UNIVERSITI TEKNOLOGI MARA

CHEMICAL CONSTITUENTS OF *POLYALTHIA CAULIFLORA* VAR. *CAULIFLORA*

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Thesis submitted in fulfillment of the requirement
for the degree of
Master of Science

Faculty of Applied Sciences

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Candidate's Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non academic institution for any other degree of qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

The stem bark of *Polyalthia cauliflora* var. *cauliflora* from the family of Annonaceae was investigated for its chemical content and biological activity. A total of ten compounds was isolated from this plant. Various chromatographic methods were used to separate all compounds including VLC, glass column, centrifugal chromatography and preparative thin layer chromatography. Phytochemical studies on the stem bark of *P. cauliflora* var. *cauliflora* resulted in the isolation of seven flavonoids; five flavones and two chalcones and two oxoaporphine alkaloids. The flavonoids obtained were 3,7-dimethoxy-5-hydroxyflavone, 5,8-dihydroxy-6,7-dimethoxyflavone, tectochrysin, 6,7-dimethoxy-5-hydroxyflavone, 5-hydroxyl-3,7,8-trimethoxyflavone, 2',4'-dihydroxy-3'-methoxychalcone and 2',4'-dihydroxychalcone while alkaloids isolated were liriodenine and lanuginosine. In addition, a mixture of phytosterol; β-sitosterol and stigmasterol was also isolated from the stem bark of *P. cauliflora* var. *cauliflora*. Structural elucidation was performed with the aid of spectroscopic methods such as ultraviolet (UV), infrared (IR), mass spectrometry (MS), 1D and 2D nuclear magnetic resonance (NMR)-COSY, HMQC and HMBC. The alcoholic crude extract was subjected to antioxidant assays which gave good activity with the percent inhibition of 98-100 % of FTC assays and 73-89 % of TBA assays. A comparison on the strength of two variety of *P. cauliflora* (*P. cauliflora* var. *cauliflora* and *P. cauliflora* var. *beccarii*) against six bacteria in antimicrobial assays was also carried out. Both crudes show weak activities against *Bacillus spizizenii* and *Staphylococcus aureus* and no activity at all against other four bacteria; *Pseudomonas aeruginosa*, *Escherichia coli*, *Salmonella typhimurium* and *Streptococcus pyogene*. Selected compounds **PCB4** and **PCB6** (6,7-dimethoxy-5-hydroxyflavone and 2',4'-dihydroxy-3'-methoxychalcone) were subjected to cytotoxic assays against three different cell lines which were HeLa (cervical cancer), HL-60 (leukemia) and MCF-7 (breast cancer). 2',4'-dihydroxy-3'-methoxychalcone (**PCB6**) shows strong activity against HL-60 and moderate activity against HeLa and MCF-7 with the IC_{50} 5.1 μg/ml, 12.2 μg/ml and 12.5 μg/ml, respectively. 6,7-dimethoxy-5-hydroxyflavone (**PCB4**) shows a weak activity against HeLa and HL-60 with the IC_{50} 25.1 μg/ml and 25.2 μg/ml, respectively and no activity at all against MCF-7.

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Nurunajah Ab. Ghani
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