

ALLELOPATHIC ACTIVITY OF THREE ERIGERON SPECIES: A COMPARATIVE STUDY

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Various invasive alien species are considered among the major threats to biodiversity and ecosystems, along with factors such as habitat degradation, pollution, and climate change. As a result, the impact of invasive alien species on native flora has received increasing attention in ecological research [1]. The successful spread of non-native plants is often associated with their allelopathic properties. Allelopathy is defined as a chemical interaction between plants that can have either positive or negative effects through the production and release of bioactive compounds. Allelochemicals can be obtained from various plant parts, including leaves, stems, flowers, buds, fruits, and roots. Plant secondary metabolites may affect seed germination and inhibit hypocotyl and radicle formation, as well as early plant growth processes such as membrane conductivity, chlorophyll production, photosynthetic activity [2].

The experiment aimed to evaluate and compare the allelopathic activity of aqueous extracts of three *Erigeron* species: *E. acris*, *E. annuus* and *E. strigosus*. All investigated species belong to the *Asteraceae* family. *E. acris* is an annual, biennial, or rarely perennial plant native to Lithuania. In contrast, *E. annuus* and *E. strigosus* are annual to biennial species native to North America. In 2012, *E. annuus* was listed as an invasive alien species in our country among other 17 plant species. *E. strigosus* is currently considered an alien species in Lithuania. Predictions indicate that it could become naturalized and spread in a similar way to *E. annuus* [3-4].

In this study, the allelopathic properties of *Erigeron* spp. were tested under laboratory conditions using a method based on aqueous extracts from plant roots, leaves, and inflorescences. Different extract concentrations (0.1, 0.5 and 1.0 M, as well as a control) were tested on five model species: lettuce (*Lactuca sativa* L.), garden pepper cress (*Lepidium sativum* L.), white clover (*Trifolium repens* L.), timothy grass (*Phleum pratense* L.) and cornflower (*Centaurea cyanus* L.) seeds. Germination and early seedling growth were evaluated.

The results showed that aqueous extracts of all three *Erigeron* species significantly affected seed germination and early seedling growth of the tested objects. However, allelopathic effects varied depending on plant morphological part and extract concentration, with inhibitory effects increasing at higher concentrations.

The allelopathic effects of aqueous extracts of *Erigeron* species on other plants have not been extensively investigated previously, particularly in comparative studies involving both native and alien species. Therefore, this study highlights the importance of research on allelopathic mechanisms and their role in plant interactions, especially in understanding the spread and management of invasive species.

Keywords: Allelopathy; plants; invasive alien species; *Erigeron*; aqueous extracts

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