

Immunomodulatory Activity of Fruit Rinds of *Garcinia indica* (Family Guttiferae) on Swiss Albino Mouse Model

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ABSTRACT

Garcinia indica (Guttiferae) is a plant widely used in the traditional medicine in India as antiscorbutic, cholagogue etc. It is prescribed in certain immune disorders like asthmatic affections, chronic catarrh and cough. The study was aimed at scientifically evaluating the immunomodulatory activity of *Garcinia indica* L. (Guttiferae), on Swiss albino mice against sheep RBC (SRBC) antigen challenge, thereby verifying the traditional usage. The major constituent of the extract was ascertained to be garcinol, by chromatographic and spectroscopic studies. Oral administration of hexane extract (HE) (50 – 300 mg/kg) elicited a dose-dependent increase in Haemagglutination antibody (HA) titers, delayed-type hypersensitivity response and phagocytosis. At the selected maximum dose, HE demonstrated higher immunostimulatory activities in comparison with control and positive standard (levamisole).

Key words: *Garcinia indica*; SRBC; Phagocytosis; HA titer; DTH

INTRODUCTION

Natural products including plants, animals and minerals have been the basis for treatment of human diseases. Herbal drugs possess negligible side effects, are less expensive and not only eliminate the disease from the patient's body but also enhance the immunity, besides playing an appreciable role towards suppressing untoward immune reactions^{1,2}.

Garcinia indica is a slow-growing slender tree of moderate size; it bears berries with arillate seeds, consists of 180 species, out of which ~30 are found in India³.

Several studies have demonstrated that garcinol derived from the fruit rinds of *Garcinia indica* exhibit significant antibiotic⁴, antileukemic⁵, antioxidant⁶, antiulcer, antioxidative and anti-glycation activities⁷. Garcinol also inhibits nitroquinoline 1-oxide-induced tongue carcinogenesis in rats⁸. *G. indica* is an ingredient of Amlavetasa- which is prescribed in chronic catarrh, cough and in various immune disorders like asthmatic affections⁹, bronchitis¹⁰ etc. in the south, IMPCOPS, Chennai^{9, 11}. These findings prompted the present investigators to explore the immunomodulatory effect of hexane extract of fruit rinds of *G. indica*.

MATERIAL AND METHODS

Collection of plant material: Fruit rinds (semi-dried) of the plant *Garcinia indica* were collected in the month of March from Udipi (Karnataka), India. Identification and authentication of the crude drug was carried out at National Botanical Research Institute, Lucknow (India).

Extraction and Isolation: Dried fruit rinds of *Garcinia indica* (500gm) were cut into irregular pieces and extracted with water. The extract was filtered, and the squeezed residue was dried in shade and powdered by grinding. The powder (200gm) was extracted with hexane (500ml) by hot percolation method using Soxhlet apparatus. The extract obtained was filtered, solvent evaporated under vacuum, and further dried in a desiccator under reduced pressure to complete drying (yield - 9.8gm w/w). The extract was subjected to preliminary qualitative tests to identify the various phyto-constituents like alkaloids, phytosteroids, flavanoids, phenolics, saponins, carbohydrates and amino acids^{12, 13, 14}.

Dried extract (1gm) was impregnated with 2 gm of silica gel and loaded onto silica gel column. The column was eluted with hexane and mixture of hexane: ethyl acetate in increasing order of polarity. The pure compound (A) was isolated by monitoring TLC with hexane: ethyl acetate (60:40) and the solvents from the eluates were evaporated under vacuum. Yield of recrystallized compound (A) was ~250 mg¹⁵.

Animals: The present study was conducted on either sex of Swiss albino mice weighing between 20-25gm. The animals were maintained in polyacrylic cages under standard laboratory conditions with temperature maintained between 22 - 27 C°, with a 12-h light and dark cycle. Commercial diet and water were given ad libitum. All procedures were reviewed and approved by the Institutional Animal Ethics Committee (IAEC) of Faculty