

Vol. 13 (1): 275-280 (2023)

## IMPACT OF MINERAL SUBSTANCES CONCENTRATION ON HEAVY METAL CONTENT IN POLYFLORAL HONEY

Serhii Razanov<sup>1\*</sup>, Tetiana Holubieva<sup>2</sup>, Yuriy Tkalic<sup>3</sup>, Lyudmyla Symochko<sup>4,5</sup>,  
Yustyna Zhylyshchych<sup>6</sup>, Oleh Bakhmat<sup>7</sup>, Uliana Nedilska<sup>7</sup>, Halyna Lysak<sup>6</sup>,  
Halina Ohorodnichuk<sup>1</sup>, Igor Holovetskyi<sup>2</sup>, Nataliia Kachmar<sup>6</sup>

<sup>1</sup>*Vinnytsia National Agrarian University, Vinnytsia, Ukraine;*

<sup>2</sup>*National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine;*

<sup>3</sup>*Dnipro State Agrarian and Economic University, Dnipro, Ukraine;*

<sup>4</sup>*Uzhhorod National University, Uzhhorod, Ukraine;*

<sup>5</sup>*Coimbra University, Coimbra, Portugal;*

<sup>6</sup>*Lviv National Environmental University, Dublyany, Lviv region, Ukraine;*

<sup>7</sup>*Higher Education Institution "Podillia State University", Kamianets-Podilskyi, Ukraine;*

\*Corresponding Author Razanov Serhii, email: [razanovsergej65@gmail.com](mailto:razanovsergej65@gmail.com);

Received November 2022; Accepted December 2022; Published January 2023;

DOI: <https://doi.org/10.31407/ijeess13.136>

### ABSTRACT

The effect of the mineral content of polyfloral honey produced by bees in the conditions of the northern Polissia of Ukraine (the zone affected by the Chernobyl nuclear power plant accident) on the level of accumulation of <sup>137</sup>Cs, Pb and Cd in it was studied. It was established that the specific activity of <sup>137</sup>Cs and the concentration of Pb and Cd in polyfloral honey depended on the content of mineral substances (ash) in this product. In the polyfloral honey produced by bees from the nectar of autumn pollinators (heather, various grasses), a higher specific activity of <sup>137</sup>Cs and the concentration of Pb and Cd were found in comparison with the same products obtained from spring nectar pollinators (apple, cherry, cherry, white acacia, spring rhinoceros). At the same time, it was found that the content of mineral substances in polyfloral honey produced by bees from autumn honey combs was 64.7% higher compared to this product produced from spring nectar pollen cones. The artificial reduction of ash content in polyfloral honey by 2.4 times due to its processing using sorption technologies contributed to the improvement of the quality of this product. In particular, a decrease in the specific activity of <sup>137</sup>Cs by 47.5% and the concentration of Pb by 59.5% and Cd by 41.2% was observed in the processed honey. At the same time, a decrease in sucrose by 1.18 pp, ash by 2.4 times and an increase in the content of amino acids by 58.8% was observed in honey.

**Keywords:** radiocesium, heavy metals, bees, pollution, toxicants, specific activity, sorbent, processing, chemical composition, amino acids.