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Investigation of Cytotoxic Compounds in Ethyl Acetate and Chloroform Extracts of Nigella sativa Seeds by Sulforhodamine-B Assay-Guided Fractionation

Authors : Harshani Uggallage, Kapila D. Dissanayaka

Abstract : A Sulforhodamine-B assay-guided fractionation on Nigella sativa seeds was conducted to determine the presence of cytotoxic compounds against human hepatoma (HepG2) cells. Initially, a freeze-dried sample of Nigella sativa seeds was sequentially extracted into solvents of increasing polarities. Crude extracts from the sequential extraction of Nigella sativa seeds in chloroform and ethyl acetate showed the highest cytotoxicity. The combined mixture of these two extracts was subjected to bioassay guided fractionation using a modified Kupchan method of partitioning, followed by Sephadex® LH-20 chromatography. This chromatographic separation process resulted in a column fraction with a convincing IC50 (half-maximal inhibitory concentration) value of 13.07µg/ml, which is considerable for developing therapeutic drug leads against human hepatoma. Reversed phase High-Performance Liquid Chromatography (HPLC) was finally conducted for the same column fraction, and the result indicates the presence of one or several main cytotoxic compounds against human HepG2 cells.

Keywords : cytotoxic compounds, half-maximal inhibitory concentration, high-performance liquid chromatography, human HepG2 cells, nigella sativa seeds, Sulforhodamine-B assay
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