

ABSTRACT

Brtníková, T., Isolation of alkaloids of the species *Geissospermum vellosii* Allemão and study of their biological activity IX., Diploma thesis, Charles University, Faculty of Pharmacy in Hradec Králové, Department of pharmacognosy and pharmaceutical botany, Hradec Králové 2024.

Key words: *Geissospermum vellosii*, bark, alkaloidal extracts, isolation of alkaloids, GC/MS analysis, biological activity, enzyme activity

In this thesis, the alkaloids from the tree *Geissospermum vellosii* Allemão, native to South America, were investigated. Its bark is traditionally used against pain, fever, malaria and digestive problems. Later, alkaloids isolated from the bark have shown interesting effects, including anticholinesterase, anticancer, anti-inflammatory, antinociceptive, antiplasmodial, antileishmanial, and antiviral effects. The aim of this work was to isolate alkaloids from the bark of the tree and determine their biological activity against cholinesterases. The inhibitory activity of alkaloids against acetylcholinesterase and butyrylcholinesterase is a precondition for the effect in the therapy of Alzheimer's disease. In earlier studies, this activity was already confirmed for some alkaloids, originating from the bark of this tree [1] [2]. Thanks to this, alkaloids with these effects can be used for the development of new drugs for Alzheimer's disease.

We worked with the fraction GV-6, from which alkaloids were isolated using chromatographic methods. TLC, preparative TLC, flash chromatography, preparative HPLC and GC-MS were used.

During the work, we did not achieve a final pure alkaloid that could be analyzed for its structure using NMR and its biological activity. The reason for not isolating a pure alkaloid was its degradation.

Citovaná literatura

- [1] Lima, J. A., R. Costa, T. W., Da Fonseca, A. C. C., Do Amaral, R. F., Nascimento, M. D. D. S. B., Santos-Filho, O. A., ... Tinoco, L. W. (2020). Geissoschizoline, a promising alkaloid for Alzheimer's disease: Inhibition of human cholinesterases, anti-inflammatory effects and molecular docking. *Bioorganic Chemistry*, 104. <https://doi.org/10.1016/j.bioorg.2020.104215>
- [2] Huang, L.-K., Kuan, Y.-C., Lin, H.-W., & Hu, C.-J. (2023). Clinical trials of new drugs for Alzheimer disease: A 2020–2023 update. *Journal of Biomedical Science*, 30(1), 83. <https://doi.org/10.1186/s12929-023-00976-6>