

Analysis of Antibacterial Activity of *Clitoria ternatea* Methanolic Leaves Extract Against *Pseudomonas aeruginosa* ATCC 10145, *Shigella sonnei* ATCC 25931 and *Staphylococcus aureus* ATCC 25923

Aliff Adrus^a@Madon^a, Maslinda Musa^{ab*}

Structured Abstract

Background: Antimicrobial resistance (AMR) is an increasing global health concern that demands alternative therapeutic strategies. Medicinal plants such as *Clitoria ternatea* (butterfly pea) are potential sources of natural antimicrobial agents due to their bioactive compounds. This study aimed to evaluate the antibacterial activity of methanolic extract of *C. ternatea* leaves against *Pseudomonas aeruginosa*, *Shigella sonnei*, and *Staphylococcus aureus*.

Methods: 200 g of *C. ternatea* leaves were extracted using 70% methanol by maceration. The extract was tested at concentrations of 3.125 to 200 mg/mL. Antibacterial activity was assessed through the disc diffusion method. Minimum Inhibitory Concentration (MIC) was determined by broth microdilution, and Minimum Bactericidal Concentration (MBC) was evaluated by subculturing on Mueller-Hinton agar. Ciprofloxacin and gentamicin were used as positive controls.

Results: Disc diffusion assay showed *P. aeruginosa* and *S. sonnei* to be resistance towards the extract at all concentrations, while *S. aureus* exhibited zones ranging from 7.03 ± 0.06 mm to 8.03 ± 0.21 mm, indicating intermediate antibacterial activity. Standard antibiotics produced significant inhibition zones for all bacteria. No MIC values could be determined up to 200 mg/mL probably due to pigment interference affecting absorbance readings and lack of inhibitory activity, and MBC results indicated bacterial growth up to 200 mg/mL, confirming the absence of bactericidal activity.

Conclusion: The methanolic leaf extract of *C. ternatea* demonstrated intermediate antibacterial activity against *S. aureus* and no activity against *P. aeruginosa* and *S. sonnei* up to 200 mg/mL concentrations. Further optimization, such as pigment removal, exploring different solvent for extraction, use of well-diffusion method for antimicrobial susceptibility testing and testing at higher concentrations than 200 mg/mL, is recommended to clarify its antimicrobial potential.

Keywords: *Clitoria ternatea*, Methanolic Leaf Extract, Antibacterial Activity, MIC, MBC

*Correspondence: maslinda64@uitm.edu.my

^a School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia

^b Centre of Chemical Synthesis and Polymer Technology (CCSPT), Universiti Teknologi MARA, Shah Alam, Malaysia