

HYGIENIC ASSESSMENT AND WAYS TO IMPROVE THE DRINKING WATER QUALITY IN MODERN CONDITIONS OF DONBASS

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Introduction. The population of the ecocrisis region, as a rule, uses poor-quality drinking water (Yu.N. Talakin et al., 2007, D.O. Lastkov, 2011). In recent years, the situation has not changed, and it should be expected that such water consumption will steadily increase due to anthropogenic pressure and adverse climate change (D.O. Lastkov, A.G. Kozakov, 2016, 2017, D.O. Lastkov, O.V. Sokolova, 2018).

The purpose of the study was to assess the hygienic conditions and forecast changes in domestic and drinking water supply and water bodies in an ecocrisis region throughout a local military conflict, as well as to develop recommendations for its quality provision.

Material and methods. A hygienic assessment of changes in domestic and drinking water supply and water bodies was carried out during 2 time periods: pre-war (2010-2013) and military (2014-2020). Statistical processing was carried out by conventional parametric methods using the MedStat licensed software package. Differences between the indicators of the pre-war and war periods were estimated by the Scheffe method of multiple comparisons.

Results. During the war period, there was a deterioration in water quality in most water supply sources and water bodies, viz. in terms of sanitary and chemical indicators, the water supply network ($p < 0.05$), the municipal water pipes ($p < 0.01$), and water from open reservoirs were assessed ($p < 0.05$); according to microbiological indicators ($p < 0.05$), including rural water supply systems ($p < 0.01$). During the war period, there was a trend towards an increase in the number of samples that did not correspond to sanitary norms in terms of the content of nitrates (by 2 times) and coliforms (by 2.1 times). The proportion of samples that did not meet the sanitary norms in terms of microbiological parameters in the pre-war years almost did not change, however there was an increase during the war period in 2015-2016. During the war period, water samples were assessed significantly more often that actually did not meet the sanitary norms: according to sanitary and chemical indicators - in public water supply systems, including open reservoirs; according to microbiological indicators - in rural water supply systems. The decrease in water quality during the war period was observed in most water sources. The amount of samples that did not meet sanitary standards in terms of sanitary and chemical indicators in the pre-war years practically did not change; during the war period there was an increase in 2015-2016 and in 2020; in terms of organoleptic indicators, there was a significant increase with a 2-fold drop in 2016 and 2019.

Conclusions. It is shown that drinking water is not one of the main sources of heavy metals in the human organism. It has been established that interfacial tensiometry used to study the surface tension of water is an informative express method for assessing the biological value of water. The present study has substantiated the negative forecast of the subsequent dynamics of the drinking water quality lacking additional treatment and under the conditions of anthropogenic pressure and adverse climate change.