

Program	Program Nucleu, contract 20N/2019, project code: PN 19-04 02 01
Project title (ENG):	Biological models and molecular biomarkers for assessing the toxic potential of water resources affected by anthropogenic pollution - SMARTWAY
Project title (RO):	<i>Modele biologice si biomarkeri moleculari pentru evaluarea potentialului toxic al resurselor de apa afectate de poluarea antropica - SMARTWAY</i>
Duration	2019 -2022
Team Leader	Dr. biol. Alina Roxana Banciu
Summary (short description) ENG	<p>The project addresses a topical issue at national and European level regarding the uncontrolled use of antibiotics and biocides and the toxic effects generated by them on the aquatic environment. The main goal is the development of experimental models using aquatic organisms and molecular biomarkers to evaluate the quality conditions of the aquatic environment and to predict the toxic potential.</p> <p>The realization of this project between 2019-2022 and the development / implementation of a molecular microchip is a national premiere. In addition, the implementation in the laboratory practice supports environmental protection agencies by monitoring and predicting the pollution generated by anthropogenic factors and at the same time favours the establishment of a national and international scientific networking specific to the field addressed.</p> <p>In 2019, starting from the objective of deepening the evidence of genetic determinism of the mechanisms of bacterial resistance to antibiotics, quantitative and qualitative studies were carried out on wastewater samples from two connections of an emergency medical unit in Bucharest and on samples from surface water and sediment taken from the natural settlements initially established, the Teleajen River and the Danube River.</p> <p>Alternative testing methods for assessing the toxic potential of aquatic ecosystems were also addressed. Alternative methods have been tested in parallel with conventional methods, which are based on morphological identification of organisms, using benthic macroinvertebrates.</p>
Summary (short description) RO	<p>Proiectul abordeaza un subiect de actualitate la nivel national si european referitor la utilizarea necontrolata a antibioticelor si biocidelor si la efectele toxice generate de acestea asupra mediului acvatic. Obiectivul general al proiectului este reprezentat de dezvoltarea unor modele experimentale utilizand organisme acvatice si biomarkeri moleculari pentru evaluarea conditiilor de calitate a mediului acvatic si predictia potentialului toxic.</p> <p>Realizarea acestui proiect in perioada 2019-2022 si dezvoltarea/ implementarea unui microcip molecular constituie o premiera la</p>

	<p>nivel national. De asemenea, implementarea in practica laboratorului vine in sprijinul agentilor de protectia mediului prin monitorizarea si predictia poluarii generate de factori antropici si totodata favorizeaza stabilirea unui networking stiintific national si international specific domeniului abordat.</p> <p>In 2019, pornind de la obiectivul de a aprofunda evidentierea determinismului genetic al mecanismelor de rezistenta bacteriana la antibiotice, s-au efectuat studii cantitative si calitative pe probe de apa uzata provenita din doua racorduri ale unei unitati medicale de urgenta din Bucuresti si pe probe de apa de suprafata si sediment prelevate din emisarii naturali stabiliti initial, raul Teleajen si Fluviul Dunarea.</p> <p>De asemenea, au fost abordate, metode de testare alternative pentru evaluarea potentialului toxic al ecosistemelor acvatice. Metodele alternative au fost testate in paralel cu metodele conventionale, cele care au la baza identificarea morfologica a organismelor, utilizandu-se macronevertebratele bentonice.</p>
Dissemination of results	
Full-paper BDI	<p>Catalina Stoica, Elena Stanescu, Iuliana Paun, Alina Roxana Banciu, Stefania Gheorghe, Irina Lucaciu, Gabriela Vasile, Mihai Nita-Lazar, <i>Danube Delta: monitoring and ecological status. A link between the past and the future</i>, Romanian Journal of Ecology & Environmental Chemistry, no. 1, 2019, pp. 72-82</p> <p>Toma Galaon, Alina Banciu, Florentina Laura Chiriac, Mihai Nita – Lazar, <i>Biodegradation of antibiotics: the balance between good and bad</i>, Romanian Journal of Ecology & Environmental Chemistry, no. 1, 2019, pp. 16-25</p>
Conferences (platform, poster, abstract / full-paper)	<p>International Conference of the Chemical Societies of the South-Eastern European Countries” Universitatea Valahia din Targoviste, <i>Modulation of the biocide effects by different chemical structures</i>, Lucian Ionescu, Alina Roxana Banciu, Daniel Mitru, Mihai Nita-Lazar (platform presentation)</p> <p>International Conference of the Chemical Societies of the South-Eastern European Countries” Universitatea Valahia din Targoviste, <i>Modulation of the effects of surfactants on the aquatic microbial communities</i>, Daniel Mitru, Alina Roxana Banciu, Lucian Ionescu, Daniela Ionica, Mihai Nita-Lazar (platform presentation)</p> <p>International Symposium „The Environment and the Industry”, SIMI 2019 – <i>Alternative methods to detect biological communities in freshwater systems</i>, Catalina Stoica, Daniela Ionica, Lucian Ionescu, Daniel Mitru, Stefania Gheorghe, Alina Roxana Banciu, Irina Lucaciu, Mihai Nita-Lazar, Book of Abstract, pg.59 (poster)</p> <p>International Symposium „The Environment and the Industry”– SIMI 2019 – <i>New eco-friendly biological models to assess the aquatic system at molecular level</i>, Alina Roxana Banciu, Catalina Stoica, Stefania Gheorghe, Mihai Nita-Lazar (platform presentation)</p>

Conferences (platform, poster, abstract / full-paper)	International Symposium „The Environment and the Industry”–SIMI 2019, <i>Comparative toxicity effects of cleaning products on fish, algae and crustacean</i> , Stefania Gheorghe, Irina Lucaciu, Daniel Mitru, Lucian Ionescu, Mihai Nita-Lazar, Proceedings book, pg.160 (platform presentation)
	International Symposium „The Environment and the Industry”–SIMI 2019, <i>A. fischeri bioreactivity toward different analgesics</i> , Lucian Ionescu, Stefania Gheorghe, Book of Abstract, pg.48 (poster)
	International Symposium „The Environment and the Industry”–SIMI 2019, <i>Monitoring of anionic and non-ionic surfactants in activated sludge samples</i> , Daniel Mitru, Irina Lucaciu, Stefania Gheorghe, Catalina Stoica, Alina Banciu, Lucian Ionescu, Daniela Ionica, Gheorghe Nechifor, Book of Abstract, pg.73 (poster)
	19 th International Symposium on Toxicity Assessment (ISTA19), 25-30 August 2019, Thessaloniki, Grecia, <i>Characterization of the freshwater environmental status by a genomic approach</i> , Catalina Stoica, Teodora Maria Onciu, Mihai Nita-Lazar, Book of Abstract, pg.58 (platform presentation)