

Hydrochemical Study of Mineral Springs of Racha

Ani Gamkrelidze, Makrine Nikolaishvili, N. Takaishvili

ani.gamkrelidze646@ens.tsu.ge

Tbilisi State University, Faculty of Exact and Natural Sciences. Department of Physical and Analytical Chemistry

Ilia Chavchavadze Avenue 3, 0179, Tbilisi, Georgia

Racha is a region in western Georgia, in the upper valley of the Rioni river. It has a rich groundwater system and is characterized by abundance of mineral springs. Nearly 50 drinking waters of distinct compositions have been identified, most of which are located in the resort of Utsera. Some of them believed to have medicinal properties, such as reducing chronic inflammation, alleviating joint pain, and improving gastrointestinal health. In Racha, a few mineral water baths and balneological treatment facilities functioned in the past [1].

These waters are widely used for drinking by both tourists and the local population. However, no data is available about their compositions. Therefore, it is important to assess their mineral contents in order to determine whether or not regular consumption could have any adverse health effects. The purpose of this research is to determine the mineral composition of the following drinking waters from Racha (Oni, Utsera): Tchala, Sortuani, Shavtskala, Piriketi, Ru and Koli.

Internationally standardized methods were used to determine the pH and the concentrations of common ions (Na^+ , K^+ , Ca^{2+} , Mg^{2+} , HCO_3^- , Cl^- , SO_4^{2-}), as well as F^- , iron and copper in these waters.

It was determined that pH values of these springs range from 6.21 to 6.69.

Based on the concentrations of ions, Tchala (Oni), Shavtskala, Piriketi and Ru (Utsera) springs are sodium-containing waters of the hydrogen carbonate class. Sortuani (Oni) is notable due to its high content of Cl^- (2942 mg/L), which is far above the limit set by the Drinking Water Technical Regulation of Georgia (250 mg/L). Koli spring belongs to the hydrogen carbonate class and magnesium group; it contains 325.7 mg/L of Mg^{2+} , which is 3.8 times higher than the limit set by normative document mentioned above (85 mg/L) [2].

The range of fluoride concentrations was found to be from 0.34 to 0.82 mg/L, which is well below the upper limit (5 mg/L) set by the technical regulation (Resolution 719).

Notably high amounts of iron are present in waters Tchala and Sortuani, with 6.1 mg/L and 13.2 mg/L concentrations respectively.

References

[1] *Resort Utsera and its History*. Tamar Jachvliani (2022)

[2] SST 85: 2019 Georgian Standard. *Natural Mineral Waters. General Technical Conditions*.