

Title: **Apoptosis, antimicrobial and antioxidant activities of phytochemicals from *Garcinia malaccensis* Hk.f**

Authors: Muhammad Taher ^a, Deny Susanti ^b, Mohamad Fazlin Rezali ^c, Farah Syahidah Ahmad Zohri ^b, Solachuddin Jauhari Arief Ichwan ^d, Suhaib Ibrahim Alkhamaiseh ^a, Farediah Ahmad ^e

^a Department of Pharmaceutical Technology, Kulliyah of Pharmacy, International Islamic University Malaysia, Jalan Istana, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia

^b Department of Biomedical Science, Kulliyah of Science, International Islamic University Malaysia, Jalan Istana, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia

^c National Metrology Institute of Malaysia, Lot PT 4803, Bandar Baru Salak Tinggi, 43900 Sepang, Selangor, Malaysia

^d Kulliyah of Dentistry, International Islamic University Malaysia, Jalan Istana, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia

^e Department of Chemistry, Faculty of Science, University Teknologi Malaysia, 81310 UTM, Johor, Malaysia

Journal: Asian Pacific Journal of Tropical Medicine, Volume 5, Issue 2, February 2012, Pages 136–141

Abstract

Objective

To study the chemical constituents of stembark of *Garcinia malaccensis* (*G. malaccensis*) together with apoptotic, antimicrobial and antioxidant activities.

Methods

Purification and structure elucidation were carried out by chromatographic and spectroscopic techniques, respectively. MTT and trypan blue exclusion methods were performed to study the cytotoxic activity. Antibacterial activity was conducted by disc diffusion and microdilution methods, whereas antioxidant activities were done by ferric thiocyanate method and DPPH radical scavenging.

Results

The phytochemical study led to the isolation of α,β -mangostin and cycloart-24-en-3 β -ol. α -Mangostin exhibited cytotoxic activity against HSC-3 cells with an IC₅₀ of 0.33 μ M. β - and α -mangostin showed activity against K562 cells with IC₅₀ of 0.40 μ M and 0.48 μ M, respectively. α -Mangostin was active against Gram-positive bacteria, *Staphylococcus aureus* (*S. aureus*) and *Bacillus anthracis* (*B. anthracis*) with inhibition zone and MIC value of (19 mm; 0.025 mg/mL) and (20 mm; 0.013 mg/mL), respectively. In antioxidant assay, α -mangostin exhibited activity as an inhibitor of lipid peroxidation.

Conclusions

G. malaccensis presence α - and β -mangostin and cycloart-24-en-3 β -ol. β -Mangostin was found very active against HSC-3 cells and K562. The results suggest that mangostins derivatives have the potential to inhibit the growth of cancer cells by inducing apoptosis. In addition, α - and β -mangostin was found inhibit the growth of Gram-positive pathogenic bacteria and also showed the activity as an inhibitor of lipid peroxidation.