

Evaluation of *in vitro* antioxidant and anti-haemolytic activity of methanol bark extract from *Nauclea orientalis* Linn.

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Introduction and Objectives: Plant derived natural compounds are good sources of antioxidants and anti-inflammatory agents. Barks of *Nauclea orientalis* Linn. are used in Ayurveda as analgesic, antipyretic, vulnerary and to treat inflammations. This study was undertaken to evaluate the *in vitro* antioxidant and Human Red Blood Cell (HRBC) membrane stabilizing effects of methanolic bark extract of *N. orientalis*, a native plant to Sri Lanka.

Methods: Antioxidant activity was evaluated through Ferric reducing power assay and Phosphomolybdenum method. HRBC membrane stabilization assay under heat and hypotonicity induced conditions were used to determine anti-haemolytic activity. The concentrations of 50 – 800 µg/ml (dry weight basis) of the bark extract were used for both assays. Simple maceration was used for extraction. BHT (Butylated Hydroxytoluene) and ascorbic acid were the standards for antioxidant assays, while Acetyl Salicylic Acid (ASA) at 200 µg/ml as the standard for *in vitro* anti-haemolytic activity. Qualitative phytochemical screening was also done for the bark extract.

Results: Concentration dependent antioxidant activity was observed with bark extract ($p < 0.05$), with 21.845 µg/ml - 351.942 µg/ml of L-ascorbic acid equivalent (AAE) and 10.754 µg/ml - 98.544 µg/ml of BHT equivalent potency. Methanol bark extract inhibited heat induced haemolysis at the concentrations of 400 µg/ml (inhibition of 7.558 ± 0.554 %) and 800 µg/ml (inhibition of 88.435 ± 130.772 %), whereas inhibition of 45.998 ± 4.710 % observed with standard acetyl salicylic acid. Haemolysis inhibitions of 0.971 ± 3.908 % and 0.681 ± 3.165 % were evident at the concentrations of 50 µg/ml and 100 µg/ml of plant extract under hypotonic conditions, while inhibition of 17.658 ± 10.570 % was observed with standard ASA at same conditions. Primary phytochemical screening suggested the presence of tannins, saponins, terpenoids, glycosides and coumarins in the methanol bark extract.

Conclusion: Methanol bark extract of *N. orientalis* exhibited both anti-haemolytic and haemolytic activities. Further extract showed concentration dependent antioxidant activity. Further studies needed on the isolated phytoconstituents from the extract.

Keywords: *Nauclea orientalis*, Bark, Methanol extract, Antioxidant activity, Anti-hemolytic activity