Program	Program NUCLEU **PN-09-13 01 19**
Project title (ENG):	Detection of microbial toxic concentrations on 11 microbial lyophilized strains – validation compared to MARA's test-
Project title (RO):	**Determinarea valorilor de concentratie microbiana toxica asupra a 11 tulpini microbiene liofilizate – validare conform testului MARA**
Duration	2015
Team Leader	Researcher biol. Mihai Nita-Lazar
Summary (short description) ENG	This project meets the interest and the legislative needs at the national and international levels to characterize the toxic effects of the chemical compounds on the environment by the bacterial microbiotests, a modern and quick alternative to the classic toxicity tests on vertebrates. The studies realized during this project gave information about the metabolic process and bacterial growth of the bacteria from the DCP-B INCD-ECOIND data base: i) *Escherichia coli* (gram-negative bacterium), ii) *Salmonella enterica* (gram-negative bacterium), iii) *Enterococcus faecalis* (gram-positive bacterium), iv) *Pseudomonas aeruginosa* (gram-negative aerobic bacillum). All bacterial strains used had a robust growth in their specific growth medium. This groeth rate was modulated in presence of chlorpyrifos methyl pesticide (Reldan). The new bacterial microbiotests was more sensitive than MARA tests decreasing the MTC50 threshold from 0.44g/l to 0.25g/l. Moreover, the duration length of the new bacterial microbiotests decreased to 3h compared to MARA's tests (18h). Overall, this project developed a more modern, radip and economically efficient new bacterial microbiotest as an alternative to the classic MARA's test.
Summary (short description) RO	Prin tematica abordata, proiectul raspunde preocuparilor si cerintelor legislative atat la nivel national, cat si international de caracterizare a toxicitatii chimicalelor din mediul inconjurator prin microbioteste bacteriene, alternativa moderna si rapida la testele clasice de toxicitate efectuate pe vertebrate. Prin aceste studii s-au caracterizat proprietatile de metabolizare, precum si cele de crestere a tulpinilor bacteriene existente in colectia bacteriana a Departamentului Control Poluare, INCD-ECOIND: i) *Escherichia coli* (bacterie gram-negativa), ii) *Salmonella enterica* (bacterie gram-negativa), (iii) *Enterococcus faecalis* (bacterie gram-pozitiva) (iv) *Pseudomonas aeruginosa* (bacil aerobic gram-negativ). Rezultatele experimentale au demonstrat ca toate tulpinile bacteriene (gram-pozitive si gram-negative) luate in studiu prezinta o rata de crestere robusta intr-un mediu de crestere specific bazat pe proprietatile lor metabolice. Rezultatele experimentale de cuantificare a toxicitatii pesticidului Reldan (clorpirifos metil – substanta activa) au demonstrat ca noul microbiotest bacterian (MTC50 0.25g/l clorpirifos metil) este mai sensibil decat testul MARA (MTC50 0.44 g/l clorpirifos metil). De asemenea, timpul de testare al noului microbiotest bacterian s-a redus de la 18h la 3h. Rezultatele experimentale obtinute au condus la dezvoltarea unui microbiotest bacterian modern, rapid si cost efficient, alternativa viabila la testul clasic MARA.
Dissemination of results	
Full-paper ISI	M.Nita-Lazar, T.Galaon, A.Banciu, I.Paun, C.Stoica, I.Lucaciu. (2016) Screening of various harmful compounds in a new bacterial biological model Journal of Environmental Protection and Ecology JEPE, **17**,

	237-247.
Conferences (platform, poster, abstract / full-paper	Nita-Lazar M., Banciu A., Paun I., Stoica C. and Lucaciu I. Unravel the pesticide effect via a bacterial approach. Proceedings of 5th BENA International Conference, 28-30 May, 2015, Alba Iulia, Romania.
	M. Nita-Lazar, T. Galaon, A. Banciu, I. Paun, C. Stoica, I. Lucaciu. Screening of various harmful compounds in a new bacterial biological model. International Symposium «The Environment and The Industry» - SIMI, 29-30 October, 2015, Bucharest, Romania
	I. Lucaciu, M. Niţă-Lazăr, E. Stănescu, I.Păun, S. Gheorghe, C.Stoica, A.R. Banciu (2015) Strategii de evaluare a biodiversităţii sistemelor acvatice aplicate în Laboratorul Bioteste-Analize Biologice Inventika - Salonul Cercetarii Romanesti, 14-17.10.2015, Bucuresti