ABSTRACT

Matějka, J. Biologically active metabolites of the plants. 8. Alkaloids of *Macleaya cordata* and their biological activity. Charles University in Prague, Faculty of Pharmacy in Hradec Králové, Department of Pharmaceutical Botany and Ecology. Hradec Králové, 2011. Diploma thesis. 69 p.

The aim of this work was to chromatografically analyze the total alkaloid extract of the plant *Macleaya cordata*, to separate at least one alkaloid in pure form and to determine its inhibition activity towards acetylcholinesterase and butyrylcholinesterase and also its antioxidant activities.

Using the column chromatography method, we obtained three alkaloids from the total extract. The first substance was named JM1 and on the basis of its MS and NMR analyses it was identified as dihydrosanguinarine. The other two substances were in a similar way identified as protopine and allocryptopine.

In all separated substances we measured their inhibition activity towards human erythrocyte acetylcholinesterase and human plasma butyrylcholinesterase. We obtained following IC_{50} values: dihydrosanguinarine: IC_{50} (HuAChE) > 1000 μM, IC_{50} (HuBuChE) > 1000 μM; protopine: IC_{50} (HuAChE) = 345,4 ± 18,1 μM, IC_{50} (HuBuChE) = 239,6 ± 10,2 μM; allocryptopine: IC_{50} (HuAChE) = 114,4 ± 3,2 μM, IC_{50} (HuBuChE) = 655,7 ± 12,0 μM. All the separated alkaloids showed lower inhibition activity towards the human cholinesterase than the standard galantamine. We can thus conclude that none of the separated substances is promising for Alzheimer's disease therapy.

Next, we studied their antioxidant activity. Dihydrosanguinarine showed a weak antioxidant activity (EC_{50} = 528 ± 20,5 μM), while the EC_{50} values of both remaining substances exceeded 1000 μM and therefore they may be said to be antioxidatively inactive.

Key words: acetylcholinesterase, Alzheimer's disease, antioxidant activity, benzophenanthridine alkaloids, butyrylcholinesterase, *Macleaya cordata.*