

ABSTRACT

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Title of diploma thesis: Amaryllidaceae alkaloids as model structures for the development of new potential drugs

The family Amaryllidaceae includes a large number of genus of flowering plants as *Hippeastrum*, *Narcissus* or *Zephyranthes*. All of them contain specific Amaryllidaceae alkaloids, which are characteristic of this family due to their chemical structures. The discovery and study of these alkaloids has attracted the attention of many scientists due to the diverse biological activity of these compounds, such as cytotoxic, anticholinesterases, antibacterial and antiviral effects.

Plants of the genus *Hippeastrum* have been used in traditional medicine to treat tumors and inflammatory disorders. This use can be explained by the alkaloids, which it contains. It is mainly lycorine, haemanthamine and pancristatine. These compounds have an antitumor effect. The species *Hippeastrum* cv. Ferrari is further rich in the alkaloid vittatine. In some research, the simple semisynthetic derivatives of haemanthamine displayed promising inhibitory activities against cholinesterases. For this reason, vittatine was chosen as next lead-structure, for preparation of semisyntetic derivatives.

Seven new derivatives were prepared by esterification of alkaloid vittatine and two was created in the form of ethers. All of them were identified by NMR and HRMS analysis. Subsequently, the ability of the derivatives to inhibit human acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE) was studied. Most of the prepared derivatives showed good inhibitory potential against BuChE. The best of them shown activity with IC₅₀ values 1.39 ± 0,08 μM.

Key words: Amaryllidaceae, genus *Hippeastrum*, semisynthetic derivatives, vittatine