



8º SIMPÓSIO DE SEGURANÇA ALIMENTAR  
SISTEMAS ALIMENTARES E ALIMENTOS SEGUROS



## THERAPEUTIC EVALUATION OF FERMENTED ORANGE BEVERAGE IN ETHANOL-INDUCED GASTRIC ULCER MODELS

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### RESUMO

Excessive alcohol consumption leads to the development of gastric ulcerative lesions. Gastric ulcer is a chronic disease characterized by an imbalance between protective and aggressive agents. Our previous investigations revealed that a functional fermented orange beverage (FOB) contained different phenolic compounds in its composition, which, through *in silico* investigations, demonstrated therapeutic biological effects, such as anti-ulcer properties. To confirm these effects *in vivo*, a model of gastric ulcers in rats was used by intragastric administration of EtOH; and treated after 1h with 0.5 mL/100 g of b.w of FOB, with or without *Mentha piperita* extract (FOB-MP). Omeprazole was used as a positive control. Blood samples were collected to determine serum glucose, and the stomach of each rat was removed to determine the secretion volume. The weight of the stomach and liver was determined. No differences were found among the experimental groups in relation to body weight, weight of the liver or stomach, nor did it change serum glucose levels ( $p \leq 0.05$ ). On the other hand, EtOH administration induced the formation of gastric ulcers, evidenced by changes in the thickness of the mucus layer, highlighting that ulcerative lesions reduce the protective mucous layer. Furthermore, histopathological evaluations revealed erosion of the gastric mucosal epithelium, hemorrhage, and inflammatory infiltration of neutrophils, which is in accordance with previous reports of this model. Furthermore, EtOH administration induced an increase in gastric juice volume ( $p \leq 0.05$ ). This increase in gastric juice volume was already expected since it is widely known that alcohol in the stomach can promote mucosal damage, influencing increased acid secretion. Treatment with FOB or FOB-MP did not reduce the ulcer induced by EtOH, as the ulcerative changes on the mucosal surface, hemorrhagic and neutrophil infiltrate are similar to the group that received only EtOH; FOB or FOB-MP did not alter the gastric juice volume compared to the EtOH-group ( $p \leq 0.05$ ). The gastric mucosa of animals that received OMEP showed little preservation of the histological aspects and were slightly more preserved than the EtOH-group. The presence of high EtOH concentration in FOB and FOB-MP (16.2%) may have been the

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determining factor for the absence of gastrorepair and antiulcerative effects. Gastroprotection trials may have more promising results than the gastroreparation trials we perform. The consumption of this functional beverage, preferably dealcoholized, can be further investigated as a nutritional adjuvant strategy in the prevention of diseases with the involvement of oxidative stress.

**PALAVRAS-CHAVE:** Phenolic compounds, Oxidative stress, Mentha piperita L