

ANTIMICROBIAL ACTIVITY EVALUATION AND PHYTOCHEMICAL SCREENING OF NATIVE PLANT AEGOPODIUM PODAGRARIA L.

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Aegopodium podagraria L. is a perennial herb belonging to the *Apiaceae* family. It grows in extensive leafy carpets and is commonly found in forests. This plant is invasive, spreads easily and outcompetes many plant species, which is why it is often considered disadvantageous [1]. However, scientific literature describes its antioxidant, anti-inflammatory and even anticancer properties [2]. It is also a source of various antibacterial and antifungal compounds. Despite the plant's biologically active compounds, its pharmacological potential remains largely overlooked, even though it is abundant in the environment and easy to obtain. Only recently researchers have begun to recognize its potential, highlighting the need to further study the phytochemicals found in *A. podagraria* and their associated biological activity.

The aim of the study is to evaluate the concentration of phenolic compounds and flavonoids in the extracts of *Aegopodium podagraria* and determine its radical scavenging activity and antimicrobial activity against four strains of bacteria: *E. coli* and *S. typhimurium* (Gram-negative) and *M. luteus* and *B. cereus* (Gram-positive) and two fungal strains: *Alternaria* spp. and *Penicillium* spp. The plant material used in the study was collected at 54.8208758°N, 24.0492927°E and air dried. Extraction was performed by standard maceration method, using two different extraction solvents – water and 75 % methanol (raw material to solvent ratio 1:40). Extraction was performed in accordance with the European Pharmacopoeia standard No. 0765. Quantitative determination of phytocompounds was conducted by spectrophotometric methods. Antimicrobial activity assay was carried out by following European Pharmacopoeia standard No. 20702.

The highest amounts of total phenols and flavonoids were observed in methanolic extract of the flowers (100,96 mg/g and 50,04 mg/g respectively). The highest radical scavenging activity was also observed in flower methanolic extracts. A positive correlation between the radical scavenging activity and phenolic compounds was established. In all cases, extraction with methanol significantly ($p \leq 0,05$) increased the yield of phenolic compounds and radical scavenging activity. Antimicrobial activity assay results showed that methanolic extracts of *A. podagraria* inhibited the growth of bacteria and fungi. The most sensitive microorganisms to their effects were *M. luteus* and *S. typhimurium*, as well as *Alternaria* spp. and *Penicillium* spp. fungi. However, the established results show that the sensitivity of microorganisms depends on the type of extract used. Established findings revealed that the native plant *Aegopodium podagraria* is a source of polyphenols, antioxidants and antimicrobial compounds, that could be useful in various industries.

[1] Jakubczyk, K., Janda, K., Styburski, D., & Łukomska, A. (2020). Goutweed (*Aegopodium podagraria* L.) – botanical characteristics and prohealthy properties*. *Postępy Higieny i Medycyny Doświadczalnej*, 74, 28–35. <https://doi.org/10.5604/01.3001.0013.8551>

[2] Sarıaltın, S. Y., Polat, D. Ç., & Yalçın, C. Ö. (2023). Cytotoxic and antioxidant activities and phytochemical analysis of *Smilax excelsa* L. and *Aegopodium podagraria* L. *Food Bioscience*, 52, 102359. <https://doi.org/10.1016/j.fbio.2023.102359>