

Antioxidant and cytotoxic effects of the tropical sponge *Neopetrosia* sp. crude extract and fractions

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Sponges (phylum Porifera), evolutionarily the oldest marine animals have recently emerged as prolific sources of novel active anti-cancer compounds, with promising avenues in drug discovery. Sponges of the genus *Neopetrosia* are particularly known as goldmines of cytotoxic compounds and its unique chemistry continues to generate interest as blueprints for medicinal chemistry. In this view, ongoing studies aim to explore the chemotherapeutic potential of the tropical sponge *Neopetrosia* sp collected from Mauritian waters. Using a battery of biological and chemical models, the total crude and fractionated extracts of *N. exigua* were assessed for their (i) metal chelating and free radical scavenging propensities (ii) cytotoxic effects against a panel of human cancer cell lines (esophageal, liver, liposarcoma, cervical and colon) evaluated by the Alamar blue metabolic assay and (iii) identification of bioactive compounds through Gas-chromatographic and mass-spectrometric analysis. The ethyl acetate fraction (EAF) showed the highest DPPH (IC₅₀: 0.54 ±0.06 mg/mL), superoxide (IC₅₀: 0.31 ±0.00 mg/mL), nitric oxide (0.44 ±0.06 mg/ml), hydroxyl (IC₅₀:0.56 ±0.05 mg/mL) and metal chelating (IC₅₀: 0.14 ±0.01 mg/mL) activities. Concomitantly the EAF also exhibited a dose dependent cytotoxic activity particularly against Flo-1 (esophageal), hela (cervical) and HepG2 (liver) with IC₅₀ values below 10 µg/mL. Fluorescent microscopical analysis revealed hallmark properties of apoptosis in treated HepG2 cancer cells. The EAF also induced an increase in reactive oxygen species generation in HepG2 cells, suggesting its potential involvement in the underlying apoptotic activity. Preliminary chemical screening of the active EAF identified the previously reported anticancer compound beta-sitosterol trimethylsilyl ether as the most significant component representing 23.9% of the extract. Overall, results reported herein suggest that the Mauritian sponge *Neopetrosia* sp extracts has high potential as chemotherapeutic agents that warrant further bioassay guided fractionation to isolate and identify active constituents present in its EAF and elucidate its molecular mechanism of action underlying its cytotoxic activity.