

## Abstract

**Charles University, Faculty of Pharmacy in Hradec Králové**

**Department:** Department of Pharmaceutical Botany (16-16130)

**Author:** Tkáčová Beáta

**Supervisor:** PharmDr. Kateřina Breiterová, Ph.D.

**Title of thesis:** Alkaloids of *Narcissus* species cultivars and their biological activity I.

**Key words:** Narcissus, alkaloids, biological activity, Alzheimer's disease.

The main aim of this diploma thesis was to obtain summary alkaloid extracts from bulbs of five species cultivars (*Narcissus* cv. Acropolis, Delta, White Marvel, Kedron, Scarlet Gem) and one variety (*Narcissus albus* var. *plenus odoratus*), labeled as AL-450, AL-457, AL-460, AL-463, AL-467 and AL-508, from which samples were subsequently prepared for GC-MS analysis and screening of biological activities (cholinesterase inhibitory activity and cytotoxicity).

Totally, 18 alkaloids were identified by GC-MS analysis, comparing their mass spectra. Identified alkaloids include 3-*O*-demethylmaritidine, 11,12-dehydroanhydrolycorine, assoanine, dehydroassoanine, galanthamine, galanthine, haemanthamine, hippeastrine, incartine, lycoramine, lycorine, narwedine, norpluvine, pancracine, pluvine, pseudolycorine and tazettine.

Samples of cultivars AL-457, AL-460, AL-463 and AL-508, showed relatively promising *hAChE* inhibitory activity in screening assay ( $c = 50 \mu\text{g/ml}$ ), presumably due to the higher content of galanthamine. The  $\text{IC}_{50}$  determination was also performed in these extracts. The results were compared with the values of standard substances galanthamine, Huperzine A and eserine. Based on the comparison, the cultivar extract AL-463 with  $\text{IC}_{50}(\text{hAChE}) = 2,53 \pm 0,61 \mu\text{g/ml}$ , was evaluated as the most effective. By performing cytotoxic activity screening ( $c = 50 \mu\text{g/ml}$ ), all tested extracts showed very promising cytotoxic activity against the panel of 10 cell lines used. This high activity may be given due to the content of known cytotoxic alkaloids, such as haemanthamine, lycorine and pseudolycorine.