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In-vitro anti-inflammatory and antioxidant activity of *Madhuca longifolia* bark grown in Sri Lanka

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Background: *Madhuca longifolia* is a valuable medicinal plant which has been valued for decades in Sri Lankan Ayurvedic medicine. The bark is used as the major component of ''paththu'' in Ayurvedic treatments.

Objective: To evaluate *in vitro* anti-inflammatory activity and antioxidant activity of two solvent extracts (70% aqueous acetone and 80% aqueous methanol) obtained from *Madhuca longifolia* bark.

Method: The crude extracts were prepared by steeping the powder of the dried bark in each solvent overnight in dark conditions. Phytochemical screening of crude extracts was performed and antioxidant activity was determined by radical scavenging activity (2,2-diphenyl-1-picrylhyrazyl-DPPH assay) and ferric-reducing antioxidant power (FRAP) assay. *In-vitro* anti-inflammatory activity was determined by heat induced HRBC (Human Red Blood Cells) membrane stabilization method with reference to the drug, aspirin. Results were analyzed by multiple comparison one-way ANOVA at Turkey 95% and independent sample t-test using the SPSS 21.0 software. At ($p<0.05$), values were considered significantly different at 95% level of confidence.

Results: The results of preliminary phytochemical analysis revealed the presence of alkaloids, phenols, flavonoids, carbohydrates, proteins and saponins in the two extracts. Radical scavenging activity of 80% aqueous methanol and 70% aqueous acetone extracts were determined as 25.4±0.1 and 23.1±0.4 mmol Trolox equivalents/100 mg Dry Weight of Bark (DWB) and antioxidant activity by FRAP were as 42.6±0.7 and 38.0±1.1 mmol Fe (ll) equivalents/100 mg (DWB) respectively. The results revealed that the 80% aqueous methanol, 70% aqueous acetone extract, and aspirin have marked dose dependent anti-inflammatory activities with an IC_{50} value of 519.100 µg/ml, 539.500 µg/ml and 1062.000 µg/ml respectively.

Conclusion: It was concluded that the two different solvent extracts had remarkable *in vitro* anti-inflammatory activity and antioxidant activity.