

News & Comments

Different Extracts of *Lavandula stoechas* can Exert Neuroprotective Effects

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Several neurodegenerative illnesses, including Alzheimer's and Parkinson's, as well as the physiological process of aging have long been connected to oxidative stress. Reactive oxygen species can harm DNA, proteins, and lipid membranes, impairing cell viability and function. These species are produced by cell disruption, oxidative respiration, or the excessive accumulation of free transition metals. Hydrogen peroxide (H₂O₂), one of the main reactive oxygen species, is created during the oxidation/redox cycle and is used as a transmitter in intracellular signalling pathways. The mode of death depends on the level of oxidative damage and encompasses necrosis, apoptosis, and programmed cell death in oxidative stress-induced neuronal cell death. With 224 genera and over 5600 species, the Lamiaceae family is one of the largest families in the world. *Lavandula stoechas* is a tomentose, 45 cm or taller shrub. *L. stoechas* is listed in numerous pharmacopoeias, including the FFD Monographs, the German Pharmacopoeia, and the French Pharmacopoeia. Studies exploring the potent antioxidant properties of *L. stoechas* extracts and their effects on various diseases have been published in the literature.

From the natural populations at Koçarl, aerial components (inflorescences) of *L. stoechas* were gathered. Raw plants were pounded into a coarse powder and dried in the shade. The 100 g of the pulverized medication was hydro distilled using a Clevenger device for 3 hrs to extract the essential oil from the plant. For the sequential extraction and total extraction methods, analytical grade n-hexane, ethyl acetate, and methanol were utilized (Carlo Erba). The SPSS 17.0 program was used to analyse the data collected for the study. A one-way analysis of variance was used to assess the data (ANOVA).

Extracts of 1.44 g water (infusion), 2.60 g n-hexane, 2.64 g ethyl acetate, 5.24 g methanol, and 2.01 g total methanol were made from the plant's aerial portions. After 24 hrs, *L. stoechas* extracts were pre-treated for 2 hrs with SH-SY5Y cells plated in 96-well plates. It was discovered that all doses of the extracts considerably preserved the colony numbers compared to the H₂O₂ toxicity group when the effects of *L. stoechas* extracts on colony formation capacities were investigated. By sustaining cell viability and colony formation capacity against H₂O₂ neurotoxicity in SH-SY5Y cells, our work showed for the first time that different *L. stoechas* extracts may exhibit neuroprotective properties.

L. stoechas has been used in traditional medicine in Europe and Iran to treat a variety of illnesses, especially cardiovascular and neurological conditions. According to certain studies, anti-inflammatory, antioxidant, anti- Alzheimer's, and anti-epileptic characteristics have neuroprotective effects. According



to in vivo research, *L. stoechas* methanol extract lessened the symptoms and progression of dementia by avoiding oxidative damage to cholinergic neurons in the mouse brain. Additionally, it has been demonstrated that *L. stoechas* essential oil protects young male mice's kidneys and liver from the oxidative stress caused by Malathion.

JOURNAL REFERENCE

Erdogan, M.A., C. Bayar, E. Ozkaya, A. Metin and D. Birim *et al.*, 2022. Neuroprotective effects of different *Lavandula stoechas*L. extracts against hydrogen peroxide toxicity *in vitro*. *Int. J. Pharmacol.*, 18: 883-896.

KEYWORDS

Lavandula stoechas, neuro-protection, SH-SY5Y cells, oxidative stress, viability, colony formation, apoptosis

