

ABSTRACT

Matoušová K.: Alkaloids of leaves of species *Liriodendron tulipifera* L. and their biological activity II. Diploma thesis, Charles University, Faculty of Pharmacy in Hradec Králové, Department of Pharmacognosy and Pharmaceutical Botany, Hradec Králové, 2023.

Key words: *Liriodendron tulipifera*, alkaloids, biological activity.

Alkaloids isolated from the leaves of *Liriodendron tulipifera* L. have been described to have a various biological activity. For Alzheimer's disease (AD) treatment is significant primarily the alkaloid's inhibitory activity towards enzymes acetylcholinesterase and butyrylcholinesterase, which contribute to the pathogenesis of AD. Substances affecting these enzymes represent the main accessible approach to AD treatment, therefore plant-based drug screening remains a relevant topic.

An alkaloid extract from the leaves of *Liriodendron tulipifera* was chosen for an isolation and identification of alkaloids due to the positive results of preliminary tests on its cholinesterase inhibitory activity.

The extract was separated by using a flash chromatography. The isolation of alkaloids from selected fractions (no. 81–89 and no. 68–89) was done by the use of preparative thin-layer chromatography. The structural analysis (implemented by NMR and MS) of isolated substances was determined and the optical rotation was measured. Modified form of Ellman's method identified inhibitory activity values for acetylcholinesterase and butyrylcholinesterase, which were then compared with literature.

The proaporphine alkaloid glaziovine and derivative of proaporphine alkaloid stepharine with sesquiterpenoid lanuginolid epoxide were isolated. Isolation of stepharine from *Liriodendron tulipifera* has not been mentioned in current literature. Derivate of stepharine with lanuginolid epoxide might have promising potential of inhibitory activity towards human cholinesterases, while glaziovine does not show any significant potential.