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Cytotoxic activity of a plant extract on cancer cells

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Chemoprevention by natural products may be considered a promising approach to cancer control and management [1]. Many studies have demonstrated antiproliferative, cytostatic and cytotoxic activities of phytochemicals against cancer cells [2]. In this study, a plant extract from *Arctium lappa*, *Berberis vulgaris* and *Eschscholtia californica* was tested as potential anticancer agent. The antitumoral activity of this plant extract was tested on four human cancer cell lines: MCF-7 (breast carcinoma cells), Huh-7 (hepatic carcinoma cells), HTB-43 (oropharyngeal carcinoma cells) and ECV-304 (urinary bladder carcinoma cells). The efficacy of the extract was compared to the common chemotherapeutic agent cyclophosphamide. Three plant extract concentrations were tested: 800, 650 and 450 ng/ml; for cyclophosphamide, three concentrations were assayed, according to literature data: 1300, 1000 and 850 ng/ml [3]. In addition, plant extract and cyclophosphamide were tested on two primary cell lines as controls, human gingival fibroblasts and human mammary fibroblasts. Cell viability was evaluated by the MTT [(3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide, Sigma] colorimetric assay and the new xCELLigence system (Roche) for real-time monitoring of cell viability. All concentrations of plant extract exhibited a high level of cytotoxicity on MCF-7, Huh-7, HTB-43 and ECV-304 cancer cells, similar to cyclophosphamide, though they slightly reduced viability of human gingival and mammary fibroblasts. Conversely, the conventional chemotherapeutic drug showed a marked cytotoxicity on control cells. The potential of the plant extract has been demonstrated *in vitro* on various types of cancers, suggesting a possible use of this natural product as a promising anticancer agent. Further studies are needed to ascertain its efficacy *in vivo* and to elucidate its mechanism(s) of action at molecular and biochemical levels.

References

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Key words

Antitumor activity, anticancer agents, xCELLigence System, .phytotherapy, cancer chemoprevtion, natural products.