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In vitro Evaluation of Anti-Inflammatory and Antibacterial Properties of Tuberous Roots of *Mirabilis Jalapa* Linn. Found in Sri Lanka

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Abstract

The Four-O'clock plant, also known as *Mirabilis jalapa* Linn. is a well-known ornamental plant prized for its folklore remedies in many countries around the world. The objective of the current study was to evaluate the anti-inflammatory and antibacterial properties of hexane, dichloromethane, methanol, and aqueous extracts of *M. jalapa* tuberous roots found in Sri Lanka in order to test the numerous claims made on the medicinal properties of this plant. The plant extracts were prepared by cold maceration method and concentrated using a rotary vacuum evaporator. The anti-inflammatory activity was evaluated using the human red blood cell (HRBC) membrane stabilization assay and the egg albumin denaturation inhibition assay. The antibacterial activity was tested against the most common wound pathogens (*Pseudomonas aeruginosa*, *Escherichia coli*, and *Staphylococcus aureus*) by both disc and well diffusion methods. The methanol extract demonstrated the highest anti-inflammatory potency in the egg albumin denaturation inhibition assay (IC_{50}= 137.8 g/mL), whereas the aqueous extract demonstrated the highest potency in the HRBC method (IC_{50} = 197.4 g/mL). All four extracts showed no discernible antibacterial activity. However, in the well diffusion method, the dichloromethane extract against *S. aureus* had the highest inhibitory zone, measuring 15.33 ± 0.33 mm, at the concentration of 400 mg/ml. Hexane extract had the second-highest inhibitory zone, measuring 14.00 ± 2.08 mm at the same concentration. This study shows that *M. jalapa*'s tuberous roots have promising anti-inflammatory properties with no significant antibacterial efficacy against the selected pathogens.

Keywords: *Four O' clock plant, Mirabilis jalapa Linn., HRBC method, Antibacterial, Anti-inflammatory*