



Part A. PERSONAL INFORMATION

CV date	23/11/2021
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First name	Esperanza		
Family name	Álvarez Rodríguez		
Gender (*)	Mujer	Birth date (dd/mm/yyyy)	14/05/1962
Social Security, Passport, ID number			
e-mail	esperanza.alvarez@usc.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	https://orcid.org/0000-0003-3470-2679		

(*) Mandatory

A.1. Current position

Position	Full Professor (Catedrática de Universidad)		
Initial date	January 2019		
Institution	University of Santiago de Compostela		
Department/Center	Soil Science and Agricultural Chemistry	Higher Polytechnic School of Engineering	
Country	Spain	Teleph. number	
Key words	Soil fertility; rhizospheric and non-rhizospheric soil; aluminium toxicity; contamination by heavy metals; contamination by antibiotics; waste for agriculture; waste as bioabsorbent of pollutants		

A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
1987-1990	PhD student (Becaria FPI) - University of Santiago de Compostela
1991-1992	Assistant of University College - University of Santiago de Compostela
1992-1995	University Assistant - University of Santiago de Compostela
1995-1997	Interim University Teacher - University of Santiago de Compostela
1997-2018	University Teacher - University of Santiago de Compostela

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Biology	University of Santiago de Compostela	1990
Graduated in Biology	University of Santiago de Compostela	1986
Bachelor's degree in Biology	University of Santiago de Compostela	1985

Part B. CV SUMMARY (max. 5000 characters, including spaces)

I carried out my PhD work entitled "Study of different forms of aluminum present in the soil solution of Galicia" in the USC, financed by a predoctoral fellowship FPI (1987-1990) and I got the Extraordinary Doctorate Award (1990). I did a pre-doctoral stay at INRA in Rennes (France) studying the geochemistry of Al. As a post-doctoral researcher first, I continued working in the INRA (Rennes) and after in the Higher School of Mines of the Oviedo Univ. (Spain). My work on aluminum speciation was pioneers in Galicia and in the temperate-humid zone. It is an element of high phytotoxicity and my research showed that the most toxic species of Al (Al^{3+}) were only present in soils with $pH < 4$ and that the high content of organic matter in our soils controlled the toxicity of the Al. This knowledge is essential for soil management to avoid Al toxicity and to improve plant production.

In 1991, I moved to the Higher Polytechnic School of Engineering (Campus of Lugo, USC) working as University Professor and I created a new researcher subgroup (Principal Researcher -IP). Currently I am a Full Professor (Catedrática de Universidad) with "five-year periods of research" ("5 *sexenios*", last one 2013-2018).



I have directed 8 Doctoral Theses that obtained the maximum qualification. Some of these Doctors are currently working in R&D for multinational companies or in teaching or research institutions. I was supervisor of two theses from other countries, one from Lithuania and another one from Brazil and both PhDs are still working at their university. I am currently supervising Thesis of doctoral students from Mozambique, Panama, another in collaboration with the University of Vigo and two from USC. I also supervised around 91 Career Graduation Works, Advanced Studies Diplomas and Final Degree Projects. For all of them, the training phase performed with us has been of clear value.

Another of my research line is related to the mine dump restoration and with the contamination by different pollutants. I worked on the restoration of the As Pontes Mine in collaboration with ENDESA and our work on the management of pyritic waste to avoid the toxicity of heavy metals and Al, was essential to successfully recover 1,200 ha of mine tailings. During the last 15 years I began to study the different wastes from various industrial activities abundant in Galicia as well as its potential to recycle them in the agriculture or to decrease the soil and water contamination. We study the use of these residues as fertilizers, amending and/or bioadsorbents for heavy metals and antibiotics in contaminated soils and waters. This line was directly related with various enterprises clearly interested on it, and included sewage sludge, wood ash, mussel shell and various other wastes and by-products. The use of bioadsorbents, allows us to reduce the negative effects of heavy metals, antibiotics and other kinds of emerging pollutants, which is a matter of main relevance and concern for researchers and the overall society. In this subject, we collaborated with the group of M. Arias (UVigo).

I was de PI of 17 research projects, 8 of them financed by the central government (CICYT, Ministries of Science and Technology; Economy and Competitiveness; Science, Innovation and Universities), and 9 of the Autonomic Government. I also participated as investigator in other 28 research projects, 10 of them international projects. As PI, I have directed more than 66 contracts with the Administration and with Companies related to industrial activities that cause environmental impacts and with waste and fertilizer management carrying out specific advisory activities in the agricultural, environmental and technological fields. I also collaborated as a researcher in other 17 contracts. As a result of this research, I have published more than 250 items (with around 180 being research papers, 135 in JCR Journals, most of them Q1 journals), earned 1 patents, as well as research awards. I presented 165 communications to national (86) and international congresses (79).

In addition, I collaborate with various research teams abroad (from Lithuania, Brazil, Tunisia, Italy, China, India, Kazakhstan), mostly in applied research, some of that being incorporated to PhD Thesis, and I am also starting agreements for supervising tasks in relation to other PhD Thesis to be carried out in foreign countries (Mozambique, Panama).

Starting from January I will be the coordinator of Sustainable Environmental and Forestry Management Unit (www.uxafores.com/equipo), a research group evaluated as competitive by the Galician Agency for Evaluation and Accreditation. I am currently evaluator of scientific works in numerous international journals and evaluator of national research projects. I was guest editor of special issues for Environmental Science and Pollution Research journals.

Part C. RELEVANT MERITS (*sorted by typology*)

C.1. Publications (*see instructions*) **Total articles JCR 2011-2021: 101. Some examples:**

1- M. Conde-Cid, R. Cela-Dablanca, G. Ferreira-Coelho, D. Fernández-Calviño, A. Núñez-Delgado, M.J. Fernández-Sanjurjo, M. Arias-Estévez, **E. Álvarez-Rodríguez**. 2021. Sulfadiazine, sulfamethazine and sulfachloropyridazine removal using three different porous materials: Pine bark, oak ash and mussel Shell. *Environmental Research* 195: 110814-110820.

2- C. Álvarez-Esmorís, M. Conde-Cid, M.J. Fernández-Sanjurjo, A. Núñez-Delgado, **E. Álvarez-Rodríguez**, M. Arias-Estévez. 2021. Environmental relevance of adsorption of doxycycline, enrofloxacin, and sulfamethoxypyridazine before and after the removal of organic matter from soils. *Journal of Environmental Management* 287: 112354-112364.

3- C. Álvarez-Esmorís, M. Conde-Cid, D. Fernández-Calviño; M.J. Fernández-Sanjurjo, A. Nuñez-Delgado, **E. Álvarez-Rodríguez**. 2020. Adsorption-desorption of doxycycline in agricultural soils: batch and stirred-flow-chamber experiments. *Environmental Research* 186: 109565-109575.



- 4- M. Conde-Cid, G. Ferreira-Coelho, D. Fernández-Calviño, A. Núñez-Delgado, M.J. Fernández-Sanjurjo, M. Arias-Estévez, **E. Álvarez-Rodríguez**. 2020. Single and simultaneous adsorption of three sulfonamides in agricultural soils: effects of pH and organic matter content. *Science of the Total Environment* 744: 140872-140882.
- 5- M. Conde-Cid, D. Fernández-Calviño, A. Núñez-Delgado, M.J. Fernández-Sanjurjo, M. Arias-Estévez, **E. Álvarez-Rodríguez**. 2020. Influence of mussel shell, oak ash and pine bark on the adsorption and desorption of sulfonamides in agricultural soils. *Journal of Environmental Management* 261: 110221-110231.
- 6- M. Conde-Cid, D. Fernández-Calviño, J.C. Nóvoa-Muñoz, A. Núñez-Delgado, M.J. Fernández-Sanjurjo, M. Arias-Estévez, **E. Álvarez-Rodríguez**. 2019. Experimental data and model prediction of tetracycline adsorption and desorption in agricultural soils. *Environmental Research* 177: 1-13.
- 7- M. Conde-Cid, G. Ferreira-Coelho, M. Arias-Estévez, C. Alvarez-Esmorís, J.C. Nóvoa-Muñoz, A. Núñez-Delgado, M.J. Fernández-Sanjurjo, **E. Álvarez-Rodríguez**. 2019. Competitive adsorption/desorption of tetracycline, oxytetracycline and chlortetracycline on pine bark, oak ash and mussel shell. *Journal of Environmental Management*. 250: 109509. DOI: 10.1016/j.jenvman.2019.109509.
- 8- M. Conde-Cid, J.C. Nóvoa-Muñoz, A. Núñez-Delgado, M.J. Fernández-Sanjurjo, M. Arias-Estévez, **E. Álvarez-Rodríguez**. 2019. Experimental data and modeling for sulfachloropyridazine and sulfamethazine adsorption/desorption on agricultural acid soils. *Microporous and Mesoporous Materials* 288:109601. DOI: 10.1016/j.micromeso. 2019. 109601.
- 9- M. Conde-Cid, D. Fernández-Calviño, M.J. Fernández-Sanjurjo, A. Núñez-Delgado, **E. Álvarez-Rodríguez**, M. Arias-Estévez. 2019. Adsorption/desorption and transport of sulfadiazine, sulfachloropyridazine, and sulfamethazine, in acid agricultural soils. *Chemosphere* 234:978-986.
- 10- D. Fernández-Calviño, L. Cutillas-Barreiro, J.C. Nóvoa-Muñoz, M. Díaz-Raviña, M.J. Fernández-Sanjurjo, **E. Álvarez-Rodríguez**, A. Núñez-Delgado, M. Arias-Estévez, J. Rousk. 2018. Using pine bark and mussel shell amendments to reclaim microbial functions in a Cu polluted acid mine soil. *Applied Soil Ecology* 127: 102-1110.

C.2. Congress. Total Congress 2011-2021: 91. Some examples:

- 1- Álvarez-Esmorís, C., Conde-Cid, M., Fernández-Calviño, D., Fernández-Sanjurjo, M.J., **Álvarez-Rodríguez, E.**, Núñez-Delgado, A., Arias-Estévez, M. , 2020. Evaluation of enrofloxacin adsorption/desorption in soils using a stirred flow chamber .Congreso: SETAC SciCon, the SETAC Europe 30th Annual Meeting. Lugar de celebración: Irlanda Fecha: 3-7 mayo 2020
- 2- Cristina Álvarez-Esmorís, Manuel Conde-Cid, María José Fernández-Sanjurjo, Avelino Núñez-Delgado, **Esperanza Álvarez-Rodríguez**; Manuel Arias-Estévez, 2019. Retention of enrofloxacin in agricultural soils. 8th International Symposium on Interactions of Soil Minerals with Organic Components and Microorganisms & International Congress of the Division 2.5 of the International Union of Soil Sciences (IUSS). ISMOM 2019. Lugar de celebración: Sevilla Fecha: 23-28 junio 2019
- 3- M. Conde-Cid , D. Fernández-Calviño, J.C. Nóvoa-Muñoz, A. Núñez-Delgado, M.J. Fernández-Sanjurjo, **E. Álvarez-Rodríguez**, M. Arias-Estévez,2019. Pine bark amendment greatly reduces the mobility of sulfonamides in soils. 5th International Congress on Water, Waste and Energy Management. WWEM-19. Actas Congreso. Lugar de celebración: París Fecha: 22-24 Julio 2019
- 4- V. Santás-Miguel , M.J. Fernández-Sanjurjo, A. Núñez-Delgado, **E. Álvarez-Rodríguez**, Á. Martín, M. Díaz-Raviña, M. Arias-Estévez, D. Fernandez-Calviño . 2019. Use of biomass ash to reduce tetracycline antibiotics toxicity on soil bacterial communities. Congreso: 5th International Congress on Water, Waste and Energy Management. WWEM-19. Actas Congreso. Lugar de celebración: París Fecha: 22-24 Julio 2019.
- 5- Sarra Karoui, Rim Ben Arfi, María J. Fernández-Sanjurjo, Avelino Núñez-Delgado, Achraf Ghorbal, **Esperanza Álvarez-Rodríguez**, 2019. Optimization of simultaneous removal of toxic oxy-tetracycline



and cadmium by novel biocomposite beads. International Congress on Energetic and Environmental Systems (IEES-219). Actas Congreso. Lugar de celebración: Túnez Fecha: 1-3 noviembre 2019

6- Sarra Karoui, Rim Ben Arfi, María J. Fernández-Sanjurjo, Avelino Nuñez-Delgado, Achraf Ghorbal, **Esperanza Álvarez-Rodríguez**, 2019. Simultaneous removal of binary toxic antibiotic and heavy metal by novel biocomposite beads: Central composite design, kinetic and isotherm study using Brouers-Sotolongo family models. 2nd Euro-Mediterranean Conference for Environmental Integration.: Actas Congreso. Lugar de celebración: Sousse (Túnez) Fecha: 10-13 octubre 2019.

C.3. Research projects. Total 2011-2021. As PI: 7. As investigator: 10. Some examples:

1- Antibióticos de consumo humano en zonas agrícolas tratadas con lodos de depuradora y estrategias de control usando bioadsorbentes: niveles, adsorción, movilidad y transporte (Ref. RTI2018-099574-B-C21). Funding Entity: Ministerio de Ciencia, Innovación y Universidades. Duration, 1/01/2019 to 31/12/2021. Principal investigator (PI): **E. Álvarez Rodríguez** & M.J. Fernandez Sanjurjo.

2- Problemas ambientales derivados de la presencia de antibióticos de uso veterinario en el suelo (Ref. CGL2015-67333-C2-1-R). Funding Entity: Ministerio de Economía y Competitividad. Duration, 1/01/2015 to 31/12/2018. PI: **E. Álvarez Rodríguez**.

3- Diagnóstico de la contaminación por metales pesados solubles en forma aniónica y otros aniones inorgánicos. medidas de control en suelos antropizados (Ref. CGL2012-36805-C02-01). Funding Entity: Ministerio de Economía y Competitividad. Duration, 01/02/2013 to 31/01/2016. PI: : **E. Álvarez**.

4- Demostración de la mejora en la biodiversidad edáfica, funcionalidad y servicios ecosistémicos en terrenos contaminados y degradados mediante fitogestión dentro de la región Interreg Sudoe (Ref. PhytoSUDOE, SOE1/P5/E0189). Funding Entity: FEDER.). Duration: 1/7/2016 to 31/10/2018. PI: USC: M.C. Monterroso. Investigator: **E. Álvarez Rodríguez**

5-Agroforestry Innovation Networks (AFINET). European Union's Horizon 2020 research and innovation programme under grant agreement No 727872. USC, Coordinator (Spain); PI: Rosa Mosquera Losada. Referencia: AFINET-727872. Investigator: **E. Álvarez Rodríguez**

6- Development of ecologically safety agropreparats of prolonged action for crop yields increasing and soils rehabilitation. MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN. Center of Physical Chemical Methods of Research and Analysis (CPCMA) OF KAZAKHSTAN; Universidad de Santiago. International Scientific Collaborator: **E. Álvarez Rodríguez**. 2018-2020. PI: Sergey Nechipurenko and Azhar Atchabarova

C.4. Contracts, technological or transfer merits. Total contracts 2011-2021: 52. Ex:

1-Análisis de suelos. Company: Delagro Sociedad Cooperativa (Refs. 2013-CE218; 2018-SG001-7). Duration: 2013-2021. PI: **E. Álvarez Rodríguez**

2-Productos plasticos de un solo uso con biodegradabilidad controlada (BIO+)” en el marco del Programa CIEN. Funding Entity: CDTI del Ministerio de Ciencia, Innovación y Universidades en colaboración con las empresas: Plásticos Industriales y Comerciales de Alfarrasí, S.L.; Thermolympic, S.L.; Nupik Internacional, S.L.U.; Pérez Cerdá, S.A.; Indesla, S.L.; Granzplast, S.A.; Duración: 18/07/2017 a 17/07/2021; PI: **E. Alvarez Rodríguez**; Programa Estratégico Cien: IDI-20171082; Cuantía: 60000€

Patent: Authors: Núñez-Delgado, A.; Fernández-Sanjurjo, M.J.; **Álvarez-Rodríguez, E.**; Seco-Reigosa, N. Composición para su uso como fertilizante y procedimiento de obtención. Nº de solicitud: 201200392. País de prioridad: España. Fecha de concesión: 23/04/2013. Nº de publicación: ES 2 382 067 B1. Entidad titular: USC (100%).