



PROCEEDINGS

7th International Conference on Multidisciplinary Approaches -2020

*“Multidisciplinary Approach to Overcome Challenges Posed by COVID-19
towards National & Global Development”*

Organized by
Faculty of Graduate Studies
University of Sri Jayewardenepura
Nugegoda, Sri Lanka

08^h & 09th December 2020

IN-VITRO CYTOTOXIC ACTIVITY OF CRUDE METHANOL EXTRACT AND ITS FRACTIONS OF SRI LANKAN MARINE BROWN ALGAE *Choonospora minima* AGAINST HUMAN RHABDOMYOSARCOMA (RD) CELL LINE

Gunathilaka M.D.T.L.^{1,2}, Samarakoon K.W.⁴, Ranasinghe P.³
and Peiris L.D.C.^{1*}

¹Department of Zoology, University of Sri Jayewardenepura, Sri Lanka

²Faculty of Graduate Studies, University of Sri Jayewardenepura, Sri Lanka

³Industrial Technology Institute, Malabe, Sri Lanka

⁴National Science and Technology Commission, Battaramulla, Sri Lanka

dinithi@sci.sjp.ac.lk

Abstract

Seaweeds are an important source of bioactive metabolites in drug development and nutraceuticals. The aim of this study was to investigate the *in vitro* cytotoxic activity of de-polysaccharide methanol extract and partition fractions of hexane, chloroform, ethyl acetate (EtOAc) and aqueous fractions of brown algae *Choonospora minima* against human rhabdomyosarcoma (RD) cell line. The selected fractions and crude methanol extract were subjected for MTT and neutral red uptake assay to determine the cell viability. Apoptotic morphological features were observed using crystal violet and fluorescence dye Hoechst staining methods. The results of both MTT and neutral red assay showed that the decrease of the percentage of cell viability in dose dependent manner as signified by cell death. The hexane and chloroform fractions of *C.minima* showed potential cytotoxic activity with IC₅₀ of 93.98±1.33 µg/ml and 106.94±1.68 µg/ml against human rhabdomyosarcoma (RD) cell line compared to the standard cycloheximide (IC₅₀: 36.17±1.78 µg/ml). In addition, a significant cytotoxic activity was observed between total crude extract and fractions of *C.minima* against RD cell lines (P>0.05). Further, potential cytotoxic activity of hexane (133.13±4.50 µg/ml) and chloroform (142.09±0.64 µg/ml) fractions of *C.minima* was confirmed by neutral red assay compared to the standard cycloheximide (32.78±0.91µg/ml). Gas chromatography-mass spectrometry analysis of the hexane fraction revealed the presence of several anti-cancer compounds. In addition, apoptotic morphological features such as cell membrane blebbing, formation of membrane bound vesicle, nuclear fragmentation and micro nuclei formation, cellular shrinkage, cellular aggregation and formation of cell clumps and chromatin condensation were observed both in hexane and chloroform fractions of *C.minima* when stained with crystal violet and florescence dye Hoechst stain. The results suggest that the hexane fraction of *C. minima* is a potential source of natural compounds to combat as anti-cancer therapy. The research grant (ASP/01/RE/SCI/2017/50) by University of Sri Jayewardenepura is acknowledged.

Keywords: *Choonospora minima*, Anti-cancer, Rhabdomyosarcoma, MTT, Neutral red, Morphology