Typhonium flagelliforme inhibits cancer cell growth in vitro and induces apoptosis: an evaluation by the bioactivity guided approach.

Full Abstract

AIM

OF THE STUDY:
Typhonium flagelliforme (Lodd.) Blume (Araceae) is a Malaysian plant used locally to combat cancer. In order to evaluate its antiproliferative activity in vitro and to possibly identify the active chemical constituents, a bioactivity guided study was conducted on the extracts of this plant.

MATERIALS AND METHODS:
The active extracts of Typhonium flagelliforme were fractionated by flash column chromatography and each fraction was evaluated for antiproliferative activity using MTT assay. The apoptotic effect of the active fraction was determined microscopically and by using TUNEL colorimetric assay. GC-MS and NMR were used to determine the chemical constituents of this active fraction.

RESULTS:
Several fractions of the hexane and dichloromethane extracts were found to inhibit the growth of NCI-H23 non-small cell lung carcinoma cell line significantly, with IC(50)<15 microg/ml. However, most of these active fractions were also found to inhibit the growth of non-tumorigenic BALB/c 3T3 mouse fibroblast cell line except for fraction 21 of the dichloromethane extract (D/F21). This particular fraction was not only less cytotoxic to the non-tumorigenic cells, where the IC(50) was 48.6 microg/ml compared to IC(50) 7.5 microg/ml for NCI-H23, but it was also found to induce apoptosis in the cancer cell line. GC-MS analysis revealed that D/F21 contains hexadecanoic acid, 1-hexadecene, phytol and a derivative of phytol. The presence of non-saturated fatty acids in this fraction was confirmed by nuclear magnetic resonance spectroscopy.

CONCLUSIONS:
D/F21 was found to be the active and cancer cell line specific fraction of Typhonium flagelliforme. Its major chemical constituents had been determined spectroscopically.

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