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DRINKING WATER QUALITY SOURCE OF LIFE

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Abstract
The relevance of the issues raised is related to the value of water as a source of human life. Our body needs high-quality drinking water for its normal functioning.

Keywords: Exogenous chemicals, Sanitary and epidemiological monitoring, Salmonella, urban areas, soil, Classification, remediation.

The urgency of the problem. Sanitary and epidemiological monitoring of bacterial pollution of water bodies is one of the links in the system of social and hygienic monitoring of the environment and is fundamental for the development of anti-epidemic and preventive measures in relation to water-related incidence of intestinal infections (7).

The problems of sanitary and epidemiological safety of water use by the population of Uzbekistan are caused by a wide range of reasons associated with anthropogenic pollution of water sources, insufficient sanitary and technical reliability of water supply systems, and a shortage of good-quality drinking water (8).

In modern conditions, the health of the population is largely determined by the impact of environmental factors. Specialists in the field of health care and environmental protection currently give priority to the state of the aquatic environment, since various infectious diseases of humans are associated with the conditions of water use of the population (9). At the same time, in Uzbekistan there is no unified concept for assessing microbial risk in the occurrence of AEI caused by water use (12). There are general WHO recommendations based on direct detection of pathogenic bacteria.

In connection with the use of surface waters for household drinking and recreational purposes, their sanitary and bacteriological characteristics deserve close attention. It has been shown that as a result of intense pollution of the hydrosphere, a significant change in the properties of bacteria, including pathogenic ones, can occur, and then the former saprophytes can exhibit aggressive qualities (10). In addition, wastewater from municipal sewerage systems and biotechnological industries is discharged into open water bodies, which also leads to a change in the typical properties of microorganisms and contributes to the development of an imbalance in the composition of the microflora of water bodies with a characteristic increase in the

number of potentially pathogenic bacteria and an expansion of their species spectrum (11).

When compiling the characteristics of the sanitary and epidemiological safety of water bodies, the main attention is focused on the indication of lactose-positive intestinal bacteria, while the lactose trait is one of the most unstable in the taxonomy of the Enterobacteriaceae family, in comparison with glucose fermentation and oxidase activity (13). The loss of a lactose trait leads to distortion of information about the epidemic safety of water use when controlled according to existing standards. Moreover, the indication of coliform bacteria by lactose fermentation deliberately excludes lactose-negative species of the Enterobacteriaceae family, including pathogenic (Salmonella, Shigella) and potentially pathogenic (Klebsiella, Proteus, Enterobacter, Hafnias, Citrobacter, Serrata, etc.) their presence in water (4). Therefore, when the bacterial composition of water meets the existing regulatory requirements, outbreaks of AQI associated with water consumption are recorded (5). At the same time, unreasonably little attention is paid to assessing the level of microbial pollution of water bodies from an epidemiological and sanitary-hygienic point of view, and the disproportion observed in the structure of the microbial community of water bodies is not taken into account (12).

Under the influence of pollutants and unfavorable factors of the aquatic environment, pathogenic bacteria, in particular salmonella, can pass into a sublethal state, which manifests itself in their temporary inability to grow on nutrient media. In addition, there are no reliable methods for isolating pathogenic enterobacteriaceae from the aquatic environment. In the future, under favorable conditions, the properties of stressed bacteria can be restored, which creates an epidemic danger of water use.

The hygienic assessment of water bodies according to complex indicators testifies to the continuing high degree of water pollution in the places of water use. The indicators of the water quality of the surface water bodies of the region remain low in terms of sanitary-chemical (primarily organoleptic and general sanitary), as well as microbiological indicators, which exceed similar average republican indicators. According to toxicological indicators, the level of water pollution in the places of water use is assessed as moderate.

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Table 1 Dynamics of discharge of some pollutants (tons) into wastewater (up to 2020 - by soluble forms, from 2021 - by gross content)

	2013y.	2014y.	2015y.	2016y.	2017y.	2018y.	2019y.	2020y.	2021y.
Copper	0,4	1,65	0,3	0,83	0,546	0,27	0,2	0,08	0,3
Zinc	1,37	3,82	1,14	0,33	1,64	0,61	0,37	0,46	0,81
Nickel	0,43	0,56	0,18	0,54	1,189	0,72	0,39	0,56	0,55
Chromium	0,21	0,22	0,14	0,19	0,142	0,21	0,21	0,09	0,07
Manganese	1,83	1,94		0,03	5,458	3,78	5,43	5,05	4,16
Lead	0,11	0,02	0,02	0,1	0,256	0,07	0,09	0,14	0,07
Phenol	0,06	0,05	0,05	0,12	0,053	0,11	0,05	0,08	0,12

The main pollutants of open water bodies are Among the ingredients of effluents in 2008:

• fluorine - 22.99 (2007 - 10.99 tons; 2006 - 11.35 tons);

• phosphorus - 102.27 (2007 - 113.12 tons; 2006 - 126.52 tons);

• chlorides - 2.52 (2007 - 2.58 thousand tons; 2006 - 3.57 thousand tons);

sulfates - 6.27 (2007 - 5.85 thousand tons; 2006 - 6.46 thousand tons);

nitrates - 2.042 (2007 - 2.311 thousand tons; 2006 - 2.144 thousand tons); iron - 9.56 (2007 - 6.52 thousand tons; 2006 - 17.07 thousand tons); suspended solids - 1.39 (2007 - 0.95 thousand tons; 2006 - 1.01 thousand tons); organic substances (by BOD) - 0.58 (2007 - 0.45 thousand tons; 2006 - 0.37 thousand tons); industrial enterprises, livestock, housing and communal facilities, dumping untreated or insufficiently treated wastewater into water bodies: tab. 1.

• chromium 6+ - 0.04 (2007 - 0.04 tons; 2006 - 0.07 tons);

• formaldehyde - 3.49 (2007 - 3.53 tons; 2006 - 4.01 tons).

The growth rate of the gross discharge of toxic substances with wastewater for the period 1992-2008. amounted to 5.70%. The largest amount of polluted wastewater flows into river basins. The damage to open water bodies is caused by storm runoff from the territories of enterprises and populated areas of 31.15 million m3 (2007 - 28.52 million m3; 2006 - 26.86 million m3). The main reason for the pollution of storm drains is the unsatisfactory maintenance of the territories, the absence of treatment facilities at the storm water outlets.

Centralized water supply to the population of the region is carried out from 803 water sources, of which 27 have water intake from surface water bodies. In connection with the deterioration of the sanitary-technical condition or the stable unsatisfactory quality of water, according to the information of Bukhara and Navoi rural settlements, the operation of 386 sources of decentralized water supply was suspended, 106 wells

were transferred to private ownership. At the same time, 46 public wells were rebuilt, or taken on the balance sheet after repair work. According to laboratory research data from the "Center for Hygiene and Epidemiology in Bukhara Region", the region as a whole has a high proportion of unsatisfactory samples from water supply sources, both in terms of sanitary and hygienic and microbiological indicators: tab. 2

Dynamics of water quality in surface water bodies in the region

Category reservoir	Sanitary and chemical indicators								
	2019 y.		2020 y.		2021 y.		2020 y.		2021 y.
	Region	RF	Region	RF	Region	RF	Region	RF	Region
I	58,4	27,0	62,2	28,0	62,5	29,7	78,1	28,3	63,29
II	41,8	27,4	40,0	27,4	50,7	27,7	53,3	27,5	43,95
Category reservoir	Микробиологические показатели								
	2019 y.		2020 y.		2021 y.		2020 y.		2021 y.
	Region	RF	Region	RF	Region	RF	Region	RF	Region
I	41,56	25,3	36,1	23,7	35,9	23,6	35,0	20,6	38,97
II	33,7	22,1	42,6	24,3	37,6	23,8	33,7	23,2	31,28

The hygienic assessment of water bodies makes it possible to predict the preservation of instability of water quality in open water bodies of the region. The underground springs of the Pri ilmen (Bukhara) territory are characterized by an increased content of mineral salts (salty in taste), as well as in most regions there is an increased iron content, in a number of regions (Bukhara and Navoi regions) increased concentrations of fluorine are revealed.

Helminths, dangerous to humans, were not detected in water bodies of categories I and II in 2008.

1.01% of unsatisfactory samples for parasitological indicators were found in wastewater. In the water of reservoirs for recreational purposes, the proportion of finds of helminth eggs was 0.4% (2007 - 0.28%), incl. in rural areas - 1.03%.

In the studied water samples, the residual amounts of pesticides from open reservoirs are in concentrations below the sensitivity limit of the measurement methods.

The population of 10 administrative territories is provided with water supply from surface water sources, the volume of water supply by communal water pipelines is 71.93 million m3 / year. The population of 20 territories of the region is supplied from underground water sources, the volume of water supply is 15.83 million m3 / year.

Before being supplied to the population, water from surface water bodies requires a full complex of purification (coagulation, settling, filtration, disinfection). Groundwater water basically requires only preventive disinfection

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