ABSTRACT

Mišáková K: Alkaloids of the Amaryllidaceae family and their biological activity 1. Diploma thesis, Charles University in Prague, Faculty of Pharmacy in Hradec Králové, Department of Pharmaceutical Botany and Ecology, Hradec Králové, 2014, 63 p.

The aim of the diploma thesis was a preparation of alkaloidal extract from *Nerine Bowdenii* to izolation of 2 pure alkaloids by column and thin layer chromatography. Subsequently these two alkaloids were subjected to structural MS and NMR analysis and tested for biological activity against human cholinesterases (HuAChE and HuBuChE) and for antioxidant and cytotoxic activity. Isolated substances were identified as ambelline and undulatine alkaloids, which have been already described previously in this plant. In the test for determining cholinesterase inhibitory activity of ambelline and undulatine the following values were measured; for ambelline: $IC_{50,\ HuAChE}$ = 169 ± 7 μM a $IC_{50,\ HuBuChE}$ = 985 ± 25 μM, for undulatine: $IC_{50,\ HuAChE}$ = 23,52 ± 1,19 μM a $IC_{50,\ HuBuChE}$ > 1000 μM. Galanthamin ($IC_{50,\ HuAChE}$ = 1,71 ± 0,007 μM, $IC_{50,\ HuBuChE}$ = 42,30± 1,30 μM), huperzin A ($IC_{50,\ HuAChE}$ = 0,033 ± 0,001 μM, $IC_{50,\ HuBuChE}$ > 1000 μM) and eserin ($IC_{50,\ HuAChE}$ = 0,063 ± 0,001 μM, $IC_{50,\ HuBuChE}$ = 0,130 ± 0,004 μM) were used like a positive controls.

In the test for determining antioxidant activity of ambelline and undulatine the following values for ambelline and undulatine were measured; EC_{50} >1000 μM. Quercetine (EC_{50} =11,11 ± 0,25) and trolox (EC_{50} =20,45 ± 1,31) were used like a positive controls.

In cooperation with the Department of Biological and Biochemical Sciences, Faculty of Chemical Technology, University of Pardubice, cytotoxic activity of ambelline was tested; IC_{50}> 50 μM. Cis platinum (IC_{50} = 27 μM) was used as standard.

Keywords: *Nerine bowdenii*, *Amaryllidaceae*, Alzheimer disease, acetylcholinesterase, butyrylcholinesterase, ambelline, undulatine