

Peppermint: The Hidden Treasure

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Abstract: Peppermint oil is obtained from the leaves of the perennial herb. the peppermint oil is extracted using steam distillation. The plant peppermint grows in different excessive water-holding soil & unique proper lands. The medicinal flora is extensively used for the treatment of various diseases in developing countries. The mint is typically produced in different areas in India. In different preparation (like toothpaste, tooth powder, cough drops etc.) menthol is used as raw material. The fresh or dried leaves are the culinary supply of mint and are utilized in breath fresheners, drinks, anti-septic etc. This is well known important medicinal plant widely used in several indigenous systems of medicine with various therapeutic benefits viz. anti-bacterial, irritable bowel disease, gastrointestinal, anti-inflammatory, cardiovascular, anti-oxidant, anti-plasmodium, anti-fungal, anti-viral, dental carries also used.

Keywords: Peppermint, *Mentha piperita* L., Menthol.

INTRODUCTION:

Aetheroleum *Menthae Piperitae* is the essential oil received with the aid of using steam distillation of the fresh overground components of *Mentha x Piperita* L. (Lamiaceae) that's discovered at the below sides of the leaves and is typically observed with the aid of using rectification and fractionation before than use and the yield is 0.1-1.0%. The oil is discovered at the undersides of the leaves, is extracted with the aid of using steam distillation and is typically observed with the aid of using rectification and fractionation before use.[1] Peppermint grows in unique properly in lands with excessive water holding limited soil. All enterprise mint varieties are seed sterile and are proliferated through the usage of the underground stolon (sprinters or rootstock) created with the aid of using manner of cutting-edge vegetation. In developing countries, medicinal flora is extensively used for the treatment of various diseases.[2] In India, Mint is typically produced in southern parts of the Himalayan zone protecting Himachal Pradesh, Haryana, Punjab, Uttar Pradesh, and Bihar. This genus can be originated in lots of environments but is best raised in wet soils and moist atmospheres. Due to their extensive variety of tolerance characteristics, they can also be grown in full sunlight.[3] Historical and Popular Uses Peppermint's Latin name, *Mentha piperita*, is derived from the Greek *Mentha*, the name of a legendary nymph thought to have metamorphosed into the plant, and the Latin piper, which means pepper.[4] Menthol is used as a raw material in toothpaste, toothpowder, chewing tobacco, confectionary, mouth fresheners, analgesic balms, cough drops, perfumes, chewing gums, goodies and the tobacco industry. The fresh or dried leaves are the culinary supply of mint and are utilized in breath fresheners, drinks, antiseptic mouth rinses, toothpaste, chewing gum, mint chocolate teas, beverages, jellies, syrups, goodies, ice creams and extensively utilized as an essential ingredient in tea, a famous tea within the northern African and Arab countries.[5] Peppermint oil is discovered to be strongly effective towards *Staphylococcus aureus* (*S. aureus*), *Bacillus cereus* (*B. cereus*), *Bacillus subtilis* (*B. subtilis*), *Enterococcus faecium* (*E. faecium*), *Klebsiella pneumonia* (*K. pneumonia*), *Escherichia coli* (*E. coli*).[6] The listing of purported benefits and makes use of peppermint as a people's treatment or in complementary and alternative clinical remedy include biliary disorders, dyspepsia, enteritis, flatulence, gastritis and gastrointestinal (GI) tract.[7] peppermint essential oil changed into contained a rich source of polyphenolic compounds and hence should own strong antioxidant properties. This benefit of medicinal plants is due to the presence of phytochemicals and lively additives consisting of vitamins, flavonoids, terpenoids, carotenoids, curcumin, lignin, saponin, a plant sterol, etc. [8]

LOCAL NAMES AROUND THE WORLD:



Fig. No 1: Local names around the world.

LOCAL NAMES IN INDIAN LANGUAGES:

Hindi, Bengali, Gujarati, Punjabi, Urdu, Marathi, Tamil and Telugu: Pudina; Kashmiri: pudina; Malayalam: peppermint candy, Pudina [9]



Fig. No 2: Taxonomy of Mentha piperita L. [10]

BOTANICAL ILLUSTRATIONS:

- **Stem:** Generally blockish erect ascending, slightly fanned and advanced component generally quadrangular.



Fig No 3: Mentha piperita stem

- **Rhizomes**

They are extensively spreading and clean with strong roots in the herb.

- **Flower**

It is 6-8 mm long, purplish, and takes place in a thick, terminal, Each flower shows a tubular calyx with 5 sharp, bushy teeth alongside with purplish, irregular, 4 split corolla, 4 quick stamens, 4-celled ovary, and projecting style ending with bifid smirch withinside the herb.



Fig No 4: Flowers of Mentha piperita [11]

- **Leaves**

They are contrary, petiolate having 4-9 cm lengthy and 1.5- 4 cm broad, pointed, and dark green on the upper face of the herb.



Fig No 5: Mentha Piperita leaves

- **Fruit**

Fruit incorporates 4 ellipsoidal nutlets within the herb, which is faded purplish or pinkish.[12]

PEPPERMINT OIL EXTRACTION:

In ancient times hydro-distillation and organic solvent extraction were the old methods commonly used for essential oil extraction but gas chromatography tech is used in oil extraction.[13] Oil is withdrawn from the whole plant above ground just ahead of flowering. Cultivated plants are short out for superior and better oil content than wild forms. The oil can be extracted by the classical procedure like steam distillation (yield: 0.1 – 1.0%) or with organic solvents from the fresh or partly dried plant.[9] The fresh aerial of *M. Piperita* was dried inside for six days at room temperature and then ground to fine a powder using a Moulinex food processor. The essential oil was extracted from 50 g of ground tissue in 1 L of water contained in a 2 L flask and heated by heating jacket at 100°C for 3 hr in a Clevenger-type apparatus, according to the procedure outline of British pharmacopoeia. The collected essential oils were dried over anhydrous sodium sulphate and stored at 4°C until examined.[14]

EVALUATION: ESSENTIAL OIL:

International Pharmacopoeia monograph [15]

General appearance: A colourless, pale yellow or pale greenish-yellow liquid.

Organoleptic properties:

- **Odour:** characteristic, penetrating
- **Taste:** characteristic, pungent, followed by a sensation of cold.

Acid value: Not greater than 1.5, determined on 5.0g diluted in 50 ml of the prescribed mixture of the solvents.

Relative density: 0.900-0.916

Reflective Index: 1.457-1.467

Optical rotation: -10°C to-30°C

Fatty oils and resins essential oil comply with the test for fatty oils and resins essential oils.

Solvent solubility: soluble with ethanol (96%), ether and methylene chloride.

General identity tests: Thin-layer and gas chromatography used for properties of monoterpene profiles.

Chemical assays: The monoterpene content decided by gas chromatography should be 1,8-cineole (6–14%), limonene (1–5%), menthone (14–32%), Menthofuran (1–9%), isomenthone (2–10%), menthyl acetate (3–5%), menthol (30–55%), pulegone (not greater than 4.0%) and carvone (not greater than 1.0%).

The proportion of 1, 8-cineole to limonene should be greater than 2.0.

CHEMICAL CONSTITUENT OR PHYTOCHEMISTRY:

Table 1: Chemical constituent or phytochemistry

Constituents	Percentage
Menthol	30.0-55.0 %
Menthone	14.0-32.0 %
Cineole	3.5-14.0 %
Methyle acetate	2.8-10.0 %
Isomenthone	1.5-10.0 %
Menthofuran	1.0-9.0 %
Limonene	1.0-5.0 %
Pulegone	Max.4.0 %
Carvone	Max.1.0 %
Isopulegol	Max.0.2 %

[4, 7, 9, 12]

PROPERTIES OF PEPPERMINT OIL:

Table 2: Properties of peppermint oil

S.N	Properties	Values
1	Molecular Formula	C ₆₂ H ₁₀₈ O ₇
2	Molecular Weight	965.51g/mol
3	Density	0.896-0.908 g/cm
4	Specific Gravity	0.90g/mol

5	Boiling point	82-93°C
6	Solubility	Slightly soluble in water and alcohol

[2,16]

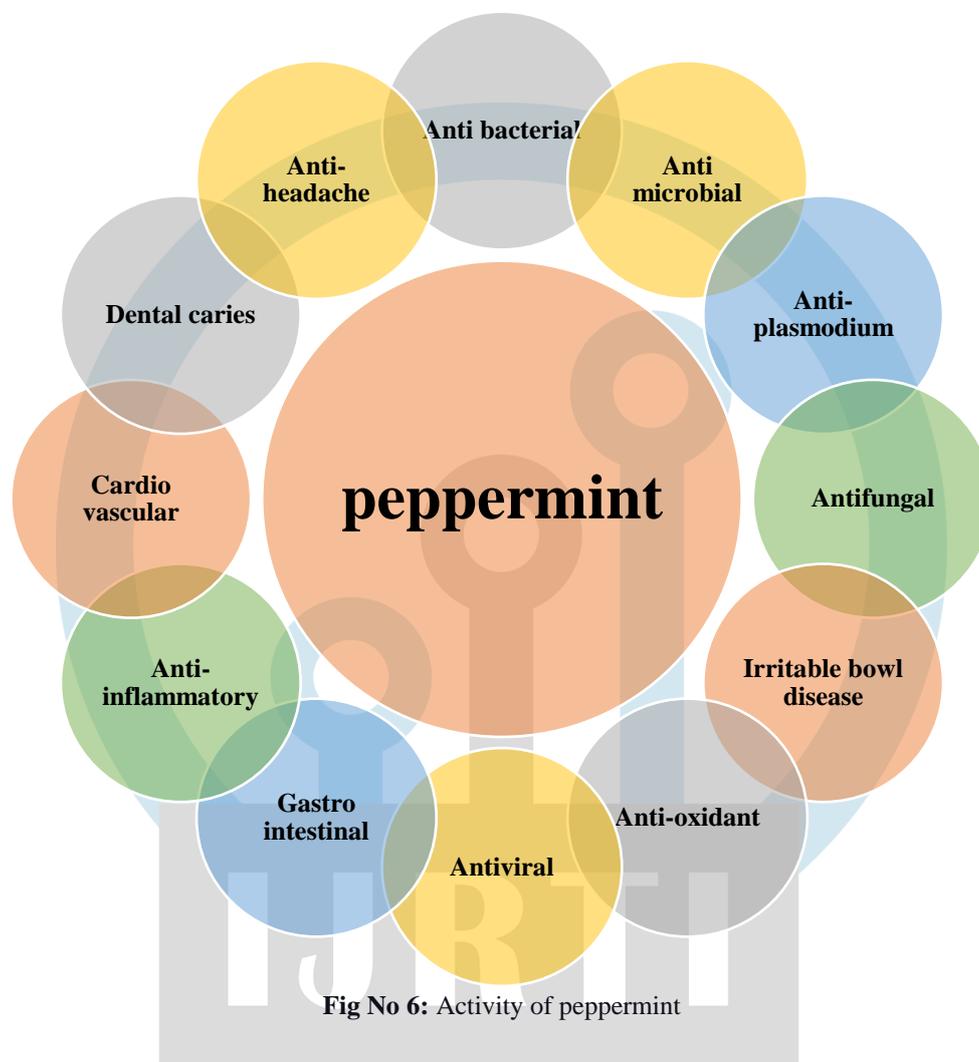
ACTIVITY OF AETHEOLEUM MENTHAE PIPERITA (PEPPERMINT):

Fig No 6: Activity of peppermint

1. Anti-bacterial Activity:

Medicinal plant life was extensively utilized in not a usual place remedy and therefore, plant secondary metabolites are more and more of action as antibacterial agents.[17] Peppermint oil and specific extract of *Mentha piperita* own powerful antibacterial action towards a few gram-positive and gram-negative micro-organism strains.[10] Peppermint oil and its extracts show the robust barrier towards the growth of various microbes which include *Escherichia coli*, *Salmonella pullorum*, Common as terrigenous, *Streptococcus faecalis*, *Acinetobacter sp.*, *Streptococcus thermophiles*, *Lactobacillus bulgaricus*, *Staphylococcus pyogenes*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Serratia marcescens*, *Mycobacterium avium*, *Salmonella typhi*, *Salmonella para Typhi A/B*, *Proteus Vulgaris*, *Yersinia enterocolitica* and *Shigella dysenteriae*. [3]

2. Antimicrobial activity:

Peppermint oil has also been shown to be a powerful antimicrobial and pest control agent in food crops and foodstuffs. [7] Menthol is virucidal towards influenza, Herpes and different viruses in vitro Aqueous extracts of peppermint. Peppermint oil and menthol have a mild antibacterial effect towards each Gram-positive and Gram-negative microorganism. Peppermints are bacteriostasis against *Streptococcus thermophilus* and *Lactobacillus bulgaricus*. Menthol is antibacterial against strains like *Staphylococcus pyogenes*, *S. aureus*, *Streptococcus pyogenes*, *Serratia marcescens*, *Escherichia-coil*, and *Mycobacterium avium*. The minimum inhibitory concentration was defined as the lowest conc. of the essential oil at which inoculate, microorganisms become killed. [4]

3. Anti-plasmodium activity:

Peppermint is well referred to as spasmodic.[8] peppermint oil exhibited antispasmodic action on rat trachea concerning prostaglandin and nitric oxide inhibited easy muscle contraction of guinea pig ileum increased potassium chloride and caused electrically.[1] Mint is a herb that is widely known for its anti-spasmodic, Painkilling, anti-inflammatory, anti-spasmodic, decongestant and antioxidant impact.[2,10] The topical utility of peppermint extract raised the ache breaking point in humans.[4] Peppermint is certainly considered one of the *Mentha* species, Menthol and menthone are the components of peppermint essential oil [10]and consumption of peppermint oil decrease the calcium influx within the jejunum and thus provide rest in the GIT tract.[3,12]

4. Antifungal activity:

Mentha piperita L. is broadly become implemented for microbial action towards microbial species in low concentration (*E-coli*) peppermint extract are bacteriostasis against *Streptococcus Thermophilus* and *Lactobacillus bulgaricus*. Peppermint oil is also active towards an acyclovir-resistant strain of HSV-1 plaque formation becomes significantly decreased with the aid of using 99%.[8] peppermint has brilliant antifungal towards *Candida Albicans*, *Aspergillus Albus* and dermatophytes fungi. [3,17]

5. Irritable bowel activity:

Small intestine bacterial overgrowth and lactose intolerance are associated with increased gas production which may sometimes trigger abdominal discomfort and bloating which are also considered additionally the cardinal signs and symptoms of IBS.[8] In 90's become observed that enteric transformed peppermint oil cases are included and effective in the remedy of this inexorably predominant issue. This valuable effect stretches out to the paediatric networks.[2]

IBS is defined as a Chronic disorder of altered bowel function characterised with the aid of using signs and symptoms of Constipation or alternating bowel habit accompanied with the aid of using aches or soreness and can consist of a constellation of different diseases.[17] Peppermint oil may be used as a non-toxic and operative innervating motion for a spastic bowel ailment. Thus, peppermint herbs are considered as significantly used for the remedy of spastic bowel Syndrome.[3]

6. Antioxidant activity:

The peppermint oil and specific extract of *M. Piperita* exhibit significant antioxidant activity.[10]

7. Antiviral activity:

The global is managing horrible communicable viral illnesses the infection of viral disease continues to be a vital worldwide problem since many viruses have resisted prophylaxis therapy longer than other micro-organisms. At the motion simplest few effective antiviral drugs are to be had for the treatment of viral disease. [3,17] Peppermint leaves in the direction of influenza A, New castle disease virus, Herpes simplex virus (HSV) and vaccinia virus in the egg and cell culture system. An alcohol extract of *M. Piperita* in combination with four different herbs inhibited the duplication of influenza viruses and peppermint helps the immune system and protects the body from viruses. [7,17]

8. Gastrointestinal activity:

Peppermint is used for non-obstructive dyspepsia without any known side effects.[3] The gastric discharging price is substantially greater with the aid of using this there can be a noteworthy antiemetic effect of *M. Piperita* in lessening the impact visible after operation infection for patients with extraordinarily sensitive muffle neuron receptor system.[2] The spasmolytic motion of peppermint oil become demonstrated on isolated rabbit and rat intestines in 1921. Studies showed peppermint essential oil is beneficial for gastrointestinal action.[8]

9. Anti-Inflammatory:

Inflammation is taken into consideration as a various factor mostly answerable for the incidence of limitless dreadful disease consisting of tumour septic shock, atherosclerosis, and abdominal obesity the peppermint constituent has played a huge position in preventing diseases like angiogenesis and inflammation.[3] The inflammation is regarded as a vital baseline response which includes cancer, septic shock, diabetes and obesity. Peppermint oil has shown a vital role in anti-inflammation disease.[17]

10. Cardiovascular activity:

The *M. Piperita* reported dilatation properties on some humans and animals. It has a lowering result on systolic pressure and heart rate and the Relaxation of the cartilaginous tube swish muscle is another result of peppermint oil. [4,10]

11. Dental Carries:

Peppermint is employed in creating Oral dentifrices because it will give overall freshness in breath and also keep dangerous breath.[4] peppermint leaves powdered were used to brighten teeth. Peppermint is employed because it helps to get rid of foul breath giving freshness and thrusting back a terrible breath.[2]

12. Anti-headache activity:

The times of herbal Therapy have been the used treatment of headache disorders Consumption of peppermint oil and derivatives is the best target for headache medical aid. [10,17] Peppermint oil is Compelling in decreasing the manifestation of pressure migraine.

MARKETED PREPARATION OF PEPPERMINT:

Apart from all of the available insecticides and pharmaceuticals or prescribed drugs peppermint provide many beneficial and valuable ordinary materials. For example, oil extracted from the leaves moves into soap wax, and lubricants, moreover it additionally makes fuels for lighting fixtures and heating.

1. Peppermint oil:



Fig No 7: Peppermint oil.[18]

Constituent:

Peppermint Essential Oil (*Mentha piperita*) Extracted from the stem, leaves, and flower of the *Mentha piperita* L. plant, peppermint oil (*Mentha piperita*) is a famous vital oil utilized in aromatherapy for each outside and inner use. There are diverse counter and business makes use of peppermint oil because of its carminative, cholagogue, antibacterial, and choleric actions. Peppermint oil is used as a flavouring agent in food and perfume in hygienic or beauty products, and as an anti-itch and cooling agent in topical pharmaceutical products. It is likewise a lively element in topical analgesics for the relaxation of joint and muscle aches. Peppermint oil may be implemented topically to briefly relieve tension-kind headaches. The use of peppermint oil within the control of irritable bowel syndrome (IBS). Peppermint oil is secure and well-tolerated at the typically recommended dosage.

2. Peppermint tea:



Fig No 8: Peppermint tea.[19]

Peppermint tea is a famous natural tea this is naturally calorie- and caffeine-free. peppermint can also additionally have some different fitness benefits, including fresher breath, higher digestion, and decreased pain from headaches. Peppermint tea additionally has antibacterial properties.

3. Peppermint cleaning soap:



Fig No 9: Peppermint cleaning soap [20]

Amazing fresh cleaning soap is ideal for one's early mornings when you want an invigorating bathing or a great raise for your fatigued body after an extended day the herbal supply of menthol capabilities a cooling effect on pores and skin and contributes to waking up dull and worn-out pores and skin. Infused with coconut and palm oils to hydrate your pores and skin, making it soft, smooth and supple. Peppermint cleaning soap is 100% pure, herbal, vegetarian, hand-crafted and made through the cold processed technique to maintain the best effectiveness of herbal ingredients. The cleaning soap is freed from chemicals, preservatives, dyes, alcohol, and artificial perfume the herbal pores and skin toner makes an exceptional addition to your normal splendour ordinary for fresh-looking skin. Valuable antioxidants assist to repair your pores and skin's herbal balance. Purifies slow pores and skin and is appropriate for all pores and skin varieties.

4. Peppermint Toothpaste:



Fig No 10: Peppermint Toothpaste [21]

Homemade toothpaste that's revolutionized my tooth and dental fitness. This recipe is made with bentonite clay. The equal clay used to make basic powder, wealthy is potassium and calcium and effective at casting off toxins. Baking soda and coconut oil help to whiten and smooth teeth. Mineral-rich salt is likewise added. Stevia and peppermint essential oil add a delicate, sweet peppermint taste to the salty mixture. Each element comes together to create a homemade toothpaste that cleans and nourishes the tooth, in a simple, chemical-free.

- 3/8 cup coconut oil soft, however no liquid
- 1/4 cup baking soda
- 1/2 tsp salt
- 1 tsp bentonite clay
- 1/2 tsp liquid stevia optional
- 5-7 drops of peppermint essential oil the quantity will depend on flavour preference.

CONCLUSION:

Peppermint oil is obtained from the leaves, and it is one of the more widely used essential oils because it contains menthol. In different preparations, menthol is used as a therapeutic agent. As a result, peppermint had antibacterial properties against both gram-positive and gram-negative bacteria. Peppermint oil is also used in food as an antioxidant and preservative. Another advantage of peppermint oil is that it has been shown to increase cardiovascular activity in both humans and animals. For the purpose of the gastrointestinal activity, peppermint is used for non-obstructive dyspepsia without any side effects. It was determined that peppermint is a suitable medicinal plant that requires much more research.

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