

ALLELOPATHIC PRINCIPLES OF SCREENING OF HIGHER PLANTS WITH HERBICIDAL EFFECT

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One of the ways of the development of environment safe techniques for weed control in agrophytocenoses is the usage allelochemicals of higher plants possessing herbicidal properties. The first and decisive step in such investigations is the finding of plant species perspective as a donor of allelochemicals with phytoherbicidal properties.

The aim of our study was screening of weeds and domesticated plants with allelopathic potential for their herbicidal ability. The water extracts and air-dry plant material was tested against weeds. The 16 weed species, including the most noxious and widespread ones in agrophytocenoses of the Steppe Zone of Ukraine were used as the test-objects.

Among studied species, the highest inhibition of seed germination of weeds, especially such as *Amaranthus retroflexus*, *Chenopodium album*, *Capsella bursa-pastoris*, *Setaria glauca* was revealed for water extracts of leaves and inflorescences of *Cirsium arvense*, inflorescences of *Barbarea vulgaris*, shoots of *Fumaria officinalis*, shoots of *Tagetes signata*.

Screening of different fractions of allelochemicals showed that the highest growth inhibiting effect had phenolic and lipophyllic fractions. The assessment of the activity of individual substances revealed that among the most active components were phenolic acids, flavonoids, terpenoids.

To develop the most effective technique of application of watersoluble allelochemicals of fresh plant parts to control weeds the possible synergistic effect of mixtures of extracts from different plants-donors was studied. It was revealed that synergistic effect had mixture of extracts from *Cirsium arvense* leaves and flowers of *Barbarea vulgaris* (1:1), flowers of *Barbarea vulgaris* and *Cirsium arvense* (2:1), shoots of *Cirsium arvense* and *Fumaria officinalis* (1:1,5).

To assess the perspectives of using allelopathic mulches from the studied donor species to control weeds we conducted allelopathic screening of their decay products. The highest phytotoxicity against weeds was found for decay products of *Tagetes patula*, *Tagetes erecta*. Taking into account their comparatively high productivity and long period of vegetation we consider this species prospective for application as allelopathic mulches for weed control in agrophytocenoses.