

Antimicrobial and Phytochemical Screening of Various Extracts of *Vernonia zeylanica*, *Merremia tridentata* and *Maanpaanjaan*

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The indigenous medicinal plants and plant derived drugs are the potential source of alternative medicine and are extensively use to treat various health ailments. Medicinal plant based antimicrobial drugs are widely prescribed for mitigating the side effects. Three medicinal plants *Vernonia zeylanica* (Kuppilai (T), Pupula (S)), *Merremia tridentate* (Muthiyarkoonthal(T), Heenmadu(S)) and Maanpaanjaan (not known its botanical name) were selected to evaluate their potential antimicrobial activity and find out the phytochemicals in crude extracts. Leaf extracts were obtained using cyclohexane, dichloromethane (DCM) and methanol as solvents. For the phytochemical analysis, starch, sugar, phenol/tannins, saponins, glycosides, steroids, terpenoids and alkaloids showed positive results. Antibacterial screening was done using agar well diffusion method and by measuring the diameter of zone of inhibition. Bacteria used were *Staphylococcus aureus*, *Klebsiella sp.*, *E.coli.*, *Pseudomonas sp.*, *Proteus sp.* and *Serratia sp.* Antifungal bio assay was done by poison food technique and calculating the percentage inhibition. Fungi used were *Fusarium sp.*, *Trichoderma sp.*, *Aspergillus sp.*, *Mucor sp.*, *Rhizopus sp.* and *Penicillium sp.* All the solvent extracts of Maanpaanjaan were able to produce a zone of inhibition against *E-coli sp* and the diameter of inhibition varies from 32.00mm to 15.25 mm. *S.aureus* is highly sensitive to the DCM extract of *V.zeylanica* which is comparable with the effect by standard streptomycin. *Proteus sp.* is more sensitive to the DCM and methanol extracts of *M.tridentata*. *E-coli* and *Staphylococcus sp.* were highly inhibited by the DCM extract of Maanpaanjaan and this was found to be the most potent in inhibiting *S.aureus* comparable with the standard antibiotic streptomycin. All the tested bacterial species were found to be inhibited by standard antibiotic streptomycin. Cyclohexane extract of *V.zeylanica* showed comparatively higher percentage of inhibition against *Proteus sp.*(14.14±0.198mm) followed by *Klebsiella*

sp.(12.01±0.09 mm), *Serratia sp.* (11.29±0.25 mm), *Staphylococcus sp.*(6.52±0.002 mm) and *E-Coli sp.*(1.30±0.11 mm). DCM extract of *V.zeylanica* showed excellent zones of inhibition for *Staphylococcus sp.*(35.30±2.61mm), *Proteus sp.*(30.95±1.93mm), *Pseudomonas sp.*(30.49±0.7mm) followed by *E-coli sp.* (21.93± 4.10 mm) and *Klebsiella sp.*(25.35±1.85 mm). Methanol extract of *V.zeylanica* showed clear zones for almost all types of bacterial species such as *Klebsiella sp.*(14.78±1.40 mm), *Serratia sp.* (14.71±0.50 mm), *Proteus sp.* (12.50±0.33mm), *staphylococcus sp.* (12.26±0.13 mm), *E-coli sp.*(11.70±0.35 mm) and *Proteus sp.*(10.93±0.31 mm). Cyclohexane extract of *M.tridentata* showed zone of inhibition varied from 16.40-10.00 mm. The DCM extract of *M.tridentata* shows inhibition only against *Staphylococcus* (26.59±5.55mm) and *Proteus* (33.23±2.86 mm). Methanol extract of *M.tridentata* showed inhibitory effect on all type of bacteria except *Serratia sp.* and the zone of inhibition varied from 27.00-10.20 mm. All the extracts of Maanpaanjaan showed excellent inhibitory effects on tested bacterial species. Cyclohexane extract was much effective over *Serratia sp.* (27.69±0.90 mm). DCM and methanol extract of this plant was very effective over *E-coli sp.* and the zone varied from 30mm to 33mm. Different solvent extracts inhibiting different fungi in various degrees. The DMC extract of Maanpaanjaan has a significant inhibitory effect on the radial growth of *Penicillium sp.* and *Fusarium sp.* The radial growth of *Tricorderma sp* is greatly inhibited by hexane extract of Maanpaanjaan followed by the methanol extract. Great inhibitory activity indicates the presence of active ingredients in the plant extracts. This study revealed that antifungal and antibacterial activity of leaves of these plants was high.

Key Words: Antimicrobial, Phytochemical, Solvents, *Vernonia sp.*,
Merremia sp., Maanpaanjaan