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Isolation of Endophytes with Antimicrobial Activity from Selected Indigenous Medicinal Plants Against Amoxicillin-Resistant Environmental Bacteria

Dhevanayagam, M.S.J.¹, Sadeepa, H.D.D.^{1,2}, Liyanage, G.Y.^{1,3}, Manage, P.M.^{1*}

¹*School of Science, Business Management School (BMS), Colombo, Sri Lanka*

²*Centre for Water Quality and Algae Research, Department of Zoology, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*

³*Department of Aquatic Bioresources, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*
**pathmalal@sjp.ac.lk*

Abstract

The continuous discovery of novel antimicrobial compounds and antibiotic-producing microorganisms is an obligatory process to overcome the antibiotic resistance of pathogenic bacteria that arises as a consequence of the misuse of antibiotics. Thus, this study is mainly focused on the isolation of endophytic bacteria and fungi with antimicrobial activity against amoxicillin-resistant environmental bacteria. The endophytes were isolated from the selected indigenous medicinal plants, namely *Acalypha indica* (Kuppameniya) and *Cyanthillium cinereum* (Monarakudumbiya). Fresh samples of the selected plants were collected from their natural habitats, and the plant parts were surface-sterilised using 70% ethanol. The endophytic bacteria and fungi were then isolated on Nutrient Agar (NA) and Potato Dextrose Agar (PDA) media respectively at room temperature. The isolated endophytic bacteria and fungi were screened for their antimicrobial activity against four previously isolated amoxicillin-resistant environmental bacteria, namely *Acinetobacter baumannii*, *Staphylococcus aureus*, *E. ludwigii* and *E. pyrinus*. As per the results, a prominent inhibition of *Staphylococcus aureus* was shown by four endophytic isolates (KpR-02B, MnS-01B, KpS-01F and MnR-04F). The AR bacteria *E. ludwigii* was prominently inhibited by two endophytic isolates (MnS-01B and MnR-04F), while *E. pyrinus* was also prominently inhibited by two endophytic isolates (MnF-03B and MnR-04F). Thus, the indigenous medicinal plants, Kuppameniya and Monarakudumbiya, can be considered as a potential source of antimicrobial compound-producing endophytes against amoxicillin-resistant environmental bacteria, which can be developed as a drug for antibiotic-resistant pathogenic bacteria.

Keywords: Antimicrobial activity, Antibiotic-resistant bacteria, Indigenous medicinal plants