Harnessing *Hyssopus officinalis* stems to counteract gastric mucosal injuries: A novel phytotherapeutic avenue

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1. BACKGROUND & RATIONALE

Gastric mucosal injury from ethanol continues to represent the pathophysiological mechanisms of ulcer development and remains a challenge in clinical practice.

Natural agents like *Hyssopus officinalis* L. stems, which contain antioxidant polyphenols, are a viable but underutilized strategy for limiting that damage. *Hyssopus officinalis*, an aromatic herb of the Lamiaceae family, is traditionally used in herbal medicine and is increasingly recognized for its antioxidant and gastroprotective properties.

2. METHODS

- **Ulcer Model:** Gastric lesions were induced in rats through the administration of absolute ethanol.
- **Treatment Doses:** The protective effect of the ethyl acetate fraction of *H. officinalis* stems was evaluated at different doses (250 mg/kg and 500 mg/kg).
- **Acute Toxicity Testing:** Assessed in mice using official **OECD guidelines**.
- **Evaluation:** Extent of mucosal damage quantitatively determined by macroscopic and histological examinations. Main phenolic/flavonoid constituents identified via **HPLC-ESI-MS/MS**.

3. PHYTOCHEMICAL PROFILING (HPLC-ESI-MS/MS)

HPLC-ESI-MS/MS analysis identified **16 compounds out of 20 reference standards** with the main constituents being:

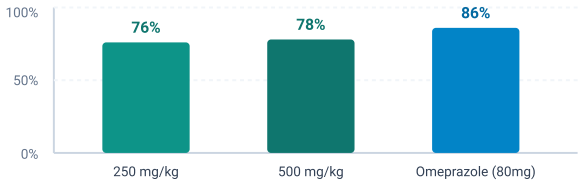
Main Component	Compound Class	Primary Bioactivity
Hydroxycoumarin	Coumarin derivative	Antioxidant & radical scavenging
Hesperetin	Flavanone flavonoid	Anti-inflammatory & cytoprotection

4. RESULTS & GASTROPROTECTION

Acute toxicity testing in mice confirmed the safety of the tested doses, with **no signs of toxicity or mortality**.

The ethyl acetate fraction of *H. officinalis* stems (AET) produced a significant gastroprotective effect against ethanol-induced gastric lesions with respect to protection:

76%	78%	86%
AET Fraction (250 mg/kg)	AET Fraction (500 mg/kg)	Omeprazole (80 mg/kg)



5. CONCLUSION

These findings highlight the potent gastroprotective capacity of the ethyl acetate extract of *Hyssopus officinalis* stems, likely linked to its high content of **hydroxycoumarin** and **hesperetin**.

> **Therapeutic Significance:** The comparable efficacy to omeprazole, together with its safety in acute toxicity testing, supports its potential as a promising natural therapeutic candidate for gastric mucosal protection.