

## In vivo carbon tetrachloride-induced hepatoprotective and in vitro cytotoxic activities of *Garcinia hombroniana* (seashore mangosteen)

### ABSTRACT

Background: *Garcinia hombroniana*, known as "manggis hutan" (jungle mangosteen) in Malaysia, is distributed in tropical Asia, Borneo, Thailand, Andaman, Nicobar Islands, Vietnam and India. In Malaysia, its ripened crimson sour fruit rind is used as a seasoning agent in curries and culinary dishes. Its roots and leaves decoction is used against skin infections and after child birth. This study aimed to evaluate *in vivo* hepatoprotective and *in vitro* cytotoxic activities of 20% methanolic ethyl acetate (MEA) *G. hombroniana* bark extract. Materials and methods: In hepatoprotective activity, liver damage was induced by treating rats with 1.0 mL carbon tetrachloride (CCl<sub>4</sub>)/kg and MEA extract was administered at a dose of 50, 250 and 500 mg/kg 24 h before intoxication with CCl<sub>4</sub>. Cytotoxicity study was performed on MCF-7 (human breast cancer), DBTRG (human glioblastoma), PC-3 (human prostate cancer) and U2OS (human osteosarcoma) cell lines. <sup>1</sup>H, <sup>13</sup>C-NMR (nuclear magnetic resonance), and IR (infrared) spectral analyses were also conducted for MEA extract. Results: In hepatoprotective activity evaluation, MEA extract at a higher dose level of 500 mg/kg showed significant (p<0.05) potency. In cytotoxicity study, MEA extract was more toxic towards MCF-7 and DBTRG cell lines causing 78.7% and 64.3% cell death, respectively. MEA extract in <sup>1</sup>H, <sup>13</sup>C-NMR, and IR spectra exhibited bands, signals and *J* (coupling constant) values representing aromatic/phenolic constituents. Conclusions: From the results, it could be concluded that MEA extract has potency to inhibit hepatotoxicity and MCF-7 and DBTRG cancer cell lines which might be due to the phenolic compounds depicted from NMR and IR spectra.

**Keyword:** Carbon tetrachloride; *Garcinia hombroniana*; Hepatoprotective activity; Cytotoxicity; NMR