

Isolation of Endophytic Fungi from *Elettariopsis Curtisii* Baker and Evaluation of Its Antimicrobial Activity

Muhammad Haris Danial Hezly^{a*}, Mohd Taufiq Mat Jalil^a

Structured Abstract

Background: The rapid emergence of multidrug-resistant (MDR) pathogens poses a serious global health threat, as many infections are increasingly difficult to treat with existing antibiotics. MDR pathogens can cause severe skin, respiratory, and gastrointestinal infections and employ various mechanisms to invade host tissues and evade immune responses. Endophytic fungi, which inhabit plant tissues without causing harm, are promising sources of novel secondary metabolites with antimicrobial potential. Therefore, there is an urgent need to explore natural sources for new antimicrobial agents capable of addressing the growing challenge of drug-resistant infections.

Methods: The study employed ethyl acetate extraction to obtain crude extracts from the stems of *E. curtisii*. The antibacterial activity of these extracts was initially assessed through primary and secondary screening, using the measurement of inhibition zones to determine effectiveness. To further evaluate antimicrobial potency, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) assays were conducted. Additionally, a phytochemical analysis was performed to identify the presence of bioactive compounds potentially responsible for the observed antibacterial effects.

Results: Seven strains of endophytic fungi were isolated from 16 tissue segments, including leaves and stems. Ethyl acetate extraction of isolates S1 and S3 yielded 1.14 g and 1.07 g of crude extract, respectively. Antibacterial evaluation revealed strong activity against Gram-positive bacteria, particularly *Staphylococcus aureus* and methicillin-resistant *S. aureus* (MRSA), with inhibition zones reaching up to 23 mm. In contrast, Gram-negative bacteria exhibited lower susceptibility to the extracts. The minimum inhibitory concentration (MIC) ranged from 50.0 to 3.00 mg/mL for isolate S1 and 25.0 to 3.00 mg/mL for isolate S2, indicating substantial antibacterial potency. Minimum bactericidal concentration (MBC) assays confirmed the bactericidal effects of the extracts against all tested strains. Phytochemical analysis identified several bioactive compounds, including saponins, terpenoids, flavonoids, and phenols.

Conclusion: The results indicate that endophytic fungi isolated from *E. curtisii* have the potential to serve as an effective source of antimicrobial agents for the treatment of multidrug-

*Correspondence: taufiqjalil@uitm.edu.my

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

Colloquium on Applied Sciences 2 2025

7-12 July 2025, Faculty of Applied Sciences, UiTM Shah Alam, Malaysia

resistant (MDR) bacterial infections. This study lays the groundwork for further investigation into the therapeutic potential of endophytic fungi as alternative agents in modern medicine

Keywords: *Elettariopsis curtisii*, antimicrobial, multidrug resistance, phytochemicals.

*Correspondence: taufiqjalil@uitm.edu.my

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