Lemon Balm

Melissa officinalis

Common names

Balm, balm mint, bee balm, sweet balm

Family

Lamiaceae (mint)

Part used

Aerial parts

Background and traditional uses

Lemon balm is a perennial herb that grows to a height between 30-125cm. It is covered in short hairs, known as trichomes, with an erect stem, petiolate leaves and white or pale-pink flowers that blossom into clusters of between four to 12 blossoms in spring and summer.[1] Both the leaves and flowers emit a fragrant, lemony scent on crushing and have a distinctive lemon taste. Lemon balm has many lateral roots, which makes the plant very adaptable to different environmental conditions. Lemon balm slows its growth in the cooler months, but the roots are perennial.[1]

Lemon balm and other plants in the *Melissa* genus are native in many areas of the world, through Europe, Asia and Northern America, and its widespread use in traditional medicine systems follows suit. The medicinal properties of lemon balm were first recorded by the ancient Greek physician and father of pharmacology, Dioscorides (40-90 AD) in his 'De Materia Medica'. Both Dioscorides and Pliny the Elder recorded frequent use of wine steeped with lemon balm and topical application of the fresh leaves to bites and stings.

Paracelsus held the plant in such high esteem that he believed it could 'completely revivify a man' and even claimed it to be the 'elixir of life'. It was especially revered by the medieval herbalists, who used it as a primary medicine for the treatment of humoral melancholy. John Evelyn saw lemon balm as a 'sovereign for the brain' and powerful memory strengthener, earning it a strong reputation as a simple for scholars.[2] Nicolas Culpeper classified lemon balm as a herb of jupiter, ruled by cancer and acting as a constitutional strengthener, particularly useful as a 'purgative of the brain'.[3] Lemon balm was used in traditional Danish medicine to treat sleeplessness caused by heartbreak, melancholy and sadness. The herb is very popular in the traditional apothecaries of Austria where the tea and external application of its essential oil was, and still is, commonly used to treat gastrointestinal, nervous, hepatic and biliary ailments.[1]

Lemon balm's botanical genus name, *Melissa*, is derived from the classical Greek word '*melisso-phyllon*' meaning 'bee-leaf,' in reference to the bee's attraction to its flower and the sweet quality of the honey produced from it.[2]

Actions

Primary:[4-7]

- Antioxidant
- Anxiolytic
- Cognitive enhancer
- Mild sedative
- Antiviral (topical)
- Carminative
- Spasmolytic
- Diaphoretic

Secondary:[8]

- Analgesic
- Antibacterial
- Antifungal
- Anti-inflammatory
- Antispasmodic
- Cholinergic
- TSH antagonist

Applications and indications

- Several human trials support the use of lemon balm in cognitive disorders, generalised anxiety disorder, hyperlipidaemia and premenstrual syndrome.[4,5,9,10]
- Traditionally, lemon balm has a wide range of applications. The World Health Organization (WHO) recommends the herb for the treatment of amenorrhoea, asthma, bee stings, coughs, dizziness, dysmenorrhoea, migraine headaches, tachycardia, toothaches, tracheobronchitis and urinary incontinence.[11]

Active constituents and pharmacodynamics

Phytochemical investigations have revealed that lemon balm contains **volatile** compounds (including geranial, neral, citronellal and geraniol), **triterpenes** (including ursolic acid and oleanolic acid) and **phenolic acids** (including cis-and trans-RA isomers, caffeic acid derivatives, luteolin, naringin and hesperidin).[1]

The **essential oils** in lemon balm are thought to be largely responsible for the antibacterial and antifungal actions of the herb, while the triterpenes display antifungal, cytotoxic and haemolytic activities. The antioxidant activity of lemon balm could be attributed to its phenolic acid content, mainly hydroxycinnamic acid derivatives such as rosmarinic acid.[1]

The mechanisms for the well-known neurological effects of lemon balm have been proposed to compose of a combination of acetylcholinesterase inhibitory activity, acetylcholine and gamma-aminobutyric acid (GABA)-receptor stimulation, GABA transaminase (GABA-T) inhibition and inhibition of matrix metallo proteinase-2.[1]

Summary of clinical evidence

Premenstrual syndrome (PMS)

In a randomised, double-blind, placebo controlled study, 93 women were randomly divided into three groups; two study groups and one placebo, with each group containing 31 subjects.[10] The study groups received either a 500mg capsule of lemon balm or a capsule containing a combination of 250mg of lemon balm and 250mg of *Nepeta menthoides* (catmint). The placebo group received a 500mg capsule of starch powder. The administered capsules were taken twice daily during the luteal phase of two consecutive menstrual cycles. A significant decrease of mean scores of PMS symptoms was seen in both the first month (–55.5) and second month (–57.3) were recorded and noted to be significantly greater in the study groups compared to the placebo group. Additionally, the mean scores of physical and psychological aspects of quality of life in both study groups were significantly greater than those of the placebo group at the resolution of the study.[10]

Antioxidant

In a double-blind, randomised, placebo-controlled trial, 58 hyperlipidaemic patients were administered either 3g encapsulated, dried lemon balm powder or placebo.[4] Fasting blood glucose, HDL, LDL, triglyceride, creatinine and liver function enzymes (including AST/ALT) were measured both before and after the two-month study. At the conclusion of the trial, both LDL and AST were significantly reduced in the study group compared to placebo. The researchers concluded that the antioxidant content of lemon balm make it an effective medicine for improving the tested parameters of hyperlipidaemic patients.[4]

Anxiolytic

In a small randomised double-blind placebo-controlled crossover trial, 18 healthy volunteers were subjected to laboratory-induced stress via a 20-minute version of the Defined Intensity Stressor Simulation (DISS) battery. [11] They received either a placebo or a 300mg or 600mg dose of a standardised extract of lemon balm. The 600mg dose significantly improved the negative mood effects of DISS, increased self-ratings of calmness and contentedness and reduced self-ratings of alertness while the placebo and 300mg dose had little effect.[11]

A prospective open-label pilot study on stressed volunteers with mild-to-moderate anxiety disorders and sleep disturbances showed that oral administration of Cyracos® (a standardised extract of lemon balm delivered in a capsule, containing a minimum of 7% rosmarinic acid and 15% hydroxycinnamic acid derivatives) at a dose of 600mg per day for 15 days significantly reduced anxiety manifestations by 18%, ameliorated 18 anxiety-associated symptoms by 15%, and lowered insomnia by 42%.[6]

Cognitive enhancement

In a randomised, double-blind, placebo-controlled trial over four months, 42 patients between the ages of 65-80 with mild to moderate Alzheimer's disease were split into groups and administered either placebo or 60 drops/day of a 1:1 ethanolic extract of lemon balm. At the conclusion of the trial, the study group displayed significantly reduced agitation and improved cognition compared to the placebo group.[12]

Dosage summary

Liquid extract (1:1): 20-40mL per week[13]
Dried herb equivalent: 2-4g three times daily[13]

Safety information

- Safety in pregnancy and lactation has not been established.[13]
- Care should be taken if prescribing lemon balm for patients taking sedative or cholinergic drugs due to possible interactions and/or additive effects.[13]

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