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**BOOK OF ABSTRACTS**



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## Quality of the Water Received from Air by Means of Conditioners

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### INTRODUCTION

Deficiency of fresh water exists in many countries of the world. Therefore, search of additional sources of drinking water is actual. It is especially actual for regions where the centralized water supply is absent. In addition, quality of water is unsatisfactory in underground or superficial sources, available to use, and demands complex and expensive technology of water treatment. These include a number of districts of Odessa region of Ukraine. The recreation centre and sanatoria located lengthways coasts of the Black Sea, estuaries and lakes have deficiency of sweet water.

One of possible ways of the partial solution of this problem is use of the water received from free air (Titlov, 2015; Osadchuk & Titlov, 2013). Receiving water from free air possibly by its cooling up to the temperature of "dew-point". This process happens in conditioners, which widely apply, to cooling of air in premises of sanatoria and recreation centre during resort season. In the course of their work, water is formed, which is a secondary product. In most cases it does not gather and is not used in no way, though its volumes considerable (Kovalenko & Kormosh, 2015).

Of course, the use of the condensate from the air conditioner without treatment for drinking needs is impossible. Because the quality is dependent on many factors, in particular from contamination and humidity, structure, operating conditions and arrangement of the air conditioning space, and other factors. Therefore, the first step in work aimed at the development of water treatment technology, derived from the air, was the analysis of indicators of the quality of such water samples, depending on the conditions of its receiving.

### RESULTS OF RESEARCH

Water samples from air were received by means of conditioners of the SenSey FTI-51MR model. These conditioners are used in a recreation centre, located on the Black Sea near Odessa. Investigated indicators of quality of samples of water of two types. The first samples are received from conditioners, which in use did not subject long time to sanitary processing. The second are received from conditioners which working surfaces regularly processed special washing solution. In samples of water defined sanitary and chemical indicators and indicators of epidemic safety. For this purpose used the standardized techniques and the modern equipment. Values of indicators of quality of the water received from air compared to requirements of the State health regulations and norms of drinking water (DSanPiN 2.2.4.171.10 Ukraine, 2010).

The analysis of results of pilot study of indicators of quality of samples of water from conditioners, which for a long time not been subjected to sanitary treatment allows to draw the following conclusions:

- Quality of water on indicators of epidemic safety is low. It does not conform to normative requirements for the following microbiological indicators: the total microbic number, total coli

form, E.coli. It is established that at these samples of water there are saprophytes of the sort Micrococcus, Staphylococcus, there is conditionally pathogenic and pathogenic flora of Enterobacteriaceae, Pseudomonadaceae and Micrococcaceae families. Besides, availability and quantitative ratio in samples of water of mold mushrooms is established: Penicillium, Cladosporium and Aspergillus, and also their associations. In particular, it is established that mushrooms of the sort Cladosporium and Penicillium in associations were dominating.

- Pilot studies of sanitary and chemical indicators of safety and quality of samples of water have shown discrepancy of number of organoleptic indicators (namely smell, turbidity, chromaticity), physical and chemical (eg pH, total iron, solid residue) and sanitary and toxicological indicators (nitrites, ammonium, the general organic carbon, boron) to the existing normative requirements. The greatest aberration is observed on such indicators as chromaticity, turbidity, the general organic carbon and the content of ammonium. The content of heavy metals and radiation indicators of quality of samples of water do not exceed normative values.

- The analysis of results of pilot study of indicators of quality of the water received from conditioners which sanitary processing constantly was carried out has shown that its quality is better, both on sanitary and chemical indicators, and on indicators of epidemic safety. At the same time, the content of ammonium still significantly exceeds norm and there are deviations on some microbiological indicators.

It is also necessary to note, very low content of salts of calcium, magnesium, sodium and potassium, and also iodine and fluorides in both types of samples of water. That is, from the point of view of physiological usefulness of mineral composition of water it needs in additional conditioning before using it for drinking (Kormosh, Kovalenko, 2015).

Thus, the executed pilot studies of quality of samples of the water received by means of conditioners from free air have shown that it does not conform to the existing requirements of drinking water. To use the received condensate as drinking water, it is necessary to develop technology of improvement of its quality. This is the next task of our research.

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