

Cytotoxic and antioxidant activities of some marine sponges from Sri Lanka evaluated by brine shrimp lethality test (BSLT) and DPPH assay

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Marine sponges are widely recognized as prolific sources of bioactive secondary metabolites with significant pharmacological potential. Despite documented sponge biodiversity along Sri Lankan coastlines, specimens from the Southern coast remain largely uncharacterised, representing a geographically distinct and unexplored chemical resource compared to previously studied Indo-Pacific populations. This study evaluated the cytotoxic and antioxidant activities of nine crude extracts from marine sponges collected at Kudawella, Southern Sri Lanka. Nine specimens were collected by scuba diving and morphologically identified to genus level. Sequential crude extracts were prepared by maceration in methanol, dichloromethane, and hexane 0.12% to 2.87% (w/w dry weight). Cytotoxic activity was assessed using the Brine Shrimp Lethality Test (BSLT) with *Artemia salina* nauplii (n=3 triplicates per extract) using potassium dichromate as positive control and artificial sea water as the negative control, and LC₅₀ values were determined by probit regression (Finney's method). Antioxidant activity was evaluated by the DPPH free radical scavenging assay. BSLT revealed high cytotoxicity in *Clathria* sp. (S02; LC₅₀ = 14.03 ± 1.2 ppm) and *Axinella* sp. (S05; LC₅₀

= 36.18 ± 2.1 ppm and S04; LC₅₀ = 57.54 ± 1.8 ppm), while *Suberites* sp. (S01; LC₅₀ = 407.38 ± 23.5 ppm and S03; LC₅₀ = 475.34 ± 28.4 ppm) showed moderate toxicity. *Halichondria* sp. (S06) and *Clathria* sp. (S09) were low toxic (LC₅₀ = 583.45 ± 35.1 ppm and 863.38 ± 51.8 ppm respectively) and order Tethyida specimens were non-toxic. DPPH assays indicated generally low antioxidant activity across extracts, with the highest scavenging observed in Order Tethyida (S07; %FRSA = 14.55 ± 0.9%), well below reference standards (ascorbic acid: 86.85%; BHT: 73.83%). These findings identify *Clathria* sp. and *Axinella* sp. as priority candidates for further bioassay-guided fractionation, characterization, and cell-line-based studies, supporting the exploration of Sri Lankan coastal sponges as potential sources of novel marine-derived pharmaceutical compounds.

Keywords:

Marine sponges, Cytotoxic activity, Brine Shrimp Lethality Test (BSLT), Antioxidant activity