

STUDY OF MICROBIOLOGICAL STATE OF THE TAP WATER IN KHARKIV

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Water is a unique and irreplaceable source of human existence, and all water bodies should be safe in epidemic relation. Sanitary and microbiological analysis of pathogenic microorganisms present in water is performed on epidemiological indications. Such pathogenic and opportunistic microorganism as Salmonella, Shigella, Pseudomonas (*Pseudomonas aeruginosa*), Staphylococcus aureus, enteroviruses, fecal streptococci (enterococci), spores of sulphite-reducing clostridia, Proteus, thermophilic microorganisms, coliphages (viruses, bacteria) and certain protozoa should be detected in water bodies depending on their type according to the regulations. Identification of sanitary indicator is based on detection and quantification of sanitary indicator microorganisms (SIM) and certain pathogenic microorganisms in the probe of the tested water source.

Qualitative sanitary indicators (SI) answer the question, if target microorganisms are present in the fixed volume of water probe or not. These SI are used in detection of pathogenic, potentially pathogenic, and certain opportunistic microorganisms, such as Salmonella, Shigella, Listeria, *Pseudomonas aeruginosa*, and others. Their presence in fixed volume of drinking water is unacceptable.

Quantification of SI gives idea about the extent of water body contamination or disinfection procedure efficiency. Quantitative SI is a content of target SIM in fixed volume of the probe. The number of SIM is expressed as SIM index: number of CFU (colonies forming units) of microorganism per unit of the fixed volume (CFU/mL, CFU/20 mL, CFU/100 mL).

We've studied 5 tap water probes taken in different areas of Kharkiv. For quantitative SI identification we used method of deep inoculation of water probes in Petri dishes with MPA (incubation time – 24 h., at 37°C): probe No 1 - 178 CFU/mL; probe No 2 - 144 CFU/mL; probe No 3 - 149 CFU/mL; probe No 4 - 279 CFU/mL; probe No 5 - 73 CFU/mL. All the harvested colonies were described; detected microflora was studied bacterioscopically (using Gram-staining) in order to obtain general qualitative identification. According to the study results, all the tested probes contained high number of opportunistic microflora, except for the probe No 5. Coliform bacteria were detected in probes No 2 and No 4, which indicates poor purification of water, secondary contamination or presence of excess organic pollution. Thus, probes No 1, 2, 3 and 4 do not conform to corresponding sanitary and hygienic standards.