

Assessment of *In vitro* Antibacterial and Anti-inflammatory Activities of Sri Lankan Medicinal Plant *Jeffreyia zeylanica* (Pupula)

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Abstract

Antibiotic resistance, global health risks, and absurd consequences of anti-inflammatory drugs are significant complications. As an alternative plant can be used. *Jeffreyia zeylanica* an endemic plant in Sri Lanka was selected to evaluate antibacterial and anti-inflammatory activities, because of its ethnomedical value and economical. *J. zeylanica* leaves were air-dried, then macerated and plant extracts were prepared using vacuum evaporation. Plant extracts were made using aqueous, methanol, dichloromethane, and hexane as solvents. To detect antibacterial activity Agar well diffusion and Disc diffusion methods were used. To assess anti-inflammatory activity egg albumin denaturation and Human Red Blood Cell (HRBC) membrane stabilization methods were used. The antibacterial activity of the plant extracts was evaluated against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Escherichia coli*. In both methods, plant extracts effectively inhibited the activity of *S. aureus*. In the agar well diffusion method, methanolic extract indicated the highest inhibition zone of 29.33 ± 0.33 mm and high effectiveness with EC_{50} of 39.05 mg/ml. In the disc diffusion method, dichloromethane extract indicated the highest zone of 14.66 ± 0.33 mm, and the most effective activity was indicated by methanolic extract with an EC_{50} of 200 mg/ml. Both methods used Gentamicin (40mg/mL, 10 μ g) as the positive control. In the protein denaturation method, hexane extract indicated the best potential activity with IC_{50} of 154.9 μ g/ml. In the HRBC method, the highest potency was indicated by dichloromethane extract with IC_{50} of 154.0 μ g/ml. Diclofenac sodium was the reference drug to evaluate the anti-inflammatory activity. The above results indicate that plant *J. zeylanica* has potential antibacterial and anti-inflammatory activity.

Keywords: *J. zeylanica*, Antibacterial activity, Anti-inflammatory activity, Endemic, Sri Lanka