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"Morphological Features, Economic Importance, and Cultivation Practices of Lophanthus anisatus Benth."

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Abstract : The article presents the results of evaluating the economic importance of the lophant plant, including its nutritional, medicinal, and other beneficial properties. In order to widely introduce this non-traditional crop into production, its morphobiological characteristics, the value of its essential oil, and recommendations for its cultivation in agriculture are provided.
Keywords: Lophant, significance and application, economic importance, medicinal properties, origin, botanical description, biological characteristics, cultivation technology, crop management, conclusion.

Аннотация: В статье представлены результаты оценки экономической значимости растения лофант, включая его пищевые, лекарственные и другие полезные свойства. С целью широкого внедрения данной нетрадиционной культуры в производство рассмотрены её морфобиологические особенности, ценность эфирного масла, а также приведены рекомендации по её возделыванию в сельском хозяйстве.
Ключевые слова: Лофант, значение и применение, экономическая значимость, лекарственные свойства, происхождение, ботаническое описание, биологические особенности, технология возделывания, уход за растением, заключение.

Annotatsiya: Maqolada lofant o‘simligining iqtisodiy ahamiyatini baholash natijalari, uning oziq-ovqat, dorivor va boshqa foydali xususiyatlari yoritilgan. Ushbu noan’anaviy ekinni qishloq xo‘jaligida keng joriy etish maqsadida uning morfobiologik xususiyatlari, efir moyining qiymati hamda uni yetishtirish bo‘yicha tavsiyalar keltirilgan.
Kalit so‘zlar: Lofant, ahamiyati va qo‘llanilishi, iqtisodiy ahamiyati, dorivor xususiyatlari, kelib chiqishi, botanika tavsifi, biologik xususiyatlari, yetishtirish texnologiyasi, ekin parvarishi, xulosa.

Introduction: It is no secret that plants existing on Earth represent a major force in maintaining the balance of life. As we know, humans have long understood the positive influence of the plant world on human well-being. Some essential oil–bearing plants, particularly those belonging to the Lamiaceae family, are valued for their rich chemical composition and medicinal properties, which help alleviate human ailments. In addition, their beautiful appearance creates attractive natural landscapes and provides people with a pleasant mood. Today, the demand for essential oil–bearing crops in agriculture, medicine, and other fields is increasing worldwide.

Currently, there are more than 3,000 species of essential oil plants, of which about 100 species are cultivated. One of such crops is lofant (Lophanthus anisatus Benth), which is being grown in many countries as an ornamental, medicinal, essential oil–bearing, spice, and valuable vegetable crop.

Origin: Lofant (Lophanthus anisatus Benth), also known as anise hyssop, is a plant that naturally grows on the North American continent, from the western United States to Canada. It is a valuable medicinal plant with a bitter aromatic taste and is highly decorative during its flowering period. In the wild, it has now almost disappeared. Currently, it is cultivated in the United States, European countries, and East Asian regions such as Japan and China as a melliferous (honey-producing), essential oil-bearing, medicinal, and ornamental plant. In Russia, however, it remains relatively little known. In recent years, the number of non-traditional vegetable crops has been increasing in our country. Among these crops, lofant (Lophanthus anisatus Benth) holds a special place. There has also been growing attention to the cultivation of medicinal and essential oil-bearing plants. One such plant is lofant (Agastache foeniculum), commonly known as “medicinal anise hyssop,” “Korean sage,” or “medical anise.” It belongs to the Lamiaceae (mint) family and is a perennial plant that naturally grows mainly in North America and some Asian countries.

Significance and Uses. Lofant greens contain essential oils, vitamin C, carotene, sugars, and organic acids. Young leaves are used in the preparation of salads, okroshka, sauces, and meat and fish dishes. Powder made from dried leaves is added to compotes, jellies, mousses, puddings, and baked products.

Medicinal Properties. The medicinal properties of lofant and the valuable composition of its chemical constituents attracted the attention of both modern medicine and traditional folk healing in the 21st century. There are several species of lofant, among which anise lofant contains essential oils with strong antibacterial properties and a scent resembling licorice and dill. It has a stimulating effect on digestive processes and is used in the form of infusions for bronchitis and diseases of the upper respiratory tract. The healing properties of lofant have long been known in Mongolian and Tibetan medicine, where its aerial parts are used to regulate metabolism, treat gastrointestinal disorders such as gastritis and hepatitis, and serve as a general tonic and anti-aging remedy. Infusions of its flowers are used both externally and internally for paralysis (especially facial nerve paralysis), paresis, and tremors of the limbs.

Botanical Description. Lofant (Lophanthus anisatus Benth) is a perennial semi-shrub herbaceous plant belonging to the Lamiaceae (mint) family. It is an upright-growing plant with a well-developed stem, reaching a height of 60–150 cm. The leaves are ovate or elongated in shape, with serrated margins and covered with glands that produce essential oils. The stem is branched, and the plant may grow up to 1.5 meters under favorable conditions. Leaves are opposite, long-petioled, and heart- to lance-shaped, with a slightly purple-brown coloration and yellowish markings. The leaf length is approximately 7–8 cm. The flowers are small, ranging in color from violet to light blue-purple, and sometimes white. They are arranged in dense spike-like inflorescences located at the tips of branches. The plant blooms from June to August, and fruiting occurs in September. The fruit is a small nutlet containing seeds that ensure natural propagation of the species. The seeds are small, brown or dark in color. Lofant is a light-loving plant that is

drought-resistant and responsive to irrigation and fertilization. It prefers fertile soils and grows poorly in waterlogged or highly calcareous soils. It is difficult to obtain seedlings on light sandy or heavy clay soils. The optimal growing temperature is 20–25°C, with relative humidity of 60–70%. The seeds germinate at temperatures around +10°C, and the vegetation period lasts 110–130 days.

Economic importance. Lophanthus anisatus Benth (lofand) is an economically valuable essential oil, medicinal, and aromatic plant. Its importance is mainly based on the high content of biologically active compounds in its leaves and flowers, including essential oils, flavonoids, vitamins, and antioxidants.

From an economic perspective, lofant is considered a multi-purpose crop. It is used in the pharmaceutical industry for the production of herbal medicines, tinctures, and biologically active supplements due to its antibacterial, anti-inflammatory, and tonic properties. In addition, its essential oil is used in perfumery, cosmetics, and aromatherapy products. In agriculture, lofant is also valuable as a honey-producing plant. Its flowers are highly attractive to bees, and it provides a long flowering period, which supports high honey yield and improves beekeeping productivity. This makes it a profitable crop for apiculture development.

Furthermore, lofant is used as a spice and food additive in the food industry, especially for flavoring teas, salads, sauces, and baked products. Its cultivation does not require highly complex agronomic practices, and it can grow in relatively poor soils, which increases its economic efficiency in marginal lands. Due to its versatility, low production cost, and wide range of applications, lofant (Lophanthus anisatus Benth) is increasingly recognized as a promising non-traditional crop with significant economic potential in agriculture and related industries.

Cultivation Technology. Lofant is grown in one place for one to ten years. The crop should be placed in a separate area so that it does not shade other plants in later years. Early harvested predecessor crops are preferred, as they allow better soil preparation. In autumn, after harvesting the previous crop, the soil is shallowly loosened to limit the germination of weeds. Then it is ploughed to a depth of 28–30 cm, and the rhizomes of perennial weeds are carefully removed. In soils that are not sufficiently fertile, peat compost or humus is applied at a rate of 3–5 kg per 1 m², as well as mineral fertilizers such as nitroammophoska at 60–70 g per 1 m². Before the onset of cold weather, the soil is repeatedly loosened and weeds are removed.

Cultivation and Management. Lofant seeds are sown in March–April either through seedlings or by direct field sowing.

Seedling method. Seeds are sown in greenhouses at a depth of 1–1.5 cm. After germination, the seedlings are transplanted to the field after 35–40 days.

Direct sowing method. 5–6 kg of seeds are used per hectare, with row spacing of 45–60 cm. During the vegetation period, weeds are removed 2–3 times, and soil loosening is carried out 1–2 times. Irrigation is performed every 7–10 days, especially during the flowering period, when it is most important.

Fertilization recommendations per hectare include 40–50 tons of organic manure (humus), 60–80 kg of nitrogen, 40–50 kg of phosphorus, and 30–40 kg of potassium fertilizers.

Harvesting and Processing. Lofant is harvested during the flowering stage (June–July). The aerial parts of the plant are cut and dried, then used as raw material rich in essential oils, flavonoids, and organic acids. Drying is carried out in the shade or at temperatures not exceeding 40°C.

Conclusion. Lofant is used as a spice in salads, marinades, and meat dishes, and is also applied in vegetable preservation, pickling, and the sausage industry. One of the important aspects of interest in folk medicine is that plant-based treatments often provide simple and effective results in a short time. It is also used in the preparation of soups, fish and meat dishes, cottage cheese products, and as a seasoning in home-made canned foods and cheese production. In addition, it is used to give a pleasant aroma and flavor to tea and cold beverages.

In conclusion, under the conditions of Surkhandarya region of the Republic of Uzbekistan, the germination rate of Mexican Amethyst, Korean lofant, and Mexican Amber Freshness varieties is as good as in other regions. The plants reach a height of 120–150 cm, begin flowering on May 19–20, and reach 100% flowering by May 26. The flowers are violet and purple in color, decorative, fragrant, and highly attractive to honeybees. The leaf length is 7.5 cm and the average leaf width is 6 cm. Each plant contains approximately 500 green leaves. The inflorescence length is 7.5 cm. The seeds are black in color and covered with a dense protective coat. Based on analyzed literature and ongoing experiments, it can be stated that, according to its biological characteristics, the introduction (acclimatization) of lofant in the southern regions of Uzbekistan has great potential. The introduction of lofant can further expand the range of vegetable crops and ensure the population is supplied with valuable and beneficial products throughout the year.

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