

## *Rhododendron arboreum* (Ericaceae): immunomodulatory and related toxicity studies

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**Abstract** In the present study, an attempt was made to evaluate the extract of the leaves of *Rhododendron arboreum* for immunomodulatory activity and related hepatotoxicity. Alcoholic extract of the leaves of *R. arboreum* was prepared by hot percolation method. Levamisole was used as the standard drug. The parameters like, humoral immune response, cell mediated immune response and total leukocyte counts (TLC) were assessed in the antigenically challenged mice with sheep RBC (SRBC). Liver function tests like total bilirubin, SGPT and SGOT were also evaluated. The, orally administered alcoholic extract of the leaves showed a significant suppression of the immune responses, in a dose dependent manner. The extract at the maximum dose (100 mg/kg) was found to possess higher immunosuppressant effect in comparison with control and levamisole ( $p < 0.001$ ). No significant difference was observed in the weights of liver and spleen of extract-treated mice in comparison with levamisole and vehicle treated mice. Liver function tests of extract-treated mice were also statistically insignificant in comparison with levamisole and vehicle-treated mice. Thus, it can be concluded

that the alcoholic extract of *R. arboreum* is an effective and safe immunosuppressive agent.

**Keywords** *R. arboreum* · Haemagglutination · DTH · Phagocytosis · SRBC

### Introduction

Many clinical disorders are associated with the immune system. Suppression of the immune system is required in the management and treatment of inflammation and allergic diseases, while stimulation is highly desirable for the treatment of HIV, immunodeficiency and infectious diseases (Koko et al. 2008). Modulation of immune response through stimulation or suppression may help in maintaining a disease free state. Modulation of immune functions, using medicinal plants and their products as a possible therapeutic measure, has become a fundamental principle of therapeutic approach. Though a number of medicinal plants are available and traditionally used to treat a variety of disease conditions, many of them remain to be explored scientifically for their immunomodulatory effects. Natural products, especially Indian medicinal plants, are a potential source of immunomodulatory compounds (Jinyvargese et al. 2005). Recently, phytopharmaceutical research has received considerable attention for developing safe and effective lead compounds with potential immunomodulatory activity. The present study was performed to evaluate *Rhododendron arboreum* (Ericaceae) leaves for their possible immunomodulatory activity and hepatotoxicity in experimental animals. *Rhododendron arboreum* is a small tree occurring in the high altitudes of 1,500 m to 6,000 m in Himalaya forests or Nilgiri Hills in South India (Sonar et al. 2012a, b). Traditionally, dried leaves were helpful in the treatment of gout and rheumatism. A polyherbal preparation “Ashoka Arishta” containing *R. arboreum* possesses oxytocic, oestrogenic and prostaglandin synthetase inhibiting

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