ABSTRACT

Malý, L.: Study of biological activity of alkaloids isolated from Fumaria officinalis L. (Fumariaceae) II. Diploma Thesis, Charles University in Prague, Faculty of Pharmacy in Hradec Králové, Department of Pharmaceutical Botany and Ecology, Hradec Králové 2014, 49 pp.

Obtained diethylether extract of *Fumaria officinalis* L. was separated to fractions in column chromatography with petrol, chloroform and ethanol. Preparative TLC and crystalisation led to isolation of five alkaloids from fraction. Alkaloids were identified by GC-MS and NMR specters, optical rotation and melting point as protopine, cryptopine, (–)-fumaricine, (+)-fumariline and (+)-parfumidine. Isolated alkaloids were tested for their inhibition activity towards acetyl- and butyrylcholinesterase and towards prolyloligopeptidase. Activities were compared with standards. Natural inhibitor galanthamine showed $IC_{50\ AChE}$ 1.710 ± 0.065 μM, $IC_{50\ BuChE}$ 42.30 ± 1.30 μM. Best inhibition activity showed protopine ($IC_{50\ AChE}$ 345.4 ± 24 μM, $IC_{50\ BuChE}$ 239.6 ± 22.3 μM) and cryptopine ($IC_{50\ AChE}$ 477.71 ± 47.33 μM, $IC_{50\ BuChE}$ 270.82 ± 39.12 μM). The highest prolyloligopeptidase inhibition activity showed (+)-parfumidine with $IC_{50\ POP}$ 99.2 μM, which was more active than used natural inhibitor baicaline ($IC_{50\ POP}$ 605.9 ± 0.021 μM). Synthetic POP inhibitor *Z*-Pro-prolinal has $IC_{50\ POP}$ 3.269 ± 0.02 nM.

Fumaria officinalis L., Fumariaceae, isoquinoline alkaloids, isolation, acetylcholinesterase, butyrylcholinesterase, prolyloligopeptidase, Alzheimer's disease, *in vitro* assay.