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Marine sponges *Sarcotragus foetidus*, *Xestospongia carbonaria* and *Spongia obscura* constituents ameliorate IL-1 β and IL-6 in lipopolysaccharide-induced RAW 264.7 macrophages and carrageenan-induced oedema in rats

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Abstract

Marine sponges are prolific producers of an array of diverse chemical structures containing compounds with multiple biological activities. In this study, whole methanol extracts and fractionated compounds from three marine sponges namely *Xestospongia carbonaria*, *Sarcotragus foetidus* and *Spongia obscura* were thoroughly investigated for their antibacterial, antifungal, antioxidant and anti-inflammatory activities. Methanol extracts and fractionated compounds were characterised using high performance liquid chromatography-mass spectrometry and gas chromatography-mass spectrometry. Extracts were checked for cytotoxicity in RAW macrophages by MTT assay, before using them for the treatment study. Enzyme linked immunosorbent assay kits were used to check the effects on inflammatory mediator's levels (PGE₂, COX-2, IL-6, IL-1 β , TNF- α) in vitro. The results demonstrated good anti-inflammatory activity of all the three marine sponges; *X. carbonaria*, *S. foetidus* and *S. obscura* suppressed the levels of anti-inflammatory cytokines in vitro. Reverse transcriptase-polymerase chain reaction confirmed the inhibition of IL-1 β and IL-6 genes expression by the isolates of *X. carbonaria* and *S. foetidus*, while reducing cytokine levels in lipopolysaccharide-induced inflammation in vitro as well as in carrageenan-induced inflammation in rats. Two semi pure compounds isolated from *X. carbonaria* and *S. foetidus* also confirmed suppression of IL-1 β and IL-6 genes expression in RAW macrophages.

Keywords: COX-2; IL-1 β ; IL-6; Murine macrophage; NO; PGE2.

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