ABSTRACT

Hrušková M.: Alkaloids from the wood of the species *Liriodendron tulipifera* L. and their activity against human cholinesterase. Diploma thesis, Charles University, Faculty of Pharmacy in Hradec Králové, Department of Pharmaceutical Botany, Hradec Králové, 2018.

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

The alkaloids from the wood of the species *Liriodendron tulipifera* L. were isolated and their inhibitory activity against acetylcholinesterase, butyrylcholinesterase and propyl oligopeptidase, which are enzymes involved in the pathophysiology of Alzheimer's disease (AD), was investigated. The search and testing of new substances, which are used in AD treatment, is very relevant, as this disease cannot be casually treated yet.

An alkaloid extract of *Liriodendron tulipifera* L. wood was tested in a preliminary testing for inhibitory activity against human cholinesterase. Because of the promising results, it was chosen for an isolation and identification of possible effective alkaloids.

The extract was carried out by column chromatography with a step gradient elution. A preparative TLC was used to isolate alkaloids. The identification of alkaloids was done by structural analyses (NMR and MS). Optically active substances were measured for their optical rotation. A modified Ellman's method was used for testing of compounds for their inhibitory activity against acetylcholinesterase and butyrylcholinesterase. The inhibitory activity of propyl oligopeptidase was measured spectrophotometrically. The results were compared with the literature.

Three alkaloids were isolated: the oxoaporphine type liriodenine, the aporphine type (+)-norglaucine and the homomorphinane type (-)-pallidine. The last mentioned was isolated from the Tulip tree for the first time. None of the alkaloids showed significant activity against human cholinesterase or propyl oligopeptidase.