ABSTRACT

Objective: To Evaluation of adaptogenic and immunomodulatory activity of ethanolic extract of *Rhododendron arboreum* leaf in acute and chronic stress modules for adaptogenic and immunomodulatory activity.

Methods : The evaluation of adaptogenic activity swimming endurance, anoxia stress tolerance test, cold restraint and immobilization stress models were used. *Withania somnifera* (100 mg/kg, p.o.) was used as reference standard. The parameters like swimming endurance time, anoxia stress tolerance time was measured for swimming and anoxia stress tolerance models respectively. However in immobilization and cold restraint stress models the biochemical and biological parameters were estimated. In immunomodulatory activity, cyclophosphamide (25 mg/kg p.o) induces immunosuppression - biologicals (thymus and spleen), haematological parameters like total RBC, WBC, DLC, Haemoglobin, body weight, carban clearance capability and arthus type hypersensitivity were estimated.

Results: Concomitant treatment with ethanolic extract at dose of 250 and 500 mg/kg, p.o. showed significant changes in increasing in swimming endurance, anoxia stress tolerance time as compared to control group. Similarly, concomitant treatment with ethanolic extract showed marked decrease in stress induced elevated levels of serum glucose, cholesterol, triglyceride, BUN as compared to stress control in both cold and immobilization stress models. Extract also prevented the variation in weight of organs like liver, spleen, adrenals and testes when compared to stress control in both models. whereas the in immunomodulatory modules the biological (spleen and thymus), haematological parameters, rate of carban clearance (as phagocytic index) and hypersensitivity reaction rate are increased when compared to negative control and immunosuppressed mice and rats respectively.

Conclusion: The present study suggests that ethanolic extract of *Rhododendron arboreum* possess a significant adaptogenic and immunomodulatory activity.

Key words: *Rhododendron arboreum*; ethanolic leaf extract; adaptogenic and Immunomodulatory activity; swimming endurance; anoxia stress tolerance ; immobilization and cold restraint stress; phagocytic index; carbon clearance test.