

OP12. Evidences for lemon-balm essential oil suppression of anxiety-related behavior in animal and *in vitro* models

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Anxiety disorders are among the most frequent psychiatric diseases, with around ¼ of the World population suffering from these disorders during their lifetimes. Besides psyche-related symptoms, these patients can have a large number of somatic symptoms as well. Although the treatment of these disorders is mainly focused on resolving its mental component, one cannot neglect the need for the treatment of accompanying somatic symptoms. *Melissa officinalis* L. (lemon balm), in various formulations, has been extensively used as an ethnomedicinal remedy for the treatment of different psyche-related symptoms and its use is considered relatively safe. In the present study, the potential activity of *M. officinalis* essential oil was evaluated in several *in vitro* models and *in vivo* animal studies mimicking or involving anxiety-related somatic symptoms. Effects of *M. officinalis* essential oil on BALB/c mice motor activity was estimated using an open field, rotarod and horizontal wire tests. The performance of mice treated with 25 mg/kg of the oil showed a statistically significant decrease in the motor impairment arising from acute anxiety (open field test), while there was a prolonged latency and a reduction of the frequency of falling from a rotating rod and/or a horizontal wire (signs of muscle weakness/spasms). Additionally, the essential oil was assayed for its potential in inhibiting acetylcholinesterase activity and was found to be a very weak enzyme inhibitor. The potential beneficial properties of the essential oil on the function of the gastrointestinal system were evaluated in the models of spontaneous and induced isolated mouse ileum contractions. Concentrations of the essential oil higher than 1 µg/mL were found to inhibit both spontaneous and induced ileum contractions. The observed activity of the essential oil could be attributed to a large number of different constituents of the oil, most probably the monoterpenes which represent more than 50% of the oil.

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