ENVIRONMENTAL ASSESSMENT OF WATER QUALITY IN POND №1 IN LYUBOTYN, KHARKIV REGION

On the territory of Lyubotyn town, Kharkiv region, in the park zone there are artificial ponds of a cascade type, consisting of 6 water objects. These water objects perform an important recreational function for Lyubotyn, also local people catch fish there.

Pond №1 is the first in this cascade, and therefore some water from it flows into the next pond. Due to this combination of reservoirs we should understand that the water quality of the following reservoirs of the cascade depends on the quality of the water in the previous ones. It is important to take into account the fact that the pond is lower in relief from the railway station and road. Although it is located in the park zone, it detains a certain amount of pollutants by vegetative cover, but there is a possibility of pollutants getting into this water object.

To assess water pond №1 conditions there were conducted physico-chemical and ecotoxicological analyses of water samples.

Ecotoxicological analysis was carried out using the method of biotesting to determine the chronic water toxicity on crustaceans Ceriodaphnia affinis Lilljeborg, which makes it possible to determine whether conditions are favorable for life of hydrobionts and fish breeding is possible in this pond. Water revealed chronic toxicity by the indicator of test objects' birth rate.

Physico-chemical analysis was used as the basis for determining the causes of water toxicity for hydrobionts, as well as for comparison with water-use standards.

Table 1 – Comparison of indicators of physical and chemical analysis with norms

№ by order	Indicators	Results of laboratory tests	Norms for water of water objects of fishery water-use
1.	Hydrogen index, pH	6,27	-
2.	Chlorides, g/m^3	88,4	300
3.	Ammonia, g/m^3	0,63	0,05
4.	Nitrites, g/m^3	0,26	0,08
5.	Dissolved oxygen, mg O_2/dm^3	3,0	-
6.	Fe (iron), g/m^3	0,101	-
7.	Zn (zinc), g/m^3	0,072	0,01
8.	Cu (copper), g/m^3	0,04	0,001

Indicators of ammonia, nitrites, zinc and copper exceed the norms for water of water objects of fishery water-use in 12,6, 3,25, 7,2 and 40 times, respectively. Such results may be related to the receipt of pollutants with surface runoff from the railway station and road. Such significant excess of MPC may be a condition for the emergence

of chronic toxicity of water. In these circumstances, we can conclude that this reservoir cannot be recommended for breeding and fishing.

Data of physical-chemical analysis showed that the pH is 6.27, so the water of the reservoir can be classified as weakly acid.

Nitrogenous substances (ammonia, nitrites and nitrates) are formed in water as a result of chemical processes and decomposition of plant residues, as well as due to the expansion of protein compounds that enter almost always with sewage water, the final product of decomposition of protein compounds is ammonia. Ammonia presence in the water of plant or mineral origin is dangerous from a sanitary point of view. Significant excess of MPC of ammonia combined with a high content of nitrites suggest that pollution happened a long time ago. The decay of organic residues may be due to insufficient content of dissolved oxygen in water. Such results indicate water acidification in pond №1, the processes of organic residues decay, and, therefore, all this indicates violation of the reservoir self-cleaning processes.

In the case of measures to clean and protect against further pollution of this reservoir, it is possible to improve its condition in order to ensure the possibility of water-use.

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