

Thyme

Thymus vulgaris

Family: Lamiaceae

Introduction

Thyme (*Thymus vulgaris*) is a perennial subshrub with small gray or green leaves that grows up to 12 inches in height.^{1,2} It produces white, pink, or light purple flowers from late spring through summer. Native to the Mediterranean region, thyme is commercially cultivated in the European countries of Austria, the Balkans, England, France, Germany, Greece, Hungary, Italy, Poland, Portugal, and Spain, as well as Morocco and the United States.^{3,4,5} A significant amount of thyme herb is also wild collected in European countries, including Albania, Bosnia & Herzegovina, and Bulgaria,⁶ of which some is now wild harvested under organic certification.⁷ Spanish thyme (*T. zygis*), native to the Iberian Peninsula, is used interchangeably with *T. vulgaris* for medicinal purposes.⁸

History and Cultural Significance

There are several theories about the origins of the name for the genus. *Thymus* may derive from the Greek word *thyō* meaning “perfume” or the Greek *thumos*, signifying courage and strength.^{8,9} In ancient Greece the phrase “to smell of thyme” was used to praise those with admirable style. In medieval times thyme was believed to instill bravery. Ladies would adorn their knights with a scarf sporting an embroidered bee hovering over a twig of thyme. The ancient Romans were some of the first to use thyme in cooking, using it to give flavor to cheeses and liqueurs.²

The fresh or dried herb of thyme and the essential oil produced by the steam distillation of the fresh flowering aerial parts are both employed for their therapeutic properties.^{1,2} European pharmacopeial-quality thyme is the whole leaves and flowers separated from the previously dried stems of

T. vulgaris or *T. zygis* or a mixture of both species, containing at least 12 ml/kg essential oil, of which at least 40% must be the sum of thymol and carvacrol.¹⁰ Thyme, used in its crude herb form, particularly in warm infusions (teas), relieves intestinal gas, expels intestinal parasites, relieves cough, and it is expectorant, antimicrobial, and astringent.⁸ Traditionally, thyme has been used to treat heartburn, gastritis, asthma, laryngitis, pertussis, and bronchitis, as well as to stimulate menstrual flow and to aid in resolving occasional childhood diarrhea and bedwetting.^{1,8,11}

Red and white thyme essential oil are produced commercially from *T. vulgaris* or *T. zygis* for use in cough drops, mouthwashes, liniments, toothpastes, detergents, and perfumes.³ Red thyme oil is preferred as white thyme oil is distilled from the red. The two main ingredients in thyme oil are thymol and carvacrol, but thymol is believed to be responsible for most of the therapeutic aspects.^{3,12} Internally, thyme oil is used for cough, bronchitis, and indigestion.^{1,2,8} Externally, the whole plant and the oil distilled

from it have been used to treat fungal infections, minor arthritis, gum disease, and tonsillitis.¹

Thyme herb (i.e., oral: tea infusion or fluidextract; topical: tea infusion for compresses) was approved by the German Commission E in 1984 for symptoms of bronchitis and whooping cough and for mucous-producing inflammations (catarrhs) of the upper respiratory tracts.¹³ In 2007, the European Medicines Evaluation Agency (EMA) published a final thyme monograph, which will be relevant for medicinal herbal product registrations in all EU-27 Member States including Germany. EMA approved thyme herb (i.e., dry extract, fluidextract, tea and tincture) as a traditional herbal medicinal product (THMP) used as an expectorant in cough associated with cold.¹⁴ Also, in 2008, Health Canada published its final monograph for thyme natural health product (NHP) compendial license applications. Health Canada approved traditional uses of thyme for gargle and/or buccal (pertaining to the mouth or cheek) use to help relieve laryngitis, tonsillitis, and mucous membrane inflammations of the mouth and/or throat; topical use as an antiseptic and/or antimicrobial to help treat minor wounds and sores; and oral use as an expectorant to help relieve the symptoms of bronchitis and catarrhs of the upper respiratory tract, to help relieve coughs, and to help relieve flatulent dyspepsia and colic.¹⁵ Thyme has also been used to treat pertussis (an acute, highly contagious infection of the respiratory tract, usually in children), stomatitis (inflammation of the oral mucosa), and halitosis.^{4,16}

Modern Research

Fluid extracts of thyme in combination with other herbs have been found to be effective in treating bronchitis.^{17,18,19} In a double-blind, placebo controlled trial, treatment of acute bronchitis with a syrup composed of thyme herb fluidextract (1:2–2.5) and English ivy leaf (*Hedera helix*, Araliaceae) fluidextract (1:1) (Bronchipret® Saft; Bionorica AG, Neumarkt, Germany) was found to be safe, well tolerated, and superior to placebo in efficacy.¹⁸ Treatment with a cough syrup composed of dry ivy leaf extract, decoction of thyme and aniseed (*Pimpinella anisum*, Apiaceae), and mucilage of marshmallow (*Althaea officinalis*, Malvaceae) root (manufactured by Weleda Hustenelixier, Weleda AG, Arlesheim, Switzerland) alleviated cough caused by common cold, bronchitis, or respiratory tract diseases with formation of mucous.²⁰ Thyme oil and its constituent, thymol, have been studied for their antimicrobial properties. Two recent in vitro studies and one human clinical trial show that thyme oil and extracts (both acetone and water), as well as the constituent thymol, may be effective against a variety of bacteria.^{21,22,23} Thymol is one of 4 active ingredients in the popular antimicrobial Listerine® mouthwash (Johnson and Johnson, a division of McNeil-PPC, Inc, New Jersey),* but it has not been adequately studied as a single active ingredient in mouthwashes.²⁴ The US Food and Drug Administration (FDA) permits the combination (thymol with eucalyptol, menthol and methyl salicylate) in Listerine as an antigingivitis/antiplaque active ingredient for use in over-the-counter (OTC) drug products.²⁵ Of interesting note, thyme oil has been studied in combination with oils of

rosemary (*Rosmarinus officinalis*, Lamiaceae), lavender (*Lavandula* spp., Lamiaceae), and cedarwood (*Cedrus atlantica*, Pinaceae) as rubbing oils for stimulating hair growth.²⁶

Future Outlook

Thyme has a small market worldwide. The demand is increasing modestly with the growth of the human population and will continue with the broadening research of its pharmacological properties.²⁷ Spain is by far the largest producer of thyme oil as it refines 35 to 45 tons yearly, with one to three tons being *T. vulgaris*. The rising costs of harvesting and distilling may keep production low as less expensive, synthetic thymol becomes more readily available.²⁸

*The characteristic taste and efficacy of Listerine® mouthwash derives from the presence of thymol in combination with eucalyptol from eucalyptus (*Eucalyptus globulus*, Myrtaceae), menthol from diverse mint oils or prepared synthetically, and methyl salicylate which is produced synthetically or is obtained by maceration and subsequent distillation with steam from wintergreen leaf (*Gaultheria procumbens*, Ericaceae) or from sweet birch bark (*Betula lenta*, Betulaceae).²⁹

—Gayle Engels

References

1. Bown D. *The Herb Society of America New Encyclopedia of Herbs and Their Uses*. London: Dorling Kindersley Ltd.; 2001.
2. Grieve M. *A Modern Herbal*. Vol. 2. New York: Dover Books; 1971.
3. Leung AY, Foster S, eds. *Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics*. 2nd ed. New York: John Wiley and Sons, Inc; 1996.
4. Wichtl M, ed. Brinckmann JA, Lindenmaier MP, trans. *Herbal Drugs and Phytopharmaceuticals*. 3rd ed. Stuttgart: Medpharm GmbH Scientific Publishers; 2004.
5. Teuscher E. *Medicinal Spices: A Handbook of Culinary Herbs, Spices, Spice Mixtures and their Essential Oils*. Stuttgart: Medpharm GmbH Scientific Publishers, 2006.
6. Kathe W, Honnef S, Heym A. *Medicinal and Aromatic Plants in Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania: A study of the collection of and trade in medicinal and aromatic plants (MAPs), relevant legislation and the potential of MAP use for financing nature conservation and protected areas*. Bonn, Germany: German Federal Agency for Nature Conservation; 2003.
7. Censkowsky U, Helberg U, Nowack A, Steidle M. *Overview of World Production and Marketing of Organic Wild Collected Products*. Geneva, Switzerland: International Trade Centre UNCTAD / WTO; 2007. Available at:

http://www.intracen.org/Organics/documents/World_Production_and_Marketing_of_Organic_Wild_Collected_Products.pdf.

8. Blumenthal M, Goldberg A, Brinckmann J, eds. *Herbal Medicine: Expanded Commission E Monographs*. Austin, TX: American Botanical Council; Newton, MA: Integrative Medicine Communications; 2000.
9. Morales R. The history, botany and taxonomy of the genus *Thymus*. In: Stahl-Biskup E, ed., Sáez F, ed. *Thyme: the Genus Thymus*. New York: Taylor & Francis; 2002.
10. European Pharmacopoeia Commission. Thyme. In: *European Pharmacopoeia*, 6th edition. Strasbourg, France: European Directorate for the Quality of Medicines (EDQM). 2008;3061-3063.
11. Felter HW, Lloyd JU. *King's American Dispensatory*. Cincinnati, OH: The Ohio Valley Company; 1905.
12. Hoffmann D. *Medical Herbalism: The Science and Practice of Herbal Medicine*. Rochester, VT: Healing Arts Press; 2003.
13. Blumenthal M, Busse WR, Goldberg A, Gruenwald J, Hall T, Riggins CW, Rister RS, eds. Klein S, Rister RS, trans. *The Complete German Commission E Monographs—Therapeutic Guide to Herbal Medicines*. Austin, TX: American Botanical Council; Boston: Integrative Medicine Communications; 1998.
14. European Medicines Agency (EMA) Committee on Herbal Medicinal Products (HMPC). Final Community Herbal Monograph on *Thymus vulgaris* L. and *Thymus zygis* L., Herba. London, UK: EMA. October 31, 2007. Available at: http://www.emea.europa.eu/pdfs/human/hmpc/thymi_herba/23411306enfin.pdf.
15. Health Canada Natural Health Products Directorate (NHPD). Thyme. In: *NHPD Compendium of Monographs*. Ottawa, Ontario: Natural Health Products Directorate. February 12, 2008. Available at: http://www.hc-sc.gc.ca/dhp-mps/alt_formats/hpfb-dgpsa/pdf/prodnatur/mono_thyme-eng.pdf.
16. European Scientific Cooperative on Phytotherapy. *ESCOP Monographs*. 2nd ed. New York: Thieme New York; 2003.
17. Gruenwald J, Graubaum HJ, Busch R. Evaluation of the non-inferiority of a fixed combination of thyme fluid- and primrose root extract in comparison to a fixed combination of thyme fluid extract and primrose root tincture in patients with acute bronchitis. A single-blind, randomized, bi-centric clinical trial [PubMed abstract]. *Arzneimittelforschung*. 2006;56(8):574-581
18. Kemmerich B, Eberhardt R, Stammer H. Efficacy and tolerability of a fluid extract combination of thyme herb and ivy leaves and matched placebo in adults suffering from acute bronchitis with productive cough. A prospective, double-blind, placebo-controlled clinical trial [PubMed abstract]. *Arzneimittelforschung*. 2006;56(9):652-660.

19. Gruenwald J, Graubaum HJ, Busch R. Efficacy and tolerability of a fixed combination of thyme and primrose root in patients with acute bronchitis. A double-blind, randomized, placebo-controlled clinical trial [PubMed abstract]. *Arzneimittelforschung*. 2005;55(11):669-676.
20. Büechi S, Vögelin R, von Eiff MM, Ramos M, Melzer J. Open trial to assess aspects of safety and efficacy of a combined herbal cough syrup with ivy and thyme [PubMed abstract]. *Forsch Komplementarmed Klass Naturheilkd*. December 2005;12(6):312-313.
21. Hammer K, Carson C, Riley T. Antimicrobial activity of essential oils and other plant extracts. *J Appl Microbiol*. June 1999;86(6):985-990.
22. Twetman S, Petersson L. Interdental caries incidence and progression in relation to mutans streptococci suppression after chlorhexidine-thymol varnish treatments in schoolchildren. *Acta Odontol Scand*. June 1999;57(3):144-148.
23. Lall N, Meyer J. In vitro inhibition of drug-resistant and drug-sensitive strains of *Mycobacterium tuberculosis* by ethnobotanically selected South African plants. *J Ethnopharm*. September 1999;66(3):347-354.
24. Ulbricht C, Basch E. *Natural Standard Herb & Supplement Reference*. St. Louis, MO: Elsevier Mosby, 2005.
25. Food and Drug Administration. 21 CFR Part 356—Oral Health Care Drug Products for Over-the-Counter Human Use; Antigingivitis/Antiplaque Drug Products; Establishment of a Monograph; Proposed Rules. *Federal Register*. May 29, 2003;68(103):32232-32287. Available at: http://www.fda.gov/cder/otcmonographs/Oral_Health_Care/gingivitis_&_plaque_PR_20030529.pdf
26. Hay I, Jamieson M, Ormerod A. Randomized trial of aromatherapy: successful treatment of alopecia areata. *Arch Dermatol*. May 1998;134(11):1349-1352.
27. Rey C, Sáez F. Field culture, in vitro culture and selection of *Thymus*. In: Stahl-Biskup E, Sáez F, eds. *Thyme: the genus Thymus*. New York: Taylor & Francis; 2002.
28. Lawrence B, Tucker A. The Genus *Thymus* as a source of commercial products. In: Stahl-Biskup E, Sáez F, eds. *Thyme: the genus Thymus*. New York: Taylor & Francis; 2002.
29. United States Pharmacopeial Convention. Eucalyptol; Menthol; Methyl Salicylate; Thymol. In: *USP 31-NF 26*. Rockville, MD: United States Pharmacopeial Convention; 2008.