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MINT PLANT AND ITS IMPORTANCE IN MEDICINE

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Abstract
Mint is widely distributed in the conditions of Uzbekistan. As is well known, due to its numerous beneficial properties, mint has been used since ancient times both as a culinary herb and in traditional medicine. In Ancient Greece, mint was considered a symbol of hospitality. The ancient Romans sprinkled mint water in banquet halls to improve mood and create a pleasant atmosphere. Mint is very rich in vitamins A and C, B vitamins, iron, manganese, folic acid, and even calcium. It is used to facilitate breathing, relieve pain, improve digestion, and alleviate dyspepsia and abdominal bloating. Mint infusions and mint leaves are used to improve the functioning of the digestive system, particularly as choleretic and antispasmodic agents. Mint oil is also beneficial for respiratory health.

Keywords: Lamiaceae family, menthol, antioxidant, anti-inflammatory, analgesic, infusion.

Introduction

Since ancient times, humanity has prepared ointments and infusions from medicinal plants and used them to treat various diseases. People have utilized plants not only as medicines but also as food, dyes, clothing materials, and agents for pest control. Among medicinal plants, one of the most significant is peppermint. Mint is a perennial herbaceous plant belonging to the Lamiaceae (mint) family, characterized by a pleasant cooling taste and aroma. Four species of mint are most commonly found in Uzbekistan. Asian mint (Mentha asiatica) is widespread throughout the country. Field mint (Mentha arvensis) and curly mint (Mentha crispa) are cultivated. Other members of this family include lemon balm (Melissa), savory (Satureja), thyme (Thymus), hyssop (Hyssopus), oregano (Origanum), horehound (Marrubium), motherwort (Leonurus), and Lagochilus. Long-leaved mint is a perennial plant. Adequate moisture and sunlight are essential for its healthy growth. If mint is shaded, both its yield and essential oil content decrease. The stem grows upright and reaches a height of 110–140 cm. The leaves are sessile or short-petioled, ovate-lanceolate, up to 15 cm long and 2–3.5 cm wide, with serrated margins and densely covered with soft hairs. The flowers are arranged in false whorls forming inflorescences and are purple in color. Mint has fragrant, toothed leaves and small purple, pink, or white flowers. It can easily be identified by its characteristic quadrangular (square-shaped in cross-section) stem. The fruit consists of four brown nutlets. Although mint flowers abundantly, it rarely produces seeds; therefore, it is propagated vegetatively by dividing and planting its roots. This plant is widely distributed in the wild. It grows along the moist banks of rivers

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and lakes, as well as in marshes and ditches in the United States, Ukraine, Western Siberia, the Caucasus, Europe, and Asia Minor.

Species of Mint

Mentha aquatica – Water mint

Mentha arvensis – Field mint or meadow mint

Mentha asiatica – Asian mint

Mentha australis – Australian mint

Mentha canadensis – Canadian mint

Mentha daurica – Dahurian mint

Mentha japonica – Japanese mint

Mentha suaveolens – Apple mint or fragrant mint

Pineapple mint (Mentha suaveolens) is a variety with rounded leaves edged in yellow. It has a very mild flavor and pleasant aroma. Bergamot mint (Mentha citrata) is sometimes called lemon, orange, or even "cologne" mint because of its sweet citrus flavor and fragrance resembling lavender. It is often added to herbal teas and soft drinks. Garden mint is one of the most commonly cultivated species. Spearmint (Mentha spicata) has grayish-green, heart-shaped leaves and a pleasant flavor. Peppermint (Mentha × piperita) is widely distributed in Europe, Africa, and America. It is a hybrid of water mint (Mentha aquatica) and spearmint (Mentha spicata). Peppermint contains up to 65% menthol, which is why it is used not only in the confectionery industry but also in the production of toothpaste, chewing gum, dental elixirs, mouth rinses, and pharmaceutical products.

Freshly harvested mint contains the following nutrients per 100 g: 44 kcal of energy, 3.3 g of protein, 0.7 g of fat, and 1.6 g of carbohydrates. One hundred grams of dried garden mint contains 285 kcal of energy, 19.9 g of protein, 6 g of fat, 22.2 g of carbohydrates, and 29.8 g of dietary fiber. Therefore, nutritionists recommend consuming no more than 12–15 fresh mint leaves per day.

Chemical Composition of Mint Essential Oil

Menthol ($C_{10}H_{18}O$) is an organic compound consisting of ten carbon atoms, eighteen hydrogen atoms, and one oxygen atom. Its structure is characterized by a cyclic aliphatic alcohol ring and it is commonly obtained from mint plants. Menthol is the primary active component of mint oil and is responsible for its characteristic taste and aroma. The menthol content in mint oil is usually around 40–60%.

Menthone ($C_{10}H_{16}O$) is a compound formed through the oxidation of menthol. It is a terpenoid naturally found in mint plants and often occurs together with menthol. Menthone possesses a pleasant fragrance and contributes to the fresh and distinctive aroma of mint oil.

Isomenthone ($C_{10}H_{16}O$) is an isomer of menthone. Although present in smaller quantities, it contributes to the overall aroma and quality of mint oil.

Limonene ($C_{10}H_{16}$) is one of the principal compounds responsible for the fragrance of citrus fruits. It has a characteristic citrus aroma and is also present in mint. Limonene contributes a slight citrus note to mint oil and exhibits mild antioxidant properties.

Cineole ($C_{10}H_{16}O$) is a monoterpenoid compound found in many essential oils. It enhances the cooling sensation of mint and supports respiratory function.

Kaempferol ($C_{15}H_{10}O_6$) is a natural flavonoid widely distributed in green leafy plants, fruits, flowers, and nuts. In mint, kaempferol contributes antibacterial and antioxidant activities.

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Properties and Benefits of Mint Oil

Mint oil possesses antioxidant, antimicrobial, and anti-inflammatory properties. It helps facilitate breathing and may be beneficial in respiratory conditions such as asthma and bronchitis. It is commonly used to clear the airways and reduce coughing.

Due to the cooling effect of menthol, which decreases the sensitivity of sensory nerve endings, mint oil can relieve muscle pain, headaches, and other types of pain. Mint improves digestive function and is particularly effective in relieving dyspepsia and abdominal bloating. It is often used to reduce stomach discomfort and promote digestion. Mint oil may help reduce stress and stabilize emotional well-being; therefore, it is widely used in aromatherapy. Menthol affects the central nervous system and may contribute to the normalization of blood pressure. The menthol contained in Corvalol helps regulate heart rhythm and dilate blood vessels. Through a reflex mechanism, menthol dilates the coronary arteries and is used in the treatment of mild forms of angina pectoris. Menthol is also considered beneficial for improving circulation and regulating heart rate. Mint tea is an effective remedy for gastrointestinal disorders and helps eliminate excess fluid from the body.

Pharmaceutical and Cosmetic Applications

Mint leaves are widely used in the pharmaceutical industry. Both dried and fresh mint serve as valuable sources of essential oils. During processing, crystalline menthol is extracted from fresh plant material. Menthol is used in the manufacture of cosmetics and personal hygiene products, including toothpastes, refreshing lotions, anti-dandruff shampoos, and aftershave balms. Infusions and herbal teas are prepared from mint leaves. Mint infusions may be used for bathing children with allergic skin rashes and can also be administered for intestinal colic and spasms.Menthol is used in the treatment of neurodermatitis, an inflammatory skin condition associated with allergic and nervous system components. Fresh flowering mint is utilized in homeopathy.Mint leaves are rich in volatile oils, including menthol, limonene, dipentene, and menthone. They also contain triterpene compounds, mineral salts, tannins, and enzymes. The highest concentration of essential oil is found in the flowers, while the leaves contain somewhat lower amounts. Long-leaved mint contains several organic acids, including malic and citric acids, as well as phytoncides and vitamins C and P.

In official medicine, mint leaves are widely incorporated into medicinal preparations. Mint tincture is prescribed at a dose of 10 drops to improve digestive tract function and relieve nausea. The tincture also exhibits diuretic and choleretic properties. In purulent bronchitis and bronchiectasis, it demonstrates disinfectant effects. It also acts as a vasodilator in cases of angina-related pain.

Medicinal Preparations Containing Menthol

Boromenthol Ointment contains 0.005 g of menthol and is a combined topical preparation with antiseptic and antispasmodic properties. It is used externally for itching, neuralgia, and rhinitis. It is contraindicated during pregnancy, lactation, and in children under three years of age.

Menovazine, which contains ethyl alcohol, menthol, novocaine, and anesthesin, is applied topically for dermatoses, myalgia, and neuralgia. Menthol stimulates nerve endings in mucous membranes and dilates superficial blood vessels, producing cooling and analgesic effects. Prolonged use may lead to dizziness, weakness, and reduced blood pressure.

Validol is a 25–30% solution of menthol in menthyl isovalerate. It is used in angina pectoris, hysteria, neurotic disorders, and as an antiemetic in patients with vestibular disorders. A 5–10% alcoholic solution and a 10% ointment are also used for treating skin itching.

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Pectusin, containing menthol, eucalyptus oil, sugar, and talc, exhibits local anti-inflammatory and antiseptic effects and is used for upper respiratory tract inflammations such as laryngitis, pharyngitis, and tracheitis.

Evkatol Drops, composed of menthol, eucalyptus tincture, and ethyl alcohol, possess antiseptic, expectorant, and anti-inflammatory properties.

Olimetin Capsules contain mint oil, purified turpentine oil, olive oil, and purified sulfur. They exhibit antispasmodic, choleretic, diuretic, and anti-inflammatory effects. For gallstone dissolution, 2 capsules are taken 3–5 times daily on an empty stomach; for prevention, 1 capsule is taken twice daily.

Anestezol Suppositories, which contain menthol, are used in the treatment of hemorrhoids and anal fissures.

Traditional Uses and Storage of Mint

For sore throat or toothache, gargling with a concentrated mint infusion is traditionally recommended. In cases of anemia, fresh mint leaves may be consumed directly.

For nausea, one tablespoon of mint leaves is boiled in a water bath for 10 minutes, cooled completely, filtered, and consumed three times daily. This infusion may also be applied externally for rinsing skin affected by rashes.

A bunch of fresh mint placed in water can remain fresh for up to a week. If the water is kept clean, the stems may even develop roots. Fresh mint can also be wrapped in a damp paper towel and stored in a refrigerator.

To dry mint, it should be hung in a cool and dry place. Once the leaves are completely dried, they can be crushed and stored in an airtight container for at least one year.

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