Abstract

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Title of thesis: Screening of biological activity of various species of the genus *Narcissus sp.* I

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Alkaloids from family Amaryllidaceae (AA) nowadays belong to the most important and also the most examined alkaloids. This is because of their structural diversity and a broad spectrum of biological effects. The main aim of my diploma was to prepare whole bulb extracts from seven different cultivated varieties of genus *Narcissus* and to select those with the highest potential to inhibit enzyme acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE). Inhibition of these enzymes is very important in the treatment of Alzheimer’s disease (AD). Summary extracts were obtained from these cultivars: *N.* cv, Apotheose (AL – 718), *N.* cv. Chromacolor (AL – 722), *N.* cv. Hungarian Rhapsody (AL – 729), *N.* cv. Mon Cheri (AL – 736), *N.* cv. Peach Cobbler (AL – 738), *N.* cv. Pink Pride (AL – 740) a *N.* cv. Red Devon (AL – 742).

The isolated extracts were subsequently analyzed by GC-MS. The following alkaloids were found in the majority of extracts: galanthamine, galanthine, haemanthamine, lycorine, lycoramine, crinine, narcissidine and hippeastrine. Each extract was also examined for its inhibitory activity towards AChE and BuChE by using recombinant enzymes. The results were compared with activity of purified reference substances galanthamine, huperzine A and eserine.

The highest inhibitory activity towards AChE showed the extracts from these cultivars: Apotheose (84,24 %), Chromacolor (77,95 %), Red Devon (81,46 %) a Hungarian Rhapsody (79,62 %). Their high activity was probably related to the content of galanthamin that is known due to its significant inhibitory activity towards AChE and it is therefore used in treatments of AD. To better characterize the activity of promising extracts, their IC_{50} was further determined. The most promising extracts for future use were cultivars Apotheose (IC_{50} =3,15 ± 0,29 μg/ml) and Red Devon (IC_{50} = 5,39 ± 0,36 μg/ml). Measured inhibitory activity of all whole bulb extracts towards BuChE was insignificant. Based on the obtained results, cultivars of genus *Narcissus* remain an interesting source of Amaryllidaceae alkaloids for future.