ABSTRACT

Baková I.: Isolation of alkaloids of the species *Magnolia soulangeana* Soul.-Bod. and study of their biological activity. Diploma thesis, Charles University, Faculty of Pharmacy in Hradec Králové, Department of Pharmaceutical Botany and Ecology, Hradec Králové, 2017.

Key words: *Magnolia solulangeana*, secondary metabolites, alkaloids, biological activity.

Secondary metabolites of plants are responsible for various biological activities. Alkaloids were described as a potentially suitable for Alzheimer's disease therapy (AD) through their inhibition activities against cholinesterases. Nowadays, these substances are important medicine for AD, therefore a screening of herbal drugs is still a current topic.

An alkaloid extract of *Magnolia* × *soulangeana* flowers was tested in a preliminary testing on anticholinesterase activity. Because of the promising results, it was chosen for an isolation and identification possible effective alkaloids.

The extract was separated by a column chromatography using aluminium oxide and a step gradient elution. Alkaloids were isolated by a repeated preparative thin-layer chromatography. Individual alkaloids were identified by a structural analysis (NMR, MS) and then their optical activity was measured. Substances were tested for an inhibition activity against human cholinesterases (AChE, BChE) using a modified Ellman's method and against prolyl oligopeptidase (POP) using a spectrophotometric method. Measured inhibition concentration values IC_{50} were compared with literature.

Four alkaloids with different structural types were isolated and identified: liriodenine, (+)-*N*-methyllaurotetanine (aporphine type), allocryptopine (protopine type) and (+)-coclaurine (benzylisoquinoline type). The last three mentioned alkaloids were isolated from this species for the first time.

Alkaloids did not show any significant inhibition activity against AChE; weak inhibition was recorded for allocryptopine (IC_{50} = 114.4 ± 10.9 μM). (+)-Coclaurine showed moderate inhibition activity against BChE (IC_{50} = 62.9 ± 6.1 μM). (+)-*N*-Methyllaurotetanine's inhibition activity against POP (IC_{50} = 135.4 ± 23.2 μM) was higher than that of baicalin, but it did not reach the inhibition level of *Z*-pro-prolinal. Isolated substances apart from (+)-coclaurine do not have any potential for future studies.