

<b>Program</b>	<b>Program NUCLEU PN 16 25 01 16</b>
<b>Project title (ENG):</b>	<b>Using of corticol lichens as biosensors in the monitoring of environmental pollution with heavy metals</b>
<b>Project title (RO):</b>	<b>Utilizarea lichenilor corticoli ca biosenzori în procesul de monitorizarea a poluării mediului înconjurător cu metale grele.</b>
<b>Duration</b>	2016 -2017
<b>Team Leader</b>	Senior Researcher Eng. Ladislau Andres
<b>Summary</b> (short description) ENG	<p>We performed comparative studies of analytic- synthetic resulting data on concentrations of heavy metals bio-accumulate in the tissue due lichens synthetic environment pollutant single system, Cd or Zn or double system solutions pollutants Cd and Zn 2, or Pb and Zn. It has developed a method for determining the degree of accumulation of heavy metals in the tissue corticols lichens; and technical work on the monitoring of heavy metal pollution of the environment by using cortocols lichens. They performed comparative studies on concentrations of heavy metals bio-accumulate in the tissue of lichens with data reported by agencies in recent years Environmental Protection on the amount of metals Cd, Ni, Pb in the atmosphere .These lichens have classified sites studied by the characteristics of bioaccumulation of metals of lichens <i>Parmelia spp.</i> and <i>Xanthoria parietina</i> in average pollution: very low, low, medium, high, compared to metal bioaccumulation characteristics of the respective Reserve lichens Iron Gates and in areas of interest. Based on data obtained will prepare a correlation Index of air quality in geographical areas of interest with the presence of corticols lichens specific area. For this index, two species were proposed (<i>Flavoparmelia caperata</i> and <i>Xanthoria parietina</i>) to be followed according to the season (in the rainy seasons it is possible to follow and analyze the species <i>Flavoparmelia caperata</i>, which in the dry season disappears from the cities). Due to the disappearance of the species mentioned above, it is possible to analyze the species <i>Xanthoria parietina</i> that excels in extreme climatic conditions, being very resistant to the stress caused by the atmospheric pollution. In addition to the accumulation and resistance properties, the above mentioned species are excellent in performing the analyzes because they have a large size (3-13 cm) which can easily be detach from the substrate. These species can be identified very easily in site, with easily detectable features.</p>
<b>Summary</b> (short description) RO	<p>S-au efectuat studii comparative analitico- sintetice ale datelor rezultate privind concentrația de metale grele bioacumulate în țesutul lichenilor datorată mediului sintetic poluant în sistem single, Cd sau Zn sau sistem dublu, soluții cu 2 poluanți Cd și Zn, sau Pb și Zn. S-a elaborat o metodă privind determinarea gradului de acumulare a metalelor grele în țesutul lichenilor corticoli; și o tehnică de lucru privind monitorizarea poluării cu metale grele din mediu înconjurător cu ajutorul lichenilor corticoli. S-au efectuat studii comparative privind concentrațiile de metale grele bioacumulate în țesutul lichenilor cu datele raportate de Agențiile de Protecția Mediului din ultimii ani privind cantitatea de metale Cd, Ni, Pb din atmosferă. S-au clasificat situ-urile studiate prin intermediul caracteristicilor de bioacumulare de metale a lichenilor <i>Parmelia spp.</i> și <i>Xanthoria parietina</i> în medii de poluare: foarte scăzut, scăzut, mediu, ridicat, în comparație cu caracteristicile de bioacumulare de metale a lichenilor respectivi din Rezervația Porțile de Fier și din zonele de interes studiate. Pe baza datelor obținute se va elabora un Index de corelare a calității aerului din zone geografice de interes cu prezenta unor licheni corticoli specifici zonei respective. Pentru acest index s-au propus doua specii (<i>Flavoparmelia caperata</i> și <i>Xanthoria parietina</i>) care trebuie urmarite in</p>

	<p>functie de anotimp (in anotimpurile ploioase se poate urmari si analiza specia <i>Flavoparmelia caperata</i> care inasa in anotimpul secetos dispare din orase). Datorita disparitiei speciei amintite mai sus, se poate analiza specia <i>Xanthoria parietina</i> care rezista excelent in conditii climatice aspre, fiind si foarte rezistenta la stresul cauzat de poluarea atmosferica. Pe langa proprietatile de acumulare si de rezistenta, speciile amintite mai sus sunt excelente in efectuarea analizelor pentru ca au un tal de dimensiuni mari (3-13 cm) care se poate detasa usor de substrat. Aceste specii se pot identifica foarte usor pe teren, avand caracteristici usor detectabile.</p>
<b>Dissemination of results</b>	
Conferences (platform, poster, abstract / full-paper	<p><b>Mășu S.</b>, Dumbrava A.R., Cd accumulation in <i>Parmelia spp.</i> species, 10-11 October 2016, 22<sup>nd</sup> <i>International Symposium on Analytical and Environmental Problems</i>, Szeged, Hungary, 219-222, ISBN 978-963-306-507-5 Publisher: University of Szeged, Department of Inorganic and Analytical Chemistry, H-6720 Szeged.</p>
	<p><b>Mășu S.</b>, Air biomonitoring using Lichens, 13-14, October 2016, <i>International Symposium „Environment and Industry”</i>, Bucharest, Romania, 134-138, ISSN -L 1843-5831</p>
	<p><b>Neidoni D.G.</b>, Mășu S., Popa M., Lichens-bioindicators of air quality, 25-27 mai 2017, <i>International U.A.B.–B.EN.A. Conference "Environmental Engineering and Sustainable Development"</i> Alba-Iulia, Romania</p>
	<p><b>Neidoni D.G.</b>, Siminic A. I., Dragalina M., Masu S., Lichens transplant from an unpolluted area in Timisoara city; 9-10 October 2017, <i>Proceedings of the 23<sup>rd</sup> International Symposium on Analytical and Environmental Problems</i>, Szeged, Hungary</p>
	<p><b>Neidoni D.G.</b>, Siminic I., Masu S., Popa M., Dumbrava A.R., Bioaccumulation studies of Cd and Zn in lichens tissue; 28-29 September 2017, <i>Book of Abstracts of the 20th International Symposium „The Environment and the Industry”</i>, Bucharest, Romania</p>
	<p><b>Neidoni D.G.</b>, Andres L., Nicorescu V., Lehr C.B., Bucur E., The use of corticolous lichen species to assess the level of air pollution with heavy metals; septembrie 2018, <i>International Symposium “The Environment And The Industry”</i>, Bucharest, Romania (În curs de realizare)</p>
Full-paper BDI	<p><b>Smaranda Mășu</b>, <i>The accumulation of metals in lichens</i>, Scientific Papers: Animal Science and Biotechnologies, 50(1), p. 147-151</p>