

“ANTIMICROBIAL ACTIVITY TEST OF ETHANOL EXTRACT OF  
GREEN BETLE LEAVES (*Piper betle* L.) AND BILIMBI LEAVES  
(*Averrhoa bilimbi* L.) COMBINATION AGAINST SEVERAL TEST”

ABSTRACT

**Background:** The pharmacological potential of plant leaves has long been utilized in traditional medicine, including as natural antimicrobial agents. Betle leaves (*Piper betle* L.) contains active compounds such as flavonoids, phenols, alkaloids, tannis, saponins, and terpenoids that act as antimicrobial. Meanwhile, Bilimbi leaves (*Averrhoa bilimbi* L.) are also rich in flavonoids, phenols, alkaloids, tannis, coumarins and triterpenoids, which have antimicrobial properties. The combination of betle leaves and bilimbi leaves extracts may produce a synergistic effect in inhibiting microbial growth.

**Research Objective:** This study aimed to determine the antimicrobial activity of the ethanol extract combination of green betel leaf (*Piper betle* L.) and bilimbi leaf (*Averrhoa bilimbi* L.) against several test microorganisms.

**Research Method:** This was an experimental laboratory study conducted to evaluate the antimicrobial activity of the ethanol extracts of betle leaves (*Piper betle* L.) and bilimbi leaves (*Averrhoa bilimbi* L.) at a concentration of 20% with combinations of 1:1, 1:3, and 3:1. The test microorganisms included *Propionibacterium acnes*, *Escherichia coli*, *Candida albicans*, dan *Malassezia furfur*. The disc diffusion method was used to assess the inhibition zones at 1x24 and 2x24 hours for bacteria, and at 2x24 and 3x24 hours for fungi.

**Results:** The combination of ethanol extract of betle leaves (*Piper betle* L.) and bilimbi leaves (*Averrhoa bilimbi* L.) in ratios of 1:1, 1:3 and 3:1. Incubated for 1x24 and 2x24 hours on bacterial tests and for 2x24 and 3x24 hours on fungal tests showed inhibitory activity against the test microbes. Measurements of the inhibition zone diameters indicated that higher extract concentrations resulted in larger inhibition zones.

**Keywords:** Green Betle Leaf (*Piper betle* L.), Bilimbi Leaf (*Averrhoa bilimbi* L.), Antimicrobial activity, *Propionibacterium acnes*, *Escherichia coli*, *Candida albicans*, *Malassezia furfur*.