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Sample analyses for *Vaccinium vitis-idaea* bioactive compounds extraction

Plants of the genus *Vaccinium* have great biological value as sources of food, medicinal and cosmetic products. One of the representatives of this genus, *Vaccinium vitis-idaea* or lingonberry, has large amount of biologically active compounds, especially arbutin, ascorbic, benzoic and ursolic acids, tannins, betain, flavonols, etc. Those components of lingonberry improve state of blood and vessels, have the antiinflammatory, antiatherosclerotic, lipotropic, antihelmintic and similar to adrenal hormones action [1]. Leaves of *V. vitis-idaea* are considered to be much richer in biologically active compounds than fruits. Extracts of the plant are widely used not only for medicinal purposes but for cosmetics additives. For example, arbutin is applied as a natural skin brightener for reduction of melanin production and getting rid of age spots. Preparations and cosmetic products from the lingonberry and its components are enough rare on the market of Ukraine. Thus, the study of technology for bioactive compounds of *V. vitis-idaea* extraction is rather relevant.

Samples from two experimental plots located in different regions of Ukraine were analyzed. The first plot was in the Carpathians, Zakarpattia oblast, Rakhiv district and the second one was in Polissya, Zhytomyr oblast, Radomyshl district. The samples of *V. vitis-idaea* plants were collected during the flowering stage in June and later, in August 2021. All analyses were carried out according standard methods. The standard procedure for the isolation and analysis of substances was based on extractions with the subsequent titration. The assay of arbutin was fulfilled by the iodometric titration or by titration of acids extracted with water with an alkali solution, or by the titrometric assay of the vitamin C with the Tillman's reagent [2]. Received results are represented in the table 1.

Table 1. Comparative results of general analysis

Parameters of samples	Zakarpattia oblast	Zhytomyr oblast
Level of radiation	50,5 becquerel/kg	79,2 becquerel/kg
Humidity	39,2 ± 2 %	47,4 ± 0,5 %
Titratable acidity	0,36 %	0,39 %
Vitamin C content	386 mg / 100 g	318 mg / 100 g
Arbutin content	8,06 %	7,24 %

The fulfilled analyses demonstrated that lingonberry material collected in Zakarpattia oblast was much better quality, with higher content of vitamin C and arbutin, and lower level of radioactivity.

It should be noted that plants of *V. vitis-idaea*, like the other representatives of the family Ericaceae, has symbiotic relationships with ericoid mycorrhizal fungi that enhance extraction of minerals from substrate. The

study of mycorrhization of lingonberry might be assist in technology improvement of plant material quality and accumulation of biologically active substances.

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2. *Ладыгина Е.Я., Сафронич Л.Н., и др.* Химический анализ лекарственных растений: Учеб. пособие для фармацевтических вузов / Под ред. Н.И. Гринкевич, Л.Н. Сафронич. — М.: Высш. школа, 1983. — 176 с.