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**FILE: ■Peppermint (*Mentha x piperita*)
■Pharmacology**

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RE: Peppermint – A Review of Medicinal Use and Pharmacology

Shah PP, D’Mello PM. A review of medicinal uses and pharmacological effects of *Mentha piperita*. *Natural Product Radiance*. 2004;3(4):214-221.

Mentha x piperita, commonly known as peppermint, is a popular medicinal plant in several traditional systems of medicine. In Ayurveda, this ingredient is used in management of gastrointestinal and skin disorders. Traditionally, peppermint has been used to treat a variety of digestive complaints and as a spasmolytic to reduce gas and cramping. Peppermint oil is used in toothache, rheumatism, muscle pains, and to relieve menstrual cramping. Peppermint is currently used to treat irritable bowel syndrome, Crohn's disease, ulcerative colitis, gallbladder and biliary tract disorders, and liver complaints. Other medicinal applications include use of peppermint oil vapor as an inhalant for respiratory congestion. Peppermint tea is used to treat coughs, bronchitis, and inflammation of the oral mucosa and throat.

The major active constituent is the volatile oil, which contains menthol, (+) neomenthol, and (+) isomenthol. The composition of the oil is strongly influenced by environmental factors such as temperature, sunlight, nutrition, salinity, water stress, plant age, and harvesting and planting time.

A majority of the research has been on the gastrointestinal effects of peppermint. Oral peppermint oil was found to be a digestive aid. It increases gastric emptying rate in both normal individuals and patients with dyspepsia (a disorder characterized by stomach pain, bloating, nausea, which increases after eating). Peppermint oil worked as a digestive aid without side effects. In vitro, peppermint relaxes gastrointestinal smooth muscle by reducing calcium influx. In animal and human studies, topical application of peppermint oil relieved colon spasm during colonoscopy, barium enema, and diverticular disease. After gynecological surgery, peppermint also reduced post-operative nausea. No studies show statistically significant effects of peppermint oil for irritable bowel syndrome. For the treatment of colon disorders, orally-administered peppermint oil must be in the form of enteric-coated capsules, which dissolve in the colon rather than the stomach. For stomach disorders, the oil should be in gelatin coated capsules, which dissolve in the stomach.

The respiratory, skin, anti-inflammatory, antimicrobial, and biliary affects of peppermint have also been evaluated. In the respiratory system, menthol stimulates cold receptors in the respiratory tract, which inhibits cough and improves nasal airflow. For skin, menthol works as a topical vasodilator (increases the diameter of the blood vessels). This vasodilatory effect enhances absorption of other topical skin medications, including cortisone, mannitol, indomethacin, morphine hydrochloride, and propranolol. In acute and chronic inflammation, the ethanolic extract of peppermint has some anti-inflammatory effects. The ethanolic extract of peppermint also has antimicrobial effects on a number of bacterial and fungal strains. For biliary disorders, the drug Rowachol® (containing menthol in combination with other monoterpenes; Rowa Pharmaceuticals; Bantry, County Cork, Ireland) reduced or dissolves cholesterol stones in the gallbladder and bile ducts.

Potential toxic compounds in peppermint are pulegone and menthol, which caused histopathological changes in the liver and cerebellum in rats with prolonged administration. Adverse reactions to enteric-coated peppermint oil capsules are rare. Excessive inhalation of mentholated preparations may cause reversible nausea, anorexia, cardiac problems, ataxia and other CNS problems. Peppermint oil is contraindicated in obstruction of the bile ducts, gallbladder inflammation, and severe liver damage. Caution is recommended in patients with hiatal hernia, kidney stones, or GI reflux, where symptoms may be worsened by peppermint.

Peppermint has a number of useful applications. Minimal negative effects are associated with the use of peppermint. Further studies to define the benefits and dosing of this pharmacological agent will be beneficial.

—*Heather S. Oliff, PhD*

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