

Comparative evaluation of antimicrobial activity of peel extracts from five Sri Lankan banana varieties

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Banana (*Musa sapientum*) peels are a significant source of valuable phytochemicals, and numerous studies have highlighted their antimicrobial activity, showcasing potential as a natural remedy for treating wound infections. In this study, hexane, ethyl acetate, and methanol extracts of peels from five banana varieties found in Sri Lanka, namely, Ambul, Anamalu, Kolikuttu, Rath kesel, and Seeni kesel, were evaluated for antimicrobial activity against four wound-associated pathogenic bacteria: *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, and ESBL-positive *Klebsiella pneumoniae*, using disk diffusion and minimum inhibitory concentration (MIC) assays. The extract showing the highest inhibitory effect was further fractionated using varying ratios of hexane and methanol by silica gel column chromatography, and the half-maximal inhibitory concentration (IC₅₀) of the most potent fraction was determined. Ethyl acetate extracts of Seeni kesel, Rath kesel, and Anamalu exhibited the largest inhibition zones in the disk diffusion assay, ranging from 7.0 mm to 9.7 mm against *E. coli* and 6.7 mm to 9.3 mm against *P. aeruginosa* at a concentration of 12 mg/disk. In the MIC assay, all peel extracts effectively inhibited *E. coli* and *P. aeruginosa* at concentrations below 250 mg/mL, confirming their antimicrobial potential. Notably, the ethyl acetate extract of Anamalu demonstrated the lowest MIC values, 3.9 mg/mL against *P. aeruginosa* and *S. aureus*, and 7.8 mg/mL against *E. coli* and *K. pneumoniae*, indicating the highest antimicrobial potency. Among the fractions eluted from the Anamalu ethyl acetate peel extract, fraction 4, having a hexane to methanol ratio of 3:7, was identified as the most potent, with an IC₅₀ of 3.69 mg/mL against *S. aureus*, highlighting its potential as a significant antibacterial agent. These findings suggest that the ethyl acetate extract of Anamalu banana peels possesses comparatively higher antimicrobial potential. Further research is needed to identify bioactive phytochemicals and explore their application in treating wound infections.

Keywords: *Banana peel, Antimicrobial activity, Wound pathogens*