Abstract No: TO 14

Determination of cytotoxicity of some selected marine sponge extracts of Sri Lanka against the histiocytic human lymphoma cell line U-937

L. N. Kosgahakumbura[1,2], Taj Muhammad[2], J. B. Gamage[1,2], S. Gunasekera[2], P. Cárdenas[2], R. P. P. K. Jayasinghe[3] and C. M. Hettiarachchi[1]*

[1] *Department of Chemistry, University of Colombo, Colombo 03, Sri Lanka*

[2] *Pharmacognosy, Department of Pharmaceutical Biosciences, Biomedical Center, Uppsala University, Box 574, SE-751 23, Uppsala, Sweden*

[3] *National Aquatic Resources Research and Development Agency (NARA), Crow Island, Colombo 15, Sri Lanka*

**Corresponding author: chamarih@chem.cmb.ac.lk*

With the rapid emergence of cancerous diseases worldwide and the adverse side effects of existing therapeutics, discovering novel candidates from potential sources is critical. In this respect, marine sponges are a promising natural resource of anticancer compounds. The objective of this research was to determine the cytotoxic properties of marine sponges against histiocytic human lymphoma cell line U-937 GTB using Fluorometric Microculture Cytotoxicity Assay (FMCA). The cytotoxicity was determined in 19 sponge crude extracts (six aqueous, seven organic and six ethanolic extracts) using FMCA and the extracts with percentage Survival Index (%SI) less than 30% up to the concentration of 0.4 $mgmL^{-1}$ were selected as the potential candidates for microfractionation. The 48 fractions obtained after microfractionation using RP-HPLC at a flow rate of 1 $mLmin^{-1}$ were tested for cytotoxicity and the most abundant masses present in the bioactive fractions were analyzed using UPLC coupled to micromass MS. Of the seven crude extracts, the organic extracts of *Manihinea* sp. and *Acanthella* sp., the aqueous and ethanolic extracts of *S. massa* with % SI less than 15% up to the concentration of 0.2 $mgmL^{-1}$ were identified as the most potent specimens. After microfractionation, the bioactive fraction numbers 30-31 and 39 of the organic extract of *Acanthella* sp. showed the strongest cytotoxicity effect with a % SI of ~30% and ~6% respectively. However, rest of the extracts showed no cytotoxicity with a % SI between 50 to 65%. Synergistic effect, decomposition of the bioactive compounds or binding of the compounds to the column without eluting might be the reasons for the absence of cytotoxicity after fractionation. The most abundant masses serve as reasonable guide when targeting compounds for large scale isolation. Nevertheless, they may not necessarily be the exact parent monoisotopic mass, as a combination of masses could arise from potential hydration, Na/K adduct formation, dimerization as well as fragmentation of the parent ion mass. In essence, the present work allows the identification of specimens with cytotoxic properties in small scale, facilitating more targeted large scale isolation protocols, saving time and resources.

Keywords: sponges, cytotoxicity, *Acanthella*, microfractionation, Sri Lanka