

# Abstract

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

**Key words:** *Narcissus* sp., bulbs, alkaloidal extracts, GC/MS analysis, biological activity, acetylcholinesterase, butyrylcholinesterase

Alzheimer's disease is a severe disease that represents the most common cause of dementia and death. The disease is characterized by a decrease of nerve cells and brain tissue. For patients with Alzheimer's disease, memory lapses are typical, at the beginning of the disease states of anxiety and depression occur. The main cause is the formation and deposition of  $\beta$ -amyloid and deficit of the neurotransmitter acetylcholine. Unfortunately, we do not know how to cure the Alzheimer's disease, but we can significantly slow it down by prolonging the mild stages of the disease. Treatment is mainly directed to AChE inhibitors to eliminate ACh deficiency.

The main goal of this diploma thesis was to obtain summary alkaloid extracts from bulbs of seven cultivars of the genus *Narcissus* sp., which could have been a potential source of substances for the treatment of Alzheimer's disease. Cultivars were specifically *Narcissus* cv. Banana Splash, *Narcissus* cv. Gentle Giant, *Narcissus* cv. Las Vegas, *Narcissus* cv. Lemon Beauty, *Narcissus* cv. Mary G. Lirette, *Narcissus* cv. Orange Progress and *Narcissus* cv. Pink Wonder. The occurrence of alkaloids in prepared extracts was subsequently evaluated by using GC-MS analysis. Then the inhibitory activity against human cholinesterases was determined for all extracts and the most interesting results were observed in cultivars AL-731 and AL-732 against AChE and in cultivar AL-741 against BuChE. Based on GC/MS analysis, the cultivar AL-735 was selected for the isolation of pure substances and especially alkaloid galanthamine, which has the potential for the preparation of semi-synthetic derivatives. From this extract managed to isolate 4 pure alkaloids, which were identified as demethyllycoramine, epi-nor-galanthamine, galanthine and acetylpluvine based on NMR analysis.