P106

CHEMICAL COMPOSITION, PROCESSES OF POLLUTION AND AUTOPURIFICATION OF THE GHIDIGHICI LAKE WATERS (2015-2018)

Viorica Gladchi, Nelly Goreaceva

Moldova State University, 60 Alexe Mateevici, Chisinau, MD-2009, Republic of Moldova
e-mail: viorica.gladchi@gmail.com

To assess chemical composition, degree of pollution and self-purification capacity of the Nistru river basin, the waters condition of the Ghidighici reservoir lake, formed on the Bac River, Dniester tributary was studied [1, 2]. During the years 2015-2018, 4-6 seasonal expeditions were organized annually with the water sampling, classical hydrochemical field studies, preservation of samples and their analysis in the laboratory.

During the research period in the storage lake alkaline water masses were formed, with an average pH of 9.2, which permanently contained carbonate ions. pH values ranged from 8.7 to 10.2, which corresponds to alkaline or strongly alkaline waters and exceeds the admissible values for surface waters. Increased alkalinity of water can contribute to the formation of toxicity and conditions of pathogenic microorganisms and development bacteria. The sum of the main ions varied between 823 mg/dm^3 and 3017 mg/dm^3, with an average of 1539 mg/dm^3. The waters were characterized with the unstable and variable content of the main ions by changing the cations and the dominant anions in the hydrochemical index of the waters. The waters in the lake can be attributed to the hydrogen carbonate-sulphate class, sodium and magnesium type. The waters of Lake Ghidighici have increased alkalinity, excessive mineralization, increased sodium ions contents, which can contribute to salinization and alkalinisation of soils. The use of these waters for irrigation purposes is limited.

The contents of dissolved oxygen during the research period varied in the range from 3.1 mg/dm^3 to 15.7 mg/dm3, with the multiannual average 9.3 mg/dm3. The waters contained substantial amounts of organic substances. The average content of organic biodegradable substances (CBO_5) was 5.0 mg O_2/dm^3, which by 60% exceeds the admissible values for aquatic ecosystems and attributes water to class V - highly polluted, red code. In the waters of the lake the increased amounts of organically degradable substances (CCO_{Cr}) were found. The content of these substances practically permanently exceeded the admissible values and presented a real danger for the lake ecosystem.

According to the nitrite and ammonium ions the waters of the lake can be attributed to class III - moderately polluted waters, yellow code. The data show the presence of phosphates in very large quantities, the average being 0.72 mg/dm^3. This contributes to the rapid eutrophication of the lake, which can have unintended consequences in the ecosystem of Bac and Dniester. The waters are extremely polluted with nutrients and organic substances. In most cases, the waters in these lakes are of class V of pollution (red code).

References
1. Mustea M., Boian I., Galcă G., Sandu M., Tăriţă A., Zubcov E., Sireţeanu D., Gladchi V., Prepeliţa A., Jeleapov V., Serenco L., Gilcă G. Starea resurselor de apă. În: Starea mediului în Republica Moldova în 2007-2010 (Raport National). – Chişinău, Tipografia "Nova-Imprim" SRL. – 2011. p. 75-80. ISBN 978-9975-4224-4-4.
2. Resursele acvatice ale Republicii Moldova/Min. Ecologiei şi Resurselor Naturale al Rep. Moldova. Vol.1: Apele de suprafaţă. – Chişinău: Î.E.P. Ştiinţa, 2007. – 248 p. ISBN 978-9975-67-294-8.