

## Evaluation of *in vitro* Anti-inflammatory Effect of *Sida cordifolia* and *Phyllanthus debilliss* Extracts

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**Background:** *Sida cordifolia* (Babila, Malvaceae) and *Phyllanthus debilliss* (Pitawakka, Euphorbiaceae) have been used in the Sri Lankan ayurvedic medicinal preparations due to their anti-inflammatory activity. However, the *in vitro* anti-inflammatory effect of these plants has not been studied scientifically.

**Objective:** To determine the *in vitro* anti-inflammatory effect of ethanol, aqueous and hexane extracts of *Sida cordifolia* (Babila) and *Phyllanthus debilliss* (Pitawakka)

**Method:** The anti-inflammatory activity was evaluated by the heat induced membrane stabilization assay against diclofenac sodium as the positive control. Percentages of human red blood cell (HRBC) membrane stabilization of different concentrations of ethanol, hexane and aqueous extracts of the plant were calculated. Haemolysis was measured at 540 nm wave length and the percentage inhibition of haemolysis was calculated. Qualitative phytochemical screening was carried out to identify the phytochemicals present in the two aqueous plant extracts. Statistical analyses were performed by ANOVA.  $p < 0.05$  was considered as statistically significant.

**Results:** Ethanol, aqueous and hexane extracts of *Phyllanthus debilliss* showed 80.52%, 65.00% and 27.98% protection, respectively compared to diclofenac sodium (96.19%) at a dose of 1000  $\mu\text{g/mL}$ . The potency of roots extract of *Sida cordifolia* was compared with diclofenac sodium (96.19%) and it showed 79.16%, 54.86%, 25.68% protection for ethanol, aqueous and hexane extracts at a dose of 1000  $\mu\text{g/mL}$  in the *in-vitro* HRBC membrane stabilization assay respectively. All the extracts showed a dose dependent significant ( $p < 0.01$ ) anti-inflammatory activity in human red blood cell membrane stabilization assay. Phytochemical analysis revealed that proteins and saponins were absent in the two plant extracts. The two extracts showed positive results for tannins, reducing sugars and flavonoids.

**Conclusions:** Ethanol extract of both plants showed the highest anti-inflammatory activity compared to hexane and aqueous extracts. Phytochemicals identified responsible for the effect and further analysis involving fractionation and identification of active constituents would allow to identify the compounds responsible for the anti-inflammatory effect of *Sida cordifolia* and *Phyllanthus debilliss*.

**Keywords:** Anti-inflammatory, Diclofenac sodium, Human Red Blood Cell (HRBC), Membrane stabilization