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L11 PHARMACEUTICALS AS MICROPOLLUTANTS IN THE ROMANIAN TISZA RIVER WATERSHED

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In the last decade, the European Union has paid a special attention to the pharmaceuticals used in the human and animal disease treatment that are released in the surface waters. The European Parliament amending the Water Framework Directive (2000/60/EC) regarding the priority substances in the field of water policy has introduced diclofenac and 17-beta-estradiol as emerging pollutants and has established the maximum allowable concentration (MAC) in surface waters.

Among the main sources of water pollution are wastewaters containing pharmaceuticals from the industrial production, hospitals and also those incompletely metabolized. These compounds have a relative persistence and toxicity in the water body and their uncontrolled input can lead to some unexpected health effects as well as increased drug resistance.

The aim of this work consists in the determination of the occurrence of some classes of pharmaceuticals widely used in the human and veterinary treatments in different water samples. The researches are focused on non-steroidal anti-inflammatory drugs, hormones, antibiotics and anticancer drugs.

The isolation of studied compounds from water matrices has been performed by solid-phase extraction (SPE) using silica C18 and Oasis HLB (hydrophilic lipophilic balance) cartridges. Drug analysis was carried out by high performance liquid chromatography coupled with diode array detector or mass spectrometer respectively. The SPE-HPLC-DAD/MS procedures were applied to the determination of studied drugs in surface water samples and wastewater samples (influent and effluent of wastewater treatment plants) collected from the Romanian Tisza River watershed. For the developed procedures, validation studies were done. The obtained results show the presence of different drugs in surface waters demonstrating the necessity of their monitoring for a better risk assessment.

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P127 CHEMICAL STUDIES AND CRITERIA FOR DETERMINING OF THE WATER QUALITY IN UKRAINE

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Protecting water resources from pollution, and ensuring clean drinking water is a priority task for all countries. Quality of water is determined by its organoleptic, chemical, microbiological and other indicators. However, chemical indicators are crucial in determining of water pollution by chemicals. Depending on the purpose for the use, water in Ukraine is subdivided into various categories: drinking water, household purposes, industrial fishing, surface water, waste water. According to these categories are determined the requirements for water quality. Chemical pollution regulated by a system of maximum permissible concentration (MPC) and prescribed regulatory documents of Ukraine, in particular, State sanitary norms and rules and State standards (DSTU). The most stringent requirements set for drinking water and water for industrial fishing.

Contaminated water in surface water bodies assessed complex index - the index of water pollution (IWP) that is given by formula:

$$IWP = \sum(C / MAC)/n$$

C – actual concentration

MAC - Maximum allowable concentration

n – number of indications

By this indicator are set 5 levels of contamination: allowable, reasonable; increased; high; very high. Water from the allowable level of surface water pollution are only in some regions, in particular this includes Transcarpathian region. In most areas of Ukraine water pollution is rated as reasonable. Wastewater must be cleaned and their discharge into the environment is generally inadmissible.

For the analysis of water in Ukraine are used spectral, chromatographic and other methods of analysis. The techniques for determining of the substances content in water approved by the Ministry of Health and the State Standard of Ukraine and there are normative documents.

In addition to determining the content of individual components such as heavy metals, anions of acids, pesticides are determined integrated indicators characterizing water quality, as dissolved oxygen, chemical and biological oxygen consumption, dry residue and some other.

Thus, the quality of water in Ukraine is subject of State control, which is held by a number of specialized services: sanitary, environmental, hydro-meteorological and other, which ensures the security of water resources for the population.

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