Abstract

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Title of Thesis: Biological activity of plant metabolites XXXIV. Alkaloids from the herb of *Glaucium flavum* CRANTZ and their impact on human cholinesterases.

Key words: *Glaucium flavum* Crantz, cataline, *N*-methyllaurotetanine, norchelidonine, protopine, AChE, BuChE.

Alzheimer's disease, the most widespread neurodegenerative disease, causes decrease of cognitive functions and dementia. The most effective therapeutic approach is the application of central cholinesterase inhibitors, which alleviate cholinergic deficit in brain and thus improve memory. Currently, intensive investigation of new active compounds including natural substances is carried on.

Within the preliminary testing, alkaloid extract from *Glaucium flavum* Crantz herb showed promising inhibition of human cholinesterases, so it was selected for further examination.

The primary alkaloid extract was acquired from dried flowering herb by extraction with ethanol and subsequent liquid extraction at different pH. This extract was treated by preparative thin layer chromatography. The structure of alkaloids was determined by spectrometric methods (MS, NMR) and their optical rotation was ascertained. Subsequently, each alkaloid was tested *in vitro* for their inhibition of human acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE) by modified Ellman's method.

Four alkaloids were obtained, aporphine alkaloids (+)-cataline and (+)-*N*-methyllaurotetatine, phenanthridine alkaloid (-)-norchelidonine and protopine

alkaloid protopine. (-)-Norchelidonine was evaluated as the most potent inhibitor of AChE (IC_{50} = 35.1 ± 3.9 μM), however, its activity is not significant enough for further investigation. Other isolated alkaloids were considered inactive against both AChE and BuChE (IC_{50} > 100 μM).