

Program	Program NUCLEU PN 18 05 03 02
Project title (ENG):	Experimental research on the application of technologies of treatment/drinking and water purge to improve their management
Project title (RO):	Cercetari experimentale privind aplicarea unor tehnologii de tratare/potabilizare si epurare a apelor in vederea imbunatatirii managementului acestora- ELFIT
Duration	2018
Team Leader	Valeria NICORESCU
Summary (short description) ENG	<p>The studies carried out within this project, in phase 1/2018, focused on two directions: the first direction of research aimed at the growth and development of <i>Lemna minor</i> L. plants; the second direction concerned the analysis of the heavy metal wastewater treatment capacity of the <i>Lemna minor</i> plant.</p> <p>In order to determine optimal plant growth conditions, nine variants of growth were studied through the variation of micro and macro-nutrients, and in particular of the compounds with phosphorus and nitrogen. The degree of plant development in all experimental lots was between 150 and 325%.</p> <p>In phyto-remediation studies, 4 types of water were used. Three of them had a monometallic content (zinc, copper, nickel), being waste water from the galvanizing processes, and one had a multimetallic content (zinc, iron, manganese), this being a mine water. Monometallic waters were diluted to determine the maximum tolerance of plant to metal. For zinc, the concentrations of 7.5, 15, 30, 50 and 75 mg / l were used; for copper 5, 10, 20, 30 mg / l; and for nickel 5, 15, 30, 50 mg / l. It is found that in general the cleaning efficiency decreases with the increase of the metal concentration in the water. The best purge yields are obtained at the lowest initial concentrations. Regarding the speed of bioaccumulation, it is found that it is high in the first 3 days, then there is a decrease in the following 4.</p>
Summary (short description) RO	<p>Studiile realizate in cadrul acestui proiect, in faza 1/2018, s-au axat pe doua directii: prima directie de cercetare a urmarit cresterea si dezvoltarea plantelor <i>Lemna minor</i> L.; a doua directie a vizat analiza capacitatii de epurare a apelor uzate cu metale grele, a plantei <i>Lemna minor</i>.</p> <p>Pentru a se determina conditiile optime de dezvoltare ale plantei, au fost studiate 9 variante de crestere prin variatia micro si macro-nutrientilor si in special a compușilor cu fosfor si azot. Gradul de dezvoltare al plantei, in toate loturile experimentale a fost cuprins între 150 și 325%.</p> <p>În studiile de fito-remediere, au fost folosite 4 tipuri de ape. Trei dintre ele au avut un conținut monometalic (zinc, cupru, nichel), fiind ape uzate provenite de la procesele de galvanizare, iar una a avut un conținut multimetalic (zinc, fier, mangan), aceasta fiind o apă de mină. Apele cu conținut monometalic au fost diluate pentru a se putea determina toleranța maximă la metal a plantei. Pentru zinc s-au utilizat concentrațiile de 7,5, 15, 30, 50 și 75 mg/l; pentru cupru 5, 10, 20, 30 mg/l; iar pentru nichel 5, 15, 30, 50 mg/l. Se constata ca, in general randamentul de epurare scade cu cresterea concentratiei de metal in apa. Cele mai bune randamente de epurare se obtin la concentratiile initiale cele mai mici. În ceea ce priveste viteza proceselor de bioacumulare, se constata ca aceasta este ridicată in primele 3 zile apoi, se observă o scădere in urmatoarele 4.</p>

Dissemination of results	
Full-paper ISI	Dorian-Gabriel Neidoni, Valeria Nicorescu, Ladislau Andres, Monica Ihos, Carol Blaziu Lehr, The capacity of Lemna Minor L. to accumulate heavy metals (zinc, copper, nickel), Revista de Chimie (Bucuresti), vol. 69, no. 11, in press, 2018
	Monica Ihos, Mihaela Dragalina, Iuliana Iordache, Dorian Neidoni, Fluoride removal from industrial effluents by combining precipitation and electrocoagulation processes, Revista de Chimie (Bucuresti), in press, vol. 70, no. 1, 2019
Conferences (platform, poster, abstract / full-paper	Monica Ihos, Mihaela Dragalina, Iuliana Iordache, Neidoni Dorian, Use of electrocoagulation as a polishing step within treatment of fluoride-rich industrial effluents, Symposium „The Enviroment and the Industry” SIMI 2018, 20-21 september, 2018, Bucuresti, pag 56-57, 2018
	Dorian-Gabriel Neidoni, Valeria Nicorescu, Ladislau Andres, Monica Ihos, Carol Blaziu Lehr, Accumulation of toxic metals in aquatic plants, 21th International Symposium „The Enviroment and the Industry” SIMI 2018, 20-21 september, 2018, Bucuresti, pag 78-79, 2018
	Dorian-Gabriel Neidoni, Valeria Nicorescu, Ladislau Andres, Monica Ihos, Mihaela Dragalina, Iuliana Iordache, Izabela Siminic, Sorina-Claudia Negrea, Lidia Ani Diaconu, Influence of phosphorus and nitrates on the species development of <i>Lemna minor L.</i> , 24 th International Symposium on Analytical and Environmental Problems Szeged, Hungary October 8-9, 2018, pag. 174-178, 2018
	Sorina Negrea, Monica Ihos, Mihaela Dragalina, Dorian Neidoni, Florica Manea, Development of groundwater management by using electrocoagulation for removal of fluoride and coexisting anions, 24 th International Symposium on Analytical and Environmental Problems Szeged, Hungary October 8-9, 2018, pag. 128-132, 2018