

LEMON BALM

(Melissa officinalis)

An Overview of its Versatility,
Effectiveness, and Indications



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BACKGROUND AND USES

Melissa officinalis, commonly called Lemon balm, or balm, is a member of the mint (Labiatae) family. A fragrant perennial with a pleasant lemon scent, lemon balm has small white to yellow flowers filled with nectar that attracts honeybees. *Melissa* is Greek for honeybee. This plant is native to Southern Europe, Northern Africa, the Mediterranean, Russia, Syria and Iran. Lemon balm grows to about 2 feet tall and is a common garden potherb grown all over the world.

Lemon balm has historically been valued as a culinary, cosmetic, and medicinal herb. Fresh lemon balm leaves are often used to top drinks and garnish salads and main dishes, while the dried leaves have been frequently used for teas. Throughout history as a medicinal herb, lemon balm has been attributed with memory-enhancing properties, used as a mild sedative, a mood elevating remedy, sleep aid, and as a digestive aid to relieve gas, stomach pain, nausea, migraine headache, and hypertension along with being known for its use with fevers to increase perspiration.

Currently in modern botanical medicine, lemon balm is being researched for its effects as a mood enhancing plant, its calming effects, and its cognition improving effects. Lemon balm's role in Alzheimer's disease management is also an area of research interest.

ACTIVE CONSTITUENTS

Active constituents include, phenolic acids and flavonoids, including up to 6% rosmarinic acid, coumaric, caffeic, luteolin-7-glucoside, rhamnazin, campesterol, catechins, chlorogenic-acid, protocatechuic acid, 10-(Alpha)-cadinol, copaene, beta-sitosterol, succinic acid, thymol, hexanoic acid, stachyose, and trans-ocimene. ¹

Rosmarinic acid is a caffeic acid derivative found in several Labiatae family members and credited with both antioxidant and immune modulating effects, as well euthyroid effects. Rosmarinic acid works by several mechanisms of action to normalize hyperthyroidism, including binding to thyroid stimulating autoantibodies and preventing them from binding to TSH receptors.

The essential oil (0.02–0.37%) content is composed of monoterpenes, sesquiterpenes and terpenoid components including citral, citronellal, eugenol, geraniol, nerol, linalool, farnesyl acetate, humulene, ursolic, and pomolic acids. ²

Research on *Melissa officinalis* has shown that growing and harvesting techniques influence the essential oil content of the plant and that the top third of the leafy plant has the highest amount of volatile oil. ³

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Tannin compounds, a common active constituent of the mint family are found in the whole plant but not in the essential oil distillate.

MEDICINAL ACTION

- Antibacterial, antifungal, antiviral
- Antispasmodic, analgesic
- Anxiolytic and sedative
- Nervine and anti-depressant
- Antioxidant
- Carminative
- Thymolyptic
- Supports normal thyroid activity when hyperthyroid

RESEARCH SUMMARY

Carminative and Anti-colic Effects

The aim of this randomized, double-blind, placebo-controlled trial was to investigate the effectiveness and side effects of a phytotherapeutic agent with *Matricaria-recutita*, *Foeniculum vulgare* and *Melissa officinalis*, in the treatment of infantile colic. 88 of the original 93 infants completed this one week trial. The study showed that colic in breastfed infants improved within 1 week of treatment with an extract based on the herbal combination of *Matricariae recutita*, *Foeniculum vulgare* and *Melissa officinalis*.⁴

Calming Effects for Insomnia and Hyperactivity

Several clinical studies have looked at *Melissa* for its calming, sleep enhancing and relaxing properties. One double blind, placebo controlled study involving 18 healthy volunteers were given either a 300 mg or 600 mg dose of a standardized lemon balm extract or placebo for 7 days. Outcomes showed that the 600 mg dose of lemon balm significantly improved mood while increasing calmness and alertness, more so than the 300mg dose. The study showed a

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dose-specific increase in calmness, and dose-dependent decrements in timed memory task performance.⁵

A second study looked at *Melissa* used in combination with *Valeriana officinalis* for effectiveness in the treatment of restlessness and nervous insomnia in children. This was a multi-center study, involving 918 children under the age of 12 years, and evaluated children for therapeutic efficacy and tolerability of the herbal medicine. In conclusion, the study found the herbal combination to be effective in younger children with restlessness and insomnia and very well tolerated.⁶

Another similar double-blind, placebo-controlled, randomized, balanced cross-over experiment looked at a single dose of a combination of *Melissa officinalis* and *Valeriana officinalis* in doses of 600, 1200, or 1800 mg. The results suggest that the combination of Melissa and Valerian possesses anxiolytic properties and that the 1800mg doses may increase anxiety.⁷

Anti-anxiety, and Mood Elevating

There are several animal studies sighting the anxiolytic and sedative effects of lemon balm with only a few human clinical studies confirming these effects. There are a number of possible active constituents in the plant which may be responsible for this activity including eugenol and citronellol which are both known to have a GABA –A receptor affinity.^{8,9} Human clinical research has reported the essential oil of lemon balm decreases agitation and social withdrawal, and improves time spent in constructive activities in a double-blind placebo controlled study involving 71 subjects over one month.¹⁰

Cognitive Function, Alzheimer's Disease

Traditional herbal knowledge suggests the use of lemon balm to improve memory, concentration and focus. Several clinical studies on lemon balm have shown encouraging results supporting the use of lemon balm for cognitive function improvement. These clinical studies showed a dose-dependant, time-dependant, and response-dependant relationship with regards to effects on memory and mood.

The dosage range of lemon balm tested for clinical effectiveness for calming effects, mood enhancing, and cognitive function improvement were 300, 600, 900, 1200, 1800mg daily. The results suggest that doses of *Melissa officinalis* at or above the maximum employed here can improve cognitive performance and mood and may therefore be a valuable adjunct in the treatment of Alzheimer's disease. The most notable cognitive and mood effects were improved memory performance and increased 'calmness' at all post dose time points for the highest dose of 1600 mg daily.¹¹

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In one clinical study *Melissa officinalis* extract was evaluated in the treatment of patients with mild to moderate Alzheimer's disease. This double blind, randomized, placebo controlled trial looked at the use of the herb for a four month period and found that *Melissa officinalis* extract produced a significantly better outcome on cognitive function than placebo. In addition, there were no significant differences in the two groups in terms of observed side effects except agitation, which was more common in the placebo group ($p = 0.03$). The study concluded that *Melissa officinalis* extract is of value in the management of mild to moderate Alzheimer's disease and has a positive effect on agitation in such patients.¹²

Anti-viral and Anti-microbial Activity

Melissa is a folkloric remedy for viral infections, and many modern clinicians report efficacy for herpetic infections. The use of herbal medicines such as *Melissa* might be a precautionary measure to prevent development of microbial resistance to synthetic antibiotics that is associated with therapeutic failures.

Molecular compounds in *Melissa* well known for their antimicrobial effects include citral (neral and geranial); citronella, trans-caryophyllene, and rosmarinic acid. Viral research suggests that rosmarinic acid and whole *Melissa* extracts inhibit the binding of individual herpes simplex I viruses from binding to host cells, and are thereby deterred from entering cells.¹³

One double-blind, placebo-controlled, randomized trial investigated the use of a *Melissa* cream on patients with recurrent herpes simplex labialis. Patients were asked to evaluate new outbreaks in terms of subjective symptom severity (burning, tingling, pain severity) and objective speed of recovery (size of the blisters, time to ulcerative stage and scab formation) while using either the *Melissa* cream or a placebo cream. Statistically significant improvements in combined symptom scores were seen from the second day on in the group using the *Melissa* cream compared to the placebo. The lesions were also shown to resolve more rapidly in the group receiving the *Melissa*.¹⁴

Normalizing Effects on the Thyroid in Hyperthyroid Subjects

Whole *Melissa* extracts and rosmarinic acid may reduce excessive thyroid activity by a variety of mechanisms including binding to thyroid stimulating auto-antibodies and inactivating them and reducing the responsive to TSH at receptor sites.^{15, 16}

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CLINICAL INDICATIONS, PRACTITIONER DOSING, CONTRAINDICATIONS AND TOXICITY

Clinical Indications

- Insomnia and restless sleep
- Restlessness and hyperactivity in children
- Nervousness, agitation and General Anxiety Disorder
- Improvement of cognitive function, concentration, memory, and focus
- Improvement of cognitive function and reduction of agitation in Alzheimer's Disease
- Antiviral activity was found to be significant against herpes simplex 1 and 2. Outbreak decreasing symptom severity, increasing rate of healing and preventing spread of infection ¹⁷
- Antibacterial against organisms Escherichia coli, Staphylococcus aureus, and several other gram-positive strain of bacteria ¹⁸
- Antifungal inhibiting activity for yeasts and filamentous fungi ¹⁸
- Gastrointestinal colic, spasm, pain, and nervous discomfort
- Antispasmodic activity on the smooth muscle of the digestive tract indicated for all types of gastrointestinal spasms and pain
- Analgesic effects are connected to the active constituents; rosmarinic acids and eugenol know to reduce inflammation and pain
- Euthyroid –promoting. Rosmarinic acid and whole *Melissa* extracts may normalize thyroid function in hyperthyroid subjects due to a variety of metabolic normalizing and immune-modulating activities. ¹⁶

Practitioner Dosing

Capsules: dosed at 300, 600, 900,1200, 1600 mg of dried herb daily

Infusion of 1.5 - 4.5 grams dried herb to 150 mls water taken as a tea, three times a day

Tincture 1:5 extract dosed at 3-5 mls three times a day

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Fluid Extract 1:1 extract dosed at 2-3 mls three times a day

Topical application of an essential oil cream to herpes simplex lesions, 4 times daily

Clinical trials used 700mg crude herb to one gram ointment topically

Contraindications

Lemon balm herb is generally well tolerated with no contraindications. Avoid using therapeutic doses in hyperthyroidism as it is undetermined by clinical evidence if lemon balm is thyroid inhibitory. Using it as a beverage tea should not be an issue.

Toxicity

There are very few reports of toxicity with the use of lemon balm, and literature review reveals no evidence of toxicity or drug interaction when given in recommended doses. There have been several clinical trials done on the use, effect, and tolerance of *Melissa officinalis* in the pediatric population with no reports of toxicity.

CONCLUSIONS

Lemon balm offers medicinal value in several different ways with both oral and topical routes of delivery. Topically, *Melissa* can be used as a virucidal in the treatment of herpes simplex type I and II sores, as an antibacterial agent for infections of the skin caused by *Staphylococcus aureus*, or as a fungicide for skin or mouth infections. Lemon balm taken internally can aid in reducing anxiety, restlessness, irritability and agitation of all types, and improve the mood, sleep, cognitive function, and mental concentration in therapeutic doses. This plant has potential in the management of Alzheimer's disease, ADHD, and General Anxiety Disorder. The role of *Melissa* in the treatment of functional gastrointestinal conditions associated with nervousness, spasm, inflammation and pain is vast, with current research supporting traditional use and knowledge.

ABOUT THE AUTHOR

Dr. Mary Bove obtained her Doctorate of Naturopathic Medicine and Midwifery Certification from Bastyr College of Natural Health Sciences in Seattle, WA and received her Diploma of Phytotherapy/Herbal Medicine at the School of Phytotherapy in Great Britain. Dr. Bove

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continues to practice Naturopathic Family Medicine at the Brattleboro Naturopathic Clinic, Brattleboro, VT. Once a full-time faculty member at Bastyr University, Dr Bove chaired the departments of Botanical Medicine and Naturopathic Midwifery. She served as adjunct faculty for the Massachusetts School of Pharmacy and Scottish School of Herbal Medicine Masters level course.

Dr. Bove is the author of the *Encyclopedia of Natural Healing for Children and Infants* considered an authoritative reference on natural pediatric medicine. Mary co-authored *Herbs for Women's Health* and has been published in many magazines, journals and collaborative books on botanical and natural medicine. She lectures and teaches internationally on the topics of naturopathic medicine, botanical medicine, pediatrics, natural pregnancy, childbirth, traditional food medicine and mind-body healing. In collaboration with *Gaia Herbs*® Dr Bove developed an herbal remedy line designed specifically for children and is an educational, medical consultant within the natural product industry. Dr. Bove has recently produced an App for iPhone, Momma Nature's **Food Pharm Guide**, a fun and informative guide to the use of common foods and herbs for health, prevention, and kitchen first aid.

REFERENCES

1. L.Weitzel C, Petersen M. Enzymes of phenylpropanoid metabolism in the important medicinal plant *Melissa officinalis* Planta. 2010 Aug;232(3):731-42.
2. Hncianu M, Aprotosoai AC, Gille E, Poiat A, Tuchilu C, Spac A, Stnescu U. Chemical composition and in vitro antimicrobial activity of essential oil *Melissa officinalis* L. from Romania. Rev Med Chir Soc Med Nat Iasi. 2008;112(3):843-7.
3. Mrlianova M, Tekel'ova D, Felklova M, Toth J, Musil P, Grancai D (2001). Comparison of the quality of *Melissa officinalis* L. cultivar Citra with mellissas of European origin. Pharmacopsychiatry., 34: 27-36.
4. Savino F, Cresi F, Castagno E, et al. A randomized double-blind placebo-controlled trial of a standardized extract of *Matricaria recutita*, *Foeniculum vulgare* and *Melissa officinalis* (ColiMil) in the treatment of breastfed colicky infants. *Phytother Res* (2005 Apr) 19(4):335-40
5. Kennedy DO, Scholey AB, Tildesley NT, et al. Modulation of mood and cognitive performance following acute administration of *Melissa officinalis* (Lemon balm), *Pharmacol Biochem Behav* (2002 Jul) 72(4):953-64
6. Muller SF, Klement S. A combination of valerian and Lemon balm is effective in the treatment of restlessness and dyssomnia in children. *Phytomedicine*. 2006;13(6):383-7.
7. Kennedy DO, Little W, Haskell CF, Scholey AB. Anxiolytic effects of a combination of *Melissa officinalis* and *Valeriana officinalis* during laboratory induced stress.
8. Aoshima and Hamamoto 1999 Awad R, et al. Bioassay-guided fractionation of Lemon balm (*Melissa officinalis* L.) using an in vitro measure of GABA transaminase activity. *Phytother Res*. 2009 Aug;23(8):1075-81.
9. Awad R, Levac D, Cybulska P, Merali Z, Trudeau VL, Arnason JT. Effects of traditionally used anxiolytic botanicals on enzymes of the gamma-aminobutyric acid (GABA) system. *Can J Physiol Pharmacol*. 2007 Sep;85(9):933-42.
10. Ballard CG, O'Brien JT, Reichelt K, Perry EK. Aromatherapy as a safe and effective treatment for the management of agitation in severe dementia: the results of a double-blind, placebo-controlled trial with *Melissa*. *J Clin Psychiatry*. 2002;63(7):553-8

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11. Kennedy DO, Wake G, Savelev S, et al. Modulation of mood and cognitive performance following acute administration of single doses of *Melissa officinalis* (Lemon balm) with human CNS nicotinic and muscarinic receptor-binding properties. *Neuropsychopharmacology* (2003 Oct) 28(10):1871-81
12. Akhondzadeh S, Noroozian M, Mohammadi M, et al. *Melissa officinalis* extract in the treatment of patients with mild to moderate Alzheimer's disease: a double blind, randomised, placebo controlled trial. *J Neurol Neurosurg Psychiatry* (2003 Jul) 74(7):863-6
13. Astani A, Reichling J, Schnitzler P. *Melissa officinalis* extract inhibits attachment of herpes simplex virus in vitro; *Chemotherapy*. 2012;58 (1):70-7.
14. Koytchev R, Alken RG, Dundarov S.. Balm mint extract (Lo-701) for topical treatment of recurring herpes labialis; *Phytomedicine*. 1999 Oct 6(4):225-30
15. Santini F, Vitti P, Ceccarini G, Mammoli C, Rosellini V, Pelosini C, Marsili A, Tonacchera M, Agretti P, Santoni T, Chiovato L, Pinchera A. In vitro assay of thyroid disruptors affecting TSH-stimulated adenylate cyclase activity; *J Endocrinol Invest*. 2003 Oct;26(10):950-5.
16. Auf'mkolk M, Ingbar JC, Kubota K, Amir SM, Ingbar SH. . Extracts and auto-oxidized constituents of certain plants inhibit the receptor-binding and the biological activity of Graves' immunoglobulin's *Endocrinology*, 1985 May;116(5):1687-93
17. Schnitzler P, Schuhmacher A, Astani A, Reichling J. *Melissa officinalis* oil affects infectivity of enveloped herpes viruses. *Phytomedicine*. 2008;15(9):734-40
18. Larrondo, Agut, and Calvo-Torras, Antimicrobial activity of essences from labiates, *Microbios* 82(332):171-20,(1995)