

BIOECOLOGICAL PROPERTIES OF MEDICINAL SPECIES OF THE MINT FAMILY (LAMIACEAE)



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Foundation of Advanced Research Sciences

Z.A.Yusupova

Ferghana State University

Sayramov Fayzullo Baratjon o'g'li

Fergana State University, student of Zootechnics faculty

Yormatova Oygul Abduqahhor qizi

Fergana State University, student of Zootechnics faculty



Annotatsiya: The mint family (Lamiaceae) is one of the biggest plant families on earth. Its representatives are widespread in warm and temperate climate countries. The mint family is one of the widespread families in the flora of Uzbekistan and is distinguished from other families by its wealth of useful species. Representatives of such groups as *Marrubium alternidens* Rech., *Melissa officinalis* L., *Mentha arvensis* L., *Origanum tythanthum* Jontseh, *Lagochilus hirsutissimus* Vved. have been used in medicine, food, confectionery and perfume industry since ancient times. 69 species belonging to 26 genera of the Lamiaceae family have medicinal properties, among the genera *Lagochilus Bunge ex Benth.* with 11 species, *Ziziphora* L. with 8 species, *Salvia* L. with 7 species, *Dracocephalum* L. with 7 species are the leaders. It was found that *Perovskia Kar.*, *Stachys* L. with 4 species, *Mentha* L., *Nepeta* L. with 3 species, *Lycopus* L., *Lamium* L., *Scutellaria* L. with 2, and only 1 of the remaining 14 families have medicinal representatives.

Kalit so'zlar: mint family (Lamiaceae), the flora of Uzbekistan, medicinal plants, species with essential oil, decorative plants.

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The daily increase in the demand for economically important plant species in the world requires the preservation, protection and restoration of their diversity. In recent years, the widespread involvement of raw materials of medicinal plant species in local and industrial production determines the need to study their biological properties and develop measures to increase and eliminate factors that negatively affect their reserves. At this point, it is of scientific and practical importance to identify farm zones with a strong need for raw materials in the pharmaceutical industry, to develop modern methods of breeding and maintaining their populations based on the study of their biological characteristics, to create raw material reserves and to prepare high-quality raw materials.

The mint family (*Lamiaceae*) is one of the largest families on earth. Its representatives are widespread mainly in countries with a warm and temperate climate. This family includes about 200 genera and 3000 species. It is known that 360 species of 53 genera grow in Central Asia, 238 species of 39 genera in Uzbekistan, and 59 species of 26 genera in the Fergana Valley. The mint family is one of the widespread families in the flora of Uzbekistan and is distinguished from other families by its wealth of useful species. Representatives of such groups as *Marrubium alternidens* Rech., *Melissa officinalis* L., *Mentha arvensis* L., *Origanum tythanthum* Jontseh, *Lagochilus hirsutissimus* Vved. have been used in medicine, food, confectionery and perfume industry since ancient times.

When analyzing the use of species of the Lamiaceae family in the national economy, the following was revealed: 143 species out of 238 species are with honey-juice (60%), 69 medicinal species (29%), 100 species with essential oil (42%), 27 decorative (11.3%), 19 food made (8%), 5 fodder (2.1%), 9 used to paint (3.8%), 2 dubil (0.8%), 10 flavoured-spicy (4.2%), 5 poisonous, alcaloid (2.1%), 74 not used (31%)

Table #1

| Medicinal | With honey-juice | With essential oil | Food made | Fodder | Decorative | Used to paint | Dubil | Flavoured-spicy | Poisonous, alcaloid | Not used |
|-----------|------------------|--------------------|-----------|--------|------------|---------------|-------|-----------------|---------------------|----------|
| 69 | 143 | 100 | 19 | 5 | 27 | 9 | 2 | 10 | 5 | 74 |
| 29% | 60% | 42% | 8% | 2,1% | 11,3% | 3,8% | 0,8% | 4,2% | 2,1% | 31% |

Use of species of the Lamiaceae family in the national economy Table #2

| | Category name | Medicinal | With honey | With essential oil | Food made | Fodder | Decorative | Used to paint | Dubil | Flavoured-spicy | Poisonous, alcaloid | Not used |
|-----|-----------------------|-----------|------------|--------------------|-----------|--------|------------|---------------|-------|-----------------|---------------------|----------|
| 1. | Phlomis L. | | 39 | | | | | | | | 1 | 6 |
| 2. | Scutellaria L. | 2 | 2 | 2 | | | | 1 | | | 1 | 36 |
| 3. | Salvia L. | 7 | 21 | 21 | 2 | | 21 | | | | | |
| 4. | Nepeta L. | 3 | 19 | 19 | | | 1 | | | | | |
| 5. | Lagochilus Bunge | 11 | | | | | | | | | | 5 |
| 6. | Dracocephalum L. | 7 | 6 | 1 | | | 1 | | | | | 7 |
| 7. | Phlomis L. | 2 | 15 | 15 | | 1 | | 2 | | | | |
| 8. | Ziziphora L. | 8 | 8 | 8 | 8 | | | | | 8 | | |
| 9. | Lophanthus Adans. | | 6 | 6 | | | | | | | | |
| 10. | Otostegia Benth. | | | | | | | | | | | 5 |
| 11. | Leonurus L. | 1 | 1 | | | | | | | | | 3 |
| 12. | Stachys L. | 4 | 3 | 3 | | | | | | | | |
| 13. | Perovskia Kar. | 4 | 4 | 4 | | | | 4 | | | | |
| 14. | Thymus L. | 1 | 4 | 4 | 1 | | | | | 1 | | |
| 15. | Mentha L. | 3 | 3 | 3 | 3 | 3 | 1 | | | | | |
| 16. | Lycopus L. | 2 | 2 | 2 | | | | 2 | 2 | | | |
| 17. | Hypogomphia Bunge | | | | | | | | | | | 1 |
| 18. | Lamium L. | 2 | 2 | 1 | | | 1 | | | | | |
| 19. | Stachyopsis Popov | | | | | | | | | | | 2 |
| 20. | Drepanocaryum Pojark. | | | | | | | | | | 1 | |
| 21. | Marrubium L. | 1 | + | + | | | | | | | + | |
| 22. | Kudrjaschevia Pojark. | | | | | | | | | | | 1 |
| 23. | Lallemantia Fisch. | 1 | | + | | | | | | | | |

| | | | | | | | | | | | | |
|-----|----------------------|---|---|---|---|---|---|--|--|---|---|---|
| 24. | Hymenocrater Fisch. | | | | | | | | | | | 1 |
| 25. | Prunella vulgaris L. | 1 | + | + | | + | + | | | | | |
| 26. | Ajuga L. | 1 | | | | | | | | | | |
| 27. | Sideritis L. | 1 | + | + | + | | | | | | | |
| 28. | Thysanotus Durand. | | | 1 | | | | | | | | |
| 29. | Phlomis L. | | | | | | | | | | | 1 |
| 30. | Chamaejasme Schrenk | | | | | | | | | | | 1 |
| 31. | Teucrium L. | 1 | | + | | | | | | | + | |
| 32. | Melissa L. | 1 | + | + | + | | | | | | | |
| 33. | Satureja L. | 1 | + | + | + | | | | | | | |
| 34. | Micromeria Benth. | | | | | | | | | | | 1 |
| 35. | Antennaria Vved. | | | | | | | | | | | 1 |
| 36. | Clinopodium L. | 1 | + | + | | | | | | | | |
| 37. | Acinos Mill. | 1 | | | | | | | | | | |
| 38. | Hyssopus L. | 1 | + | + | + | | | | | + | | |
| 39. | Origanum L. | 1 | + | + | + | | | | | | | |

Information about the bioecological properties of some medicinal representatives of the Lamiaceae family is given below.

Marrubium alternidens Rech. Perennial, with many stems, sparsely branched coarse hairy, 30-80 cm high. The leaves are round, long-banded, toothed-forked. The flowers are numerous, and the calyx is 9-11 mm long and is covered with star hairs. The leaves of the crown are white, the outer side is occupied by star-shaped hairs, the length is 9-11 mm, the leaf is cut into two parts. The nut is a three-sided ovate, 1.5 mm long. It blooms and seeds in May-September.

It grows as a weed in gardens, on the edge of fields, and on abandoned land. It is distributed in Tashkent, Fergana, Samarkand, Bukhara and Surkhandarya regions.

In folk medicine, the above ground part is used. A decoction of the upper part of the earth is used as a gargle in the mouth and throat in diseases such as sore throat, chronic colds of the respiratory tract and toothache. Antimony has been proven to have a calming and blood pressure-lowering effect.

Melissa officinalis L.(Medicinal lemongrass) Perennial herb with an erect stem, branching from the base, covered with thick rough glands and hairs, smelling like lemon, 30-60 cm tall. The leaves are egg-shaped, the edges have large teeth, the lower side is hairless, and the upper side is sparsely hairy. The flowers are long-stalked and arranged in a round shape. The calyx is 7-8 mm long and has long fibrous hair. The petals are white, slightly hairy on the outside, 13-14 mm long. Nut three-sided, dark brown, 1.7 mm long. It blooms in June-August and ripens in July-September. It grows in the middle regions of mountains, rocks, and shadows. It is distributed in Tashkent, Kashkadarya, Fergana, Surkhandarya regions.

The above-ground part is used in medicine. A decoction of the surface (sometimes leaves) is used to regulate indigestion, treat anemia, some nervous and heart diseases, and is antispasmodic, analgesic, expectorant, diuretic, and carminative. *Melissa officinalis L.* is mainly used in folk medicine.

Mentha arvensis L.(Field mint, water mint) - Perennial, erect stem, branching from the base, four-sided stem, 25-50 cm high. The leaves are long lanceolate, covered with thick, short hairs. The flowers form a spike-like ball at the end of the branches and stems. The calyx is 2.5 mm long, with three pointed sharp teeth. Petals are pink-purple, 4-5 mm long. It blooms in July-August, and its seeds ripen in August-September. It grows on the banks of streams and water bodies in the plains and mountain regions. Distributed in Tashkent and Fergana regions.

Leaves and essential oil are used in medicine. Medicinal preparations of the leaf, decoction, tincture, juice are used against nausea and vomiting and to improve digestion. Peppermint water is also used as a mouthwash and to improve the taste of liquid medicines. The leaf is used as a sedative, laxative and tea for stomach ailments, essential oil is included in tablets and drops for stomach ache, and

menthol is included in Ingofen. The leaf of the plant is included in the composition of zdrenko.

Origanum tyttanthum Jontseh (Small-flowered mountain basil)- Perennial, erect stem, numerous, branching from the top, height 30-60 cm. The leaf is ovoid or longer, the base is obtuse, the edges are smooth, the surface is hairless. The flowers are collected in sessile spike-like, semi-umbrella-like inflorescences. Calyx 3 mm long with short hairs. Petal pale bluish-pink, 5 mm long. The nut is dark brown, 0.75 mm long. It blooms in July-August and its seeds ripen in July-September. It grows in rocky and gravelly places in the middle and lower regions of the mountains. It is distributed in Tashkent, Andijan, Fergana, Samarkand and Surkhandarya regions.

The surface part contains essential oil, triterpene acids, coumarins, flavonoids and other substances. Liquid extract of the above-ground part of common mountain basil is used as an expectorant in respiratory tract diseases, when bowel movement is weakened, to stimulate appetite, to improve digestion, to expel urine and gas. The liquid extract is part of pertussin, which is used in respiratory diseases and whooping cough. Thymol is used to disinfect the mucous membrane of the mouth and to relieve toothaches, and to treat fungal skin diseases, and sometimes to expel worms.

Lagochilus hirsutissimus Vved.- Perennial, woody stems, erect, rarely branching, height (10)-15-30 cm. The leaves are rhombic-ovate, deeply carved, hairy at the tip. 4-8 flowers are located in leaf axils. The calyx is bell-shaped, the tips are pointed, the lower calyx is 20-25 mm long. The petals are white with brown rays, 25-27 mm long. It blooms in June-July.

It grows in areas with gravelly and fine soil in the foothills. It is distributed in front of the mountain in Fergana region (Kurama ridge).

It is used to accelerate blood transfusion, that is, to stop bleeding

Leonurus turkestanicus V. Krecz.et, Kuprian. Perennial, upright growing with numerous stems, branching from the top, finely hairy, 40-50 cm high. The appearance of leaves is divided into circular five-lobed pieces. The flowers are sessile, few in a ring shape. The calyx is 8-9 mm long, short-hairy, and the long ends become thorny. Petals are pink-red, hairy on the outside, 12-13 mm long. The fruit is a light brown nut with sharp edges. It blooms in June-July, and its seeds ripen in July-August.

It grows in wet, gravelly soil in the middle regions of the mountains.

It is distributed in Tashkent, Smarkand, Kashkadarya and Surkhandarya regions.

The surface part contains flavonoids (rutin, quercetin and quinqueloside), alkaloids, essential oil, vitamin C, carotene, astringent and substances. Tincture, antimony and liquid extract of medicinal preparations are used as a sedative to

treat high blood pressure, nervousness and some heart diseases, cardiac neurosis and cardiosclerosis.

Stachys silvatica L. Perennial, straight-growing stem, 1m high. The leaf is large, with large serrate teeth, both surfaces are sparsely hairy, banded. The flowers are sparsely clustered, and the flower is located in the axils of the leaves. The calyx is 8-9 mm long and has a triangular shape with a thorn at the tip. Petals are dark brownish-red, 14-16 mm long, the lower lip is 1.5 times longer than the upper lip. Blooms in June.

It grows in thickets in the middle parts of the mountains. Widespread in Ferghana region (Chodaksoy).

The liquid extract prepared from the upper part of the earth is used against inflammation, bleeding due to fibromyoma, and for rapid contraction of the uterus.

Scutellaria oxystegia Juz. Perennial, sparsely numerous cushion-shaped, one-year branches thin 5-10 cm long, herbaceous plant. The leaves are elliptic, in some cases the edges are smooth. The flowers are located in the axils of the upper leaves. The calyx is 2 mm long, and the seed becomes slightly longer when ripe. Petals are pale yellow, 25-30 mm long. It blooms in June-August, and its seeds ripen in July-September.

It grows on the rocks in the middle regions of the mountains. Distributed in Tashkent (shagaltog), Fergana, Samarkand regions.

The root of this plant is used against spasmodic diseases.

Ziziphora tenuior L. (Thin desert mint) - Annual, branching from the base, downy hairy, long hairs in flower clusters, height 5-30 cm. The leaves are 2 pairs of long ovate short banded leaves on the stem, and the calyx is 5-8 mm long. Triangular tip, toothed. The petals are light purple. 8-11 mm long. The nut is elongated with 3 sides. It is brown in color. 1.5 mm long.

It blooms in May-June, and its seeds ripen in June-August.

It is distributed in rocky, clayey and gravelly areas of all mountain and mid-mountain regions of Uzbekistan.

Decoction made from the plant is used to improve the functioning of the heart, to improve the functioning of the intestines, for colic and constipation.

Thymus serpyllum L. Perennial, ground-covering shrub with lignified parts in front of the roots. New branches are hairy, height 5-10 (15) cm. The leaves are sessile, inverted ovate. 3-4 veined, glabrous, edges formed. The flowers are spike-shaped balls at the ends of the stems. The calyx is 4-5 mm long. Petals are pink-red, 5-7 mm long. It blooms in June-August, and its seeds ripen in July-September. It grows in stony and gravelly soils in the middle and upper regions of the mountains. It grows in Tashkent, Fergana and Samarkand regions. The tincture of the surface is used as a pain reliever, in radiculitis, against cough, and in colic.

Perovskia serophulariifolia Bunge - Perennial shrub with a thick stem, brown bark, height 60-120 cm. The leaves are oblong or ovate, bluntly toothed, the flowers are few-flowered with short stalks, forming a ring-like shingle inflorescence. The length of the calyx is 5-6 mm, purple, all parts are covered with long hairs. Petals are purple, 11-12 mm long, sparsely fluffy. It blooms in June-July and ripens in July-August.

It grows in rocky, gravelly areas in the lower regions of the mountains. In folk medicine, the above-ground part is used. A decoction prepared from the surface of the earth is used to treat scabies and skin diseases. It was experimentally determined that the ointment prepared from antimony and tincture of the surface of the earth has a bactericidal effect and the property of healing wounds, and for this purpose, it is recommended to be used in scientific medicine.



. ZiziphoraZ. tenuior L. pedicellataPazij. etVved.



Prunella vulgaris L. *Origanum thythanthum* Gontsch.



Eremostachys MenthaspeciosaRupr.asiaticaBoriss.

| | Categories | Number of types | General type number ratio% |
|---|-----------------------------------|-----------------|----------------------------|
| 1 | <i>Lagochilus Bunge ex Benth.</i> | 11 | 16 % |
| 2 | <i>Ziziphora L.</i> | 8 | 11,6 % |
| 3 | <i>Salvia L.</i> | 7 | 10,1 % |
| 4 | <i>Dracocephalum L.</i> | 7 | 10,1 % |
| 5 | <i>PerovskiaKar.</i> | 4 | 5,8 % |
| 6 | <i>Stachys L.</i> | 4 | 5,8 % |
| 7 | <i>Qolgan 20 turkum</i> | 28 | 40,6 % |
| | | 69 | 100 % |

69 species belonging to 26 genera of the *Lamiaceae* family have medicinal properties, among the genera *Lagochilus Bunge ex Benth.* with 11 species, *Ziziphora L.* with 8 species, *Salvia L.* with 7 species, *Dracocephalum L.* with 7 species are the leaders. It was found that *PerovskiaKar.*, *Stachys L.* with 4 species, *Mentha L.*, *Nepeta L.* with 3 species, *Lycopus L.*, *Lamium L.*, *Scutellaria L.* with 2, and only 1 of the remaining 14 families have medicinal representatives.

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