

Investigation of antimicrobial properties of *Axinella donnani* and *Xestospongia sp.*

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Sponges (phylum Porifera) are sessile marine filter feeders that have developed efficient defense mechanisms against their enemies which include viruses, bacteria, or eukaryotic organisms. Sponges are a good source of nucleosides, terpenes, sterols, cyclic peptides, alkaloids, fatty acids, peroxides and amino acid derivatives. These types of extracted bioactive substances have shown excellent anticancer, antibacterial, antifungal, antiviral, antiprotozoal, anthelmintic, anti-inflammatory, immunosuppressive, neuro suppressive and antifouling activities. However, very few studies have been conducted on Sri Lankan sponge fauna to investigate such properties. Hence, the main objective of this study was to investigate the antimicrobial activity of selected sponge samples from Pigeon Island, Trincomalee, Sri Lanka. Methanol (MeOH) and 1:1 dichloromethane:methanol (DCM:MeOH) extracts of *Axinella donnani* and *Xestospongia sp.* were tested for antimicrobial activity via disk diffusion assay against Gram positive bacteria: *Bacillus subtilis*, *Staphylococcus aureus*; Gram negative bacteria: *Pseudomonas aeruginosa*, *Escherichia coli* and two fungi, *Penicillium notatum*, *Curvularia lunata*. Antibacterial assay of the present research revealed that only methanol extracts of *Axinella donnani* sponge has antibacterial activity against Gram negative bacteria; *P. aeruginosa* showing 10.3 ± 0.1 mm inhibition zone. However, other three extracts did not show any antibacterial activity against the tested Gram positive and Gram negative bacteria. The methanol extract of *A. donnani* was subjected to Minimum Inhibitory Concentration (MIC) assay and the results showed the MIC value of 300 μ g per disk for *P. aeruginosa*. Also, antifungal assay with MeOH and DCM:MeOH extracts did not show any activity against the both fungal species tested in the study. Further studies are ongoing to isolate antimicrobial compounds from *A. donnani* sponge.

Keywords: Antibacterial activity, antifungal activity, crude extracts, marine sponges, Minimum Inhibitory Concentration

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