potential for widespread adoption in water treatment practices. This study not only adds to the current understanding of sustainable water treatment technologies but also provides valuable insights for future research and innovation. By promoting the utilization of natural materials for water purification, it advocates for a holistic approach to addressing water contamination and scarcity, thereby fostering environmental sustainability and public health.