

## Qualitative Phytochemical Analysis and *In-vitro* Antibacterial Activity of *Volkameria inermis* Leaf Extracts against Common Pathogenic Bacteria

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**Background:** Coastal Sri Lankan *Volkameria inermis* belongs to the family Lamiaceae, is a plant with traditional ayurvedic uses. Its antibacterial properties and phytochemical composition is not scientifically explored adequately.

**Objectives:** To evaluate the antibacterial activities of hexane, dichloromethane and ethyl acetate extracts of *V. inermis* against common human pathogens i.e., *Staphylococcus aureus*, Methicillin resistant *Staphylococcus aureus* (MRSA), *Escherichia coli* and Diphtheroids along with phytochemical screening

**Methods:** Fresh leaves (750g) of *V. inermis* were extracted with hexane, dichloromethane and ethyl acetate sequentially for three times, extraction yielded 102mg, 163mg and 41mg respectively. Crude extracts were separately dissolved in DMSO (100mg/mL). Ciprofloxacin (3mg/mL) and DMSO used as the positive and negative controls. Antibacterial sensitivity was tested using agar disc diffusion assay (10 $\mu$ L per disc) in triplicates, and mean diameter was calculated.

**Results:** Hexane extract showed the highest inhibition against *S. aureus*, MRSA, and Diphtheroids with mean( $\pm$ SD) inhibition zone diameters of 10.4( $\pm$ 0.3)mm, 11.3( $\pm$ 0.6)mm and 12.1( $\pm$ 0.6)mm, respectively. Dichloromethane extract, and ethyl acetate extract inhibited the growth of MRSA and *S. aureus* with inhibition zone diameters in the range of 8mm to 11mm, while the positive control exhibited inhibition zone diameters more than 24mm for all the tested organisms. However, none of the extracts showed inhibition of *E. coli*. Negative control did not show inhibition zones for the tested organisms. Phytochemical screening tests revealed the presence of terpenoid compounds in all of the extracts. Dragendorff's test for alkaloids and FeCl<sub>3</sub> test for phenolic compounds were positive only for the ethyl acetate extract.

**Conclusions:** Hexane and dichloromethane extracts were effective against most tested organisms. It can be concluded that relatively non-polar metabolites within the plant exhibit strong antibacterial effects. Additionally, the ethyl acetate extract shows evidence of antibacterial phenolic compounds and alkaloids.

**Keywords:** Antibacterial activity, Diphtheroids, Human pathogens, Sequential extraction, *Volkameria inermis*