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Dracocephalum kotschy pdf

Dracocephalum kotschy. **Dracocephalum kotschy** common name. **Dracocephalum thymiflorum.** **Dracocephalum multicaule.**

Objectives: Dracocephalum has over 60 species and is found mainly in the temperate regions of Asia and Europe. One of these species, i.e., Dracocephalum kotschy Boiss, is known to have a number of medicinal properties and active ingredients in many parts of the world. Despite being an endemic wild-flowering plant of great importance, the plant is currently considered endangered in Iran. Besides, there is paucity of information on the significance of the medicinal properties and active constituents of D. kotschy among the Iranian people. On that account a systematic review of studies reporting on the medicinal properties and active ingredients and its significance to human and animal health was conducted and the existing knowledge gaps were identified. **Methods:** The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used in the search for published articles on medicinal properties and active ingredients of D. kotschy and its significance on humans and animals in Iran. The search was confined to scientific articles from repositories of popular data bases and search engines among them PubMed, Web of Science, Google Scholar, Science Direct, SpringerLink, and Scopus. The search narrowed down on scientific journals, books, and book chapters focusing on the medicinal properties of D. kotschy in Iran for the period between 1970 and 2018. **Results:** A total of 1158 scientific articles were sourced from the various databases, out of which 38 met the search criteria and qualified for this review. The studies were conducted in only 9 of the 31 provinces of Iran, with a large proportion in Isfahan province, central Iran. The studies showed that all plant parts (roots, aerial parts, flowers, and leaves) had active constituents. Essential oils and aerial plant parts were the main components studied. Nevertheless, the most frequently reported constituents were xanthomicrol, limonene, luteolin, geraniol, apigenin, and calycopterin. A number of medicinal properties were reported among them antioxidant, antibacterial, anticancerous, antinociceptive, antihyperlipidemic, antispasmodic, cytotoxic, and immunomodulatory effects. The plant was also reported to be a remedy for inflammatory pain, headaches, congestion, liver disorders, ulcer, fever, renal pain, dyspepsia, stomach ache, abdominal pain, joints pains, muscle spasm, congestion, bloating, and wound healing effects, among others. **Conclusion:** This review has shown that D. kotschy is an important medicinal plant with a large number of active constituents and great potential to safeguard human and animal health in Iran. However, over utilization of the D. kotschy plant is already endangering its existence. Nevertheless, more studies need be conducted across the country. 1. Hooper D., Field H. Useful Plants and Drugs of Iran and Iraq. Vol. 9. Field Museum of Natural History, Botanical Series no. 3; 1937. [CrossRef] [Google Scholar]2. Kinghorn A.

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RESEARCH ARTICLE

Trichomes and Regeneration by Direct Organogenesis of Medicinal Plant *Dracocephalum kotschy* L. Using Shoot Tips (Lamiaceae)

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Abstract

The present study describes the procedure for micropropagation of *Dracocephalum kotschy* L. using shoot tips from in vitro-generated plants. The best response was observed for shoot tips on MS medium containing 5 mg 6-benzylaminopurine L¹ and 0.2 mg 1-naphthaleneacetic L¹ acid. Regeneration for other types of the explant hypocotyls and cotyledons did not show satisfactory results so that the explants did not develop into normal shoots and in turn developed into the calli after 12 days of culture. Histochemical analysis showed that only the shoot tip revealed a direct induction of more totipotential protuberances that arise around the cut end of the explants. Elongation of shoot buds was obtained on MS medium containing 1 mg BAP L⁻¹ + 0.5 mg IBA L⁻¹. Regenerated shoots rooted best on the same medium of elongation. After hardening, the rooted plants were transferred to the greenhouse where they grew, matured, and flowered normally with a survival rate of 95%. We concluded that the present protocol can be efficiently used for mass propagation of *Dracocephalum kotschy*.

Key words: *Dracocephalum kotschy*, organogenesis, regeneration, trichomes

Abbreviations

BAP: 6-benzylaminopurine; KIN: kinetin; NAA: 1-naphthalene acetic acid; IBA: indole-3-butyric acid

Introduction

Many species of Lamiaceae are aromatic and often used as herbs, spices, folk medicine, and as a source of fragrance (Werker et al. 1985). The *Dracocephalum kotschy* L., a wild-growing flowering plant belonging to the family Lamiaceae, is best known for the essential oil common to many members of the family (Gohbani et al. 2004). Many biologically active essential oils have been isolated from various members of the family in southwestern Asia. *D. kotschy* has been used as a medicinal herb for several years in Iran as a folk medicine for its antispasmodic and analgesic properties (Jahani et al. 2005). Anti-hyperlipidemic (Sajadi et al. 1998) and immunomodulatory (Amirghofran et al. 2000) effects have been reported for *D. kotschy*. The preferentially inhibitory effects on the multiplication of tumor cells may offer a means of developing drugs effective against cancer in humans. One of the methods for finding such agents is to investigate cell division in plant material, particularly those which have been reported to have anti-cancer, anti-inflammatory, anti-fungal, or anti-bacterial effects (Cordell et al. 1991; Cox and Balick 1994; Wu et al. 2002). Spinal-Z is a traditional Iranian anti-cancer remedy (Jahani et al. 2005; Sobhani et al. 2002) which was used as a traditional medicine as a plant concoction for the treatment of many forms of cancer in humans. It was believed that the concoction was specifically effective against leukemia and GI tract malignancy. Spinal-Z is an extract composed of two plants: *Peperomia hirsuta* Linn seeds and *Dracocephalum kotschy* Boiss leaves (Jahani et al.

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Original Research Paper

Phytochemical screening and evaluation of antioxidant activities of *Dracocephalum kotschy* and determination of its luteolin content

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Abstract
Objective: *Dracocephalum kotschy* (Lamiaceae family) has been used as traditional medicine for stomach and liver disorders, headache and congestion. In the present study, we have investigated phytochemical properties and antioxidant activities of dichloromethane, ethyl acetate and methanol extracts of *D. kotschy*.
Material and Methods: Antioxidant activities of extracts were evaluated using the integration of HPLC-DPPH and ferric reducing antioxidant power (FRAP) methods. In addition, the luteolin content was determined using HPLC method.
Results: The highest antioxidant activity was observed for the methanol extract (among the three tested extracts) showing 50% DPPH scavenging activity at 4.5 µg/ml as compared to butylated hydroxy toluene (BHT) and ascorbic acid (5.00 µg/ml, 0.97 µg/ml). Also, luteolin was detected in methanol extract; it was identified by comparing its retention time and DAD spectra with standard and it was one of antioxidant components of this plant. In addition, the antioxidant activity of methanol extract was higher than BHT, in FRAP assay. Total phenolic content was in the range of 11.62-22.29 mg Gallic acid (µg/ml) of dry extract and flavonoid content was in the range of 3.975-5.02 mg. Quantities of gram of extract for dichloromethane, ethyl acetate and methanol extracts. The quantity of luteolin in *D. kotschy* was found to be 1961.005 µg/g of dried plant.
Conclusion: The results of this investigation indicated that luteolin plays major role in the antioxidant activity of the plant.

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