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Antimicrobial Activity of *Mangifera zeylanica* Stem Bark from two Climatic Zones in Sri Lanka

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Abstract

Mangifera zeylanica commonly known as 'atamba' is an endemic plant in Sri Lanka. In traditional medicine, the stem bark is used for its anti-inflammatory properties. The antimicrobial properties of leaf extracts have also been reported. This study investigates the antimicrobial properties of the stem bark obtained from Rambukkana (intermediate zone) and Neluwa (wet zone). Specimens of *M. zeylanica* stem bark was collected from the two locations, and the plants were authenticated at Bandaranayaka Memorial Ayurvedic Research Institute, Nawinna. The plant barks were separated into inner bark and outer bark, washed with distilled water and air dried. The dried bark was coarsely powdered and extracted into aqueous and methanol. The aqueous extract was freeze dried and the methanol extract was rotary evaporated. The obtained products were dissolved in sterile distilled water to prepare a dilution series of 100 mg mL^{-1}, 50 mg mL^{-1}, 25 mg mL^{-1} and 12.5 mg mL^{-1}. The antimicrobial activity against *Staphylococcus aureus* (ATCC 25923), *Pseudomonas aeruginosa* (ATCC 27953), *Escherichia coli* (ATCC 25932) and *Candida albicans* (ATCC 10231) were determined using agar disc diffusion and agar well diffusion assay methods. The average zone of inhibition of the extracts were compared with the zone of inhibition obtained by the standard gentamicin discs (10 µg) for bacteria and ketoconazole discs (10 µg) for *C. albicans*. Methanol extracts of Rambukkana and Galle inner bark had antibacterial activity against *S. aureus* with an average zone of inhibition (ZOI) of 20.67 mm while none of the extracts had antimicrobial activity against *E. coli*. The highest ZOI against *P. aeruginosa* (15.33 mm) was found in aqueous extract of Rambukkana outer bark, while Galle outer bark gave a ZOI of (13.33 mm). Methanol extract of Rambukkana inner bark gave an average ZOI of 14.33 mm against *C. albicans* while methanol extract of Galle inner bark had an average ZOI of 11.5 mm. Irrespective of the climatic condition the methanol extract of inner bark of both Rambukkana and Galle samples have shown antimicrobial activity against *S. aureus*. The antimicrobial activity against *C. albicans* and *P. aeruginosa* were shown by Rambukkana outer and inner barks are comparable with the antimicrobial activity shown by the Galle outer and inner barks.

Keywords: Antimicrobial, Methanol, Aqueous