ABSTRACT

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Title of thesis: Biologically Active Metabolites of Plants V. Alkaloids from *Eschscholtzia californica* CHAM. and their Biological Activity

The aim of this thesis was to treat the mixture of tertiary isochinoline alkaloids from the species *Eschscholtzia californica* CHAM. (Papaveraceae). Three pure alkaloids were isolated by using common chromatografic methods. The alkaloids were identified by MS and 1-D and 2-D NMR methods. The first isolated alkaloid was identified as tertiary alkaloid protopine, the second as tertiary alkaloid eschscholtzine and the last one as O-methylcaryachine.

All of the alkaloids were tested on ability to inhibit human erythrocytic acetylcholinesterase (HuAChE) and serum butyrylcholinesterase (HuBuChE). The inhibition activities for protopine were determined IC_{50}= 423 ± 10,5 μM (HuAChE) and IC_{50}= 333 ± 3,3 μM (HuBuChE). The values of inhibition for alkaloid eschscholtzine were determined IC_{50}= 519 ± 5,8 μM (HuAChE) and IC_{50}>1 mM (HuBuChE). And for O-methylcaryachine the values of inhibition were determined IC_{50}= 498 ± 7,1μM (HuAChE) and IC_{50}>1 mM (HuBuChE). The values of IC_{50} for standards were determined IC_{50}= 6,9 ± 0,3 μM (HuAChE) and IC_{50}= 156 ± 6,9 μM (HuBuChE) for galanthamine and IC_{50} =0,25 ± 0,01 μM (HuAChE) and IC_{50}>1 mM (HuBuChE) for huperzine A. According to their IC_{50} values isolated alkaloids showed only weak inhibition capacity in comparison with the used standards.

It is known, that oxidative stress plays a very important role in the pathogenesis of AD. For this reason we also investigated the antioxidant activity of the isolated compounds using the DPPH test; unfortunately all tested alkaloids were inactive EC_{50}>1 mM.

Key words: *Eschscholtzia californica* CHAM., isochinoline alkaloids, acetylcholinesterase, butyrylcholinesterase, Alzheimer‘s disease.