

## Abstract

Klíčová A.: Alkaloids from wood of the species *Liriodendron tulipifera* L. and their biological activity. Diploma thesis, Charles University, Faculty of Pharmacy in Hradec Králové, Department: Pharmaceutical Botany, Hradec Králové, 2018.

Supervisor: PharmDr. Anna Hošťálková, Ph.D.

**Key words:** *Liriodendron tulipifera*, secondary metabolites, alkaloids, biological activity

Alzheimer's disease (AD) is the most common type of dementia. It is neurodegenerative disorder. Patients suffer from cognitive disorder in combination with aphasia, apraxia or disorders of executive functions, which leads to exacerbation of working or social skills. Nowadays, there exist no casual treatment for AD, and that is why the intense research is still waging. Currently there are available remedies, which can slow down progress of AD. These drugs includes also natural substances.

An alkaloid extract of *Liriodendron tulipifera* L. wood showed promising inhibition of human cholinesterases in a preliminary testing. These results were the reason why this extract has been chosen for further isolation of single alkaloids and identification of their biological activity.

Isolation was made by column chromatography with step gradient elution. Then was used preparative TLC to isolate single alkaloids. Identification of alkaloids was accomplished by using structural analyses (NMR and MS). Single alkaloids were measured for their optical rotation. Isolated alkaloids were tested for their inhibition against human acetylcholinesterase and butyrylcholinesterase, and for inhibition activity against prolyloligopeptidase (POP), which was measured spectrophotometrically. Results were compared with literature data.

Three alkaloids were isolated: (+)-*N*-methylalurotetanine, (+)-reticuline and (+)-glaucine. (+)-Reticuline was isolated from *L. tulipifera* for the first time and it showed significant inhibition of butyrylcholinesterase, but none of acetylcholinesterase. Neither (+)-glaucine nor (+)-*N*-methylalurotetanin had inhibition activity