Abstract

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Title of thesis: Cytotoxic activity of selected *Narcissus* cultivars *in vitro*.

Key words: *Narcissus*, Amaryllidaceae alkaloids, cytotoxicity, HepG2

The main focus of this diploma thesis is the screening of summary alkaloidal extracts of selected cultivars of the genus *Narcissus* for their cytotoxic activity against HepG2 liver carcinoma cell line. In the second phase, the cytotoxic activity of the majorly represented Amaryllidaceae alkaloids (AmA) was screened, followed by an IC_{50} value determination. All studied alkaloidal extracts underwent also GC-MS and GC-FID qualitative and quantitative analysis to identify as many alkaloids as possible.

A total of 23 alkaloids, namely 11,12-didehydroanhydrolycorine, 1-*O*-acetyl-10-norpluviine, 9-*O*-methylpseudolycorine, anhydropseudolycorine, assoanine, dehydroassoanine, dihydrolycorine, *epi*-norgalanthamine, galanthamine, galanthine, haemanthamine, hippeastrine, incartine, caranine, lycoramine, lycoraminone, lycorine, narwedine, norpluviine, pluviine, pseudolycorine, sanguinine, tazettine and several unspecified alkaloids of the homolycorine structural type were identified using GC-MS analysis by comparing the mass spectra obtained from six of examined cultivars. All studied extracts were further subjected to GC-FID analysis to quantify the majorly represented AmA – galanthamine, haemanthamine, lycorine and tazettine.

The highest inhibitory activity against HepG2 cell line was exhibited by the summary alkaloidal extract AL-456 from *Narcissus* cv Unique. Considering the major representation of the lycorine structural type AmA (82 % by GC-MS) and the abundant representation of haemanthamine (13 % by GC-MS), this activity was expected. In the determination of cytotoxic activity of individual AmA, lycorine showed the highest activity ($IC_{50} = 13.8 \pm 2.7$ μM). On the contrary, almost no cytotoxic activity was found for galanthamine and tazettine, which is consistent with the fact that galanthamine has been used in clinical practice for the treatment of Alzheimer-type dementia.