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Antibacterial and antioxidant activity of different solvent extractions of leaves and bark of *Erythrina variegata*

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Introduction: Plant-based antimicrobials have been proven to be a promising treatment option with several advantages, including fewer side effects and highly diverse pharmacological activities due to secondary metabolites. *Erythrina variegata,* known as the Coral tree, possesses many therapeutic activities, including antibacterial, antioxidant, anthelminthic, anti-inflammatory, and cytotoxic activities, and is frequently used in Siddha medicine. *Erythrina variegata* is widely distributed in Malaysia, Sri Lanka, and India.

Objective: To evaluate the antibacterial and antioxidant properties of different solvent extractions of leaves and bark of *Erythrina variegata.*

Methodology: Dried leaves and bark powder were macerated separately with water, ethanol, and ethyl acetate. The antibacterial activity of extracts was tested against *Staphylococcus aureus* and *Pseudomonas aeruginosa* using the agar well diffusion method, and the zone of inhibition for each extract was measured. Gentamycin and Ciprofloxacin were used as positive controls. The antioxidant activity of the extracts was determined by the DPPH (2,2-diphenyl-1-picryl-hydrazyl-hydrate) assay method, and ascorbic acid was used as standard. IC_{50} values of plant extracts and standard were measured. All the tests were triplicated. Independent samples t-test was used to compare the anti-bacterial activity with positive control at a 95% confidence level, and a p-value less than 0.05 was considered statistically significant. All the results were analysed using SPSS version 26.

Results: The highest antioxidant activity was observed with ethanol bark extract (IC_{50}=420.18 µg/ml), and leaf aqueous plant extract had IC_{50} of 528.74 µg/ml. Anti-bacterial activity of all extracts showed significant differences with positive controls ($p<0.05$). Ethyl acetate extract of leaves and bark showed the highest inhibitory activity against *Staphylococcus aureus* (18±1.00 cm), while ethanolic leaf extract showed the highest inhibitory activity against *Pseudomonas aeruginosa* (29.5 cm).

Conclusion: The plant leaves of *Erythrina variegata* had more anti-bacterial activity, while the bark of *Erythrina variegata* showed more antioxidant activity. Further studies are needed to identify the compounds responsible for the antioxidant and antibacterial activities of the plant.

Keywords: *Erythrina variegata,* Antioxidant activity, Antibacterial activity