Abstract

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Title of diploma thesis: Alkaloids of *Narcissus pseudonarcissus* cv. Carlton (Amaryllidaceae): isolation, structural identification, biological activity II

Key words: *Narcissus*, Amaryllidaceae, alkaloids, isolation, biological activity

In this thesis, a fraction of alkaloid extract obtained from *Narcissus pseudonarcissus* cv. Carlton was processed with the aim of isolating at least two alkaloids in a pure form. Using methods of flash chromatography and preparative TLC two alkaloid compounds were successfully isolated. These compounds were subsequently identified by GC-MS, HPLC-MS, and NMR analyses as alkaloids of the homolycorine structural type — lycorenine, and of the haemanthamine structural type — haemanthamine.

In biological activity assays, the isolated alkaloids lycorenine and haemanthamine were tested for their inhibitory activity against enzymes associated with AD, specifically AChE, BuChE, POP, and GSK-3β. For comparison of inhibitory activity against AChE and BuChE, galantamine (IC_{50} 1.7 ± 0.1 μM) and huperzine A (IC_{50} 0.033 ± 0.001 μM) were used as standards. Z-Pro-prolinal (IC_{50} 2.75×10^{-3} μM) and berberine (IC_{50} 142 ± 21 μM) were used as standards for comparison of inhibitory activity against POP. For GSK-3β, the standard compound Sb-415286 (% = 70 nM) was used. Neither of the isolated alkaloids demonstrated significant inhibitory activity against the enzymes associated with AD.

The isolated alkaloids were screened against nine human cancer cell lines, specifically Jurkat, MOLT-4, A549, HT-29, PANC-1, A2780, HeLa, MCF-7, and SAOS-2, with the control healthy cell line MRC-5. Haemanthamine exhibited notable results, particularly against the MOLT-4, HT-29, Jurkat, HeLa, and MCF-7 cell lines. In contrast, lycorenine did not show any cytotoxic activity.