

MEDICINAL SIGNIFICANCE OF PRODUCING *LEVISTICUM OFFICINALE* W.D.J.KOCH

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ABSTRACT

Essential oils of the medicinal plant *Levisticum Officinale* W.D.J.Koch are a thick, mobile mass of red-yellow color, highly soluble in alcohol. The oil contains terpenes, terpineol, terpininuratene, terpineol-nitrol-pichericin, dihydrate, cineole, as well as acetic, iso-valeric and benzoic acids. The decoction is served when dropsy comes out, the upper passages, the gastrointestinal tract open. Cleanses the skin well, promotes healing of purulent wounds. Improves the condition of patients with rheumatism and gout. A strong diuretic. A decoction of roots and leaves is used to eliminate pigment spots on the skin. In folk medicine, the plant *Levisticum Officinale* W.D.J.Koch is used to treat nervous diseases, fever, and difficult labor. A decoction or tincture is used to wipe hair to strengthen it; fresh crushed leaves are used to relieve headaches by applying to the sore spot.

Keywords: oil, leaves, roots, trunk, seeds, flowers, medicine, alcohol, pigment, selection, seed production, substance, dihydrate, terpineol, cineol.

АННОТАЦИЯ

Эфирные масла лекарственного растения *Levisticum Officinale* W.D.J.Koch представляют собой густую подвижную массу красно-коричневого цвета, отлично растворяющуюся в спирте. В состав масла входят терпены, терпинеол, терпининуратен, терпинеол-нитрол-пикерицин, диогидрат, цинеол, а также уксусная, изо-валериановая и бензойный кислоты. Отвар корня используют при лечении водянки, заболеваний верхних дыхательных путей, желудочно-кишечного тракта. Хорошо очищает кожу, способствует заживлению гнойных ран. Улучшает состояние больных при ревматизме и подагре. Сильное мочегонное средство. Отвар из корней и листьев употребляют для устранения пигментных пятен на коже. В народной медицине растения *Levisticum Officinale* W.D.J.Koch применяют для лечения нервных заболеваний, лихорадки, при затрудненных родах.

Отваром или настойкой протирают волосы для их укрепления, свежими растёртыми листьями снимают головные боли, прикладывая к больному месту.

Ключевые слова: масло, листья, корни, ствол, семена, цветы, лекарство, спирт, пигмент, селекция, семеноводство, вещество, диогидрат, терпинеол, цинеол

INTRODUCTION

Plants of the celery family (Apiaceae), used in folk medicine, have a wide spectrum of action due to containing various phytochemical compounds. One of promising plants of this family is Lovage (*Levisticum Officinale*). Herbaceous perennial, polycarpic, up to 2 m high. The root is thick, taproot, brownish; caudex thick multi-headed. The stem is straight, with a bluish coating, fist-shaped, branched at the apex, at the base covered with scale-like remains of dead leaf petioles, 2–4 cm in diameter. The petioles of the lower leaves are long, glabrous, round in cross-section with a narrow notch on the adaxial side, hollow, with peripheral vascular bundles. The leaf blades are dark green, shiny, broadly triangular or rhombic in outline, complex. The leaves are large, obovate in outline, wedge-shaped at the base, entire, and coarsely incised-toothed at the apex with cartilaginous teeth at the tip. The stem leaves gradually become smaller towards the apex and become less complex. The highest seats. Heterophylly is characteristic. The flowers are collected in an inflorescence of a complex umbrella, about 12 cm in diameter, with 12–20 rough rays on the inner side and somewhat expanded at the top, 4–6 cm long. The involucre leaves are numerous, lanceolate, white-membranous along the edge, bent downward, finely ciliated along the edge, often also rough on the upper surface. Umbrellas are 5–12 mm in diameter, with 20–26 flowers. The involucre leaves are numerous, somewhat fused at the base. The petals are bright yellow, small, about 1 mm long and wide, elliptical in outline, with a very short claw at the base, slightly notched at the apex and with the apex curved inward. During flowering, the sub-columns are short-conical, later simply conical. Stylodia are short, 1.5–2 mm long, bent toward the dorsal side of the mericarp. The fruit is a yellow-brown two-seeded, elliptical, 5–7 mm long and 3–4 mm wide. Carpophorus bifid to the base. Mericarps are slightly compressed from the back, yellow-brown in color when ripe. The marginal ribs are wing-shaped, the dorsal ribs are keel-shaped. The commissary is narrow. Exocarp of small cells.

The center of origin of the species is believed to be Iran and Afghanistan. Currently, the species grows almost everywhere - on the Eurasian continent, North and South America, Africa, Australia. It is

specified that the range covers the European part of Russia and the Caucasus, Eastern Europe and Eastern Asia.

Due to pharmacological properties biologically active substances contained in various parts of *Levisticum officinale*, this the plant is increasingly used in medical practice, but as a medicinal raw materials are included in a number of European Pharmacopoeias.

Lovage is a cold-resistant plant, winters well, grows back early in the spring and forms seeds in northern regions, demanding light, moisture and soil fertility, development occurs in a two-year cycle. In the first year, a powerful rosette of leaves and a rhizome are formed, in the second year - a flowering stem and seeds. Lack of moisture leads to delayed growth, reduced yield and its quality. It is valued for its high content of essential oils, vitamins, mineral salts, as well as for its tonic effect. Lovage is propagated by seeds sown before winter or in early spring. It produces abundant self-seeding, which is transplanted into beds to grow new plants. Lovage also grows well when dividing perennial roots. If you decide to propagate this plant by seeds, do not sow randomly, but in rows, first germinating green shoots at 10-15 cm and using them as young greens. Then you can thin out the plants by 30-40 cm, gradually increasing the distance between plants and between rows to 60-70 cm. This area is enough for long-term cultivation of this large and powerful plant. In the fall, it would be good to sprinkle the plant with peat or humus. Lovage grows on different soils: clay, sand, peat, but develops more luxuriantly on breathable, moderately moist and nutritious soils. With excessive nitrogen application, the plant becomes too strong, and the root reaches large sizes, but its pulp loses density and juiciness, becomes loose, and darkens when cooked. Therefore, you should not get carried away with nitrogen fertilizers, but be sure to add potassium and microelements. Before sowing seeds, add humus or compost to the soil at the rate of 4-5 kg of compost, 15-20 g of urea, 20 g of superphosphate (ordinary) and 30 g of potassium sulfate, a glass of ash per 1 m². Then, depending on the condition of the plant, you can carry out organic and mineral fertilizing with microelements. To grow good lovage roots, you need to remove the flower stalks in time, not allowing them to rise. Do not cut off a lot of greenery, this affects the filling of the roots. Greenery for the table will provide thinning of thickened plants. For seeds, it is enough to leave one specimen of lovage.

This same plant – tall, densely foliated, with large dark green leaves, as if polished to a shine, high yellowish umbrella-shaped peduncles – can also be decorative.

When growing lovage, only a few leaves are taken from it in the first year - for seasoning. Only in September of the

following year, the rhizomes are dug up, cleaned, strung on cords and hung to dry; larger ones are cut in half lengthwise to speed up drying. Pharmaceutical raw materials, often affected by insects and, in addition, hygroscopic, should be stored in tightly closed containers. The fruits are collected in late autumn, when they are fully ripe. Leaves for seasoning can be taken all year round. The above-ground part is taken when the roots are dug up, but dried in the air separately.

Caring for lovage includes regular loosening and weeding. If there is a lack of moisture, watering is carried out. In subsequent years, early spring fertilizing is included, which is repeated in the second half of summer. If there is no need to obtain seeds, timely breaking off of flower stalks is carried out when they reach a height of no more than 10 cm. Harvesting of products can begin in the fall of the first year, or early in the spring of the second year. During wintering, plants do not fall out due to low temperatures.

Lovage is popularly called mountain celery. Indeed, they are close botanical relatives. In the wild, lovage grew on the slopes and foothills of mountains, hence its other name - mountain celery. It also grew in lower, moist places, where it developed even more luxuriantly.

CONCLUSION

The pharmacological action of the plant raw material of lovage is due to the presence of biologically active substances of various structures and compositions in plants. Many of them have anti-inflammatory, antibacterial, antifungal and antioxidant effects. Phthalides of lovage are also characterized by hepatoprotective properties; flavonoids have a cytotoxic effect on tumor cells, neuroprotective and antithrombotic effects, and in small concentrations they have a positive effect on the reproductive system. The properties of chlorogenic acids of lovage include antinociceptive and antihypertensive effects. Polyacetylenes are capable of suppressing the growth of tumor cells and are bioactive in relation to antiplatelet aggregation. The most significant alkaloid of plant raw materials is tetramethylpyrazine, the bioactivity of which is due to antiplatelet, anti-inflammatory and neuroprotective effects. Due to the complex of bioactive compounds and individual components isolated from various parts of lovage, which have a wide spectrum of pharmacological action, the prospect of its use in medical and pharmaceutical practice can be outlined.

REFERENCES

1. Assessment report on *Levisticum officinale* Koch, radix. – 2012 EMA/HMPC/524623/2011 Committee on Herbal Medicinal Products (HMPC)



2. Bylaitė, E. Influence of Harvesting Time on the Composition of Volatile Components in Different Anatomical Parts of *Levisticum officinale* Koch. / E. Bylaitė, R. Venskutonis, J.P. Roozen // *J Agricult and Food Chem.* – 1998. – Vol. 46(9). – P. 3735-40.
3. Miran, M. Characterization and Antibacterial Activity of Phthalides from the Roots of the Medicinal Herb *Levisticum officinale* W.D.J. Koch. / M. Miran et al. // *Iranian Journal of Pharmaceutical Research.* – 2020. – Vol. 19 – P. 182-186.
4. Roslon, W. Effect of Plantation Establishment and Raw Material Stabilization on the Useful Traits of Lovage Leaves (*Levisticum officinale* Koch.) / W. Roslon, E. Osińska, A. Wajs-Bonikowska // *Acta Scient Polonorum-hortorum Cultus.* – 2013. – Vol. 12. – P. 141-55.
5. Sertel, S. Chemical Composition and antiproliferative activity of essential oil from the leaves of a medicinal herb, *Levisticum officinale*, against UMSCC1 head and neck squamous carcinoma cells. / S. Sertel, T. Eichhorn, P.K. Plinkert, T. Efferth // *Anticancer Res.* – 2011 – Vol. 31(1). – P. 185-91
6. Velázquez-Moyado, J.A. Gastroprotective effect of diligustilide isolated from roots of *Ligusticum porteri* Coulter & Rose (Apiaceae) on ethanol-induced lesions in rats. / J.A. Velázquez-Moyado et al. // *J Ethnopharmacol.* – 2015. – Vol. 174. – P. 403-9.
7. Venskutonis, P. Essential Oils in Food Preservation, Flavor and Safety. Edited by V.R. Preedy. / Chapter 62 - Lovage (*Levisticum officinale* Koch.) Oils. 2016. – P. 539-49.
8. Xu, L. Tetramethylpyrazine Attenuated Sevoflurane-Induced Neurotoxicity by Enhancing Autophagy through GPR50/CREB Pathway in SH-SY5Y Cells / L. Xu et al. // *Am J Chin Med.* – 2020. Vol. 48(4). – P. 945-66.

