Evaluation of anti-proliferative potential of medicinal plant extracts on cervical cancer cell lines

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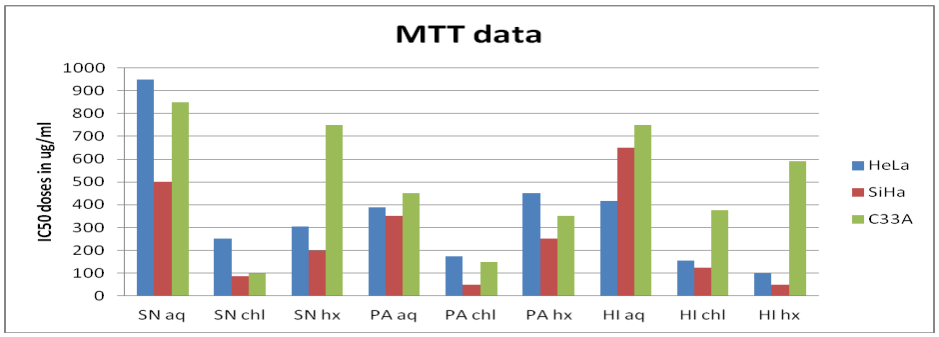
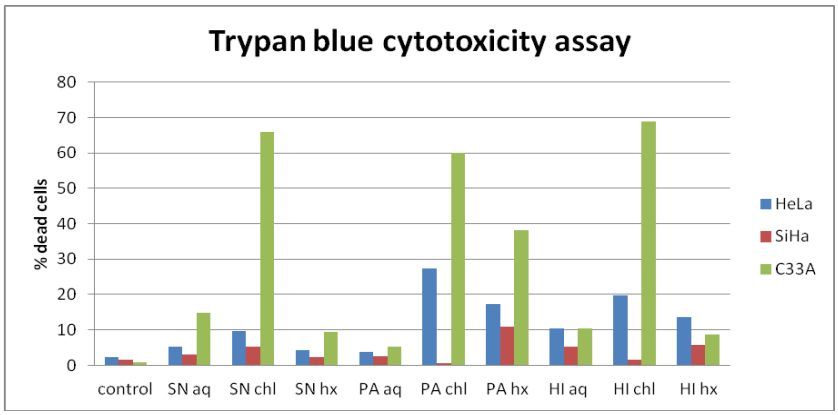
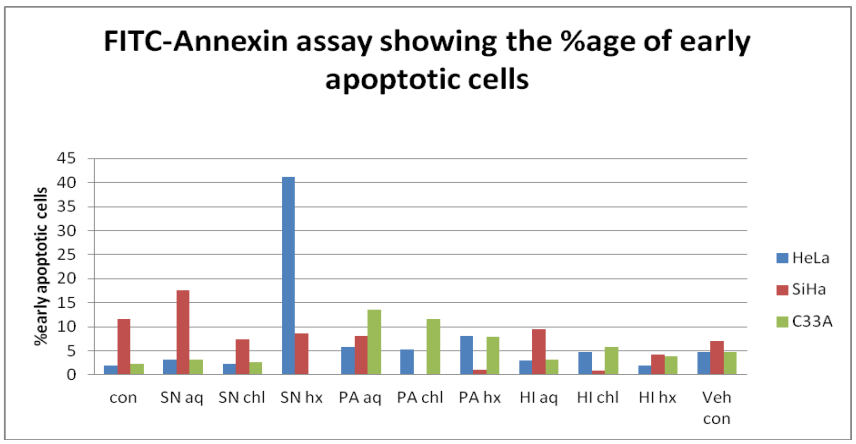
Cancer cell lines are deficient in the process of apoptosis or programmed cell death. Therefore induction of apoptosis has become an approach for cancer therapeutics. Evaluation of anti proliferative activity of aqueous and organic extracts of three medicinal plants, namely *Phyllanthus amarus* (Euphorbiaceae), *Solanum nigrum L*. (Solanaceae) and *Heliotropium indicum* L. (Boraginaceae) mainly through induction of apoptosis in cervical cancer cell lines (SiHa, HeLa and C33A) is the main objective of this project. Dried and powdered whole plants were weighed (50g) and extracted with methanol and distilled water. The extracts were then lyophilized and dissolved in their respective solvents to obtain the desired concentration. Cells (HeLa, SiHa and C33A) were then treated with the Aqueous, hexane and Methanolic extracts of *Phyllanthus amarus* ($P_{aq,}$ P_{hx} and P_{mt}), *Heliotropium indicum* ($H_{aq,}H_{hx}$ and H_{mt}) and *Solanum nigrum*(S_{aq} S_{hx} and S_{mt}). After 24 hrs of treatment, cells were stained with Hoechst 33258 for nuclear morphology study.MTT assay was undertaken to determine the IC50 doses of the extract. Percentage of apoptotic cells were estimated by Annexin-FITC assay. Single cell Gel Electrophoresis was undertaken to study DNA damage. From our study it was observed that,

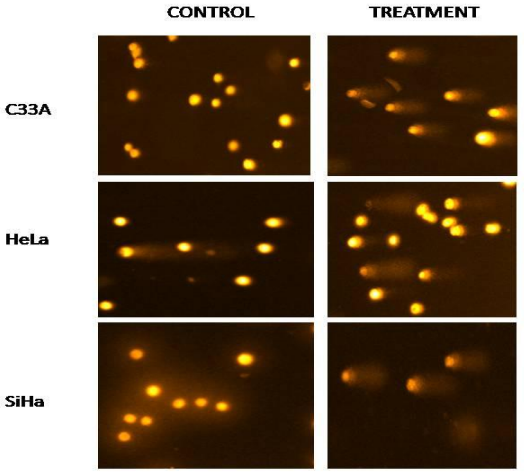
***Solanum nigrum* extracts**: Hexane fraction works at higher concentration for HeLa and C33A cell lines while the MeOH-H2O works at higher concentration for all cell lines. Chloroform fraction is effective at lower concentration.
***Phyllanthus amarus* extracts**: Hexane and MeOH-H2O fraction is capable of causing 50% cell death at concentration below 100µg/µl. Chloroform fraction works equally well at lower concentrations for all three cell lines.
***Heliotropium indicum* extracts**: HeLa and SiHa cell lines are the most affected with lower concentration of the hexane fraction.

Percentage of late apoptotic cells were mostly observed after 24 hrs. treatment in all the cells treated with the plant extracts. From the above obtained results it can be deduced that *Phyllanthus amarus* extract is the most effective one as it is capable of causing cell death at much lower concentration than the other two.









Cells were treated with *S.nigrum* (Chloroform extract) and studied by SCGE,treated cells showed tails indicating damaged DNA.