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Essential oil of *Cymbopogon citratus* (lemongrass) and geraniol, but not citral, promote gastric healing activity in mice

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Abstract

Cymbopogon citratus, popularly known as lemongrass, is used for the treatment of gastric, nervous and hypertensive disorders, in addition to its use in the food and pharmaceutical industries. This study evaluated the gastroprotective and gastric healing effect of essential oil of *C. citratus* (EOCC), citral and geraniol at doses of 1-100 mg/kg (p.o) on acute ethanol-induced ulcer and chronic acetic acid-induced ulcer. Histological and histochemical evaluation was also performed, as well as the in vitro evaluation of the effects of these phytochemicals on H⁺/K⁺-ATPase activity. In the ethanol-induced gastric ulcer, the minimum effective oral dose of EOCC, citral and geraniol were 10, 100 and 3 mg/kg, reducing the ulcer area by 51.67%, 96.57% and 55.74%, respectively, compared to vehicle group (25.82 ± 3.59 mm²). Moreover, EOCC (10 mg/kg, p.o) and geraniol (3 mg/kg), but not citral (100 mg/kg), accelerated the gastric healing process by 34.52 and 80.57%, compared to acetic-acid ulcerated group treated with vehicle (36.04 ± 1.03 mm²). These healing effects were confirmed histologically by the contraction of the ulcer base and by the enhancement on mucin staining in slices of ulcer site from mice treated with EOCC or geraniol. Interestingly, EOCC and citral at 100 µg/ml inhibited the H⁺/K⁺-ATPase activity by 28.26% and 44.36%, whereas geraniol did not change this parameter. Together, these findings confirm the gastroprotective and healing gastric ulcer effects of essential oil from aerial parts of *C. citratus* and added the information that geraniol, but not citral, promotes healing effects on installed ulcers.

Keywords: Gastric mucus barrier; Gastric ulcer; H(+)/K(+)-ATPase; Triterpene.

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