

ABSTRACT

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Title of Diploma thesis: Preparation of lycorine derivatives and their biological activity

The plants of the Amaryllidaceae family are one of the most important sources of biologically active alkaloids. Lycorine, a phenanthridine alkaloid, isolated from various species of the Amaryllidaceae plant family, has attracted considerable attention due to its promising biological activities. Specifically, its anticancer properties have been evaluated *in vitro* and *in vivo* in various preclinical models of human cancers. Further biological effects manifested by lycorine are: antiviral, antibacterial, antifungal, antiplasmodial, anti-oxidant, anti-inflammatory and insect antifeedant effects, as well as ascorbic acid biosynthesis and RNA inhibitory activity. So far, lycorine was used for preparation of many derivatives by modification of different functional groups in its molecule, and screened for a various biological activities such as anticancer activity, inhibition of cholinesterases, antiplasmodial, antitrypanosomal, antiviral and anti-*Trichomonas vaginalis* activity. The present work deals with the preparation of lycorine derivatives and their biological activity connected to the treatment of Alzheimer's disease and anticancer activity. Fifteen ester lycorine derivatives were prepared. The chemical structures were elucidated by MS, NMR experiments and optical rotation. Some of the prepared compounds were screened for their cytotoxic activity on a panel of selected cancerous and noncancerous cell lines. Unfortunately, none of the tested substances has shown required toxicity. In the AchE/BuchE inhibition potential study, interesting BuchE inhibitory activity has been demonstrated only by 1,2-di-*O*,*O'*-benzoylycorine ($IC_{50} = 29.65 \pm 6.81 \mu M$).

Key words: alkaloid, lycorine, derivatives, biological activity