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Integrated Monitoring of Landscapes of the Cascade System Lower Don - Taganrog Bay

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ABSTRACT

The natural and natural-anthropogenic landscapes, including the delta of the Don River, and the coast of the Taganrog Bay were studied. The patterns of accumulation of heavy metals and priority PAHs by wild plants depending on growing conditions, level of technogenic load and their species characteristics have been determined. Pollutants accumulate to a greater extent in plants of the northern coast of the bay and along shipping routes in the Don delta, especially those growing on coastal sediments. Exceeding the maximum permissible concentrations, clarkes and background content of pollutants in the above-ground part of natural herbaceous vegetation has been established: Ni - by 20 times, Pb - by 8 times and Cd - by 5 times, DahA - by 7 times. High accumulation of HM by *Phragmites australis, Xanthium orientale* L. and *Elytrigia repens* has been revealed. These species act as indicators of environmental stress in coastal areas. According to the integral indicator of plant pollution by heavy metals, the studied territory is classified as buffer or impact; according to PAHs, individual sites on the coast meet background requirements. The adaptability of the studied plant species to pollution was assessed. It was shown that *Xanthium orientale* L. demonstrates significant destructive changes in morphology and low adaptability to adverse conditions. *Phragmites australis* Cav. and *Typha laxmannii* Lepech. are moderately resistant species. *Rumex confertus* Willd. showed high adaptability to pollution. The main factors controlling the distribution and mass transfer of heavy metals in the soil-coastal sediments-bottom sediments system in the Sea of Azov basin have been identified. The content of loosely bound compounds in coastal sediments is higher than in soils and bottom sediments. Based on the bioavailability coefficient, it has been established that Cd and Zn are priority pollutants with a high mass transfer capacity. The accumulation of Mn, Pb and Ni is hazardous, especially in coastal sediments located at the boundary of terrestrial and aquatic landscapes.

Keywords: environmental pollution, heavy metals, PAH, plants, herbaceous vegetation

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