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In vitro antiproliferative activity of methanolic fraction of *Rubus fairholmianus* Gard. Root on MCF-7 human breast cancer cells

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Traditional plant based system of medicine or herbal medicine is an important part of the health care system in most of the countries. *Rubus* is one of the important genera with significant pharmacological activities. Aim of this study is to focus the importance of *Rubus fairholmianus* in the pharmaceutical industry for the development of cost-effective drugs for cancer treatment. The *in vivo* antitumor, pharmacological and antioxidant properties of this plant encouraged authors to study the *in vitro* anticancer activities. Morphological examination of MCF-7 cells after 24 h treatment with *Rubus fairholmianus* methanolic sub-fraction (RFM) was observed by inverted microscopy. The cell viability was determined by trypan blue dye exclusion assay. The CellTiter-Glo[1] luminescent ATP assay carried out to estimate the proliferation rates by measuring cellular ATP levels. The release of LDH is a measure of cell membrane damage to the cells after RFM treatment and it was measured by CytoTox96[1] Assay. The Annexin V-FITC apoptosis detection kit was used to distinguish the apoptotic and non-apoptotic cells using flow cytometry. The morphological features of RFM treated cells showed the decreased cell numbers and induction of apoptosis. The viability of treated cells decreased considerably in a dose dependant manner. Viability of untreated cells was 95.8% whereas the treated cells showed 80.52, 71.98 and 56.72% for 5, 10 and 20 µg/ml, concentrations. The increased ATP level of untreated cells depicts the higher energetic level. The RFM treated cells resulted a substantial decrease (p<0.001) in cellular proliferation. The treatments activated a higher release of LDH and showed an increase in LDH levels significantly. The population of apoptotic cells increased with increase in concentration of RFM. The RFM treated cells showed an increase in the percentages of early and late apoptotic cells. The non-apoptotic or necrotic cells concentration in the treated groups found to be very low. In the untreated groups; the population of early and late apoptotic cells were less. When MCF-7 cells were treated with RFM, the apoptotic population increased concurrently and induced a decrease in the viable cell (Annexin V-/PI-) population. This is the first evidence about the *in vitro* antiproliferative activity of RFM on MCF-7 human breast cancer cells. Further work is wanted to characterise the bioactive compounds responsible for the cell death. Due to the apoptosis inducing properties of this extract, it can be considered as an effective adjuvant therapeutic agent after the clinical trials.

Biography:

Dr. Blassan P George is a postdoctoral research fellow, doing research in photodynamic therapy of cancer at Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa since July 2014 under the supervision of Prof. Heidi Abrahamse. His interests include phyto-pharmacological evaluation of berries collected from Western Ghats with special reference to cancer. He has completed the anticancer activities of *Rubus* species in breast, colorectal, lung cancer and melanoma cells and the results have been published and presented in international accredited journals and conferences. Currently he engaged in testing the phototoxic activities of *Rubus* extracts and the coupled phthalocyanine photosensitizers on breast cancer cells. He received PhD degree in Biotechnology from Bharathiar University, India.