

<b>Program</b>	Program Nucleu, contract 20N/2019, project code: PN 19 04 03 01
<b>Project title (ENG):</b>	Advanced materials, methods and technologies applied in water/wastewater treatment
<b>Project title (RO):</b>	Materiale, metode si tehnologii avansate cu aplicatii in tratarea / epurarea apelor
<b>Duration</b>	2019 – 2022
<b>Team Leader</b>	PhD. Eng. Lucian Alexandru Constantin
<b>Summary</b> (short description) ENG	<p>The general objective of the project is to develop advanced materials, methods, technologies with potential use in water/wastewater treatment. Both the legal aspects related to drinking water production and those linked with advanced wastewater treatment are considered. In order to achieve the general objective, the project defines the following specific objectives (SO):</p> <ul style="list-style-type: none"> <li>• SO1 - Technologies based on combined processes including membrane processes for reduction of pollutants from water</li> <li>• SO2 – Technology for reduction of halogenated compounds content from groundwater sources intended for human consumption via sonolysis associated with biological processes</li> <li>• SO3 – Technologies for degradation of emerging organic pollutants such as parabens, phthalates, ciprofloxacin, flutamide from wastewater using advanced oxidation processes</li> <li>• SO4 – Non-conventional treatment technology for wastewater generated from precious metals lixiviation</li> <li>• SO5 – New materials with adsorbent properties for wastewater treatment</li> <li>• SO6 – Mathematical model for assessment of biological wastewater processes</li> </ul> <p>Activities performed so far were concretised in 5 research studies and 6 tested at lab scale experimental models covering all projects' specific objectives, namely development of combined processes (membrane processes included), sonolysis associated with biological processes applied to groundwater with halogenated compounds content, advanced oxidation processes (including contributions to elucidation of kinetics and degradation mechanisms of some emerging contaminants classes), alternative treatment methods for process water generated by metals' lixiviation, development of new materials with adsorbent properties through reuse of vegetal waste as well as development of mathematical model dedicated to efficiency increase of wastewater treatment plants biological step.</p>
<b>Summary</b> (short description) RO	<p>Obiectivul general al proiectului este reprezentat de dezvoltarea de materiale, metode, tehnologii avansate cu aplicatii in tratarea/epurarea apelor. Sunt avute in vedere atat aspectele legate de obtinerea de apa destinata consumului uman cat si cele legate de epurarea avansata a apelor reziduale. In vederea atingerii obiectivului general prezentul proiect defineste urmatoarele obiective specifice (OS):</p> <ul style="list-style-type: none"> <li>• OS1 – Tehnologii bazate pe procedee combinate incluzand procese membranare pentru reducerea potentialului poluant al apelor</li> </ul>

	<ul style="list-style-type: none"> <li>• OS2 – Tehnologie de diminuare a continutului de compusi halogenati din ape subterane destinate obtinerii apei potabile prin sonoliza asociata cu procedee biologice</li> <li>• OS3 – Tehnologii de indepartare a unor poluanti organici emergenti de tipul parabeni, ftalati, ciprofloxacina, flutamida din apele uzate prin procese de oxidare avansata</li> <li>• OS4 – Tehnologie neconventionala de epurare a apelor uzate de proces rezultate de la lixivierea metalelor pretioase</li> <li>• OS5 – Noi materiale cu proprietati adsorbante destinate epurarii apelor uzate</li> <li>• OS6 – Model matematic pentru evaluarea eficientei proceselor biologice de epurare</li> </ul> <p>Activitatile derulate pana acum s-au concretizat in 5 studii de cercetare si 6 modele experimentale testate care acopera toate obiectivele specifice ale proiectului, respectiv dezvoltarea proceselor combinate (ce includ procesele membranare), sonoliza asociata cu procese biologice aplicate apelor subterane cu continut de compusi halogenati, procese de oxidare avansata (inclusiv contributiile legate de elucidarea cineticilor si mecanismelor de degradare a unor clase de poluanti emergenti), procese de epurare alternative a apelor de proces provenite de la lixivierea metalelor, dezvoltarea de noi materiale cu proprietati adsorbante prin valorificarea deseurilor vegetale precum si dezvoltarea unui model matematic dedicat eficientizarii treptei biologice a statiilor de epurare.</p>
<b>Dissemination of results</b>	
PhD Thesis – Title RO, ENG	N/A
Full-paper ISI	L.A. Constantin, M.A. Constantin, I. Nitoi, F.L. Chiriac, T. Galaon, <i>Comparative experimental study of an endocrine disruptor degradation by UV/H<sub>2</sub>O<sub>2</sub> and UV/H<sub>2</sub>O<sub>2</sub>/TiO<sub>2</sub> systems</i> , Revista de Chimie, 71 (4), pg. 304-312, 2020
	N.M. Marin, G. Batrinescu, I. Stanculescu, L. Constantin, N.I. Cristea, A.I. Ionescu, G.A. Traistaru, <i>Experimental model for Cu (II) and Fe (III) sorption from synthetic solutions based on maize stalk</i> , propus spre publicare in Revista de Chimie, article registration no 20.0212 – transmis spre publicare
	R.E. Scutariu, G. Batrinescu, G. Nechifor, I.A. Ionescu, <i>Comparative analysis of the processes of collagen concentration by ultrafiltration using different types of membrane</i> , propus spre publicare in Journal of Applied Polymer Science, article registration no. 20201678 – transmis spre publicare
Full-paper BDI	L.A. Constantin, M.A. Constantin, I. Nitoi, T. Galaon, V.R. Badescu, N.I. Cristea, <i>Comparison of flutamide degradation via UV/TiO<sub>2</sub>, UV/H<sub>2</sub>O<sub>2</sub> and UV/H<sub>2</sub>O<sub>2</sub>/TiO<sub>2</sub> systems</i> , propus spre publicare in Romanian Journal of Ecology & Environmental Chemistry, article registration no. 58; acceptat la publicare pentru nr. 1/2020
Book, book chapters	N/A
Conferences (platform, poster, abstract / full-paper)	L.A. Constantin, M.A. Constantin, I. Nitoi, T. Galaon, I. Cristea, <i>Screening experiments on flutamide degradation via TiO<sub>2</sub> assisted photocatalyse</i> , 22nd International Symposium „The Environment and the Industry”, SIMI 2019, 26-27 September 2019, Bucharest, Book of

	Abstracts, ISSN-L: 1843-5831, pg. 44-45, 2019, DOI: 10.21698/simi2019.ab15
	N.M.Marin, G. Batrinescu, L. Constantin, L. Dinu, G. Traistaru, M. Nita-Lazar, L.F. Pascu, C.B. Lehr, <i>Cellulosic material derived from maize stalk for Cu(II) and Fe(III) removal</i> , 22nd International Symposium „The Environment and the Industry”, SIMI 2019, 26-27 September 2019, Bucharest, Book of Abstracts, ISSN-L: 1843-5831, pg. 44-45, 2019, DOI: 10.21698/simi2019.ab02
	M.A. Constantin, L.A. Constantin, N.I. Cristea, T. Galaon, I. Nitoi, <i>Preliminary experiments on ciprofloxacin degradation via TiO<sub>2</sub> assisted photo catalyse</i> , propusa pentru 23 <sup>rd</sup> International Symposium „The Environment and the Industry” E-SIMI 2020, 24 September 2020, Bucharest, comunicare acceptata
	L.A. Constantin, I. Nitoi, N.I. Cristea, M.A. Constantin, <i>Methyl paraben degradation using titanium dioxide assisted photo catalyse</i> - propusa pentru 23 <sup>rd</sup> International Symposium „The Environment and the Industry” E-SIMI 2020, 24 September 2020, Bucharest, comunicare acceptata
Patents (approved or proposal)	N/A