Program	**Program NUCLEU PN 16 25 03 11**
Project title (ENG):	**Recycling fly ash in phytoremediation processes of soils polluted with oil products**
Project title (RO):	**Reciclarea cenusilor de termocentrala in procese de fitoremediere a solurilor poluate cu produse petroliere**
Duration	2016 -2017
Team Leader	Senior Researcher Eng. Valeria Nicorescu
Summary (short description) ENG	In the phytoremediation processes of land contaminated with petroleum products (70,45-120,52g / kg s.u.) were studied as process variables: different plant species and mixtures thereof (grasses, leguminous, grasslands plants); use of sludge from sewage treatment plants; the use of lignite-fired ash; using indigenous volcanic tuff. There were elaborated experimental models regarding the in situ phytoremediation of the soils polluted with petroleum products by applying the thermo-central ash for optimizing the process. Experiments were conducted in situ, on soils heavily polluted with petroleum products. For the validation of the phytoremediation models, the synthetic analytical studies of the data from the installation and development of a herbaceous plant crop on variants of polluted soil unfertilized / fertilized with urban sludge were performed in the absence / presence of the ash of the thermal power plant or of the volcanic tuff indigenous. In this way, parallel to a decontamination process of polluted soil, two types of wastes recovery is made: stabilized sludge, resulting from the urban waste water treatment plants and the thermal power station. Based on the experimental data obtained, a phytoremediation technology for soils polluted with petroleum products has been proposed, using as fertilizer the stabilized sludge and an ash amendment for the thermal power station.
Summary (short description) RO	În procesele de fitoremediere a terenurilor contaminate cu produse petroliere (70,45-120,52g/kg s.u) au fost studiate ca variabile de proces: specii diferite de plante şi amestecuri ale acestora (graminee, leguminoase plante de pajişti); utilizarea namolurilor de la statii de epurare ape menajere; utilizarea cenusii de termocentrala pe lignit; utilizarea tufului vulcanic indigen. Au fost de elaborate modele experimentale privind fitoremedierea in situ a solurilor poluate cu produse petroliere aplicând cenuşa de termocentrală pentru optimizarea procesului. Experimentele s-au efectuat, in situ, pe soluri puternic poluate cu produse petroliere. Pentru validarea modelelor de fitoremediere s-a procedat la studii comparative analitico-sintetice a datelor rezultate din procesul de instalare şi dezvoltare a unei culturi de plante ierboase pe variante de sol poluate nefertilizate/fertilizate cu nămol orăşenesc în absenţa/prezenţa cenuşii de termocentrală sau a tufului vulcanic indigen. În acest fel, paralel cu un proces de decontaminare a solului poluat se realizeaza şi o valorificare a doua tipuri de deseuri: namol stabilizat, rezultat din statiile de epurare orasenesti si cenuşa de termocentrala. In baza datelor experimentale obtinute s-a propus o tehnologie de fitoremediere a solurilor poluate cu produse petroliere utilizand ca si fertilizator namolul stabilizat si amendament - cenusa de termocentrala.

Dissemination of results	
Conferences (platform, poster, abstract / full-paper	**Mâșu S.,** The use fly ash in situ phytoremediation of crude oil polluted soils, 10-11 October, **2016,** *22nd International Symposium on Analytical and Environmental Problems*, Szeged, Hungary, Proceeding 223-226**,** ISBN 978-963-306-507-5 Publisher: University of Szeged, Department of Inorganic and Analytical Chemistry, H-6720 Szeged.
	Mâşu Smaranda, Grecu Eugenia, Popa Maria , Oncioiu Ionica, *Aspects in situ oil polluted soil phytoremediation with pastures*, International U.A.B. –B.EN.A Conference „Environmental Engineering and Sustenable Development, 6th, Alba Iulia, Romania, May 25-27th, 2017, Book af Abstracts, p. 251
	Smaranda** Mâşu*, Nicolai Dragomir, Stefanita Mirel Pana, ***Carol Blaziu Lehr, *In-situ phytoremediation variants for TPH polluted soils*, 20th International Symposium "The Environment and the Industry", Bucharest, Romania, September 28-29, 2017, Book of Proceedings, p. 34-41
	Amanda Izabela Siminic, Dorian-Gabriel Neidoni , Mihaela Dragalina, Smaranda Mâşu, *The recycling of fly ash in phytoremediation processes of soils polluted with petroleum products*, 23rd International Symposium on Analytical and Environmental Problems, October 9-10, 2017, Szeged, Hungary, Book of Proceedings, p. 230-233
Full-paper ISI	S. Masu, E. Grecu, M. Popa, I. Oncioiu. Aspects in situ Oil Pollution Soil Phytoremediation with Pasture Plants. Journal of Environmental Protection and Ecology (JEPE), 2017, Vol. 18 (4), pag.1398-1402
Full-paper BDI	Florica Morariu, ***Smaranda Mâșu***, Adina Horablaga, Anca Andreea Marin, Dumitru Popescu, Gheorghe Ciobanu, *Recycling of biological sludge for the fertilizing of soils cultivated with Lolium perenne*, Scientific Papers: Animal Science and Biotechnologies, 2017, 50 (1), P. 152-156