

Abstract

The presented doctoral dissertation is based on a series of publications on the optimization of extraction and isolation processes of the secondary metabolites derived from plants of the Zingiberaceae family and the determination of their pharmacological activities. The research material used in the studied were rhizomes of ginger *Zingiber officinale* and turmeric *Curcuma longa* in the form of raw and processed material. In the carried out research, the problem of the identification of pharmacologically valuable secondary metabolites directly in the total extract was undertaken. Planar chromatography with biodetection was used to realize this undertaken task. TLC bioautography that was used by the author as a screening method was aimed at quick determination of potent secondary metabolites and aimed at a significant reduction in the time and costs of analyzes. Bioautographic studies focused on the compounds that may be used in the treatment of neurodegenerative disorders and metabolites with antibacterial properties. Despite a high popularity of the investigated spices, the majority of the described in the scientific literature tests were conducted on the total extracts mainly. Still the tests on single components are missing. The assessment of the impact of individual components on the total pharmacological effect of both plants is an important element of novelty of these publications.

The above described studies have been supplemented with an assessment of the antidepressant and anti-tumor potential of the secondary metabolites from the obtained extracts isolated by column chromatography and countercurrent chromatography. Particular attention was focused on the use of centrifugal partition chromatography (CPC, also called hydrostatic countercurrent chromatography) in the process of isolation of individual phenolic compounds from turmeric rhizomes for anti-tumor activity studies.

The below presented publications show the conditions of extraction and analysis of two groups of natural products: polyphenols and terpenes that are characterized by different physicochemical properties. Large differences between the two groups in terms of polarity encouraged the use of different extraction techniques and two instrumental methods to study the quantitative and qualitative composition of extracts: liquid chromatography coupled with mass spectrometry and gas chromatography coupled with mass spectrometry.

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