

# Antidepressant-like effects of an aqueous extract of lavender (*Lavandula angustifolia* Mill.) in rats

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The purpose of the present study was to examine the antidepressant-like effects of an aqueous extract of lavender (LAE) by using the forced swimming test (FST), the most widely used animal model of depression. LAE was orally administered to rats three times, i.e., 24, 5, and 1 h prior to the FST. The administration of LAE (3,428 mg/kg body weight) showed a significant reduction of immobility time in the FST, the effect of which was comparable to that of the synthetic antidepressant imipramine (30 mg/kg). In addition, the same dose of LAE did not change the locomotor activity in the open field test. These results suggest that LAE might have antidepressant-like effects that are independent of motor stimulation. Furthermore, the active ingredients of LAE were suggested to be non-volatile constituents, since linalool, the main aroma constituent of lavender, was completely removed during the preparation of LAE.

LAE increased  $\gamma$ -aminobutyric acid (GABA) in the hypothalamus, and in contrary, GABA concentration did not change in serum. Then, GABA-T activity and GAD activity were researched in hypothalamus. As a result, GABA-T activity did not change, and GAD activity increased.

These results suggest that LAE (3428 mg/kg) might have antidepressant-like effects by mechanisms increasing GABA in hypothalamus. Moreover, the GABA increase by LAE might be attributed to the enhancement of GAD activity in hypothalamus.