

PHENOLIC COMPOUNDS IN BUCKWHEAT HERB EXTRACT AND THEIR BIOLOGICAL ACTIVITY

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Common buckwheat (*Fagopyrum esculentum* Moench.), one from perspective alternative crops, belong to good weed competitors of annual weeds especially. The inhibition of weeds is explained by competition among plants and quickly growth of buckwheat and by allelopathy potential.

The aim of this work was confirm on test plant (*Lactuca sativa*) inhibitive effects of exudates from germinated buckwheat achenes, extracts of dry aboveground buckwheat biomass and soil from buckwheat stand and to determine the phenolic compounds as potential allelochemicals.

Buckwheat (variety Pyra) was grown on plots in České Budějovice (380 m a.s.l., sand-loam brown soil gleyficated) in year 2003. Soil (from depth 0-100 mm) and aboveground buckwheat biomass were sampled before buckwheat harvest.

Plants were dried at 40°C, ground and extracted with distilled water (1:10) and then diluted to concentrations: 75%, 50%, 25% and 12,5% (control distilled water).

Soil samples were extracted with distilled water in mass ration 1:1 (in relation to moisture). Filtered supernatant was used in concentrations 100, 75, 50, 25, 12,5 % (control - extract of soil without plants).

Extracts (6ml) were applied on filter paper with 30 seeds of lettuce in Petri dish. Assay with seeds of buckwheat and lettuce was designed in 3 variations (21 lettuce seeds x 21 buckwheat achenes - in rows, 42 buckwheat achenes, 42 lettuce seeds) on filter paper with in Petri dishes. All assays had 4 repetitions. We evaluated length of lettuce root and hypocotyl.

We used 20 germinate lettuce seeds (germl-2mm) that were situated on double layer of filter paper, covered with 50g dry soil, moistened with 10 ml distilled water and then covered with plastic film to laboratory test with soil. Growth intensity of seeds was evaluated.

Exudates of geminate achenes and extract (100-50%) of dry buckwheat biomass inhibited growth of lettuce root. Influence of buckwheat root exudates on lettuce growth was not observed if we used soil extract (1:1) but it was significant if we used soil from buckwheat stand.

The analyses of the buckwheat extracts were performed on both HPLC and GC-MS instruments. We have found by HPLC analysis quercetin and its derivatives, e.g. rutin and some unknown derivatives as prevailing compounds, further catechin and epicatechin. Using GC-MS we have found in ethylacetate extracts of different part of the plants beside benzoic and cinnamic acids very interesting phenolic compounds, e.g. 2,4,5-trimethylphenol, 3,4,5-trimethoxyphenol, 2-methoxy-6-(2-propenyl)fenol (o-allylguaajakol) and 4-(3-hydroxy-1-propenyl)-2-methoxyfenol.

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