

# ABSTRACT

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Title: Alkaloids of family Amaryllidaceae: genus *Hippeastrum*

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The aim of this diploma thesis was to unify current findings about alkaloids isolated from selected plants of the *Hippeastrum* genus in the Amaryllidaceae family. The phytochemical characteristics of the examined species was introduced, and a group of alkaloids which were isolated from these plant species was composed. Also, the biological activity was evaluated.

Up to date, at least 13 plant species of the *Hippeastrum* genus were examined from the phytochemical perspective. Out of these species examined, 56 different alkaloids with defined structure were isolated. The isolated alkaloids are divided into several groups based on their structure. Namely, these are lycorine, homolycorine, crinine, galanthamine, narciclasine, tazettine, haemanthamine and montanine structural types. Also, alkaloids which differed structurally from these basic types were found in several plants studied. In the substances gained, the antiproliferative activity, inhibitory activity against the acetylcholinesterase and butyrylcholinesterase enzymes, antimalaric, antiviral activity and several others were observed. The structure-activity dependence of the substances studied was found. With regard to cytotoxicity, the alkaloids of the lycorine structural type are probably the most efficient. The alkaloids of the galanthamine structural type proved the highest inhibitory activity against the acetylcholinesterase. The most significant antimalaric activity was observed in the alkaloids of the lycorine and haemanthamine structural type. In therapy, only galanthamine was found to be effective, so far. This was thanks to its ability to markedly increase the cholinergic neurotransmission which is used for the Alzheimer's disease treatment.