

Antimicrobial activity of *Plectranthus amboinicus*, *Bacopa monnieri*, *Flueggea leucopyrus* and *Cymbopogon citratus* plant extracts against common pathogens

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Introduction and Objectives: *Plectranthus amboinicus* (Kapparawalliya [S], Karpuravalli [T]), *Bacopa monnieri* (Lunuwila [S], Nilappachai [T]), *Flueggea leucopyrus* (Katupila [S], Mudpulanti [T]) and *Cymbopogon citratus* (Sera [S], Serai [T]) are natural herbal plants found in Sri Lanka that have significant ayurvedic medicinal uses. The current study was conducted to evaluate the antimicrobial activity of methanolic extracts of *P. amboinicus*, *B. monnieri*, *F. leucopyrus*, and *C. citratus* against common pathogens *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Salmonella* spp., and *Escherichia coli*. (S-sinhala; T-Tamil)

Methods: The plant leaves were extracted with methanol by maceration using dried leaves: solvent ratio of 1:3. 400mg of each plant crude was dissolved in 1 ml of 10% Dimethyl Sulfoxide (DMSO). The agar-well diffusion assay was performed using Mueller Hinton agar in a concentration series of two-fold dilutions starting from 400 mg/ml to 12.25 mg/ml. Gentamicin (10 µg/ml) was used as the positive control. The diameter of the inhibition zones was measured and evaluated to determine the antibacterial activity using GraphPad Prism 9 software.

Results: Gentamicin (10 µg/ml) exhibited a zone of inhibition (ZOI) for all tested bacteria ranging from 26.7 ± 0.6 mm to 28.3 ± 0.6 mm. All extracts at 400 mg/ml exhibited an inhibitory effect against all tested bacterial strains while *B. monnieri*, *F. leucopyrus*, and *C. citratus* showed a greater activity against *S. aureus* and *E. coli*. The methanolic extracts of *P. amboinicus* showed much less activity compared to the other three plant extracts. The results are summarised in the table below.

Table 1: Results of antimicrobial susceptibility test of leaf extract

Plant Extract (400 mg/ml)	Tested organisms			
	<i>S. aureus</i> (ATCC 25923)	<i>P. aeruginosa</i> (ATCC 27853)	<i>Salmonella</i> spp.	<i>E. coli</i> (ATCC 25922)
	Diameter of zone of inhibition (mm)			
<i>F. leucopyrus</i>	25.0 ± 1.0	18.3 ± 0.6	19.3 ± 0.6	18.3 ± 0.6
<i>P. amboinicus</i>	16.7 ± 0.6	8.7 ± 0.6	9.7 ± 1.2	4.7 ± 4.2
<i>B. monnieri</i>	30.3 ± 0.6	16.7 ± 0.6	21.3 ± 0.6	21.7 ± 0.6
<i>C. citratus</i>	25.0 ± 1.0	18.3 ± 0.6	19.3 ± 0.6	18.3 ± 0.6

Conclusions: *B. monnieri* and *F. leucopyrus* showed strong antimicrobial activity, while *P. amboinicus* had the lowest activity. The study can be extended to investigate different combinations of plant extracts for their synergistic effects.


Keywords: Antimicrobial activity, Common pathogens, Agar well diffusion assay

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