

## Evaluation of Medicinal Plants, *Catunaregam spinosa*, *Houttuynia cordata*, and *Rhapis excelsa* from Malaysia for Antibacterial, Antifungal and Antiviral Properties

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**Abstract :** Traditionally, medicinal plants have been used to treat different kinds of ailments including infectious diseases. They serve as a good source of lead compounds for the development of new and safer anti-infective agents. This study aimed to investigate the antimicrobial potential of the leaves of three medicinal plants, namely *Catunaregam spinosa* (Rubiaceae; Mountain pomegranate), *Houttuynia cordata* (Saururaceae; "fishy-smell herb") and *Rhapis excelsa* (Arecaceae; "broadleaf lady palm"). The leaves extracts were obtained by sequential extraction using hexane, chloroform, ethyl acetate, ethanol, methanol and water. The antibacterial and antifungal activities were assessed using a colorimetric broth microdilution method against a panel of human pathogenic bacteria (Gram-positive: *Bacillus cereus* and *Staphylococcus aureus*; Gram-negative: *Escherichia coli*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*) and fungi (yeasts: *Candida albicans*, *Candida parapsilosis* and *Cryptococcus neoformans*; Moulds: *Aspergillus fumigatus* and *Trichophyton mentagrophytes*) respectively; while antiviral activity was evaluated against the Chikungunya virus on monkey kidney epithelial (Vero) cells by neutral red uptake assay. All the plant extracts showed bacteriostatic activity, however, only 72% of the extracts (13/18) were found to have bactericidal activity. The lowest minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were given by the hexane extract of *C. spinosa* against *S. aureus* with the values of 0.16 and 0.31 mg/mL respectively. All the extracts also possessed fungistatic activity. Only the hexane, chloroform and ethyl acetate extracts of *H. cordata* exerted inhibitory activity against *A. fumigatus*, giving the lowest fungal susceptibility index of 16.7%. In contrast, only 61% of the extracts (11/18) showed fungicidal activity. The ethanol extract of *R. excelsa* exhibited the strongest fungicidal activity against *C. albicans*, *C. parapsilosis* and *T. mentagrophytes* with minimum fungicidal concentration (MFC) values of 0.04–0.08 mg/mL, in addition to its methanol extract against *T. mentagrophytes* (MFC=0.02 mg/mL). For anti-Chikungunya virus activity, only chloroform and ethyl acetate extracts of *R. excelsa* showed significant antiviral activity with 50% effective concentrations (EC50) of 29.9 and 78.1 µg/mL respectively. Extracts of *R. excelsa* warrant further investigations into their active principles responsible for antifungal and antiviral properties.

**Keywords :** bactericidal, Chikungunya virus, extraction, fungicidal

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