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Mentha Spicata L.: A Commercial Medicinal and Aromatic Crop for Cultivation

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Abstract

Mentha spicata L. (Spearmint) is a significant aromatic, therapeutic and culinary herb. The chemical compounds limonene, 1,8-cineole, carvone, dihydrocarvone and dihydrocarveol make up the majority of the essential oil found in plant. It has minimal percentages of menthol and menthone. No-a-days commercial and health are the two major issues for the public. The goal of the current review is to provide a detailed survey on the biological characteristics, health advantages and commercial uses of the plant under study.

Mainbody- M. spicata include its anti-inflammatory, antiviral, antifungal, antioxidant and antibacterial properties. Additionally, M. spicata can be used to treat fevers, headaches, nausea, cramps, toothaches, jaundice and sore throats. Fresh or dried M. spicata leaves are used in herbal tea, spices, foods and beverages.

Conclusion-The M. spicata plant's leaves are used to make various aromatic agents. The different medical applications of M. spicata are covered in this article. The data revealed that limonene, 1,8-cineole, carvone, dihydrocarvone and dihydrocarveol are the major components in the M. spicata. In addition, M. spicata (spearmint) is a very effective remedy for a number of different conditions.

Keywords- *Mentha spicata L.*, essential oil, carvone, medicinal herb

Introduction:

The culinary and medicinal herb *M. spicata L.*, also known as spearmint, belongs to the Lamiaceae family. The *M. spicata* species come in the MSS-5, Arka, Neera, and Neerkalka varieties (cimap.res.in). The term "spearmint" comes from the words spear (sprout of a plant, spire) and mint, and it refers to the plant's spiry blooms. It is a plant that thrives in moderate climates and can be found in Asia's tropical regions, and our nation is planning to keep more of this crop growing. Today, our eating and living practices are continually

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evolving.. On the one hand, people are using new herbs and spices for their food, while on the other hand, health-conscious individuals are also consuming herbal tea made from advantageous medicinal plants. As a flavouring ingredient *M. spicata* is added to cooked meals.*M. spicata is* utilised as a herbal tea because of its medicinal properties (Lixian., 2018). In terms of medicinal plants, *M. spicata is* a beneficial herb. Because spearmint is widely used in India, the demand for it is currently rising steadily, but the supply isn't keeping up with the need. This explains why goods created from this plant are more valuable on the market. Due to the current circumstances, it is essential to encourage the growth of *M. spicata* (spearmint) in order to meet the rising demand and increase production levels while lowering the price of the products derived from it. The flavour and health benefits of spearmint make it popular around the globe. The component percentage of *M. spicata* essential oil may change depending on the environment (Mahboubi., 2018).

Morphology:

M. spicata is a perennial herb, has smooth stems and small, green leaves. The plant is 30–100 cm long (Ganesan et al., 2021). The length and width of the leaves are 5–9 cm and 1.5–3 cm, respectively. pH levels between 6.0 and 7.0 are ideal for spearmint plant growth. Volatile oil, which is present in the tiny, spotted glands on the leaves, gives the plant its aroma and colour. The spearmint plant produces flowers that are pink-white in colour, 2.5–3 mm long and broad and arranged in slender spikes (Anwar et al., 2019).

Geographical Distribution:

M. spicata is grown in Europe, Asia, North Africa, America, India and Brazil in a range of tropical to temperate conditions. The plains region is conducive to its successful cultivation. In addition to Jammu and Kashmir, Assam, Punjab, Tamil Nadu, Australia and China are other major distribution areas for *M. spicata* (Li et al., 2018).

Chemical Composition Of Spearmint Essential Oil:

The main components of the essential oil of *M. spicata L.* were found to be carvone (45.96%), pulegone (13.89%), limonen (12.80%), 1,8-cineole (7.77%), -caryophyllene (5.51%), dihydrocarvone (3.44%), piperitenone (1.84%), -bourbonene (1.26%), and germacrene D (1.24%) (Shahsavarpour et al., 2017). Carvone (49.62-76.65%), limonene (9.57-22.3%), and 1,8-cineole .(1.32-2.62%) are the chemical components of *M. spicata* oil, according to the North-West Himalayan region of India (Mahboubi, 2018).

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Biological Activities of Spearmint:

The medicinal plant *M. spicata* (spearmint) is particularly efficient. Many human diseases and bodily ailments are treated with this. Jaundice (Sharma et al., 2012), asthma, headache, stomachache, allergies, digestive disorders, fever, cold, and cough can all be treated with this plant. It functions as medication (Ali-Shtayeh et al., 2019). The following is a description of spearmint's biological characteristics:-

- **Antiviral-** Due to the high concentration of carvone and limonene in the oil, spearmint essential oil (SEO) has an antiviral effect (Majid et al., 2021).
- **Antifungal-** *M. spicata* essential oil is quite helpful in treating infections brought on by pathogenic moulds (*Aspergillus niger, Rhizopus solam* and *Fusarium solani*). A few drops of essential oil should be added to the bathwater when taking a bath in order to prevent infection brought on by too much moisture on the skin. The illness can be treated if spearmint oil is combined with any other carrier oil and administered to the affected area. *M. spicata* exhibits antifungal activity against penicillium because of the chemical components limonene, menthol, menthone, and carvone (Smid et a1., 1995).

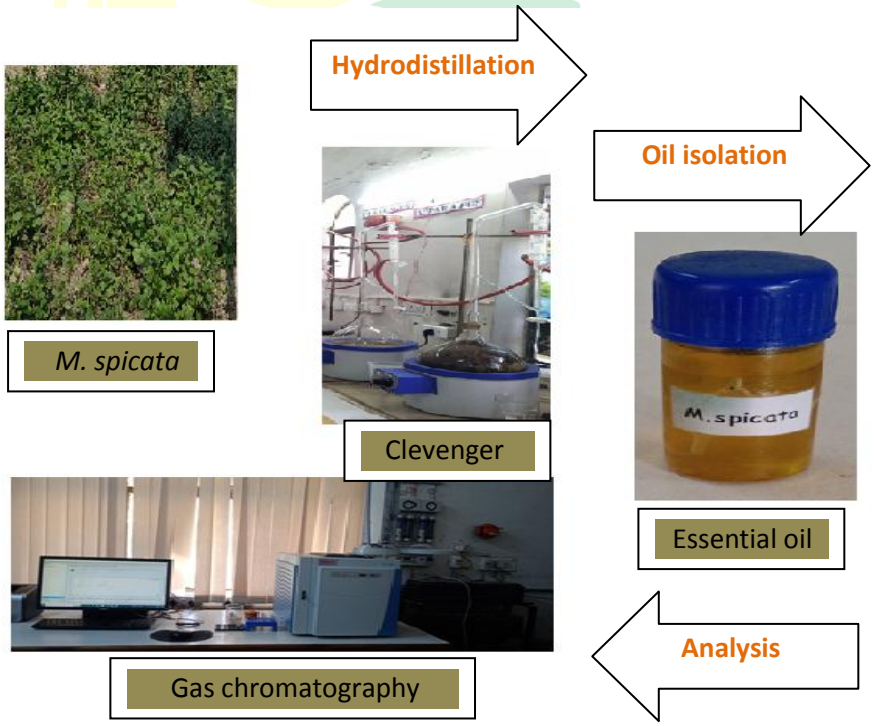

Fig. 1 View of *M. spicata* L. essential oil isolation and analysis

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- **Antibacterial-** Gram-positive and gram-negative bacteria that lead to food spoiling, such as *Staphylococcus aureus* and *E. coli*, can both be inhibited by spearmint essential oil (SEO) (Sharafi et al., 2010, Fitsiou et al., 2016).
- **Anti-inflammatory**-Both pre-clinical and clinical models have shown the anti-inflammatory capabilities of limonene, a significant active component of spearmint es sential oil (SEO). As an anti-inflammatory product, SEO is a potential agent (Wang et al., 2018).
- **Anti-oxidant-** The elimination of damaging free radicals by the body is made easier by spearmint. With a high concentration of non-volatile phenolic chemicals, particularly flavonoids, spearmint has strong antioxidant action (Li et al., 2018).
- **Anti-cancerous-** Carvone and limonene, two chemical components found in spearmint essential oil (SEO), may be used to treat cancer by slowing the growth of tumour cells. According to Hussain et al., 2010, the leaves of spearmint are cytotoxic to human leukaemia cell lines and mice fibrosarcoma cells.

6. Health Benefits of Spearmint:

- The body receives a variety of minerals from spearmint, including potassium, magnesium, calcium, phosphorus, vitamin C, iron, and vitamin A. Due to its ability to reduce flatulence, spearmint is regarded as one of the best herbs for the human body (Mahboubi., 2018).
- The phenolic acids and flavanoids in spearmint essential oil support the body's defenc es against viral infections, the common cold, nausea, discomfort, etc (Li et al., 2018).

Commercial Applications of Spearmint:

- **Herbal Tea-** Both fresh and dried spearmint can be used (Lawrence, 2006). Fresh or dried spearmint leaves are used to make tea. The spearmint leaves are cut into little pieces and stored in a tea bag after drying. To prevent air exposure and preserve the flavour and nutrients of spearmint, tea bags should be kept in airtight pouches or containers. Add the spearmint leaves to the pan of boiling water. Afterward, stop the flame and let it cool for a while, then the water should be filtered and flavoured with sugar, honey, lemon juice, or other ingredients.
- **Oral drop and soft capsule-** For the relief of flatulence and gastrointestinal problem, spearmint essential oil is advised. A small number of clinical trials have been carried

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out to evaluate the effectiveness of spearmint essential oil (SEO) in the oral drop-in therapy of intestinal illnesses (Mahboubi., 2018), but much more research is necessary to establish the effectiveness of spearmint essential oil (EO). A soft capsule and an oral drop are the two traditional formats in which spearmint essential oil (SEO) is utilised as a commercial product.

Conclusion:

The important culinary, medicinal and aromatic herb is *M. spicata*. Limonene, 1,8-cineole, carvone, dihydrocarvone, and dihydrocarveol are the major chemical components that are found in *M. spicata* essential oil. Menthol and menthone are present in very small quantities. The anti-inflammatory, antiviral, antifungal, antioxidant and antibacterial activities were found in *M. spicata*. Additionally, *M. spicata* (spearmint) is a highly efficient treatment for a variety of ailments. In addition, many health issues, such as headaches, nausea, cramps and toothaches can all be treated using *M. spicata*. It is used commercially; various fragrant substances are made from the leaves of *M. spicata*.

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