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Immunomodulatory activity of a Sri Lankan Demospongiae Marine sponge species Class Demospongiae): A Pilot Study

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Sponges are considered the most important marine invertebrates following the discovery of sponge derived secondary metabolites. Although a few bioactivities and bioactive compounds were previously reported from Sri Lankan sponges, we for the first time undertook to investigate the immunomodulatory activity of a marine sponge species in Sri Lanka.

Samples of a soft marine sponge species of Class Demospongiae, were collected from Katthankudy, Batticaloa through a collaboration with NARA, Sri Lanka and repeatedly extracted in absolute methanol and dichloromethane. The sponge crude extracts (SCE) obtained following rota evaporation (R 200-USA) at 40 °C was used for immunological assays. The test groups of adult wistar rats (N = 6) were orally administered with 2 doses (25 and 50 mg/kg) of the SCE in 5% ethanol while the control (N = 6) received 5% ethanol. Following 14 days of consecutive treatment, some selected non functional and functional immunological parameters of rats were determined using standard methodology.

Compared with the control, significant immunosuppressive as well as immuno stimulatory activities were observed in the test groups for both non functional and functional immunological tests. Rat platelet count significantly increased at post treatment with both doses of the SCE tested ($P < 0.05$). Significantly increased splenocyte counts were detected with the 25 mg/kg dose ($P < 0.05$), but not with the 50 mg/kg dose. Conversely. white blood cell counts and bone marrow cell counts, as well as spleen weight/body weight ratio of the treated rats had significantly decreased with both doses tested ($P < 0.05$) while the suppression was higher ($P < 0.001$) with the 50 mg/kg dose. When compared with the controls, the functional tests based on phagocytosis showed immunomodulation; the phagocytic capacity had significantly increased in rats treated with the 25 mg/kg dose ($P < 0.05$) but had decreased significantly with the 50 mg/kg dose. Nevertheless, the serum nitric oxide level was significantly ($P < 0.05$) suppressed for both doses tested.

In conclusion, this pilotstudy for the first time in Sri Lanka, demonstrated that this yet to be identified Demospongiae marine sponge species, may contain secondary metabolites that effectively immunomodulated the rat following a 14 consecutive day oral treatment regimen.
Keywords: Sri Lankan marine sponges, immunomodulation

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