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TITLE

Cytotoxic Effects of Polymethoxyflavones Isolated from Kaempferia parviflora

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Although several studies covered the anti-proliferative and cytotoxic effects of the rhizome extracts of *Kaempferia parviflora* Wall. ex. Baker towards cancer cells, cytotoxicity of its pure methoxyflavone components remain undetermined. This study was aimed to evaluate the cytotoxicity of 3,5,7,4'-tetramethoxyflavone (TeMF), 5,7,4'-trimethoxyflavone (TMF), and 5-hydroxy-3,7,3',4'-tetramethoxyflavone (5-H-TeMF) purified from its rhizome extracts on human colorectal carcinoma (HCT-15) cells. All these three compounds showed a dose-dependent inhibitory effect on HCT-15 cells. Significant numbers of apoptotic nuclei and quantities of condensed chromatin were also observed. TMF produced a higher level of fragmented DNA compared to TeMF or 5-H-TeMF. In addition TMF-treated cells showed the highest levels of caspase-3 activity than those treated with the other two compounds. Caspase-3 activity was reduced when Z-VAD-FMK, a caspase inhibitor, was administered along with each compound. Furthermore, caspase-3 activity was increased by the four concentrations of TMF in a dose-dependent manner. These results strongly suggest that TeMF, TMF, and 5-H-TeMF caused cell death *via* an apoptotic pathway. Therefore all these compounds have the potentiality to be the novel anti-cancer drugs.