Objective
To study the chemical constituents of stem bark 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-3β-ol. α-Mangostin exhibited cytotoxic activity against HSC-3 cells with an IC50 of 0.33 μM. β- and α-mangostin showed activity against K562 cells with IC50 of 0.40 μM and 0.48 μM, 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-3β-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.