ABSTRACT

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Title of diploma thesis: Alkaloids of genus *Narcissus*: isolation, structural identification, biological activity

Key words: *Narcissus*, alkaloids, biological activity, Alzheimer´s disease, cytotoxic activity

The aim of the diploma thesis was an isolation of alkaloids with a focus on minor fractions. These fractions were obtained from the summary alkaloid extract of *Narcissus pseudonarcissus* cv. Carlton. The method of preparative TLC was used for the isolation of alkaloids. Three substances of alkaloid origin marked as Fj 3-4/kr, F 7/2-1, F 7/2-3 were isolated from the assigned fractions. These substances were identified as alkaloids of homolycorine type lycorenine, homolycorine and hippeastrine by using GC-MS, NMR and optical rotation. The results were also compared with data in the literature.

These three alkaloids were tested for their inhibitory activity against AChE, BuChE, POP and GSK-3β. The inhibitory activity against AChE and BuChE was compared with the reference substances galanthamine (IC_{50} AChE = 1,71 ± 0,07 μM, IC_{50} BuChE = 42,3 ± 1,3 μM) and huperzine A (IC_{50} AChE = 0,033 ± 0,001 μM, IC_{50} BuChE> 1000 μM). The inhibitory activity against POP was compared to Z-Pro-prolinal (IC_{50} POP = 3,27 ± 0,02 mM) and berberine (IC_{50} POP = 0,14 ± 0,02 mM). The most active one of the isolated alkaloids was homolycorine. Inhibitory activity of homolycorine against AChE (IC_{50} = 63,7 ± 4,3 μM), BuChE (IC_{50} = 151 ± 19 μM) and POP (40,6 ± 1,3 mM). Moderate inhibitory activity against GSK-3β was observed in alkaloids homolycorine (% inhibition = 54 ± 1) and lycorenine (% inhibition = 48 ± 3).

Isolated alkaloids were tested for their cytotoxic activity using nine cancer cell lines including Jurkat, MOLT-4, A549, HT-29, PANC-1, A2780, HeLa, MCF-7, SAOS-2. The results did not indicate any significant cytotoxic activity.