Ekologija i upravljanje drenažnim vodama s poljoprivrednih zemljišta

Maria ŠPOLJAR[1], Farrukh KATTAKULOV[2], Rustam RAZAKOV[3]

[1]Sveučilište u Zagrebu, Prirodoslovno - matematički fakultet, Biološki odsjek, Zoologijski zavod, Rooseveltov trg 6, 10000 Zagreb, Hrvatska, (e-mail: maria.spoljar@biol.pmf.hr)
[2]Tashkent Institute of Irrigation and Melioration, Faculty of Hydromelioration, Department of Hydrology and Hydrogeology, Kari Niyaziy 39, 100000 Tashkent, Uzbekistan
[3]Scientific Consulting Center "Ecoservice" Nongovernmental organization (NGO), U. Nasir 13A, 100070 Tashkent, Uzbekistan

Sažetak

Glavni cilj ovog rada bio je utvrditi utjecaj umjetnih močvarnih staništa u pročišćavanju drenažnih voda. Makrofiti imaju važnu ulogu u poboljšanju kvalitete vode. U semi-aridnim područjima male količine vode zahtijevaju racionalno korištenje i ponovnu upotrebu. U skladu s održivim razvojem i zaštitom okoliša, zahtijeva se pročišćavanje drenažnih voda zbog visokih koncentracija onečišćivača i njihovih negativnih učinaka na usjeve i/ili recipijente. Ovo istraživanje provedeno je u sjeverozapadnom Uzbekistanu (Karakalpakstan), primjenom umjetne močvare, odnosno protočnog bioplatoa (22000 m^2) sa sljedećim makrofitima: *Phragmites communis*, *Typha angustifolia*, *T. latifolia*, *Scirpus lacustris*. Rezultati ovog rada ukazuju na značajno smanjenje koncentracija (50 do 100%) organskih tvari, hranjivih tvari, halogeniranih derivata ugljikovodika i nafte te teških metala nakon protoka vode kroz bioplato s makrofitima. Najviša akumulacija teških metala zabilježena je u stalno uronjenom dijelu, u odnosu na dio stabljike iznad vode, gdje su željezo i mangan postigli znatno veće kooncentracije u odnosu na bakar, krom i cink. Također, važna funkcija umjetnih močvara očituje u zaštiti obale od erozije. Rezultati ovog istraživanja ukazuju da su alternativni pročišćivaći otpadnih voda vrlo učinkoviti u uklanjanju širokog spektra onečišćivača, a također su jeftini, energetski nisu zahtjevni I jednostavni su za upravljanje.

Ključne riječi: ponovna upotreba drenažnih voda, umjetne močvare, onečišćivsči, semi-aridno područje

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Ecology and management of agricultural drainage waters

Maria ŠPOLJAR[1], Farrukh KATTAKULOV[2], Rustam RAZAKOV[3]

[1]University of Zagreb, Faculty of Science, Department of Biology, Division of Zoology,
Rooseveltov trg 6, 10000 Zagreb, Croatia, (e-mail: maria.spoljar@biol.pmf.hr)
[2]Tashkent Institute of Irrigation and Melioration, Faculty of Hydromelioration, Department of Hydrology and Hydrogeology,
Kari Niyaziy 39, 100000 Tashkent, Uzbekistan
[3]Scientific Consulting Center "Ecoservice" Nongovernmental organization (NGO), U. Nasir 13A, 100070 Tashkent, Uzbekistan

Abstract

The main goal of this study was to determine influence of artificial wetlands, in the purification of drainage waters. Macrophytes are well known intermediates in the water quality improvement. In semi-arid regions water deficit requests its rational use and reuse. In the view of sustainable development and environmental protection drainage water should be treated because of high concentrations of pollutants and their negative effects on crops and/or recipient waters. This study was conducted in northwest Uzbekistan (Karakalpakstan), applying artificial wetlands i.e. riverbed bioplato (22000 m^2) with emergent macrophytes: *Phragmites communis, Typha angustifolia, T. latifolia, Scirpus lacustris.* Results indicated significant decreasing in concentrations (50 to 100%) of organic matters, nutrients, halogenated cyclic hydrocarbons, oils, and heavy metals in drainage channels after water flowed through the artificial wetland. The highest accumulation of heavy metals was observed in submerged in comparison to the emergent part of stems, where iron and manganese achieved significantly higher concentrations opposite to the copper, chrome and zinc. Also, important function of that bioplato is recognized in biological coastal protection to prevent soil erosion. Results of this study suggest that alternative wastewater treatment plant are efficient in the removal of wide range of pollutants with advantages as cheap, not energy demanding and easy to manage.

Key words: drainage water reuse, artificial wetlands, pollutants, semi-arid region

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