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BIO-TESTING OF ZOOHUMUS USING VARIOUS TEST OBJECTS

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Introduction. Currently, the use and further processing of organic waste as secondary raw materials is a pressing environmental issue. Every year in Russia, more than 17 million tons of food waste are generated in agricultural firms, households, public catering establishments, retail and wholesale trade [1]. There are many ways to utilize such waste, which differ in their economic efficiency, environmental feasibility and technical capabilities [2,3]. In recent years, bioconversion of organic production and consumption waste using living organisms such as earthworms, housefly larvae or black soldier flies has been actively developing in many countries. Not only the biomass of these organisms, but also the resulting products of their vital activity, which can be used as fertilizer, are of fodder and other value.

Main part.

In a series of experiments, zoohumus obtained from the processing of organic waste by black soldier fly larvae at Zeronix LLC (Moscow) was used. This is a dark-brown loose mass with a faint smell of ammonia [4]. The aim of the work was to evaluate the biotoxicity and hazard class of zoohumus using generally accepted methods, using test objects - crustaceans Dapnia magna and ciliates Paramecium caudatum, as well as on oat and wheat seeds [5]. The acute toxicity of zoohumus solution extracts and the chemotoxic reaction of ciliates were determined on ciliates and daphnia. Oat and wheat seeds were soaked for 24 hours in aqueous extracts of zoohumus at concentrations of 0.1%, 0.5%, 1.0%, 1.5%, 3.0%, and then grown by the roll method for 10 days. The assessment of plant phytotoxicity included the determination of the following indicators: seed germination, germination energy, root and sprout length.

Conclusions.

Based on the results of biotesting on test organisms daphnia and ciliates, it can be concluded that zoohumus belongs to hazard class 4 (low hazard). The phytotoxic effect of aqueous extracts from zoohumus when soaking oat seeds was manifested only in the "germination energy" indicator in the variant with the highest concentration (3% solution). Soaking seeds in zoohumus solutions stimulated seed germination, which significantly increased by 12-35% compared to the control (water) in variants with all concentrations except 0.1%.

List of references

1. Subrakova L.K. Economics of food waste management in Russia // VSU Bulletin. Series. Economics and Management. - 2021. - No. 1. - P. 37-48.

2. Volkova E. N. Problems and solutions for bioconversion of food waste // Current aspects and prospects for the development of modern biotechnology: Collection of reports of the int. scientific conf. - Belgorod: BSTU named after V.G. Shukhov, 2024. - P. 173-177.

3. Volkova E. N. Measures for the disposal of bakery products that have lost their consumer properties // Ecological readings - 2023: Proceedings of the XIV national. scientific and practical conf. (with international participation). - Omsk: OGAU named after P.A. Stolypin, 2023. - P. 157-161.

4. Zeronics. — 2025. — URL: https://zeronixbio.com/ru/nashi-produktyi/ (access date: 02/09/2025)

5. Volkova E.N., Antonov I.V., Spiridonova M.V., Mitrofanova Yu.S. Assessment of bio- and phytotoxicity of zoohumus from cultivation of black soldier fly larvae // International Scientific Research Journal. – 2024. – No. 11(149). – DOI 10.60797/IRJ.2024.149.28.