



**INFLUENCE OF DRINKING WATER COMPOSITION ON MAJOR
SALIVARY GLAND MORPHOLOGY AND FUNCTION**

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Relevance of the Study

It is well known that the shortage of drinking water is becoming one of the most pressing global problems. Scientists emphasize the necessity of using groundwater as a source of potable water. However, the composition of drinking water differs from that of tap water in several parameters. The use of brackish groundwater as a drinking source leads to a number of physiological changes in the body.

Continuous consumption of water with varying chemical composition affects the salivary glands and, consequently, their secretion — saliva. As is known, one of the primary causes of diseases in the body is external environmental factors. Any substance entering the body exerts both direct and indirect effects on digestive organs. Prolonged exposure to unfavorable factors may result in significant pathological changes.

To date, the effects of groundwater on certain organs, such as the thyroid gland, have been studied. However, its impact on salivary glands remains insufficiently explored, which determines the relevance of this research.

The oral cavity is considered a “mirror” of the body. Salivary glands play a crucial role not only in initiating digestion but also in protecting the oral



cavity and teeth, inhibiting bacterial growth, and maintaining oral hygiene. Saliva regulates the pH level of the oral environment. Dysfunction or decreased activity of salivary glands may lead to various health disorders. Therefore, maintaining salivary gland health is essential for overall well-being.

Objectives of the Study

1. To determine, under laboratory conditions, the qualitative composition of groundwater extracted from a depth of 10 meters on the territory of the Bukhara State Medical Institute, as well as tap water, and to compare the obtained results with the State Standard of Uzbekistan O'zDSt 950:2011
2. To identify morphological changes in the salivary glands of healthy outbred white rats aged 6–9 months and weighing 250–300 g that consumed groundwater.
3. To evaluate, over a period of 3 months, the immunological composition of saliva in rats consuming groundwater and compare it with that of rats consuming tap water.

Materials and Methods / Analysis of Results

The study involved healthy outbred white laboratory rats weighing 250–300 g. A total of 130 animals were divided into two groups:

Group I (Control): 40 rats consuming centralized (tap) drinking water.

Group II (Experimental): 100 rats consuming groundwater extracted from a depth of 10 meters.

The experiment was conducted over a period of 3 months. The control group received tap water daily, while the experimental group received groundwater.

The chemical composition of the water samples was analyzed and compared with the standards established by the State Standard of Uzbekistan (O'zDSt 950:2011). The results demonstrated that several parameters of groundwater exceeded permissible limits, justifying further investigation of its biological effects, particularly on salivary glands.





Study Focus

This study is devoted to the analysis of the chemical composition of groundwater extracted from a depth of 10 meters within the territory of the Bukhara State Medical Institute and the assessment of its effects on the morphological state of salivary glands and immunological parameters of saliva in laboratory rats. The obtained data were compared with national standards and tap water indicators.

Conclusions

1. The chemical composition of groundwater extracted from a depth of 10 meters on the territory of the Bukhara State Medical Institute requires correction in accordance with the requirements of O'zDSt 950:2011.
2. In rats consuming groundwater, morphological changes were observed in the parotid salivary gland cells, including hypertrophy and interstitial edema.
3. Immunological analysis of saliva in these animals revealed a decrease in anti-inflammatory responses and antimicrobial protection, along with activation of inflammatory processes.