

Cytotoxic properties and complete nuclear magnetic resonance assignment of isolated xanthenes from the root of *Garcinia cowa* Roxb.

ABSTRACT

Objective: To isolate compounds from the roots of *Garcinia cowa* and to evaluate their cytotoxic activity against breast (MCF-7), prostate (DU-145), and lung (H-460) cell lines.

Materials and Methods: The ground air-dried root was sequentially macerated with hexane, dichloromethane (DCM), ethyl acetate (EtOAc), and methanol. The DCM soluble extract was fractionated by vacuum liquid chromatography, column chromatography, and radial chromatography over silica gel with hexane, EtOAc and methanol as eluent in progressively increasing polarity manner; to yield three compounds. Their structures were elucidated based on their spectroscopic data and their comparison with those of the literature. The cytotoxicity of isolated compounds was carried out against human cell lines by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide colorimetric assay. The extract was added at various concentrations (0.1, 1, 10 and 100 mg/ml). The level of cytotoxicity was determined by calculating the level of IC₅₀ that was based on the percentage of the cell death following the 24 h incubation with the extract.

Results: Phytochemical study on the roots of *G. cowa* yielded rubraxanthone (3), cowanine (4) and 1,5-dihydroxyxanthone (5). Compound 4 with an IC₅₀ value of $4.1 \pm 1.0 \mu\text{M}$, $5.4 \pm 2.3 \mu\text{M}$ and $11.3 \pm 10.0 \mu\text{M}$ against MCF-7, H-460, and DU-145, respectively while compound 3 was found to be inactive.

Conclusion: The results indicate that *G. cowa* roots could be important sources of natural cytotoxic compounds.

Keyword: Cytotoxic activity; DU-145; *Garcinia cowa* Roxb.; H-460; MCF-7; Nuclear magnetic resonance; Spectroscopy; Structure elucidation; Xanthone