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Impact of Natural and Man-Made Factors on Mineral Composition of the Ardon River Water and Hydrophytes

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The Unal basin located in mountain region of Northern Ossetia (the Caucasus) belongs to Pb-Zn natural province with anthropogenic and natural transformation of the environment leading to risks of ecological damage. Activity of the Misursk Mining Combine and its Arkhon-Khosta tailings caused a significant local increase of Pb, Cd, Cu, Zn content in soils, water and biotic components relative to background values [1-5]. A catastrophic mud flow of 2002 and the later construction of a gas pipeline and a dam for hydroelectric power station changed local landscapes and biota (plants, algae, and amphibia).
Biogeochemical studies performed in the area in 2001, 2003 and 2008 showed that in some cases the specified factors might change the structure of landscapes due to enhanced mass migration and the erosion of outcropping rocks which could be followed by corresponding transformation of the chemical composition of draining waters and flood plain soils, and could also change the character of species' invasion. Algae were proved to adapt and to indicate both natural and man-made transformation of the environment [3, 4]. A distinct relation between the particle size of the suspended matter in the Ardon river waters and water mineralization was discovered. However, heavy metals' concentration level in waters of the Ardon river appeared in general to be within the acceptable hygienic standards and therefore ecologically not critical.

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