

ALLELOPATHIC ACTIVITY OF BUCKWHEAT: IDENTIFICATION OF BIOLOGICAL ACTIVE SUBSTANCES USING HPLC

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Annual buckwheat (*Fagopyrum esculentum* Moench.) a smother crop cultivated for forage, grain and as cover crop, shows allelopathic activity against weeds, especially quackgrass (Golisz & Gawroński, 2003). The aim of this work was to detect of the most commonly listed for buckwheat biologically active compounds in plant of this species in regard to cultivars and plant organs.

Biologically active compounds (chlorogenic, ferulic, caffeic, and gallic acids, rutin, quercetin, (+)-catechin and epicatechin) were detected in field grown plants of buckwheat cvs. Hruszowska, Kora, Luba, and Panda (all presently cultivated in Poland). Seeds were sown in the beginning of May at optimal as shown in other our studies (Golisz. et al. 2002) sowing rate of 75 kg×ha⁻¹. The above ground organs of buckwheat were harvested after about two months of cultivation, at the full flowering stage. At harvest the plants were divided into: leaves, stems and inflorescence and fresh weights of these organs were recorded. Sub-samples of 1.0 g DM were used for the analysis using High Performance Liquid Chromatography (HPLC). Analyses were conducted with System Breeze 1525 Waters with Column Sym C₁₈ (5 µm; 4.6 x 150 mm). Extractions and purifications were performed according to recommended for each compounds protocols with modifications.

Each of the analyzed compounds was present in all tested cultivars of buckwheat and organs but the concentrations substantially differed depending on the compound and plant organs. Differences between cultivars were much less evident. Among the analyzed compounds the highest concentration was recorded for rutin and this was true both for each plant organ and for all cultivars. Among organs the highest concentration of rutin was recorded for leaves (147,3 - 120,8 mg g⁻¹ DM depending on cultivars) and the lowest for stems (25,0 - 36,0 mg g⁻¹ DM). The lowest concentrations, among analyzed compounds, was recorded in case of ferulic acid which ranged between 0,01 and 0,13 mg g⁻¹ DM with the highest concentration in the inflorescence (0,06 - 0,13 mg g⁻¹ DM depending on cvs.).

The results showed that the plants of all cultivars of buckwheat synthesized commonly listed for this species the biological active compounds but their levels differed depending on compound and plant organ but to a less degree on cultivars.

REFERENCES

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