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02590134**Synergistic effects of *Nepeta menthoides* and *Melissa officinalis* aqueous extracts on reserpine-induced depressive-like behaviors in mice**

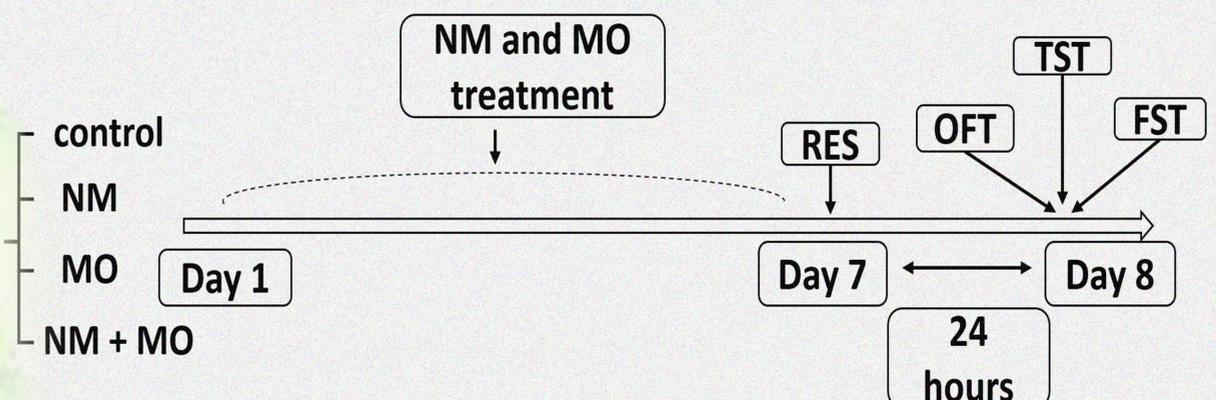
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[*s.talebi@shahed.ac.ir](mailto:s.talebi@shahed.ac.ir)**Introduction**

Nepeta menthoides Boiss. & Buhse and *Melissa officinalis* are extensively used in Persian medicine for the treatment of depression. Considering the active ingredients and main phenolic compounds of these plants and possible synergistic effects, this study examined the antidepressant and antioxidant activities of aqueous extract of *N. menthoides* (NM) and *M. officinalis* (MO) in reserpinized mice alone and combination.

Material and Methods

Mice were pretreated orally for 1-week with normal saline (10 ml/kg), fluoxetine (20 mg/kg), imipramine (10 mg/kg), NM (50–100–200–400 mg/kg), MO (150–350–550–750 mg/kg), and combination (NM 50 with MO 150 mg/kg). The behavioral changes were evaluated using forced swim, tail suspension, and open field tests, 24 hr after reserpine injection (4 mg/kg) on eighth day. The amounts of active components in the extracts and catalase (CAT) as a brain oxidative stress were measured with enzyme-linked immunosorbent assay.

**Results**

Data showed that this combination produced a synergistic action on behaviors and a significant increase in CAT activity. High-performance liquid chromatography results showed that rosmarinic acid contents in MO and NM were 6.42 ± 1.1 and 11.03 ± 2.16 mg/g of dried extract, respectively. Total flavonoid and phenolic contents of MO were higher than NM.

Discussion and Conclusion

The findings suggest that the present combination produces an antidepressant-like effect, which is possibly triggered by its antioxidant properties.

Keywords

Nepeta menthoides, *Melissa officinalis*, Pharmacological synergy, Antidepressant effects, Catalase activity, Persian medicine

