

Determination of in vitro antimicrobial properties of *Rhinacanthus nasutus* and *Pergularia daemia* against selected control strains of Gram-positive and Gram-negative bacteria

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Introduction and Objectives: Development of resistance to existing antibiotics is one of current day's rising health concerns. Therapeutic benefits of herbs used in traditional medicines are now being increasingly studied to see the possibility of harnessing their properties of these herbs as an antibacterial agent. This study aims to identify the antibacterial properties of the extracts from *Rhinacanthus nasutus* (Madahangu) and *Pergularia daemia* (Aniththa) against selected Gram-positive and -negative bacteria.

Method: Matured leaves of *R. nasutus* and *P. daemia* were used to make methanol, aqueous and hexane extracts through the maceration technique. The extracted powder was used to make a two-fold dilution series with the concentration range of 100 mg/ml to 25 mg/ml. Plant extracts were screened against four Gram-negative and Gram-positive bacterial strains: *Staphylococcus aureus* (ATCC25923), *Escherichia coli* (ATCC25922), *Salmonella enterica* (ATCC14028) and *Shigella flexneri* (ATCC12022). Antibacterial properties of the plant extracts were assessed using well diffusion method on Muller-Hinton Agar media (CLSI 2023). Erythromycin (15 µg) and ciprofloxacin (5 µg) were used as the positive controls for Gram-positive and Gram-negative strains respectively.

Results: *S. aureus* was sensitive to erythromycin (d=20mm) and ciprofloxacin (d=24mm). and all the Gram-negative organisms were sensitive to ciprofloxacin (d=24mm). Zones of inhibition were observed in the methanolic extracts of *R. nasutus* (d=10mm) and *P. daemia* (d=10mm) against *S. aureus* at 100 mg/ml and 75 mg/ml, respectively, while there were no inhibitory zones at 50 mg/ml and 25 mg/ml concentrations. All extract types from both plants, across all tested concentrations, failed to demonstrate antibacterial activity against *E. coli* (0 mm), *S. enterica* (0 mm) and *S. flexneri* (0 mm).

Conclusion: *R. nasutus* and *P. daemia* have a concentration dependent antibacterial activity against *S. aureus*. Further studies are recommended using additional Gram-positive bacterial species, including both cocci and bacilli, to determine the wider antibacterial potential of the tested extracts.

Keywords: *Rhinacanthus nasutus*, *Pergularia daemia*, Antibacterial activity, Methanolic extracts, Gram-positive bacteria

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