## Exploring the Potential of Durian Byproducts in Creating Antibacterial and Anti-inflammatory

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## Abstract

Durian (Durio zibethinus) is a popular fruit in Thailand, known for its rich bioactive compounds, including flavonoids, ascorbic acid, carotenoids, and sulfur-based volatiles, which have antibacterial and antioxidant properties. With the increasing interest in natural wound-healing agents, the use of durian byproducts, such as husks, flesh, cores, and seeds, was being explored. This study evaluated the antibacterial and anti-inflammatory activity of different durian byproducts for natural wound care applications. Due to the limitations of bacterial strains, the tests used bacteria commonly found in everyday environments, particularly on contaminated surfaces and unclean wounds. Durian byproducts were collected, dried, and extracted using ethanol before testing their inhibitory effects. For the antibacterial activity, bacteria from everyday surfaces were cultured on agar plates, and durian extracts were applied on top, the control group was a separate plate without any durian extracts was used to compare bacterial growth. The inhibition zones in the areas with durian extracts were observed, indicating antibacterial activity. For the anti-inflammatory activity, a saline solution was used to cause mild inflammation, and durian extracts were added to observe their effect on reducing inflammation. The control group only used the saline solution. The results revealed that the durian husk exhibited the highest antibacterial and anti-inflammatory activity, followed by the seeds, cores, and flesh. The husk, rich in cellulose and bioactive compounds, illustrated significant antibacterial and anti-inflammatory properties, suggesting its potential for wound healing. Though the seeds and flesh also displayed antibacterial and anti-inflammatory effects, their efficacy was lower than the husk's. This indicates that the husk may be the best for wound-care applications, while other durian parts also hold some beneficial properties. The outcomes highlight the potential for using durian byproducts, especially the husk, as an environmentally friendly source of antibacterial and anti-inflammatory agents, which could be an alternative to synthetic wound-care products. Future research should explore their effects on clinically relevant pathogens, optimize extraction techniques, and assess long-term stability, safety, and potential for wider medical applications.

Keywords: durian, antibacterial, wound healing, husk, bioactive compounds, anti-inflammatory

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