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## Antioxidant Activity of Buckwheat Seed Extracts

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Buckwheat seeds contain potential antioxidants, such as tocopherols and phenolic substances, namely 3-flavanols, flavones, flavonols, rutin, stilbenes and phenolic acids [1, 2]. These compounds possess antibacterial, anti-inflammatory, antiviral, anticarcinogenic and antimutagenic effects [3]. Flavonoids improve blood circulation, prevent formation of blood clots, diminish amount of cholesterol in blood, strengthen capillaries, improve oxygen supply to cells, protect skin and delay influence of free radicals.

The aim of our research was investigation of the effect of solvents on the yield, total phenolic content (TPC) and antioxidant activity of buckwheat seed extracts.

We investigated seeds of buckwheat variety „Aiva”, supplied by LUA Skriveri Research Centre. Buckwheat seeds were dried in conventional dryer or irradiated in microwave oven (as it can enhance TPC [4]) and further used whole or ground. Extraction was realized with solvents of different polarity; aqueous mixtures of ethanol and acetone were used, too.

Following extraction methods were applied:

A – 3 hours at boiling temperature of solvent;  
B – 24 hours with Orbital Shaker OS-10 (mixing rate 200 rpm) at room temperature;  
C – 10 minutes ultrasonification (wave amplitude 50 µm; pulse control 1.0 s : 1.0 s);  
D – 8 hours with Soxhlet extractor.

TPC of buckwheat extracts was determined by Folin-Denis method and expressed as gallic acid equivalents (mg GAE/100 g buckwheat seeds).

The antioxidant activity of the buckwheat seed extracts was measured in terms of free

radical-scavenging ability, using the DPPH method. The absorbance of the solution was detected at 517 nm.

When extraction was carried out according method B, highest TPC was detected for aqueous ethanol and acetone extracts. Method C provided the best results in case of extracts obtained from seeds which were preheated in microwave oven.

We found out that TPC of hydrophilic extracts is within the limits 73-801 mg GAE/100 g buckwheat seeds, but in case of lipophilic extracts - 11-42 mg GAE/100g buckwheat seeds.

The best radical scavenging ability was reached in case of aqueous ethanol and acetone extracts of whole seeds and ground seeds pretreated in microwave oven.

Nowadays permitted maximum level of synthetic antioxidant added to edible oil is 0.02%; extracts of buckwheat seed are considered as safe and might be added to food at 0.05-0.5% concentration.

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