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Cratoxy Formosum (Jack) Dyer Leaf Extract-Induced Human Breast and Liver Cancer Cells Death

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Abstract : Cratoxylum formosum (Jack) Dyer (CF) has been used for the traditional medicines in South East Asian and Thailand. Normally, northeast Thai vegetables have proven cytotoxic to many cancer cells. Therefore, the present study aims to explore the molecular mechanisms underlying CF-induced cancer cell death and apoptosis on breast and liver cancer cells. The cytotoxicity and antiproliferative effects of CF on the human breast MCF-7 and liver HepG2 cancer cell lines were evaluated using sulforhodamine B assay and colony formation assay. Cell migration assay was measured using wound healing assay. The apoptosis induction mechanisms were investigated through reactive oxygen species formation, caspase 3 activity, and JC-1 activity. Gene expression by real-time PCR and apoptosis related protein levels by Western blot analysis. CF induced MCF-7 and HepG2 cell death by time- and dose-dependent manner. Furthermore, CF had the greater cytotoxic potency on MCF-7 more than HepG2 cells with IC50 values of 85.70+4.52 µM and 219.03±9.96 µM respectively, at 24 h. Treatment with CF also caused a dose-dependent decrease in colony forming ability and cell migration, especially on MCF-7 cells. CF induced ROS formation, increased caspase 3 activities, and decreased the mitochondrial membrane potential, and causing apoptotic body production and DNA fragmentation. CF significantly decreased expression of the cell cycle regulatory protein RAC1 and downstream proteins, cdk6. Additionally, CF enhanced p21 and reduced cyclin D1 protein levels. CF leaf extract induced cell death, apoptosis, antimigration in both of MCF-7 and HepG2 cells. CF could be useful for developing to anticancer drug candidate for breast and liver cancer therapy.

Keywords : cratoxylum formosum (jack) dyer, breast cancer, liver cancer, cell death
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