

## ABSTRACT

The devastating effect of cancer is a worldwide concern. In Kenya, cancer is ranked third cause of death after infectious and cardiovascular diseases. Unfortunately current therapeutic modalities have been found to possess side effects coupled with the emergence of anticancer drug resistance. This has necessitated the search for novel therapeutic products with better efficacy, safety and affordability through identification of anti-tumor agents from natural products. In this study the laboratory based *in vitro* antineoplastic activity and phytochemical profiles of methanol extracts of four medicinal plants, *Piptadinastrum africanum*, *Kigelia africana*, *Centella asiatica* and *Chaemocrista nigricans* was investigated against NCI-H1155 lung adenocarcinoma cell line. These plants were obtained from ethnopharmacological survey previously done within Lake Victoria Basin. Extraction and concentration of the collected and dried plant samples to obtain crude extracts as well as phytochemical screening of the crude extracts was done following phytochemical standard procedures. The cell line, from American type cell culture (ATCC), was exposed to the extracts at varying concentrations and antiproliferative analysis using 3-(4, 5-Dimethyl-2-thiazolyl)-2, 5-diphenyl-2-tetrazolium bromide (MTT) colorimetric assay was performed. Statistical differences among fractions of the extract were determined by one way ANOVA. Qualitative Phytochemical analysis of each of the four plants extracts showed presence of terpenoids, alkaloids, saponins, tannins and steroids. Steroids were higher in the bark of *P. africanum* and the fruits of *K. africana*. Flavonoid was absent only in extracts of *C. nigricans* and coumarins present only in the extracts of *K. africana*. The methanolic extracts of the fruits of *K. africana*, leaves of *C. asiatica*, bark of *P. africanum* and *C. nigricans* had inhibitory effects with  $IC_{50}$  8.07ug/ml, 15.69ug/ml, 26.57ug/ml and 28.86ug/ml (p values of 0.055, 0.042, 0.069, and 0.079) respectively. The MTT assay results indicated that all the extracts exerted selected dose dependent inhibition actions on NCI-H1155 cells. The phytochemical compounds were found to trigger morphological changes (blebbing pattern and cell shrinkage) that are associated with apoptosis in the lung adenocarcinoma cell lines. The varying inhibitory activities against tested human lung adenocarcinoma cell line justify the traditional use of these plants in the management of cancers. These data lend support for traditional use of these plants as anti-tumor agents and potential source of natural products for treatment of cancer especially in resource limited countries. However, further phytochemical

characterization of the extracts and flow cytometric analysis is necessary to exhaustively describe the mechanisms of cancer cell apoptosis of these four plant extracts.