

Mechanisms of gastroprotection of methanol extract of *Melastoma malabathricum* leaves

ABSTRACT

Background

Melastoma malabathricum L. (Melastomaceae) is a small shrub with various medicinal uses. The present study was carried out to determine the gastroprotective mechanisms of methanol extract of *M. malabathricum* leaves (MEMM) in rats.

Methods

The extract's mechanisms of gastroprotection (50, 250, 500 mg/kg) were studied using the pylorus-ligation in rat model wherein volume, pH, free and total acidity of gastric juice, and gastric wall mucus content were determined. The involvement of endogenous nitric oxide (NO) and sulfhydryl (SH) compounds in the gastroprotective effect of MEMM were also measured. MEMM was subjected to the antioxidant, anti-inflammatory and phytochemical analysis and HPLC profiling.

Results

MEMM contained various phyto-constituents with quercitrin being identified as part of them. MEMM and quercitrin: i) significantly ($p < 0.05$) reduced the volume and acidity of gastric juice while increasing the pH and gastric wall mucus content.; ii) significantly ($p < 0.05$) increased the level of SOD, GTP and GTR while significantly ($p < 0.05$) reduced the level of CAT, MPO and TBARS activities.; iii) exerted gastroprotective activity when assessed using the ethanol-induced gastric ulcer assay, which was reversed by NG-nitro-L-arginine methyl esters (L-NAME; an inhibitor of NO synthase) and N-ethylmaleimide (NEM; a sulfhydryl (SH) blocker). MEMM inhibited the lipoxygenase (LOX) and xanthine oxidase (XO) activities with the highest affinity for the former while quercitrin showed high affinity for XO activity.

Conclusions

MEMM exhibited a gastroprotective activity due partly to the presence of quercitrin, its antioxidant and anti-inflammatory activities, and via the modulation of NO and SH groups.

Keyword: *Melastoma malabathricum*; Melastomaceae; Methanol extract; Gastroprotective mechanisms; Nitric oxide; Sulfhydryl group; Antioxidant; Anti-inflammatory