Ex vivo cytotoxic activity of *Eragrostis Tremula* on MCF-7 Human Breast Cancer Cells Via Induction of Apoptosis

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ABSTRACT

Statement of the Problem: Plants have been used for medical purposes since the beginning of human history and are the basis of modern medicine. Most chemotherapeutic drugs for cancer treatment are molecules identified and isolated from plants or their synthetic derivatives. Current therapeutic

approaches which include surgery, chemotherapy and radiotherapy are associated with adverse side effects arising from lack of specificity for tumours. Here we show that the methanolic root extract of Eragrostis tremula could be an effective alternative anti-tumour agent.

Methodology and Theoritical Orientation: Phytochemical screening of the methanolic roots extract by using different biochemical tests confirmed the presence of phyto-constituents like Alkaloids, Flavonoids, Glycosides, Phenol, Saponin, Steroids/Terpenoids, Tanin, and Cardial glycoside. Ex vivo cytotoxic activities of extracted root on cancerous and non-cancerous cell lines were evaluated by using (3-(4, 5-dimethyl thiazole2yl)-2,5-diphenyl tetrazolium bromide) MTT-based assay and Cychlophophamine(CPY) as control.

Findings: The result of IC50 show selective cytotoxicity on tumour cell line MCF7/CPY (4.68±0.46/0.42±0.01µg/mL). The cytotoxic effect which is dose dependent was found to be significant. The extract failed to show cytotoxicity on HaCaT/CPY (97.22±0.45/77.3±0.8 µg/mL) cells at the concentration that was cytotoxic to tumour cell lines, indicating less cytotoxic effects of the extract against human 'non-cancerous' cells). Furthermore, Hoechst 33342 staining and DNA fragmentation assays revealed hallmark properties of apoptosis such as membrane blebbing, nuclear condensations, and DNA fragmentation.

Conclusion& significance: Conclusion& Significance: The methanolic root extract of *Eragrostis tremula* could be an effective alternative as an anti-tumour agent and the specificity index need to be further evaluated with multiple tumor cell lines to establish its universality. Also to be further evaluated is the mechanisms of cytotoxicity.

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