Identification and Quantification of Quercetin, A Major Constituent of Artocarpus altilis by Targeting Related Genes of Apoptosis and Cell Cycle: In Vitro Cytotoxic Activity Against Human Lung Carcinoma Cell Lines

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Abstract
Nine phenolic compounds were identified and quantified in Artocarpus altilis fruit. One of the main compounds was quercetin, which is the major class of flavanoids. It has been identified and quantified in pulp part of A. altilis fruit of methanol extract. The aim of the study was to evaluate in vitro cytotoxic assay. Inhibition on concentration 50% on cell activity was determined using trypan blue exclusion assay. Apoptosis induction and cell cycle regulation were studied by flow cytometric analysis. The expression of apoptosis and cell cycle-related regulatory genes were assessed by RT-qPCR study in the methanol extract of pulp part on human lung carcinoma (A549) cell line. A significant increase of cells at G2/M phase was detected (P < 0.05). Furthermore, the pulp of the fruit downregulated the expression of anti-apoptosis gene BCL-2 and upregulated the expression of pro-apoptosis gene BAX. CASPASE-3 was also activated by the fruit, which started a CASPASE-3 dependent mitochondrial pathway to induce apoptosis. As the results, the pulp was the most active in terms of all tests, due to high amount of quercetin in pulp part, 78% of total flavonoids. Taken together, these findings suggested that A. altilis induces apoptosis in a mitochondrial-dependent pathway by releasing and upregulating CYTOCHROME C expression and regulates the expression of downstream apoptotic components, including BCL-2 and BAX.

Keywords
KeyWords Plus: P. COMUMARIC ACID; PHENOLIC COMPOUNDS; CANCER STATISTICS; NITRIC OXIDE; ANTIPROLIFERATIVE ACTIVITY; LIQUID CHROMATOGRAPHY; FRUIT EXTRACT; G2/M ARREST; FERULIC ACID; HUMAN BREAST

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