INTERNATIONAL MULTI DISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
eISSN 2394-6334 Impact factor: 7,854 Volume 12, issue 11 (2025)

INFORMATION ON THE BIOLOGY OF ESSENTIAL OIL PLANTS AND THEIR IMPORTANCE

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Abstract: 2500 species of flowering plants distributed on Earth contain essential oils. Essential oils protect plants from various diseases and pests, as well as serve to prevent plant tissues from rotting and to restore them when damaged. In addition, information is provided that from ancient times to the present day, people have been using the leaves, fruits and seeds of various spices and essential oil plants to give food a delicious taste and pleasant aroma.

Keywords : Uzbekistan, pharmaceuticals, ether, perfumery, cosmetics, borneol, octylene, pinene, camphor.

Abstract: 2500 species of flowering plants distributed on Earth contain essential oils. Essential oils, along with protecting plants from various diseases and pests, serve to prevent decay and regeneration of plant tissues when damaged. At the same time, there is information that from ancient times to the present day, people have been using the leaves, fruits, and seeds of various spices and essential oil plants to give food a pleasant taste and aroma.

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Annotation: 2500 vidov tsvetkovyx rasteniy, rasprostranennyx po vsemu miru, soderjat efirnye masla. Efirnye masla ne tolko zashchishchayut rasteniya ot razlichnykh bolezney i vrediteley, no i slujat dlya predovrashcheniya gnieniya i vosstanovleniya tkaney rastenyi pri ix poverjdenii. Naryadu s etim, privedeny svedeniya o tom, chto s drevnih vremen do nasikh dney lyudi spolzovali listya, plody i semena razlichnyx spetsii i efiromaslichnyx rastenii dlya pridaniya pishche horoshego vkusa i priyatnogo aromata.

Key words: Uzbekistan, pharmaceuticals, ether, perfumery, cosmetics, borneol, octylene, pinene, camphor.

Introduction. The nature of our independent Republic is very diverse, and the flora of deserts, mountains and forests grows and develops in a unique order, interdependently. Only plants that have adapted to these unique living conditions to a certain extent survive. Along with the use of wild fauna and flora, it is important to preserve their numbers and preserve the flora on the verge of extinction. The flora is one of the main components of the natural environment and an important component of the natural wealth of our homeland. It serves as a source of industry, medicines, raw materials, food products and other material resources necessary to meet the needs of the national economy.

All flowering plants on Earth belong to 300 families, of which 2,500 species from 87 families have been identified as containing essential oils. In the flora of the CIS countries, more than 1,100 species from 77 families are essential oil plants. In Uzbekistan, 607 species of essential oil plants are known, belonging to 261 orders and 56 families.

The purpose and objectives of the research: Cultivation of essential oil plants and their application in the national economy.

The CIS countries occupy a leading position in the world in terms of planting and harvesting essential oil plants. Currently, the total area under cultivation of essential oil plants is more than 230,000 hectares. In our country, 1,650 tons of essential oils of 39 varieties were produced in 1967, from which more than 400 types of perfumery and cosmetic products and more than 60 types of aromatic soaps were prepared. In our country, along with the production of natural essential oils, synthetic aromatic substances are also obtained by chemical methods. When synthesizing these substances, the source of raw materials is some components of essential oils; linalool, citral, citranellal, eugenol, anethole, as well as coal, oil, peat, which are mainly formed from natural plant residues.

The largest enterprise producing synthetic substances in the CIS countries is the Kaluga Combine. This enterprise has a production capacity of 50% of the total synthetic substances. Currently, 3,000 tons of synthetic odorants of 150 names are produced annually, which are used in some sectors of our industry. Despite the fact that the technology for obtaining essential oils and the production of synthetic odorants have been well established to meet the demand for essential oils in various sectors of the national economy, the need for essential oils is still growing. Therefore, in recent times, the main attention has been paid to further and scientifically studying essential oil plants. Essential oils accumulate in special places (tubules) of cells and tissues in various organs of plants (leaf, stem, flower, fruit, seed and root). In addition, they are found in the form of emulsions in cell sap and parenchyma cells. Depending on the growth and development conditions of the plant, the amount of essential oils in it varies. Essential oils differ from vegetable oils in that their chemical composition is very complex, volatile and fragrant. If essential oils come into contact with paper or material, they do not leave any stains. Vegetable oils do. Also, essential oils are not consumed as food, while vegetable oils are consumed. Essential oils are found in free form in most plants and are isolated by steam distillation or extraction. In some plants, essential oils are combined with glucosides and other substances. Fermentation is used to isolate them in their pure form. Essential oils consist of various organic compounds formed from a complex combination of several substances, often genetically interconnected. Their components include hydrocarbons, alcohols, aldehydes, ketones, phenols, lactones, esters, quinones, acids, nitrogenous compounds and other substances. If the amount of one of the components in the composition of essential oils is high, it determines the smell of the oil, that is, its physical and chemical properties. The most important components of essential oils for the perfume industry are oxygen compounds. Essential oils extracted from plants have the property of rapidly changing in the open air, under the influence of light. As a result, their color, composition and properties change. At high temperatures, they form polymer compounds that boil. The main reason for this phenomenon is the oxidation of some of the components in the composition of essential oils under the influence of oxygen and air humidity, which also leads to the loss of their volatile state. If essential oils contain aldehydes, then their color darkens.

There are several views and opinions about the function and importance of essential oils in plant organs, some of which we will discuss below, for example, according to some views, essential oils protect plants from various diseases and the effects of pests. At the same time, when plant tissues are damaged, they serve to prevent them from rotting and to restore them. However, it is known from the literature and our personal observations that mint, marmarak, ylang-ylang, avrug and many other plants with essential oils are usually subject to various diseases and damage. There is a second opinion that essential oils protect plants from being eaten by animals. It should be said that we all know that plants such as wormwood, tarragon, lavender are eaten by cattle, sheep and goats. There is also a third idea that the essential oils in the flowers of plants attract insects and are used for pollination. According to Tindal, essential oils evaporate, envelop the plant and to some extent block the passage of hot air. As a result, they protect the

plant from overheating during the day and cooling at night, and also control the evaporation of water in the plant. According to Sharab, essential oils are formed in plants as a reserve substance in their green parts. Then they gradually begin to move to the fruit-bearing organs. During the flowering period, some of them are spent, and the rest returns to the leaves. According to Menard and Merny, essential oils are waste products formed during the life of the plant , which plants try to remove from all its organs. Essential oils are composed of complex compounds, the components of which are different. The formation of essential oil components also varies. However, it should be noted that essential oils play an important physiological role in plants. They are products of complex compounds formed as a result of metabolism.

Since ancient times, people have been using the leaves, fruits and seeds of various spices and essential oil plants to give food a delicious taste and pleasant aroma. Recently, raw materials obtained from essential oil plants have been used in various sectors of the national economy. In particular, essential oils are widely used in the perfume industry to produce perfumes, toothpastes and powders, lipsticks and soaps. In pharmaceuticals, some essential oils and their mixtures are used in the treatment of menthol, thymol, anethole, etc., due to their antiseptic properties, in the preparation of various medicines (for toothache, skin diseases, hair care). An alcoholic solution of menthol is used for injuries of the oral cavity and inflammation of the respiratory tract, and for non-infectious diseases of the gastrointestinal tract. Validol, camphor-heart, thymol and eugenol - are widely used in the treatment of dental diseases. Essential oils are of great importance in the food industry. They are used in the production of candies, various pastries, alcoholic and non-alcoholic drinks, wines, liqueurs. It is impossible to do without essential oils in the canning and fishing industries. After essential oils are extracted from the seeds of some plants (coriander, anise, cumin), oils used for technical purposes are obtained from them. The remaining kernels are considered high-quality, protein food for animals. Most essential oil plants are roses, marigolds, basil, and marigolds, in turn, ornamental, lavender, coriander, marjoram and hyssop are among the best honey plants. Recently, in addition to essential oils, artificially obtained aromatic substances. But they cannot replace essential oils. Artificially obtained odorous substances cannot be used in the canning and fishing industries, in the production of vodka, wine and liqueurs. They are used in the preparation of fruit essences. Below we will dwell on some essential oil plants growing wild in our republic, which are considered raw materials for certain sectors of the national economy.

Juniperus zeravschanica Kom. is a tree of the cypress family, reaching a height of 20 meters, and in some cases a low shrub, branched, with thick branches, thin at the ends, and reddish bark. The fruit (pod) is 9-12 mm long, with a short band, 2-3, sometimes 4 seeds, spherical, green when raw, dark brown when ripe, covered with gray wax. The seeds are 5-7.5 mm long, triangular-ovate, the lateral ones are slightly larger, convex, with a groove, whitish when unripe, brown when ripe. The kizilarcha grows in mountainous areas of Tashkent, Fergana, Samarkand and Kashkadarya regions on small gravelly soils (at an altitude of 1000-2500 m above sea level). It sometimes forms fairly thick juniper forests. It is important in improving the land reclamation of mountains and preventing wind and rain erosion. Its fruits can also be used to make kimiz. Such kimiz is more healing, has a good taste and aroma. In the past, it was widely used as a building material. Young (barra) branches of the kizilarcha contain 0.45-0.75 percent essential oil. This oil is colorless, has a strong odor, and is mainly composed of myrcene, cedrol, camphene, and terpenes. It is used in perfumery and medicine.

PEROVIC (Perovskia scrophulariifolia Bge.) is a small shrub belonging to the family of Labiatae, reaching a height of 120 cm. The base of the stem is woody, the bark is brown. The leaves are lanceolate or ovate, blunt, heart-shaped at the base, large, blunt, serrated, old leaves are hairless, with remnants of stellate hairs on the leaf blade. The flowers are short-stalked, few-

flowered, and form panicles in the form of a spike. The inflorescences are small, ovate, falling off. The sepals are 5-6 mm, purple-colored serrate. Perovic blooms in June-July, and the seeds ripen in July-August. This plant grows abundantly in small gravelly soils and slopes of hilly and mountainous regions. Its main resources are located in the Fergana Valley and the mountainous regions of the Kashkadarya region. From one hectare of avrug gardens, 1.5-2.5 tons of raw materials (in dried weight) can be harvested. The green parts and inflorescences of avrug are rich in essential oils. The essential oils contained in it can be used in the preparation of various scented soaps and perfumes. The amount of essential oils in avrug reaches 1.14-2.3 percent. They are yellow or brown in color and have a pungent odor. The basis of the essential oil is camphene, cineole, aromadendrene-caryophyllene.

WILD CARNATION (Dianthus tetralepis Nevsky) is a perennial herb of the carnation family, with a woody and strongly branched stem at the base, reaching a height of 15-25 cm. The leaf is 1-1.5 mm wide, sharp, glabrous, green or gray. The sepals are cylindrical, obtuse-triangular, sharply toothed, 2-3 times smaller than the tube. The corollas are 40-45 mm long, white or light red, deeply carved. Wild carnation blooms in May-July, and its seeds ripen in July-August. It grows in all mountainous regions of our republic on small gravelly and stony soils. Its flower is fragrant and contains valuable essential oil, which can be used in perfumery to produce high-quality perfumes and colognes. The flower of the plant contains 0.15-0.2 percent essential oil and is yellow in color. Wild carnation is considered an ornamental plant; therefore, it can be planted and grown in gardens

OQSHAIR (Ferula jaeschkeana Vatke.) is a perennial monocarpic herb of the umbelliferae family, growing to 100-150 cm tall. The stem is thick, branched in the upper part, reddish-brown in color. The leaves are large, soft, quickly withering, the upper side is often glabrous, the lower side is pubescent, the basal leaf is wide, 3-cut, the segments are double-pinnately cut. The stem leaf is slightly smaller, the appearance of the whorl leaf is ovate, soft, covering the stem. The umbrella consists of umbels of various sizes; the diameter is up to 16 cm , the umbels are 10-15-flowered, without whorl leaves. The sepals are toothless. The petals are 2.5 mm, flat, yellow with a bent tip. The fruit is flat, slightly narrowed, 20-32 mm long, 10-22 mm wide, ovoid or oblong-ovoid, reddish-brown in color, it blooms in May-June and the fruit ripens in July-August. Aqshair grows in soil and small rocky areas of mountainous and pasture regions. It forms some aqshair forests. In folk medicine, aqshair resin has been used to treat ulcers and various wounds. The root of the plant contains 0.4-0.7 percent resin, and the resin contains 11-15 percent essential oil. It is light green and has a very strong, characteristic odor.

is a perennial herb belonging to the Lamiaceae family , growing up to 50 cm tall. The stem is erect, branched and has soft hairs. The leaves are banded, elongated rhombic. The flowers are banded, equal to or slightly longer than the long sepals. The basal leaves are long banded. The sepals are 2.5 mm long, sharply toothed, with short curly hairs, 4 times smaller than the tube. The corolla is 4-5 mm long, light red-purple. Mint blooms in July-August, and its seeds ripen in August-September. This plant is widespread in wet and dry lands (along the banks of ditches, on river banks) of the Tashkent and Fergana regions, in general, in oases and in the hilly regions. In folk medicine, water mint is used to improve the functioning of the respiratory and digestive systems, normalize heart rate, and treat gout. Water mint essential oils are used in the perfume industry to make toothpastes and pastes, and scented soaps. Water mint contains 0.5 percent essential oil in the entire above-ground part during flowering, and 1.2 percent in the leaves. It is greenish-yellow in color, has a pleasant odor, and is slightly bitter, and is mainly composed of menthol, menthone, carene, linalool, and pulegone.

Yarrow (Achillea filipendulina Lam.) is a perennial herb of the Asteraceae family, growing to 60-85 cm tall. It has many stems, thick, wavy edges, and hairy glands. The leaves are long,

feather-like, with large toothed lobes, the lower leaves are serrated, and the upper ones are unserrated. The basket is 4-10 mm in size, consisting of a different number of flowers, and the basket is located at the ends of the branch. The flowers are 2-5 mm in diameter, cylindrical, and yellow in color. The seeds are 2-2.25 mm long, oblong-lanceolate, grayish-black in color. This plant blooms in June-September, and the seeds ripen in August-September. Dastarbash grows abundantly along streams, river banks, and gravelly and rocky slopes in the hilly and mountainous regions of the republic. It is a medicinal and essential oil plant, and its decoction or juice can be used to treat stomach aches and hemorrhoids. The plant contains 0.24 percent essential oil in its leaves during flowering, 0.19 percent in the above-ground part, 0.32 percent in the inflorescences, and 0.38 percent in the inflorescences during fertilization. This oil is light yellow in color, has an unpleasant, pungent odor. The composition of the essential oil consists of octylene, pinene, borneol, camphor, camphene, and complex ethereal alcohols. It is a source of essential oil, borneol, and camphor.

Wormwood (Artemisia absinthim L.) is a perennial herb of the family of complex flowers, with one or more stems, branched at the top, up to 100 cm tall. The leaves on the lower part of the stem are 20 cm long, 3 times pinnately cut, with a whole toothed edge, the leaves in the middle part are short-striped, double pinnately cut, the upper ones are almost unstriped, pinnate or entire. The inflorescences are in the form of a raceme; the baskets are 2-5 mm wide, 40-80-flowered, and spherical. The inflorescence is pubescent, hairy. The seed flowers are in the form of a thread-like tube, the seeds are 1 mm long, brown. The whole body of the plant is covered with short, thick hairs, which are white in color. Wormwood blooms small and its seeds ripen in September. This plant is widespread in the mountainous regions of the republic, along the banks of ditches in oases, on roadsides, under walls, in abandoned lands and in groves. Young leaves and branches of the wormwood can be used as a spice in fried foods. Dried leaves and branches are used in the production of vermouth and liqueur. In folk medicine, wormwood juice is used for abdominal pain, to release gases accumulated in the intestines, and as an appetite stimulant. In medicine, the juice (extract) prepared from its leaves and flowering parts is also used as an appetite stimulant and to improve the functioning of the digestive organs. The above-ground parts of the wormwood contain 0.5-2 percent essential oil, protein, glucoside - absinthe, resin, vitamin C, and various acid salts . In addition, it contains malic and succinic acids, mineral salts, astringents, and artemisinin. The basis of the essential oil of Ermon is formed by phellandrene, pinene, terpene-alcohol-thujone and ketone-thujone. It has a pungent odor, is blue-green or dark green and is difficult to separate from water.

YUG'ON (Prangos tschimgnica B. Fedtsch.) is a perennial herb up to 100 cm tall, belonging to the family of Apiaceae. The stem is branched in the upper part with a groove, and is located in a ring on the stem. The basal leaves are long-striped, oblong-ovate, many times pinnately carved, the stem leaves are long and many-lobed. The umbel is large, 20 cm wide, with a groove, thickened, and the whorl consists of 6 leaflets. The umbels have 10-15 flowers. The fruit is a banded, broadly elliptical, 15 mm in size, with a convex edge. It blooms in June, and the seeds ripen in July. Yugon is found on the gravelly slopes of the Tashkent region and among trees and shrubs. The leaves of the plant contain 0.12 percent essential oil, the stems 0.05 percent, the fruits 0.38 percent, and the roots 0.45 percent. This oil is light yellow in color and has a pleasant odor. It can be used in the preparation of toothpastes and pastes, as well as various soaps.

RESEDA (Reseda luteola L.) is a biennial herb up to 80 cm tall, belonging to the Resedaceae family. The stem is erect, with one or more branches. The leaves are entire, 6-9 cm long, 9-12 mm wide, without a band and hairless; the lower leaves are obovate, blunt-pointed, compressed towards the base. The inflorescences are spike-shaped; 13-15 cm long, 10 mm wide, dense, erect, sometimes branched at the bottom. The flowers are banded, small, yellow. Sepals 4,

identical, 2 mm long, oblong. Carpels 4, yellow. Stamens 40, thread-shaped. Reseda blooms and produces seeds in May-August. It is distributed along ditches, roadsides, river banks, near crops, and mountain slopes in Tashkent, Samarkand, and Surkhandarya regions. The plant can be used to dye fabrics yellow. Its above-ground part contains a yellow substance - luteolin, 0.09-0.27 percent essential oil, and the seeds contain 30-34 percent oil. The essential oil has a pungent odor and is light yellow in color, and can be used in perfumery.

SALVIA (Salvia sclarea L.) is a perennial herb belonging to the Lamiaceae family, growing 50-100 cm tall. The stem is erect, hard, branched, covered with thick hairs. The leaves are banded, large-ovate, heart-shaped at the base, especially curly hairy on the lower side. The basal leaves are broadly ovate, without a band, sharp at the tip, almost veil-like, white or light red-violet in color. The flowers are short-banded, arranged in 2-flowered axils of the basal leaves, forming a pyramidal inflorescence. The sepals are 9-11 mm long, covered with curly and glandular hairs, 1.5 times shorter than the tube. The sepals are light red-violet in color. The nut is 2.5 mm long, round, three-sided, light brown in color. Marmarak blooms in June-July, and its seeds ripen in July-August. It is often found in oases, hilly and mountainous regions. Marmarak leaves are used in liquid dishes, jams. Its dried leaves can be used in the preparation of various preserves, in the production of vodka, liqueur. In medicine, marmarak is used to treat some diseases of the respiratory tract and digestive organs. Marmarak is one of the main essential oil plants, and it is a raw material for some sectors of our national economy. The essential oil obtained from it is highly valued in perfumery, canning industry, wine production and pharmaceuticals. When the marmarak is blooming, its inflorescences contain 0.38 percent essential oil, during flowering - 0.31 percent, and when the seeds are ripe - 0.45-0.48 percent. The essential oil is light yellow, fragrant, and consists mainly of borneol, cineol, pinene, and thujone. In addition to essential oil, marmarak contains tannins, resin, phytoncides, and vitamins A and C. The seeds contain 25-30 percent oil. This oil is higher in quality than cottonseed oil. Marmarak oil has a high iodine content, so it dries quickly. High-quality aliphatic oils can be prepared from it.

In conclusion, essential oils, due to their volatile and bactericidal properties, as well as their pleasant aroma, can be used to disinfect public buildings, schools, kindergartens, cinemas. They are used to combat pests and diseases of agricultural plants.

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