

HEAVY METALS CONTENT IN WATER-BOTTOM SEDIMENTS SYSTEM OF THE PRUT RIVER (REPUBLIC OF MOLDOVA)

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Heavy metals are essentially for hydrobionts, while at high concentrations being toxic. According to EU Directive (2006/11EC), due to their toxicity and bioaccumulation, metals and their compounds are introduced in the list of hazardous substances to the aquatic body [1].

Metals in natural waters are presented both in dissolved and suspended forms. The proportion of these forms is varied for different metals and different water bodies. The toxicity and sedimentary potential of heavy metals are changed depending on their forms [2].

The metals are presented in different phases of the water system, including abiotic and biotic phases. As abiotic phases can be distinguished bottom sediments, their interstitial water, particulate materials and water [3]. Of the three phases (water, particulate materials and sediments), about 99% of the total content of metals is presented in sediments [4].

In order to identify the variation of heavy metals content, along the Prut River, the samples were collected seasonally. For determination of the heavy metals content in the sediments (freshly sampled), the extraction procedure recommended by the American Geological Agency was used [5]. The content of heavy metals was determined by the flame atomic absorption spectrometry.

During of 2009-2010 years, the increasing trend of Cu content in the water layer along the Prut River has been established, while a higher content of Zn was identified in the middle sector. In the most samples the content of heavy metals in interstitial water is exceeding their concentrations in the water horizon. This demonstrates that the sediments can become a potential source of the metals mobilization in water layer.

The content of heavy metals in the water layer did not exceed the allowable maximums set by the EU [6], Romania [7], USA [8] and Canada [9]. The content of heavy metals in the sediments, generally, did not exceed the quality requirements adopted in Romania [7]. However, the content of Ni exceeded the threshold effect level for bottom sediments, according to the USA [8] and Canada criteria [9].

References:

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