

HYDROCHEMICAL ANALYSIS OF DRINKING WATERS IN SEVERAL VILLAGES OF THE DEDOPLISTSKARO MUNICIPALITY, KAKHETI REGION

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The hydrochemical analysis of drinking waters in several villages (Zemo Machkhaani, Mirzaani, Arboshiki, Ozaani, Gamarjveba) of the Dedoplistskaro Municipality in the Kakheti Region aims to assess the chemical composition of water resources and identify potential risks to population health.

The assessment of hydrochemical indicators includes the determination of pH, temporary and total hardness, permanganate oxidizability, and other parameters. Preliminary results indicate that a significant portion of the water resources in the Dedoplistskaro municipality fall into the categories of hard or very hard waters, which is characteristic of regions with carbonate geological structures. The examined water samples exhibit a slightly alkaline nature, with pH values ranging between 7.5 and 8.0. The permanganate oxidizability does not exceed 1 mg O₂/L, which meets the requirements set for drinking water (maximum allowable value: 3 mg O₂/L) [1]. The total hardness in most drinking water samples falls within the normative range; only the drinking waters of the villages of Ozaani and Gamarjveba somewhat exceed the standard established by Georgian regulations (by 1.2-fold and 1.3-fold, respectively), which sets the acceptable range at 7–10 mg-eq/L.

An important part of the analysis involves the determination of heavy metals (Pb, Cd, Zn, Cr, Cu, Mn, and Fe) using a Microwave Plasma Atomic Emission Spectrometer (MP-AES 4210). The study showed that the concentrations of these heavy metals in the analyzed water samples do not exceed the maximum permissible limits established by the World Health Organization (WHO) and the national standards of Georgia [1, 2]. The obtained results are crucial for assessing the ecological condition of the municipality's water supply system and for improving water quality. The research also provides a basis for developing recommendations aimed at the protection of water resources, the prevention of potential pollution sources, and safeguarding public health.

References

- [1] Resolution No. 58 of 2014 of Georgian Government on Potable Water.
- [2] Guidelines for drinking-water quality. WHO. 2022.