

**ANTIMICROBIAL ACTIVITY OF ESSENTIAL OIL IN STAR
ANISE (*Illicium Verum*) WITH HONEY**

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This Final Year Project Report entitled "**Antimicrobial Activity of Essential Oil in Star Anise (*Illicium Verum*) with Honey**" was submitted by Rezauddin bin Mohd Zain 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

ANTIMICROBIAL ACTIVITY OF ESSENTIAL OIL IN STAR ANISE (*Illicium Verum*) WITH HONEY

Star anise (*Illicium verum*) is a multifaceted spice renowned for its culinary allure and medicinal potential. Derived from the dried, star-shaped fruit of the evergreen *Illicium verum* tree, star anise boasts an essential oil abundant in bioactive compounds. Traditionally, it has found application in herbal remedies, offering relief for digestive ailments and respiratory issues. The spice is valued for its antimicrobial attributes, particularly against certain bacteria and fungi. While honey, a natural sweet substance produced by bees from flower nectar, has long been recognized for its diverse therapeutic properties, including potent antibacterial effects. Its antimicrobial attributes arise from various factors, such as its low pH, high sugar content, phenolic acid compounds and the production of hydrogen peroxide by the enzyme glucose oxidase. Notably, anethole and D-limonene emerge as primary substances known for their potential antibacterial properties, contributing to the distinctive aroma of star anise essential oil. The analysis utilizing the disc diffusion method assesses inhibitory effects against both Gram-positive (*Staphylococcus aureus*) and Gram-negative (*Escherichia coli*) bacteria. The essential oil samples were prepared at concentrations of 70%, 80%, and 90%, while the combination with honey featured concentrations of 10%, 30%, and 50%. The antibacterial activity of these samples was evaluated against *Staphylococcus aureus* (*S. aureus*) and *Escherichia coli* (*E. coli*). The findings reveal compelling results, showcasing notable variations in antibacterial efficacy across different concentrations. This study not only emphasizes the inherent antibacterial potential of star anise essential oil but also explores the synergistic effects when combined with honey.

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