

COMPARISON OF THE ALLELOPATHIC ACTIVITY OF THE NATIVE ERIGERON ACRIS AND THE INVASIVE ERIGERON ANNUUS

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Many invasive species are considered to be one of 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 species has received increasing attention in ecological research [1]. The success of the spread of non-native plants is determined by their allelopathic properties. Allelopathy is defined as a process of chemical interaction between plants with either positive or negative effects through the production and release of chemical compounds. Allelochemicals are known to be derived from different parts of the plant: leaves, stems, flowers, buds, fruits, and roots. They can affect seed germination in other plants and suppress hypocotyl and radicle formation, as well as the growth of the whole plant in the early stages [2].

The aim of the experiment was to evaluate and compare the allelopathic activity of aqueous extracts of *E. acris* L. and *E. annuus* (L.) Desf (*Asteraceae*). *Erigeron acris* is an annual, biennial, or rarely perennial plant, which is native to Lithuania. *Erigeron annuus* is a rapidly spreading biennial plant, native to North America. In 2012, it was listed among 17 other plant species as invasive in our country [3-4].

In this study, the allelopathic properties of *E. acris* and *E. annuus* were tested under laboratory conditions using two methods. The first method was based on aqueous extracts of *E. acris* and *E. annuus* roots, leaves, and inflorescences. Different concentrations (0.1; 0.5; 1.0 M) were tested on the five model plants: 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. The second method we used was the agar sandwich method. Dried leaves of *E. acris* and *E. annuus* were tested on lettuce seeds.

The results showed that both plants, native *E. acris* and invasive *E. annuus* extracts had a significant effect on the parameters of germination and seedling growth of the tested plants. However, allelopathic effect of *E. acris* and *E. annuus* differed depending on the morphological part of the plant and the extract concentration. The inhibitory effect increased with increasing concentration. The effects of aqueous leaf extract and dry leaf were also compared.

The allelopathic effect of aqueous extracts of *E. acris* and *E. annuus* on other plants has not been extensively studied, especially using the agar sandwich method. Therefore, this study highlights the importance of studying allelopathic mechanisms and their role, especially in the spread and control of invasive species.

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[2] Scavo, A. et. al., Plant allelochemicals: agronomic, nutritional and ecological relevance in the soil system. *Plant Soil* 442, 23–48 (2019).

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