

STUDY OF BIOHUMUS HUMIC ACIDS EXTRACTED FROM BOTTOM SEDIMENTS

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Abstract: humic and gimatomelanoic acids are constituent components of the organic matter of the soil. Especially the possibilities of humic substances are unlimited, they find practical application in various fields of industry. The article deals with the study of biohumushumic acidsthat are extracted from bottom sediments in the Koshkorgan, Shert and Yermakozen water resevoirs of the South Kazakhstan region. As a result of research work humic acids biohumus can be used as preparations for plant growth. The high value of the biohumus obtained on the basis of bottom sediments is established. Since the bottom sediments of reservoirs are a complex multicomponent system containing both organic and mineral substances. It is shown on the basis of chemical analyzes that humic acids of Shert vermicompost have a higher density, in comparison with other samples. This shows a large amount of humic substance content.

Keywords: bottom sediment, biohumus, humic acid.

ИЗУЧЕНИЕ ГУМИНОВЫХ КИСЛОТ БИОГУМУСОВ, ПОЛУЧЕННЫХ ИЗ ДОННЫХ ОСАДКОВ

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Аннотация: гуминовые и гиматомелановые кислоты являются составляющими компонентами органического вещества почвы. Возможности гуминовых веществ безграничны, они находят практическое применение в различных областях промышленности. В статье изучены гуминовые кислоты биогумусов на основе полученных из донных осадков водохранилищ (Кошкорган, Ермак-Узен, Шерт) Южно-Казахстанской области. В результате исследовательских работ гуминовые кислоты биогумусов можно использовать как препараты для роста растений. Установлена высокая удобрительная ценность полученного биогумуса на основе донных осадков. Так как донные отложения водохранилищ являются сложной многокомпонентной системой, содержащей как органические, так и минеральные вещества. Показано на основе химических анализов, что гуминовые кислоты биогумуса Шерт имеют более высокую плотность, по сравнению с другими образцами. Это показывает большое количества содержания гуминовых веществ.

Ключевые слова: донные осадки, биогумус, гуминовые кислоты.

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Humic substances (from Latin humus - land, soil) were first isolated from peat by the German scientist F. Achard in 1786 and already more than 200 years are studied by scientists from different countries. Many attention to humic substances was given by the great Swedish chemist J. Berzelius.

Humic substances are responsible for the life support of soil biota and hydrobiotics, but since they remain stable for a long time (radiocarbon dating of hundreds and thousands of years), they thereby guarantee the continuous supply of plants and microorganisms with energy and building material. Humus and fulvic acid are the main components of humic substances. Humus acids are high molecular nitrogen oxycarboxylic compounds. They contain different functional groups and consist of arbitrary flavor chains, without any repetitive definite structured groups. Humus things contain mainly humic acids. They include humic acids, fulvic acids and

humus. Humus acids are the group of well-soluble humus acids in the alkalis. They don't dissolve in water. There is no specific structural formula for the humus and fulvic acids. Orlov method was used to extract humic acids [1-4].

Agrochemical parameters of the soil, fertilizers are important for the growth and development of plants. Since the agrochemical parameters depend on the formation of humus and its composition (Table 1).

Table 1. Agrochemical indicators of Vermicompost (on average)

Vermicompost	Mass fraction, %				
	humus	total nitrogen	C	C:N	humic acid
Koshkorgan	6,9±0,5	4,4±0,3	14,0±0,2	4,8±0,2	4,55±0,2
Yermakozen	2,6±0,2	3,3±0,1	14,4±0,3	4,7±0,1	1,61±0,7
Shert	6,7±0,5	3,5±0,4	14,6±0,5	4,3±0,5	4,19±0,5

Optical density and radiation coefficients of humic and fulvic acids of the biohumus have been measured on the photometer "KFK-3-01" (Fig. 1, 2).

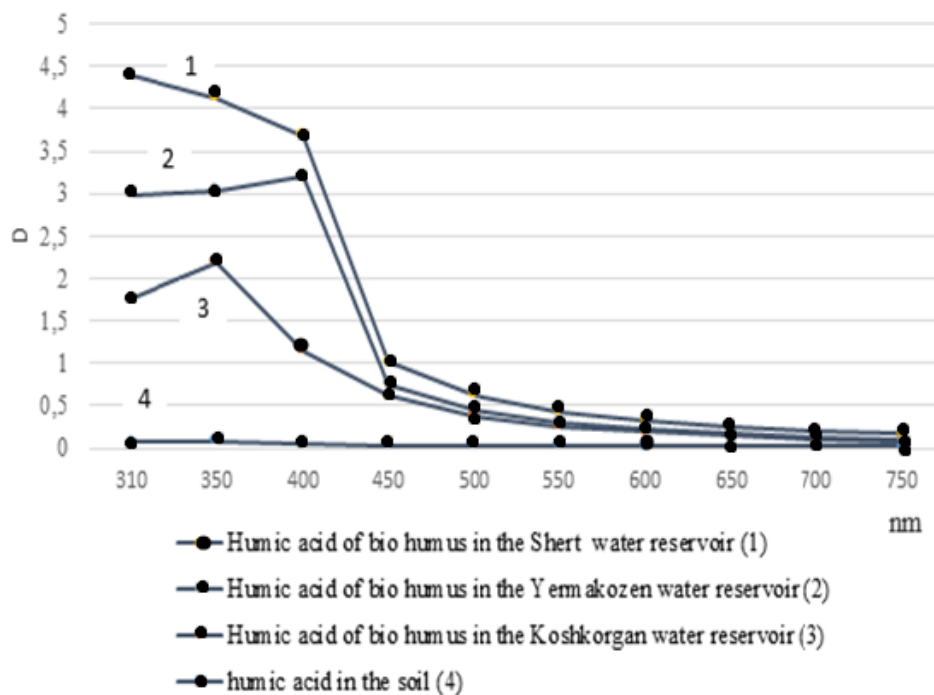


Fig. 1. Optical density of humic acid obtained from vermicompost

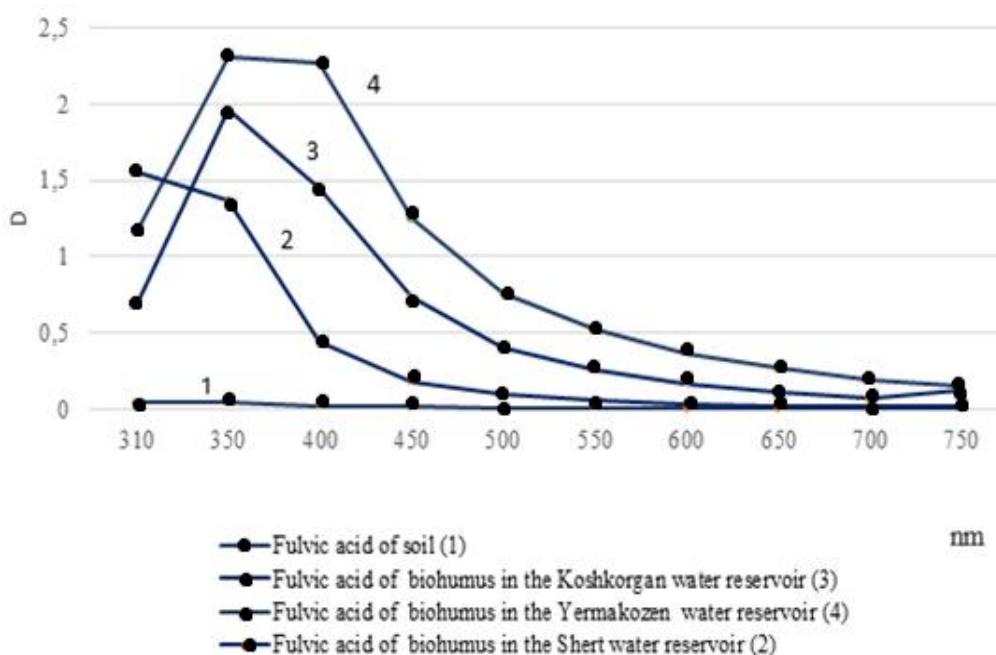


Fig. 2. Optical density of fulvic acids obtained from vermicompost

It is apparent that the value of the optical density depends on the wave length $D = f(\lambda)$ which is observed in the microwave part of the spectrum.

It was found out that the optical density of humus and fulvic acid of biohumus that obtained on the basis of bottom sediments of reservoirs is higher than the density of ordinary soil humic acid. It is characterized by the presence of aromatic humic substances. The increase in optical density can be explained by the increase of aromatic structures of molecules and the reduction of aliphatic moieties. The higher the carbon dioxide, the higher its density. The optical density of humic acids according to the above graphic schemes can be shown in the next row by Shert>Ermakozen>Koshkorgan. As it was established, various forms of humic acids impart various properties to the organism of the vermicompost in the soil system, giving them mineral substances due to their characteristics. We have also found that the microorganisms in the soil have a beneficial effect on the survival and reproduction of plants, and have a positive effect on the well-being of plants. Thus, the humus acids of biohumus obtained by treating the sludge are used in practice to increase the productivity and quality of the installation.

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