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grain size of activated carbon, as a matrix, is 2,0–2,8 mm The lipolytic activity of the enzyme immobilized under these conditions is preserved by more than 30 % compared to the native one.

In order to optimize the conditions of fermentation of hydrogenated fat by immobilized lipase, a study of its physical and chemical properties was carried out. For the immobilized lipase Rhizopus japonicus, the pH optimum value expanded with a shift from 7.0 to 6.5, and a significant increase in pH stability was observed during prolonged incubation of the immobilized preparation by alkaline and acidic pH environment. It was established that lipase immobilization leads to an expansion of the thermos-optimum, as well as stabilization of the enzyme during prolonged incubation at a temperature of 40 °C and at higher temperatures (60–80 °C). It is established that at 40 °C 80 % of the activity of the immobilized enzyme persists for 50 min, and then its value gradually decreases and after 150 min is 50 % [4].

The results show a higher stability of immobilized lipase Rhizopus japonicus. Further use of hydrolyzed waste will yield new products that is additive to rubber wares. The experimental results obtained indicate a higher stability of Rhizopus japonicus immobilized lipase compared to the native one. The high activity and stability of immobilized lipase make it possible to recommend it for bioconversion of oil and fat waste.

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RESEARCH OF THE INFLUENCE OF THE BAIKAL EM ON THE COMPOSTING OF FOOD MIXTURE

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The study of the influence of Baikal EM on the composting process of the food mixture was performed according to the following basic parameters: change of temperature, pH, number of microorganisms in the mixture and CO2 emission from the reactor. The maturity of the compost was determined by the germination index and the ratio of total Carbon and Nitrogen content in the composted mixture Addition of a microbiological additive accelerates the maturation of compost under meso- and thermophilic conditions.

Keywords: microbiological additive, composting, food waste, phytotoxicity.

To study the effect of Baikal EM on the composting process, a mixture of food waste was used, namely, cleaning potatoes, carrots, zucchini and cabbage leaves in a 1: 1: 1: 1 ratio, and each was added soil – southern black humus. Observations were performed in meso- and thermophilic modes, at 19 (sample 1) and 55 °C (sample 2), respectively, and the control sample (sample 3). The fermentation process was carried out for 38–40 days.

During the study, the reactors were isolated from environmental influences, at constant humidity of 72 % and stirring the mixture. The temperature of the compostable mixture was determined using an alcohol thermometer, the end of which was immersed in the test mixture [1].

Selection of a gas mixture of 50 cm^3 volume was carried out using disposable plastic syringes. The syringe was attached to a tube to remove gases from the reactors. To determine the amount of carbon dioxide in the sample, we used a gas chromatograph "Chromatek Crystal 5000.2" [2].

Determination of total Carbon was performed by the Türin method, and total Nitrogen was determined by the Caledal method. The number of microorganisms was estimated by the Koch method [3], namely by sowing on a solid nutrient medium in Petri dishes [4].

According to the results of research, it was found that when adding the microbiological additive Baikal EM, samples 1 and 2 show a high level of compost maturity. The control sample, in which distilled water was used instead of microbiological additives, showed that all were not mature and phytotoxic.

The study of the index of germination of vegetable seeds on the compost under study obtained in samples 1 and 2 was carried out by determining the number of germinated radish seeds (Raphanussativus) and the length of seedlings in water extracts from compost compared with control (sample 3).

The results of the study indicate that the index of germination of radish seeds gradually increases with the duration of fermentation. The control sample was phytotoxic and contained viable weed seeds and pathogenic microflora.

The control sample, which did not contain Baikal EM preparation, was characterized by twice the number of meso- and thermophilic microorganisms than samples 1 and 2.

Despite changes in the composting process, the final pH values in 1, 2 and 3 samples are approximately one-to-one and vary in the range from 6.8 to 7.1 units. pH.

Analyzing the properties of the obtained compost, we can conclude that the introduction of microbiological additive of the preparation "Baikal EM" is expedient for fermentation in meso- and thermophilic modes. Compost in samples 1 and 2 can be used as a fertilizer, it is mature and does not contain seeds of harmful weeds and pathogens.

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RESISTANCE OF LAKES OF BELARUS TO EUTROPHICATION IN THE CONDITIONS OF VARIABLE CLIMATE

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The consequences of climatic changes for the lakes of Belarus with different morphometry, trophic state, as well as the level of anthropogenic impact are described. It is shown that the most severe consequences of an increase in air temperature are expected for unstable mesotrophic with signs of lake oligotrophy, the least vulnerable are large stable mesotrophic and eutrophic lakes.

Keywords: lake, climate, climate change, lake resistance to eutrophication.

To effectively manage lake ecosystems and prevent the negative impact of climatic conditions and anthropogenic pressure on them, an analysis of the relationships between the abiotic and biotic components of limnosystems and external factors determining the nature of their response to changing climatic conditions is necessary.

The increase in water temperature that occurs during climate warming causes an increase in thermal stratification, which, in turn, is the cause of eutrophication of lakes. Therefore, in order to analyze the response of lake ecosystems to climatic fluctuations, the resistance of lakes to eutrophication was analyzed. To calculate the integral stability indices of 148 different types of lakes in Belarus, we used the method of randomized summary indicators described in [1]. The set of initial characteristics presented in [2] includes morphometric, hydrochemical, and hydrodynamic indicators.

The calculated stability indices vary from 0,144 for Lake Balduk to 0,777 for Lake Naroch and reflect the ability of lake ecosystems to withstand external natural and anthropogenic influences and internal processes that disrupt the structure and normal functioning of the entire ecosystem or separately its abiotic and biotic parts. Unstable mesotrophic lakes with signs of oligotrophy and mesotrophic deep lakes with small means of stability index (less than 0,452) are the most vulnerable to climate change. In conditions of climate warming, they will

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