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Committee on Herbal Medicinal Products (HMPC)

## List of references supporting the assessment of *Mentha x piperita* L., folium and aetheroleum

Final – Revision 1

**The European Medicines Agency acknowledges that copies of the underlying works used to produce this monograph were provided for research only with exclusion of any commercial purpose.**

Abdullah D, Ping QN, Liu GJ. Enhancing effect of essential oils on the penetration of 5-fluorouracil through rat skin. *Yao Xue Bao*, 1996, 31(3):214-221

Adam B, Liebrechts T, Best J, Bechmann L, Lackner C, Neumann J, Koehler S, Holtmann G. A combination of peppermint oil and caraway oil attenuates the post-inflammatory visceral hyperalgesia in a rat model. *Scand J Gastroenterol*, 2006, 41(2):155-160

Akdogan M, Klinik I, Oncu M, Karaoz E, Delibas N. Investigation of biochemical and histopathological effects of *Mentha piperitae* L., and *Mentha spicata* L., on kidney tissue in rats. *Hum Exp Toxicol* 2003, 22:213-219

Akdogan M, Gultekin F, Yontem M. Effect of *Mentha piperitae* (Labiatae) and *Mentha spicata* (Labiatae) on iron absorption in rats. *Toxicol Ind Health* 2004a, 20:119-122

Akdogan M, Ozguner M, Aydin G, Gokalp O. Investigation of biochemical and histopathological effects of *Mentha piperitae* L and *Mentha spicata* L., on liver tissue in rats. *Hum Exp Toxicol* 2004b, 23:21-28

Akdogan M, Ozguner M, Kocat A, Oncu M, Cicek E. Effects of peppermint teas on plasma testosterone, folliclestimulating hormone and luteinizing hormone levels and testicular tissues in rats. *Urology* 2004c, 64:394-398

Aktug SE, Karapinar M. Sensitivity of some common food-poisoning *bacteria* to *thyme*, mint and bay leaves. *Intern J Food Microbiol* 1986, 3:349-354

Alam MS, Roy PK, Miah AR, Mollick SH, Khan MR, Mahmud MC, Khatun S., Efficacy of Peppermint oil in diarrhea predominant IBS - a double blind randomized placebo - controlled study. *Mymensingh Med J*. 2013, 22(1):27-30 (Abstract only available).

Alves JGB, Brito R, Cavalcanti TS. Effectiveness of *Mentha piperita* in the Treatment of Infantile Colic: A Crossover Study, *E-Based Complement Altern Med* 2012, Article ID 981352, 4 pages  
doi:10.1155/2012/981352

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- Alwan AH, Abdul-Latif M, Jawad, Albana AS, Ali KF. Antiviral activity of some Iraqi indigenous plants. *Intern J Crude Drug Res*, 1988, 2:107-111
- Ambross, NS. Synthetic antispasmodic or peppermint for the irritable bowel syndrome sufferer: a double blind comparative study. Abstract World Congr Gastroenterol, Sydney 1990. (Abstract only available)
- Ando S, Nishida T, Ishida M, Hosoda K, Bayaru E. Effect of peppermint feeding on the digestibility, ruminal fermentation and protozoa. *Livest Prod Sci* 2003, 82:245-248
- Anon. Die gastroösophageale Refluxkrankheit. *Dtsch Apoth Ztg* 1990, 130:2684
- Asao T, Mochiki E, Suzuki H, Nakamura J, Hirayama I, Morinaga N, *et al.* An easy method for the intraluminal administration of peppermint oil before colonoscopy and its effectiveness in reducing colonic spasm. *Gastrointest Endosc.* 2001, 53(2):172-177
- Asao T, Kuwano H, Ide M, Hirayama I, Nakamura JI, Fujita KI, Horiuti R. Spasmolytic effect of peppermint oil in barium during double-contrast barium enema compared with Buscopan. *Clin Radiol.* 2003, 58(4):301-305
- Augiseau L, Barbin Y, Verbist J-F. Une intoxication par une infusion de menthe. *Plantes méd phytothér;* 1987, XXI(2):149-152
- Barnick CG, Cardozo L. The treatment of abdominal distension and dyspepsia with enteric coated peppermint oil following routine gynaecological intraperitoneal surgery. *J Obstetr Gynaecol* 1990, 10:423-424
- Behrends M, Beiderlinden M, Peters J. Acute Lung Injury after Peppermint oil injection. *Anesth Analg* 2005, 101:1160-1162
- Blumenthal M, Busse WR, Göldberg A. *et al.*, (eds). The Complete Commission E Monographs: Therapeutic Guide to Herbal Medicines. Boston, MA: *Integrative Med. Commun.* 1998 (several amendments), 180-182
- Bishop J, Northston K, Green J, Thompson EA. The use of Complementary and Alternative Medicine in pregnancy: Data from the Avon Longitudinal Study of Parents and Children (ALSPAC); *Complem Ther Med* 2011, 19:303-310
- Blaszczyk T, Krzyzanowska J, Lamer-Zarawska E. Screening for antimycotic properties of 56 traditional chinese drugs. *Phytother. Res.* 2000, 14:210-212
- Bowen I, Cubbin I. *Mentha piperita* and *Mentha spicata*. *Adv. Effects Herbal Drugs* 1992, 171-178
- Boyd EM, Sheppard EP. A bronchomucotropic action in rabbits from inhaled menthol and thymol. *Arch Int Pharmacodyn* 1969, 182(1):206-214
- Bradley PR (Ed). *British Herbal Compendium*. Vol 1. Bournemouth, Dorset UK: British Herbal Medicine Association, 1992, 174-176
- Capanni M, Surrenti E, Biagini MR, Milani S, Surrenti C, Galli A. Efficacy of peppermint oil in the treatment of irritable bowel syndrome: a randomized, controlled trial. *Gazz Med Ital Arch Sci Med* 2005, 164(2):119-126
- Cappello G, Spezzaferro M, Grossi L, Manzoli L, Marzio L. Peppermint oil (Mintoil) in the treatment of irritable bowel syndrome: a prospective double blind placebo-controlled randomized trial. *Dig Liver Dis.* 2007, 39(6):530-536

Carling L, Svedberg LE, Hulten S. Short term treatment of the irritable bowel syndrome: a placebo-controlled trial of Peppermint oil against hyoscyamine. *Opuscula Med* 1989, 34:55- 57

Cash BD, Epstein MS, Shah SM. A Novel Delivery System of Peppermint Oil Is an Effective Therapy for Irritable Bowel Syndrome Symptoms. *Dig Dis Sci*. 2016, 61(2):560-571, doi: 10.1007/s10620-015-3858-7

Coderre K, Faria C, Dyer E. Probable warfarin interaction with menthol cough drops. *Pharmacother* 2010, 30(1), doi: 10.1592/phco.30.1.110

Croteau R, Loomis WD. Biosynthesis of squalene and other triterpenes in *Mentha piperita* from mevalonate-2-<sup>14</sup> C. *Phytochemistry* 1973, 12:1957-1965.

Czalbert HJ, Neder M, Feher K. Experiences with colpermin therapy (Tillots-England) at patients of irritable colon syndrome. *Gyogyszereszet* 1990, 34(5):251-253

Dang J, Ardila-Hani A, Amichai MM, Chua K, Pimentel M, Systematic review of diagnostic criteria for IBS demonstrates poor validity and utilization of Rome III, *Neurogastroenterol Motil*. 2012 24(9):853-e397, doi: 10.1111/j.1365-2982.2012.01943.x. Epub 2012

Das PK, Rathor, Sinha PS, Santal AK: Effect on ciliary movements of some agents which come in contact with the respiratory tract. College of Medical Sciences, Banaras Hindu Univ 1970

Davies SJ, Harding LM, Baranowski AP: A novel treatment of post-herpetic neuralgia using peppermint oil. *Clin. J. Pain*. 2002, 18(3):200-202

Della Loggia R, Tubaro A, Lunder TL. Evaluation of some pharmacological activities of a peppermint extract. *Fitoterapia* 1990, 61:215-221

Dew MJ, Evans BK, Rhodes J. Peppermint oil for the irritable bowel syndrome: a multicentre trial. *Br. J. Clin. Pract*. 1984, 38(11-12):394-398

Demirbas D, Cingi C, Çakli H, Kaya E. Use of rhinomanometry in common rhinologic disorders. *Expert Rev. Med. Devices*. 2011, 8(6):769-777

Dorman HJD, Kosar M, Kahlos K, Holm Y, Hiltunen R. Antioxidant properties and composition of aqueous extracts from *Mentha* species, hybrids, varieties, and cultivars. *J. Agric. Food Chem*. 2003, 51: 4563-4569

Dost F H, Leiber B. Menthol and Menthol-containing External Remedies, Use Mode od Effect and Tolerance in Children, Georg Thieme Verlag, Stuttgart, 1967, 99-107

Dresser G, Wachter V, Wong S, BA, Wong H, Bailey BS. Evaluation of peppermint oil and ascorbyl palmitate as inhibitors of cytochrome P4503A4 activity *in vitro* and *in vivo*. *Clin. Pharmacol. Ther*. 2002, 72:247-255

Drossman DA, Corazziari E, Delvaux M, Spiller RC, Talley NJ, Thompson WG, Whitehead WE (Editors). Rome III: The Functional Gastrointestinal Disorders, Third Edition. McLean, VA: Degnon Associates, Inc., 2006

Duband F, Carnat AP, Car'nat A, Petit Jean-Freytet C, Clair G, Lamaison JL. Composition Aromatique et polyphénolique de l'infusé de Menthe, *Mentha x piperita* L. *Ann. Pharm Franç* 1992, 50, 3:146-155

Eccles R, Griffiths H, Newton CG, Tolley NS: The effects of menthol isomers on nasal sensation of airflow. *Clin. Otolaryng*. 1988, 13:25-29

Eccles R, Menthol: Effects on nasal sensation of airflow and the Drive to Breathe; *Curr. Allergy Asthma Rep*. 2003, 3:210-214

EDQM 2015: Ph. Eur. expert group 13A comments and data (confidential) provided during public consultation on the 'HMPC public statement on the use of herbal medicinal products containing pulegone/menthofuran'

El-Salhy, Irritable bowel syndrome: Diagnosis and pathogenesis, *World J. Gastroenterology*, 2012, 18(37):5151-5163

EMA/CHMP/172616/2012, a Concept paper on the revision of the CHMP points to consider on the evaluation of medicinal products for the treatment of irritable bowel syndrome (CPMP/EWP/785/97)

EMA/HMPC/138386/2005 Rev. 1, 2014, Public statement on the use of herbal medicinal products containing pulegone and menthofuran.

EMA/HMPC/138386/2005 Public statement on the use of herbal medicinal products containing pulegone and menthofurane.

Ernst E. Adverse effects of herbal drugs in dermatology. *Br J Derm.* 2000, 143:923-929

ESCOP Monographs. The Scientific Foundation for herbal Medicinal products: *Menthae piperitae Aetheroleum*. Peppermint leaf. Ed. 2. Stuttgart 2003, New York: Georg Thieme-Verlag, 329-336

ESCOP Monographs. The Scientific Foundation for herbal Medicinal products: *Menthae piperitae folium*. Peppermint leaf. Ed. 2. Stuttgart 2003, New York: Georg Thieme-Verlag, 337-339

European Pharmacopoeia Peppermint leaf. Monograph Nr.01/2011:0406.

European Pharmacopoeia Peppermint leaf dry extract, Monograph Nr 04/2009: 2382

European Pharmacopoeia Peppermint Oil. Monograph Nr.07/2012:0405

Evans BK. Multicentre trial of peppermint oil capsules in irritable bowel syndrome: a multicentre trial. *Br. J. Clin. Pract.* 1982, 38:394-395

Fachinfo Euminz (R) N. Peppermint oil. Lichtwer Pharma, GmbH, Berlin 1997

Farmakopea Polska. Monografie Decocta, Infusa, Macerationes, Warszawa Panstwowy Zaklad Wydawnictw Lekarskich,; Wydanie III, 1959, Suppl. II:28-29

Fernández F. *Mentha piperita* en el tratamiento de síndrome de colon irritable. *Inv. Med. Internat.* 1990, 17:42-46

Food and Drug Research Labs., Inc. 1973.: Teratologic evaluation of FDA 71-57 (Menthol natural, Brazilian).

Ford AC, Talley NJ, Spiegel BM, Foxx-Orenstein AE, Schiller L, Quigley EM, Moayyedi P. Effect of fibre, antispasmodics, and peppermint oil in the treatment of irritable bowel syndrome: systematic review and meta-analysis. *BMJ* 2008, 337:a2313

Ford AC, Moayyedi P, Lacy BE, Lembo AJ, Saito YA, Schiller L, Soffer EE, Spiegel BMR, Quigley EM *et al.* American College of Gastroenterology Monograph on the Management of Irritable Bowel Syndrome and Chronic Idiopathic Constipation, *Am J Gastroenterol* 2014, 109:S2-S26, doi: 10.1038/ajg.2014.187

Forster HB, Niklas H, Lutz S. Antispasmodic effects of some medicinal plants. *Planta Med* 1980, 40:309-319

Forster H. Spasmolytische Wirkung pflanzlicher Canninativa. *Z Allg Med* 1983, 59:1327-1333

- Gaworsky G, Vollmut T, Dozier M, Heck J, Dunn L. An immunotoxicity assessment of food flavoring ingredients. *Food Chem. Toxic* 1994, 32 (5):409-415
- Gelal A, Balkan D, Czeybek D, Kaplan Y, Gurier S, Guven H, Benowitz N. Effect of menthol on the pharmacokinetics and pharmacodynamics of Felodipine in healthy subjects. *Eur. J. Clin. Pharmacol.* 2005, 60:785-790
- Gilchrest BA Pruritus. Pathogenesis, therapy and significance in systemic disease states. *Archiv Intern Med.* 1982, 142/1:101-105
- Glover DD, Amonkar M, Rybeck BF, Tracy TS. Prescription, over-the-counter, and herbal medicine use in a rural, obstetric population, *Am J Obstet Gynecol* 2003, 188(4):1039-1044
- Göbel H, Schmidt G, Soyka D. Effect of peppermint and eucalyptus oil preparations on neurophysiological and experimental algometric headache parameters. *Cephalalgia* 1994, 14:228-234
- Göbel H, *et al.*, Essential plant oils and headache mechanisms. *Phytomedicine* 1995, 2(2):93-102
- Göbel H, Fresenius J, Heinze A, Dworschak M, Soyka D. Effectiveness of oleum menthae piperitae and paracetamol in therapy of headache of the tension type. *Nervenarzt* 1996, 67:672-681
- Goerg KJ, Spilker TH: Effect of Peppermint oil and caraway oil on gastrointestinal motility in healthy volunteers: a pharmacodynamic study using simultaneous determination of gastric and gall-bladder emptying and orocecal transitime. *Aliment. Pharmacol. Ther.* 2003, 17:445-451
- Grigoleit HG, Grigoleit P. Gastrointestinal clinical pharmacology of peppermint oil. *Phytomedicine* 2005a, 12(8):607-611
- Grigoleit HG, Grigoleit P. Peppermint oil in irritable bowel syndrome. *Phytomedicine* 2005b, 12(8):601-606
- Guédon D, Pasquier B, Analysis and Distribution of Flavonoid Glycosides and Rosmarinic Acid in 40 *Mentha x piperita* Clones. *J Agric Food chem.* 1994, 42:679-684
- Hadley SK, Gaarder SM. Treatment of irritable bowel syndrome. *American Family Physician* 2005, 15; 72(12):2501
- Haen E. Expektoranzien, Antitussiva, broncho-epasmolytika. *Med Monatsschr Pharmazeuten* 1989, 12:344-55
- Hänsel R, Haas H. Therapie mit Phytopharmaca. Berlin: Springer-Verlag 1984: 113, 116, 133,143, 180 and 269
- Hänsel R, Sticher O, Steinegger E. Menthol. In: *Pharmakognosie-Phytopharmazie*, 6th ed. Berlin: Springer-Verlag, 1999, 756-8
- Harries N, James K, Pugh W. Antifoaming and carminative actions of volatile oils. *J. Clin. Pharmacy* 1978, 2:171-177
- Hawthorn M, Ferrante J, Luchowski E, Rutledge A, Wei XY, Triggle DJ. The actions of peppermint oil and menthol on calcium channel dependent processes in intestinal, neuronal and cardiac preparations. *Aliment. Pharmacol. Ther.* 1988, 2(2):101-118
- Heinle H. *et al.* Intestinal spasmolytic effects of STW 5 (Iberogast®) and its components. *Phytomedicine* 13, 2006, SV:75-79

Heimes K, Hauk F, Verspohl EJ, Mode of action of peppermint oil and (-)-menthol with respect to 5-HT<sub>3</sub> receptor subtypes: binding studies, cation uptake by receptor channels and contraction of isolated rat ileum, *Phytother Res.* 2011, 25(5):702-8. doi: 10.1002/ptr.3316. Epub 2010 Nov 12

Health Canada Peppermint monograph, Drugs & Health Products, Natural Health Products Ingredients Database, Feb. 2008

Heng MC. Local necrosis and interstitial nephritis due to topical methyl salicylate and menthol. *Cutis* 1987, 39(5):442-444 (Abstract only available)

Herrmann EC Jr, Kucera LS. Antiviral substances in plants of the *mint family* (Labiatae). III. Peppermint (*Mentha piperita*) and other mint plants. *Proceed Soc Exper Biol Med*, 1967, 874-878

Herro E, Jacob SE. *Mentha piperita* (peppermint), *Dermatitis*. 2010, 21(6):327-329

Hiki N, Kurosaka H, Tatsutomi Y, Shimoyama S, Tsuji E, *et al.*, Peppermint oil reduces gastric spasm during upper endoscopy: a randomized, double-blind, double-dummy controlled trial. *Gastrointest. Endoscopy* 2003, 57(4):475-482

Hiki N, Kaminishi M, Hasunuma T, Nakamura M, Nomura S, Yahagi N, *et al.* A phase I Study Evaluating Tolerability, Pharmacokinetics, and Preliminary Efficacy of L-Menthol in Upper Gastrointestinal Endoscopy, *Clin pharmacol & Therap*, 2011, 90(2):221-228

Hills JM, Aaronson PI. The mechanism of action of peppermint oil on gastrointestinal smooth muscle. An analysis using patch clamp electrophysiology and isolated tissue pharmacology in rabbit and guinea pig. *Gastroenterology* 1991, 101:55-65

Holst L, Wright D, Haavik S, Nordeng H. Safety and efficacy of herbal remedies in obstetrics-review and clinical implications. *Midwifery* 2011, 27:80-86

Hurrell RF, Reddy M, Cook JD. Inhibition of non-haem iron absorption in man by polyphenolic-containing beverages. *Br. J. Nutr.* 1999, 81:289-295

Ilmberger Heuberger E, Mahrhofer C, Dessovic H, Kowarik D, Buchbauer G. The influence of Essential Oils on Human Attention. I: *Alertness. Chem. Senses* 2001, 26:239-245

Imagawa A, Hata H, Nakatsu M, Yoshida Y, Takeuchi K, Inokuchi T, *et al.* Peppermint oil solution is useful as an antispasmodic drug for esophagogastroduodenoscopy, especially for elderly patients. *Dig Dis Sci.* 2012, 57:2379-2384

Inamori M, Akiyama T, Akimoto K, Fujita K, Takahashi H, Yoneda M, *et al.*, Early effects of peppermint oil on gastric emptying: a crossover study using a continuous real-time <sup>13</sup>C breath test (BreathID system). *J Gastroenterol.* 2007, 42:539-542

Inoue T, Sugimoto Y, Masuda H, Kamei C. Effects of Peppermint (*Mentha piperita* L.) Extracts on Experimental Rhinitis in Rats. *Biol. Pharm. Bull.* 2001, 24(1):92-95

International Headache Society, The International Classification of Headache Disorders, 3rd edition (beta version), *Cephalalgia*, 2013, 33(9):629-808

Jain D, Pathak N, Khan S, Raghuram GV, Bhargava A, Samarth R, Mishra PK. Evaluation of cytotoxicity and anticarcinogenic potential of *Mentha* leaf, extracts, *Int J Toxicol.* 2011, 30(2):225-236. doi: 10.1177/1091581810390527. Epub 2011 (Abstract only available)

Julien F, Voiron B, Bernillon J, Fabre-Bonvin J. Highly oxygenated flavones from *Mentha piperita*. *Phytochemistry* 1984, 23:2972-2973

- Kasem RF, Hegazy RH, Arafa MA, AbdelMohsen MM. Chemopreventive effect of *Mentha piperita* on dimethylbenz[a]anthracene and formaldehyde-induced tongue carcinogenesis in mice (histological and immunohistochemical study), *J Oral Pathol Med*. 2014, 43(7):484-91. doi: 10.1111/jop.12150. Epub 2014, (Abstract only available).
- Kassebaum PJ, Shaw DL, Tomich DJ. Possible warfarin interaction with menthol cough drops. *Ann. Pharmacother*. 2005, 39(2):365-367. Epub 2005
- Khanna R, MacDonald JK, Lavesque BG Peppermint Oil for the treatment of Irritable Bowel Syndrome, A Systematic Review and Meta-analysis, *J Clin Gastroenterol*, 2014, 48(6):505-12. doi: 10.1097/MCG.0b013e3182a88357
- Khayyal MT, Ghazaly MA, Kenawy SA, Seif-el-Nasr, Mahram I, Kafafi Y, Okpahyi S. Antiulcerogenic Effect of Some Gastrointestinally Acting Plant Extracts and Their Combination. *ArzneimittelforschDrug Res*. 2001, 51(II):545-553
- Kline R, Barbero, G. The use of peppermint oil in the treatment of recurrent abdominal pain in children. *Gut* 1997, 41(Suppl. 1), A90 P 046
- Kline RM, Kline JJ, Di Palma J, Barbero GJ. Enteric coated, ph-dependent peppermint oil capsules for the treatment of irritable bowel syndrome in children. *J. Pediatr*. 2001, 138:126-128
- Kohlert, Rensen, März, Schindler, Graefe, Veit. Bioavailability and pharmacokinetics of natural volatile terpenes in animals and humans. *Planta Med* 2000, 66:495-505
- Koutroumanidou E, Kimbaris A, Kortsaris A, Bezirtzoglou E, Polissiou M, Charalabopoulos K, Pagonopoulou O. Increased Seizure Latency and Decreased Severity of Pentylentetrazol-Induced Seizures in Mice after Essential Oil Administration, *Epilepsy Res Treat* 2013, Article ID 532657
- Lallement-Guilbert N, Bézanger-Beauquesne L. Recherches sur les flavonoides de quelques Labiées médicinales (romarin, mentha poivrée, sauge officinale). *Plant Méd Phytothér* 1970, 4:92-107
- Lawson MJ, Knight RE, Tran K, Walker G, Robers-Thomson I. Failure of enteric-coated Peppermint oil in the irritable bowel syndrome: A randomized double-blind crossover study. *J. Gastroent. Hepatol*. 1988, 3:235-238
- Lazukta JR, Mierauskiene J, Slapsyte ., Dedonyte. Genotoxicity of dill, peppermint and pine essential oils in human lymphocytes and *Drosophila melanogaster*. *Food Chem Toxicol*. 2001, 39:485-492
- Lech, Y, Olesen KM, Hey H, Rask-Pedersen E, Vilien M, and Ostergaard O. Behandling af colon irritabile med Pebermynteolie. En dobbeltblind undersogelse med placebo [Treatment of irritable bowel syndrome with peppermint oil. A double-blind study with a placebo]. *Ugeskr Laeger* 1988, 150(40):2388-2389
- Leicester RJ: Peppermint oil to reduce colonic spasm during endoscopy. *Lancet* 1982, II:989
- Lindemann J, Tsakiropoulou E, Scheithauer MO, Konstantinidis I, Wiesmiller KM. Impact of menthol inhalation on nasal mucosal temperature and nasal patency. *Am. J. Rhinol*.2008, 22(4):402-405
- Litvinenko VI, Popova TP, Simonjan AV, Zoz IG, Sokolov VS. "Gerbstoffe" und Oxyzimtsäureabkömmlinge in Labiatian. *Planta Med* 1975, 27:372-380
- Liu, JH, Chen GH, Yeh HZ, Huang CK, Poon SK. Enteric-coated peppermint-oil capsules in the treatment of irritable bowel syndrome: a prospective, randomized trial. *J. Gastroenterol*. 1997, 32(6):765-768

- Longstreth G.F, Thompson WG, Chey WD, Houghton LA, Mearin F, Spiller RC. Functional Bowel Disorders, *Gastroenterology* 2006, 130:1480-1491
- Madyastha KM, Srivatsan V. Studies on the metabolism of l-menthol in rats. *Drug Metab Dispos.* 1988 Sep-Oct; 16(5):765-72. (Abstract only available)
- Madsen C, Würtzen G, Carstensen J. Short-term toxicity study in rats dosed with menthone; *Toxicology Letts.* 1986, 32:147-152
- Mahady GB, Pendland SL, Stoia A, Hamill FA, Fabricant D, Dietz BM, Chadwick LR. *In vitro* susceptibility of helicobacter pylori to botanicals used traditionally for the treatment of gastrointestinal disorders. *Phytother Res.* 2005, 19(11):988-991
- Maliakal PP, Wanwimolrum S. Effect of herbal *teas* on hepatic drug metabolizing enzymes in rats. *J. Pharm. Pharmacol.*, 2001, 53:1323-1329
- Martin D., Valdez J, Boren J, Mayersohn M.I. Dermal absorption of camphor, menthol and methyl salicylate in humans. *J. Clin. Pharm.* 2004, 44:1151-1157
- Mckay DL, Blumberg JB. A review of the Bioactivity and potential health benefits of Peppermint tea (*mentha piperita* L.), *Phytother Res*, 2006, 20:619-633
- Meamarbashi A, Rajabi A. The effects of peppermint on exercise performance *J Intern Soc Sports Nutr* 2013, 10(1):15
- MedlinePlus Medical Encyclopedia: Peppermint overdose.  
<https://medlineplus.gov/ency/article/002685.htm>, accessed 26/011/2017
- Merat S, Khalili S, Mostajabi P, *et al.*, The Effect of Enteric-Coated, Delayed-Release Peppermint Oil on Irritable Bowel Syndrome, *Dig Dis Sci*; 2010, 55:1385–1390
- Mills S, Bone K, *The essential Guide to Herbal Safety.* 2005. Churchill Livingstone
- Mimica-Dukic N, Bozin B, Sokovic M, Mihajlovic B, Matavulj M. Antimicrobials and antioxidant activities of Three *Mentha* species essential oils, *Planta Med* 2003, 69(5):413-419
- Mahmood SA, Abbas NA, Rojas NL. Effects of aqueous extracts of peppermint, fennel, dill and cimun on isolated rabbit duodenum. *U Aden J Nat Appl Sci* 2003, 7: 377-383
- Morton CA, Garioch J, Todd P, Lamey PJ, Forsyth A. Contact sensitivity to menthol and peppermint in patients with intra-oral symptoms. *Contact Dermatitis.* 1995, 32(5):281-284
- Münst GJ, Schlaur H, Nuesch HJ, Vetter D, Holik K, Hammer B, Hohler S. Pfefferminzöl. I (Colpermins) im Vergleich zu Mebeverin (Duspatalin) als Therapeutikum des Colon irritabile [Peppermint oil (Colpermins) by comparison with mebeverine (Duspatalin) as treatment for irritable colon – a double blind study]. *Therapiewoche Schweiz* 1987, 9:853–858
- Murray MJ, Lincoln DE, Marble PM. Oil composition of *Mentha aquatica* x *M. spicata* F1 hybrids in relation to the origin of x *M. piperita*. *Canad. J. Genet. Cytol.* 1972, 14:13-29
- Nadkarni KM: *Mentha piperita*, Linn. Indian Materia Medica, 3rd revised edition. 1976, 789-790, (reprinted 1999)
- Nair B. Final report on the Safety Assessment of *Mentha Piperita* (Peppermint) Oil, *Mentha Piperita* Leaf extract, *Mentha Piperita* Leaf, and *Mentha Piperita* Leaf Water. *Int. J. Toxicol.* 2001, 20 (Suppl. 3):61–73



- Nash P, Gould SR, Bernardo DE. Peppermint oil does not relieve the pain of irritable bowel syndrome. *Br. J. Clin. Pract.* 1986, 40(7):292–293
- Nath SS, Pandey C, Roy D., A near fatal case of high dose peppermint oil ingestion- Lessons learnt. *Indian J Anaesth.* 2012, 56(6):582-4. doi: 10.4103/0019 -5049.104585
- National Toxicology Program, Toxicology and carcinogenesis studies of Pulegone (CAS No. 89-82-7) in F344/N rats and B6C3F1 mice (gavage studies), 2011, NIH Publication No. 11-5905
- Natural Standard Research Collaboration, Peppermint oil. Evidence based monograph 2005, Medlineplus
- Naveed U, Mir Azam K, Taous K Afl Haq A, Waqar A, *Mentha piperita* in nephrotoxicity - a possible intervention to ameliorate renal derangements associated with gentamicin, *Indian J Pharmacol.* 2014; 46(2): 166–170. doi: 10.4103/0253-7613.129309
- Niesel S. Untersuchungen zum Freisetungsverhalten und zur Stabilität ausgewählter wertbestimmender Pflanzeninhaltsstoffe unter besonderer Berücksichtigung moderner phytochemischer Analysenverfahren. Inaugural-Dissertation Freie Universität, Berlin, 1992
- Nordeng H, Bayne K, Havnen G, Paulsen B S. Use of herbal drugs during pregnancy among 600 Norwegian women in relation to concurrent use of conventional drugs and pregnancy outcome, *Compl Thera Clin Pract.* 2011, 17:147-151
- Pallivalapila AR, Stewart D, Shetty A, Pande B, Singh R, McLay JS., Use of Complementary and Alternative Medicines During the Third Trimester; *Obstet Gynecol* 2015, 125:204–211
- Papathanasopoulos A, Rotondo A, Janssen P, Boesmans W, Farré R, Vanden Berghe P, Tack J. Effect of acute peppermint oil administration on gastric sensorimotor function and nutrient tolerance in health, *Neurogastroenterol Motil* 2013, 25, e263–e271
- Pasechnik IK, Gelia EV. Choleric preparation from peppermint. *Farm Zh (1Gey)* 1966, 21:49-53; through *Chem Abstr* 1967, 66:36450. (Abstract only available)
- Pasechnik IK. Study of choleric properties specific to flavonoids from *Menthae piperita* leaves. *Farmakol Toksikol* 1966, 29:735-7; through *Chem Abstr* 1967, 66:54111 (Abstract only available)
- Peppermint. Complete Peppermint information from Drugs.com. [www.drugs.com](http://www.drugs.com). Accessed 16/10/2007
- Pereira EJ, Sim L, Driver HS, Parker CM, Fitzpatrick MF. The effect of inhaled menthol on upper airway resistance in humans: A randomized controlled crossover study. *Can Respir J* 2013, 20(1): e1-e4
- Pittler MH, Ernst E. Peppermint oil for irritable bowel syndrome: A critical review and metaanalysis. *Am. J. Gastroenterol.* 1998, 93(7):1131-1135
- Rees, WDW, Evans BK, Rhodes J. Treating irritable bowel syndrome with peppermint oil. *Br. Med. J.* 1979, 2(6194):835-836
- Reiter M, Brandt W. Relaxant effects on tracheal and ileal smooth muscles of the guinea Pig. *Arzneim-Forsch/Drug Res* 1985, 35:408–414
- Reynolds JEF, editor. Peppermint oil. In: Martindale. The Extra Pharmacopoeia, 27<sup>th</sup> edition, London: Pharmaceutical Press 1977, 1024
- Riachi LG, Abi-Zaid IE, Moreira RF, De Maria CA. Volatile composition of peppermint (*Mentha piperita* L.) commercial teas through solid phase extraction, *Arch Latinoame Nutr.* 2012, 62(4):389-392 (Abstract only available)

- Roe FJ, Palmer AK, Worden AN, Van Abbé NJ. Safety evaluation of toothpaste containing chloroform. I. Long-term studies in mice. *J. Environ. Pathol. Toxicol.* 1979, 2:799-819
- Rogers SN, Pahor AL. A form of stomatitis induced by excessive peppermint consumption. *Dent update.* 1995, 22(1):36-37
- Romero-Jimenez M, Campos-Sanchez J, Analla M, Munoz-Serrano A, Alonso-Moraga A. Genotoxicity and anti-genotoxicity of some traditional medicinal herbs. *Mutat. Research* 2005, 585(1-2):147-155
- Ruepert L, Quartero AO, de Wit NJ, van der Heijden GJ, Rubin G, Muris JWM. Bulking agents, antispasmodics and antidepressants for the treatment of irritable bowel syndrome (Review), *Cochrane Database of Systematic Reviews, The Cochrane Library* 2011, Issue 8
- Russin W, Hoesly J, Elson C, Tanner M, Gould M. Inhibition of rat mammary carcinogenesis by monoterpenoids. *Oxford J. Carcinogenesis* 1989, 10(11):2161-2164
- Samman MA, Bowen ID, Taiba K, Antonius J, Hannan MA. Mint prevents shama-induced carcinogenesis in hamster cheek pouch. *Carcinogenesis* 1998, 19:1795-1801
- Samarth RM, Goyal PK, Kumar A. Modulation of Serum Phosphatases Activity in Swiss Albino Mice Against Gamma Irradiation by *Mentha piperitae* Linn. *Phytother Res* 2002, 16: 586-589
- Samarth RM, Goyal PK, Kumar A. Protection of Swiss albino mice against whole-body gamma irradiation by *Mentha piperita* (Linn). *Phytother Res* 2004, 18:546-550
- Samarth RM, Panwar M, Kumar M, Kumar A. Protective effects of *Mentha piperitae* Linn on benzo[a]pyrene-induced lung carcinogenicity and mutagenicity in Swiss albino mice *Mutagenesis* 2006, 21(1):61-66
- Sameena Y, Ashok K. Evaluation of chemoprevention of skin papilloma by *M. piperitae*. *J Med Aromatic Plant Sci* 2001, 22:84-88
- Samojlik I, Petković S, Mimica-Dukić N, Božin B. Acute and chronic pretreatment with essential oil of peppermint (*Mentha x piperita* L., Lamiaceae) influences drug effects, *Phytother Res.* 2012, 26(6):820-5. doi: 10.1002/ptr.3638. Epub 2011 Nov 10
- Sanaka Madhusudhan R, Ferguson D, Kyprianou A, Kale H, Mullen K, Amini S. Does instillation of peppermint oil solution in the cecum facilitate terminal ileal intubation? A prospective, randomized, double-blind study. *Gastrointestinal endoscopy* 2004, 59(5):265
- Santos MA. Menthol induced Asthma: a case report; *J. Invest. Allergol. Clin. Immunol.* 2001, 11(1):56-58
- Sharma A, Kumar Sharma M, Kumar M. Protective effect of *Mentha piperita* against arsenic- induced toxicity in liver of Swiss albino mice. *Basic Clin. Pharmacol. Toxicol.* 2007, 100, 4:249-257
- Schelz Z, Molnar J, Hohmann J. Antimicrobial and antiplasmid activities of essential oils. *Fitoterapia*, 2006, 77(4):279-285
- Schemann Michel K, Zeller F, Hohenester B, Rühl A. Region-specific effects of STW5 and its components in gastric fundus, corpus and antrum. *Phytomedicine* 2006, 13:SV 90-99
- Schilcher H. Pharmakologie und Toxikologie ätherischer Öle. *Therapiewoche* 1986, 36:100-12
- Schmulson M, Drossman D. What Is New in Rome IV. *J Neurogastroenterol Motil* 2017, 23:151-163
- Schneider MME *et al.* Efficacy of Colpermin in the treatment of patients with irritable bowel syndrome [abstract]. *Gastroenterol.* 1990, 98: A389

- Shaw G, Srivastava ED, Sadlier M, Swann P, James JY, Rhodes J.: Stress management for irritable bowel syndrome: a controlled trial. *Digestion* 1991, 50:36-42
- Schuhmacher A, Reichling J, Schnitzler P. Virucidal effect of peppermint oil on the enveloped viruses herpes simplex virus type 1 and type 2 *in vitro*. *Phytomedicine* 2003, 10: 504-510
- Siegers C, Guo Z, Pentz R. Choloretic properties of herbal drugs. *Progress Pharmacol. Clin. Pharmacol.* 1991, 8(4):531-535
- Sigmund DJ, McNally EF. The action of a carminative on the lower esophageal sphincter. *Gastroenterol.* 1969, 56:13
- Somerville KW, Richmond CR, Bell GD. Delayed release peppermint oil capsules (Colpermin) for the spastic colon syndrome: a pharmacokinetic study. *British journal of clinical pharmacology* 1984, 18(4):638-40
- Sparks MJ, O'Sullivan P, Herrington AA, Morcos SK. Does peppermint oil relieve spasm during barium enema? *Br. J. Radiol.* 1995, 68(812):841-843
- Steinegger E, Hiinsel R. Pfefferrninzbltter und Pfefferminzbl. In: Pharmakognosie, Sth ed. Ber-lin: Springer-Verlag, 1992, 302-304
- Taher YA. Antinociceptive activity of *Mentha piperita* leaf aqueous extract in mice, *Libyan J Med* 2012, 7:16205 - DOI: 10.3402/ljm.v7i0.16205
- Tayarani-Najaran Z, Talasaz-Firoozi E, Nasiri R, Jalali N, Hassanzadeh MK. Antiemetic activity of volatile oil from *Mentha spicata* and *Mentha piperita* in chemotherapy-induced nausea and vomiting. *E cancer med sci.* 2013, 7:290
- Tate S. Peppermint oil: a treatment for postoperative nausea. *J. Adv. Nurs.* 1997, 26:543-549
- Thomas JG. Letters to the editor. *The Lancet*, 1962, 222
- Trabace L, Avato P, Mazzoccoli M, Siro-Brigiani G. Choloretic activity of some typical components of essential oils. *Planta Med* 1992, 58 (Suppl. 1):650-651
- US National Cancer Institute (1979) Bioassay of DL-menthol for possible carcinogenicity. Report NCI-CG-TR-98. US National Technical Information Service report No. PB-288761, Bethesda, Maryland, United States
- Wacher VJ, Wong S, Wong HT. Peppermint oil enhances cyclosporine oral bioavailability in rats: comparison with D-alpha-tocopheryl poly (ethylene glycol 1000) succinate (TPGS) and ketoconazole. *J. Pharm. Sci.* 2002, 91(1):77-90
- Wall GC, Bryant GA, Bottenberg MM, Maki ED, Miesner AR. Irritable bowel syndrome: A concise review of current treatment concepts. *World J Gastroenterol* 2014, 20(27):8796-8806
- Weiss W, Koelbl C. Therapie des Colon irritable mit Pfefferminzo " I-kapseln [Treatment of irritable bowel syndrome with peppermint oil capsules]. *Therapiewoche Osterr* 1988, 3, 3-8
- Weydert Joy A, Ball Thomas M, Davis Melinda F. Systematic Review of Treatments for Recurrent Abdominal Pain, *Pediatrics* 2003, 111(1):e1-11
- Wichtl M. Teedrogen und phytopharmaka. Wissenschaftliche Verlag GmbH, 2002,4:84
- Wildgrube HJ. Untersuchung zur Wirksamkeit von Pfefferminzo I auf Beschwerdebild und funktionelle Parameter bei Patienten mit Reizdarm-Syndrom (Studie) [Investigation of the efficacy of peppermint

oil on the symptoms and functional parameters of patients with irritable bowel syndrome (study)].  
*Naturheilpraxis* 1988, 41, 2-5

WHO Geneva Evaluation of certain food additives. Fifty-first report of the Joint FAO/WHO Expert Committee on the Food Additives, 2000

WHO monographs on selected medicinal plants, *Aetheroleum Menthae Piperitae*, vol 2, 2002, 188-198

WHO monographs on selected medicinal plants, *Folium Menthae piperitae*, vol 2, 2002, 199-205

Wiśniewski W, Jablonsky S, Jeżerską K, Poniatowska H, Wpływ Czynników Fizycznych na Zawartość Olejków Eterychnych w Odwarach z Niektórych Surowców Roslinnych. *Acta Poloniae Pharmaceutica*, 1962, Tom XIX, 378-382

#### **References assessed but not quoted in the AR:**

Eccles R. Menthol and related cooling compounds. *Rev. J. Pharm. Pharmacol.* 1994, 46:618-630

Farmakopea Polska. *Folium menthae piperitae*, Warszawa Państwowy Zakład Wydawnictw Lekarskich, Wydanie III, 1954, 260-261

Fluckiger FA, Hanbury. *Pharmacographia. A History of the Principal Drugs of Vegetable Origin met within GB and British India.* 2<sup>nd</sup> edition. London: Macmillian and Co. 1879

Foster S. *Herbs for Your Health.* Loveland, CO: Interweave Press, 1996, 72-73

Freise J, Köhler S. Peppermint oil-caraway oil fixed combination in non-ulcer dyspepsia--comparison of the effects of enteric preparations. *Pharmazie.* 1999, 54:210-215

*Tincture Menthae piperitae.* *Ergänzungsbuch um Deutschen Arzneibuch.* Deutscher Apotheker- Verlag, Stuttgart, 1953, 496

Wichtl M. *Herbal Drugs and Phytopharmaceuticals.* Boca Raton, FL: CRC Press, 1994, 336-338