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Antibacterial Activity of Ethanolic Extract of *Plectranthus amboinicus* Against Pathogenic Bacteria

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Structured Abstract

Background The emergence of antibiotic-resistant pathogenic bacteria urges the production of more effective, safe, and competent drugs or antibiotics for therapeutic medicine. Today, most researchers are interested in the natural antimicrobial activities driven by plant sources as an alternative treatment. *Plectranthus amboinicus* belongs to the family *Lamiaceae*. It is a succulent plant that climbs, has toothed margins with heart-shaped leaves, is scented, and possesses short delicate erect hairs. The compounds that are found in *Plectranthus amboinicus* from the extraction process have beneficial antimicrobial properties that can fight against pathogens. This study was conducted to investigate the antibacterial activity of ethanol extract from *Plectranthus amboinicus* against six different bacteria, Gram-positive bacteria (*Staphylococcus aureus, Methicillin-resistant Staphylococcus aureus* (MRSA ATCC 43300), *Bacillus subtilis*) and Gram-negative bacteria (*Escherichia coli, Salmonella typhi, and Pseudomonas aeruginosa*).

Methods: The crude extract from *Plectranthus amboinicus* was prepared using a solvent such as ethanol and was subjected to antibacterial activity using a disc diffusion assay. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were employed to screen the antibacterial activity of the crude extracts and to assess the MIC and MBC values.

Results: This study showed that ethanolic extract from *Plectranthus amboinicus* was successfully extracted with a yield of 35.52%. After 24 hours of incubation, the extract of 400mg/mL concentration was found to be more effective against Gram-positive bacteria compared to Gram-negative bacteria. MRSA ATCC 43300 was found to be the most susceptible bacterium with a 12.33 mm diameter at a concentration of 400mg/ml toward ethanol extract, The MIC and MBC test showed that the ethanolic extract was bactericidal to Gram-positive bacteria and bacteriostatic to Gram-negative bacteria.

Conclusion: The data suggest that the ethanolic extract of *Plectranthus amboinicus* can inhibit or/and kill bacteria at 400 mg/mL concentration against the test bacteria. Identification of phytochemical and time-kill assay is best recommended for further studies of the antimicrobial activity of the *plant Plectranthus ambonicus.*

Keywords: Antibacterial activity, Ethanolic extract, Disc diffusion assay, Minimum inhibitory concentration, Minimum bactericidal concentration, *Plectranthus amboinicus*

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