Thematic Section: Physicochemical Research. **Full Paper**
Subsection: Biochemistry. *Reference Object Identifier* – ROI: jbc-01/17-51-7-69
The Digital Object Identifier – DOI: 10.37952/ROI-jbc-01/17-51-7-69
Submitted on Jule 08, 2017.

Thematic course: Influence of infrared radiation on antioxidant activity of plant raw material and structured water adsorbed inside. Part 4.

Features of structured water in clover samples

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Keywords: total antioxidant activity, clover leaves and stems, water extracts, adsorbed structured water in clover samples.

Abstract

The total antioxidant activity (TAA) of water extracts of 11 samples, which are dried samples and seeds of perennial and annual legume grass meadow clover (*Trifolium pretense L.*) grown in different conditions in the Republic of North Ossetia-Alania, as well as of adsorbed structured water containing inside these samples has been investigated. Considering dried clover samples, maximal TAA was determined for "Dar`yal" variety (it is equal of 2.763g rutin), and minimal one – for wild growing clover at "Gornaya Saniba" at an altitude of 1800 m, namely 2.403g rutin (per 100g of absolute dry sample). TAA of dried clover seeds is by 47.65-29.06% (relative), it is 3.566g rutin per 100g for "Alexandriski" variety, and minimal one is 3.548g rutin for 'Inkarnatny' variety (per 100g of absolute dry sample). TAA of water adsorbed during final drying of clover samples, which were cut and dried by air and shade method, were calculated. The final drying and measuring were realized at the temperature of 105 °C using moisture detector MX-50 (Japan). Antioxidant properties, exceeding such properties of distilled water (control) in the range from 23618 times ("Farn" variety) to 4 times ("Dar`yal" variety) for samples and from 7604 times ('Inkarnatny' variety) to 0 times ('Shabdar' variety) for seeds were revealed. Oxidative properties of water inside samples, exceeding such level of distilled water by 5152 times were determined for "Alexandriski" variety, and by 720 times for "Vladikavkazsky" variety. The prospect of using the characteristics of the change in the summary indices of the antioxidant activity of plant raw materials at elevated temperatures is shown to determine the physicochemical parameter of thermal stability, which is taken into account in various technologies for their processing. The best thermal stability at 105 °C was detected for "Vladikavkazsky" clover variety both for samples 8% and "Alexandriski" (0.25%) for seeds. Maximum TAA losses were determined for 'Farn' variety, namely 48% for samples, and for 'Inkarnatny' variety – 20% for seeds.

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