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Methanol extract of *Muntingia calabura* leaves attenuates CCl₄-induced liver injury: possible synergistic action of flavonoids and volatile bioactive compounds on endogenous defence system (Article)

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Abstract

CONTEXT: *Muntingia calabura* L. (Muntingiaceae) exerts antioxidant and anti-inflammatory activities, thus, it might be a good hepatoprotective agent. OBJECTIVE: This study investigates the effect of methanol extract of *M. calabura* leaves (MMCL) on hepatic antioxidant and anti-inflammatory activities in CCl₄-induced hepatotoxic rat. MATERIALS AND METHODS: Sprague Dawley rats (n = 6) were treated (p.o.) with 10% DMSO (Groups 1 and 2), 50 mg/kg N-acetylcysteine (Group 3) or, 50, 250, or 500 mg/kg MMCL (Groups 4-6) for 7 consecutive days followed by pretreatment (i.p.) with vehicle (Group 1) or 50% CCl₄ in olive oil (v/v) (Groups 2-6) on day 7th. Plasma liver enzymes and hepatic antioxidant enzymes and pro-inflammatory cytokines concentrations were measured while liver histopathology was examined. RESULTS: MMCL, at 500 mg/kg, significantly (p < 0.05) ameliorated CCl₄-induced hepatotoxicity by decreasing the plasma level of alanine transaminase (429.1 versus 168.7 U/L) and aspartate transaminase (513.8 versus 438.1 U/L) as well as the tissue level of nitric oxide (62.7 versus 24.1 nmol/g tissue). At 50, 250, or 500 mg/kg, MMCL significantly (p < 0.05) reduced the tumour necrosis factor α (87.8 versus 32.7 pg/mg tissue), interleukin-1β (1474.4 versus 618.3 pg/mg tissue), and interleukin-6 (136.7 versus 30.8 pg/mg tissue) while increased the liver catalase (92.1 versus 114.4 U/g tissue) and superoxide dismutase (3.4 versus 5.5 U/g tissue). Additionally, qualitative phytochemicals analysis showed that MMCL contained gallic acid, ferulic acid, quercetin, and genistein. DISCUSSION AND CONCLUSIONS: MMCL ability to attenuate CCl₄-induced hepatotoxicity could be helpful in the development of hepatoprotective agents with fewer side effects.

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