

Abstract

Čakurdová, M.: Alkaloids of *Papaver rhoeas* L. (Papaveraceae) and their biological activity related to Alzheimer's disease II. Diploma thesis, Charles University in Prague, Faculty of Pharmacy in Hradec Králové, Department of Pharmaceutical Botany and Ecology, Hradec Králové, 2017.

The aim of this work was focused on isolation of alkaloids from the fraction 1 (joined fractions 20-27), which was obtained from the summary alkaloid extract of *Papaver rhoeas* L. (Papaveraceae). The alkaloids were identified by structural analysis NMR, GC-MS, optical activity and melting point. Two alkaloids were identified as (–)-stylophine and (+)-rhoeadine.

Isolated substances were tested on ability to inhibit the enzymes acetylcholinesterase, butyrylcholinesterase and prolyl oligopeptidase. Obtained data were expressed as IC₅₀ values: (–)-stylophine (IC₅₀ AChE = 522 ± 67 μM, IC₅₀ BuChE = >1000 μM, IC₅₀ POP = >790 μM); (+)-rhoeadine (IC₅₀ AChE = 915 ± 64 μM, IC₅₀ BuChE = >1000 μM, IC₅₀ POP = >790 μM). None of the isolated substances showed so potent cholinesterase inhibitory activity as the alkaloids galanthamine (IC₅₀ AChE = 1.71 ± 0.065 μM, IC₅₀ BuChE = 42.30 ± 1.30 μM) and huperzine A (IC₅₀ AChE = 0.033 ± 0.001 μM, IC₅₀ BuChE = >1000 μM) or rivastigmine (IC₅₀ AChE = 0.037 ± 0.001 μM, IC₅₀ BuChE = 3.3 ± 0.3 nM). Similarly, none of the isolated substances demonstrated a promising prolyl oligopeptidase inhibitory activity. IC₅₀ values of both alkaloids were >790 μM.

Keywords: Alzheimer's disease, *Papaver rhoeas* L., acetylcholinesterase, butyrylcholinesterase, prolyl oligopeptidase