Studies on Immunomodulatory Activity of *Capparis zeylanica* Leaf Extracts

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**ABSTRACT:** The methanolic and aqueous extracts of *Capparis zeylanica* are known to exhibit immunomodulatory activity. In the present investigation, the effect of ethanolic extract and its fractions on cellular humoral functions in mice have been studied. Alcoholic extract revealed significant (ANOVA followed by Dunnett’s Multiple Comparison test) immunostimulation by *in-vitro* phagocytosis, delayed hypersensitivity and haemagglutination model. Oral administration of EFCZ (ethyl acetate fraction) and NFCZ (n-butanol fraction) among the four fractions (20-40 mg/kg) significantly inhibited sheep red blood cells (SRBC) – induced delayed type hypersensitivity reactions and significantly increased the *in vitro* phagocytic index. It also produced a significant, dose related decrease in sheep erythrocyte specific haemagglutination antibody titre. The results obtained indicate the ability of the EFCZ and NFCZ fraction of *Capparis zeylanica* to modulate both cell mediated and the humoral components of the immune system.

**KEYWORDS**: Immunomodulatory activity; Phagocytosis; Delayed hypersensitivity; Capparis zeylanica

**Introduction**

Immunomodulation is a process, which alters the immune system of an organism by interfering with its functions. This interference results in either immunostimulation or immunosuppression. An immunomodulator is substance that helps to regulate the immune system. This “regulation” is a normalization process, so that an immunomodulator helps to optimise immune response. Immunomodulators are becoming very popular in the worldwide natural health were as these do not tend to boost immunity, but to normalize it. Keeping this in view, efforts have to be directed to modulate the immune responses, to permit effective treatment of various ailments associated with immune system and thus the development of a safe and effective immunomodulator for clinical use. Immunomodulators are biological response modifiers; exert their effects by improving host defense mechanisms against diseases. Immune regulation is a complex balance between regulatory and effector cells and any imbalance in immunological mechanism can lead to pathogenesis (Sehar et al., 2008).

Herbal medicine has become an integral part of standard healthcare, based on a combination of time honored traditional usage and ongoing scientific research. Increased interest in medicinal herbs has prompted for scientific scrutiny of their therapeutic potential and safety. Some of the medicinal plants are believed to enhance the natural resistance of the body to infections (Atal et al., 1986).

*Capparis zeylanica*, Linn. (family: Capparidaceae) is commonly Known as Indian caper, is a climbing shrub found throughout India and has been used as a ‘Rasayana’ drug in the traditional medicine.

Ayurvedic system of medicine. ‘Rasayana’ plants are particularly recommended for the treatment of immune disorders (Dhanukar et al., 1999). In Northern India, the leaves are widely used as counter-irritant, febrifuge and as a cataplasm in swellings, boils and piles (Chopra, 1969). The various species of genus *Capparis* are useful in the treatment of cough, asthma, inflammation, fevers, cholera and also useful as poultice in gout and rheumatism (Kirtikar and Basu, 1987; Chopra, 1969). Modern phytochemical screening of the plant has shown the presence of fatty acids (Haque et al., 2004) and flavonoids in the leaves (Sharaf, 1997). Flavonoids have been known to possess antioxidant, antineoplastic, antiulcer, anti-inflammatory and antimicrobial activities (Narayana et al., 2001; Middleton, 1998). The present study was therefore, undertaken to explore the immunomodulatory activity of ethanolic extract and fractions obtained thereof from *Capparis zeylanica* leaves on cellular and humoral immune responses to the antigenic challenge by sheep RBCs and phagocytic activity of *Candida albicans* by human PMN cells.

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