 ISSN 2362-0412

Preclinical studies on the Immunomodulatory Property of *Alpinia calcarata* (s. Araththa) and *Solanum surattense* (s. Ela batu) in Rats

K.K.A. Kithmini [a], E.P.S. Chandana [b*], P.M.C. de Silva [a], M. Hettiihewa [c]

[a]*Department of Zoology, Faculty of Science, University of Ruhuna, Wellamadama, Matara, Sri Lanka.*
[b]*Department of Biosystems Technology, Faculty of Technology, University of Ruhuna, Matara, Sri Lanka.*
[c]*ImmunoPharmacologist, Dean Faculty of Health Sciences, CINEC CAMPUS, Malabe, Sri Lanka*

*Corresponding author: *epschandana@gmail.com*

ABSTRACT

Both herbalism and conventional synthetic medicines provide options for immunomodulation. However most of the synthetic drugs accompany undesirable side effects. Apparently, plant-based medicines leave no side effects and provide more safe therapies. The present study was undertaken to elucidate toxic effects, anti-oxidant capacity and immunomodulatory potential of ethanolic extracts of *Alpinia calcarata* (dried rhizome) and *Solanum surattense* (dried root bark) which are used by traditional and Ayurvedic practitioners of Sri Lanka to treat various ailments. No significant behavioral or morphological changes were observed in rats after treating with high doses (1000mg/kg, 500mg/kg) of both plants. In these rats, liver enzymes namely Alanine Transaminase (ALT) and Gamma Glutamyl Transpeptidase (GGT) levels were measured using ELISA. Crude extracts of both plants were tested using DPPH method, TAC assay and Cayman assay to survey antioxidant potential. *A.calcarata* was further investigated to study its effects on cytokine expression in rats and IFN gamma expression on cultured human leukocytes. In those studies rats were orally fed with *A.calcarata* extract for a period of 45 days at dose of 200mg/kg in 2 days intervals while control group was given normal saline. Cultured human leukocytes were treated with different concentrations of *A.calcarata* for 2 days. No significant increase of ALT and GGT were observed in *A.calcarata* treated rats ($p > 0.05$). However, high doses (1000mg/kg, 500mg/kg) of *S.surattense* treatment elevated ALT and GGT levels significantly ($p < 0.05$). Both extracts possess significantly high anti-oxidant capacity when compared with commonly known anti-oxidants ($p < 0.05$). IL2, IL5, IL17, IFN-ɣ cytokine secretions were significantly increased after 30 and 45 days of administration ($p < 0.05$). *A.calcarata* extracts stimulated the increase in TH1 cytokine (IFN-γ) level in cell culture supernatant in a dose dependent manner. According to the results of this study *A.calcarata* rhizome extract is a positive immunomodulator in all aspects.

Keywords: *A. calcarata*, Anti-oxidant, Cytokines, , Immunomodulation, *S.surattense*