DOI: 10.46991/JISEES.2025.SI1.072

Ultrasonic Extraction and Bioactivity Assessment of Phenolic Compounds in Transformed Wormwood Roots

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ABSTRACT

To assess the composition of phenolic compounds in extracts from the transformed roots of A. annua and A. vulgaris obtained via ultrasonic treatment, and to evaluate their anti-inflammatory activity in experimental models. Materials and methods: the total phenolic content was determined using the Folin-Ciocalteu method. The extracted substances were measured according to the State Pharmacopoeia of the Republic of Belarus. High-performance liquid chromatography was conducted using an Agilent 1200 chromatograph equipped with a diode-array detector and an Agilent 6410 mass selective detector. Anti-inflammatory activity was studied in male Wistar rats. Lipopolysaccharide from Escherichia coli was used to induce a febrile response. Ultrasonic extraction of the transformed roots of A. annua and A. vulgaris was effective in isolating phenolic compounds. In the obtained extracts, eight compounds were identified, mainly caffeoylquinic acids and caffeic acid derivatives. The study of the effects of the extracts on deep body temperature in rats under both normal conditions and systemic inflammation led to the conclusion that the biologically active substances of wormwood had a modulating effect on thermoregulatory responses. Intragastric administration of an extract from the transformed roots of A. annua 40 minutes prior to systemic administration of lipopolysaccharide from Escherichia coli altered the febrile response pattern, specifically reducing the severity of phase II fever. Ultrasonic extraction effectively isolated phenolic compounds from transformed roots of A. annua and A. vulgaris, with caffeoylquinic acids and caffeic acid derivatives being the main components. The extracts, especially from A. annua, showed a modulating effect on thermoregulation during systemic inflammation indicating their potential anti-inflammatory activity.

Keywords: ultrasonic extraction, phenolic compounds, transformed roots, *Artemisia* L., anti-inflammatory activity

Acknowledgement: The authors are grateful to Dr. N.A. Matveeva for providing the culture of transformed roots, and to Dr. A.G. Shutova for her support and contribution to the research.

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