MINISTERIO DE CIENCIA E INNOVACIÓN

Financiado por la Unión Europea NextGenerationEU

Plan de Recuperación, Transformación y Resiliencia

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

CV date	20/01/2023

Part A. PERSONAL INFORMATION

First name	JUAN JOSE		
Family name	LUCENA MAROTTA		
Gender:	male		
Researcher ID	L-3513-2013		
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https://portalcientifico.uam.es/es/ipublic/researcher/259966		Web	www.micronutrientsinplants.com

A.1. Situación profesional actual

Institution	Universidad Autónoma de Madrid		
Dptment./Center	Química Agrícola y Bromatología		
Country	Spain	Telph	914973968
Position	Catedrático de Universidad	Initial date	2006-01-28
keywords	Agricultural chemistry, soil, plant, fertilizers, micronutrients		

A.2.Previous positions (research activity interruptions, art. 45.2.c))

Period	Position/Institution/Country/Interruption cause
01-05-16// 31-06-21	Department head
10-01-06// at present	Senior Professor Universidad Autónoma of Madrid
1-07-99// 31-10-99	MEC research grant. Beltsville Agricultural Research Center. USDA. Washington (USA)
1-07-96// 30-9-96	Intercampus Lecturer. Universidad Agraria Antonio Narro (México)
1-8-94 // 31-10-94	Senior NATO grant. University of Wisconsin-Madison (USA)
30-10-93// 9-01-06	Full Professor Autónoma of Madrid
1-10-93// 29-10-93	Lecturer Universidad Autónoma of Madrid
1-10-88// 30- 9-93	LRU Assistant professor Universidad Autónoma of Madrid
1-10-87// 30- 9-88	Fulbright Colorado State University (USA)
1- 1-87// 30- 9-87	Assistant professor Universidad Autónoma of Madrid
1- 1-83// 31-12-86	FPI Grant holder Universidad Autónoma of Madrid
1- 7-86// 1-12-86	Fundación R. Areces Grant holder Universidad Autónoma of Madrid

A.3. Education

Ph.D., Licensed, Graduate	University/Country	Year
Ph.D. Agricultural Chemistry	Universidad Autónoma de Madrid	1986
Licensed in Chemistry	Universidad Autónoma de Madrid	1982

Part B. CV SUMMARY

Graduated (1982) in Chemistry at the University Autónoma of Madrid. FPI Grant (1963-1986). Ph.D (1986, UAM) on the chemistry of chelation in the soil plant-system. Fulbright postdoc in Colorado State University with WL Lindsay studying Chemical equilibria of natural and synthetic chelates (1987-88). LRU assistant (1988-1993). Other postdoc research on chelates characterization and chelate-plant interaction in U. of Wisconsin with P Barak (1994 NATO grant) and in Beltsville ARC (USDA) with R Chaney (1999 MEC Grant) respectively. Full professor 1993- 2006. Senior Professor 2006-today.

Research Activities: Chemistry of micronutrients in fertilizers (chelates and complexes), soils and plants. Special fertilizers (Si, algae extracts)

Main achievements: due to the great variability among Fe chelates quality in the market (J. Plant Nutr.1995, 18:1209), we developed an HPLC method to quantify Fe chelates in fertilizers (J Chrom A 1996,727:253 and 1997,789:453). With this basis, CEN delivered several standards that are now Official Methods in Europe. EDDHA isomers were firstly described (Plant Soil 2006,279:31; J Agric Food Chem 2006,54:4355, etc) by our group. Also, we elucidate the mechanisms of interaction of chelates with soil and plants (J Agric Food Chem 2001,49:5258; J Plant Nutr 2006,29:423, Org Biomol Chem 2012,10:2272; J Sci Food Agric 2016,96:1111). Recently we have investigated new ecofriendly chelating agents (J Chrom A, 2005,1064:67; Plant Soil 2006,279:31 and 2009,325:65, Front. Plant Sci 2015, 6:752). Our group has also provided the analytical methods now required in the UE for the control natural complexes of these fertilizers (J Agric Food Chem, 2007,55:5746) and the knowledge of their behavior in the soil plant system (J Plant Nutr Soil Sci, 173:900; J Agric Food Chem, 60,3331.

We were pioneer on the use of several techniques such as **stable isotopes** to track Fe or Zn applied by fertilizes in plants (Ana. Bioanal Chem 2008,390:579; J Sc. Food Agric 2011,91:395).

The special fertilizer market is now under the focus. Our current project deals with its harmonization. It includes different product categories, which efficacy and evaluation methods need to be clarified. The understanding of the mechanisms related to Si and algae extract effects on micronutrient nutrition is needed. Also testing and determining fertilizer properties of new micronutrient product will be on our focus.

This research has needed a large number of collaborations from National and International centers and the support of private companies.

Author in 13 books, 132 Papers in scientific journals, 78 Papers in book chapters, 30 papers in dissemination technical journals. **Research Leader** in 62 projects. Adviser in 16 PhD. Participation in **scientific meetings**: Invited for 23 lectures and panelist in 5 roundtables.179 voluntary communications. Organizer (one as president) of four Meetings. 6 research Sexennial (last in 2020) + 1 Transfer Sexennial

Part C. RELEVANT MERITS (sorted by typology)

C.1. . Publications (last relevant ten papers in Q1)

- López-Rayo S, Valverde S, and Lucena JJ* (2023) [S,S]-EDDS ligand as a soil solubilizer of Fe, Mn, Zn, and Cu to improve plant nutrition in deficient soils. J. Agric. Food Chem 2023, 71, 25, 9728–9737 DOI: 10.1021/acs.jafc.3c02057
- Valverde S, Williams PL, Mayans B, Lucena JJ and Hernández-Apaolaza, L (2022) Comparative study of the chemical composition and antifungal activity of commercial brown seaweed extracts Front. Plant Sci. 13:1017925. doi: 10.3389/fpls.2022.1017925

- Valverde S, Arcas A, López-Rayo S and Lucena JJ (2022) Enantioselective Separation of a Novel Iron Chelate Prototype with Potential Use as Fertilizer by HPLC-DAD ACS Agric. Sci. Technol. 2022, DOI:10.1021/acsagscitech.2c00133
- Valverde S, Arcas A, López-Rayo S and Lucena JJ (2021) Fast Determination of a Novel Iron Chelate Prototype Used as a Fertilizer by Liquid Chromatography Coupled to a Diode Array Detector J Agric Food Chem 2021 69 (51), 15746-15754 DOI: 0.1021/acs.jafc.1c05943
- Islas-Valdez S, López-Rayo S and Lucena JJ* 2021 Implications of the Mn:ligand ratio for Mn uptake by *Glycine max* L. plants fertilized with heptagluconate and gluconate complexes. J. Sci. Food. Agric. doi: 10.1002/jsfa.11110.
- Cieschi MT and Lucena JJ 2021 Leonardite iron humate and synthetic iron chelates mixtures in Glycine max nutrition. J. Sci. Food. Agric. doi: 10.1002/jsfa.11060
- Islas-Valdez S, López-Rayo S, Arcos J, Menéndez N, Lucena JJ 2020 Effect ofFe:ligand ratios on hydroponic conditions and calcareous soil in Solanum lycopersicum L. and Glycine max L. fertilized with heptagluconate and gluconate. Journal of the Science of Food and Agriculture 100: 1106–1117
- Islas-Valdez S, López-Rayo S, Hristov-Emilov H, Hernández-Apaolaza L, Lucena JJ* 2020 Assessing metal–lignosulfonates as fertilizers using gel filtration chromatography and high-performance size exclusion chromatography. Int J. Biol Macromol. 142:163-171
- Ferreira CM, López-Rayo S, Lucena JJ*, Soares EV, Soares HM* 2019 Evaluation of the efficacy of two newbiotechnological-based freeze-dried fertilizers for sustainable Fe deficiency correction of soybean plants grown in calcareous soils. Frontiersin Plant Science. 10:1335
- Cieschi MT, Polyakov AY, Lebedev VA, Volkov DS, Pankratov DA, VeligzhaninAA, Perminova IV and Lucena JJ 2019. Eco-Friendly Iron-Humic Nanofertilizers Synthesisfor the Prevention of Iron Chlorosis in Soybean (*Glycine* max) Grown in Calcareous Soil. Frontiers in Plant Science. 10:413

C2. Congress (relevant)

19 Keynotes speaks in international meetings

Disseminator speaker in scientific sessions, on more than 30 occasions for various national and international companies

Last ten by invitation

- Lucena, J.J.* and López-Rayo, S. Iron fertilization: Providing external sources or mining soil Fe? 19th International Symposium on Iron Nutrition and Interaction in Plants. ISINIP 2018. July 2018. Taipei (Taiwan)
- Lucena J.J. Extractos de aminoácidos como complejantes de metales y como bioestimulantes Santarem (Portugal), Octubre 27-28, 2016. 2º Sympósio Nacional de Fertilição e Ambiente.
- Lucena J.J. Quelatos de micronutrientes metálicos: Criterios de eficacia. Maceió (Brasil), Septiembre 17-21, 2012. Fertibio XXX Reunião Brasileira de Fertilidade do Solo e Nutrição de Plantas
- Lucena J.J. Tendencias actuales en la investigación sobre fertilizantes de micronutrientes metálicos. Madrid (Spain), Julio 23-26, 2012. 6th International XIV Simposio Hispano-Luso de Nutrición Mineral de las Plantas.
- Lucena J.J. Searching for new, effective, cheap and environmental friendly Fe fertilizers. Amherst, Massachusetts (USA), Junio 17-21, 2012. 16th International Symposium on Iron Nutrition and Interactions in Plants.
- Lucena J.J. Legislación y buenas prácticas agrícolas en la fertilización con micronutrientes. Almería. Noviembre 2009. III Jornadas del Grupo de Fertilización de la SECH.
- Lucena J.J. Fertilizantes de micronutrientes: Implicaciones medioambientales. Oviedo. Septiembre 2009. XXXII Bienal de la RSEQ
- Lucena J.J. What's new in micronutrient chelates and complexes in Europe? Barcelona.

Marzo 2009. VII New Ag International Conference and exhibition.

C.3 Projects

IP of 23 project (9 of competitive calls, including one of infraestructures) and one company sponsored Chair during the last 10 years. Raised a total of 2.678.659 Euros

Three last obtained in competitive calls

- Una valorización innovadora de ligninas Kraft en fertilizantes y bioestimulantes sostenibles basados en economía circular (lignoeficien-P) Ministerio de Ciencia e innovación CPP2021-008409 2022-2025
- Uso de una nueva molécula natural y orgánica, con capacidad de inhibir la actividad ureasa, en fertilizantes organominerales (orgamin-plus) Ministerio de Ciencia e innovación CPP2021-008323 3 años. 2022-2025
- Nuevos fertilizantes de micronutrientes y bioestimulantes: criterios de eficacia y mecanismos de acción. Ministerio de Ciencia, Innovación y Universidades. RTI2018-096268-B-I00

C.4 Patents

- PCT7ES-01/00243, (14,06,01) WO 02/00604 A1
- P 2001-101385
- P 2004-0407607.1; 0413698.2 EPO 70444; WO2005095305-A1; AN 2005:1103721; CAN 143:366656; AN 2005:1103721
- EP 06127041.9-2103; WO2008077897-A1 20080703; CAN 149:104017; AN 2008:796513; EP1939157-A1; IN200902067-P2; AU2007338021-A1; KR2009097889-A; EP2125671-A1; MX2009006727-A1; CN101616880
- EP 09461511.9 – 2117
- PCT/PT2019/050041

C.5 Thesis

Supervisor of 16 PhD thesis and 3 in develoment. Two of them were awared with the "Fertiberia price to the best PhD thesis in Agriculture"

C.6. Member de International committees

Member of the Organizing committee in 7th ISINIP. Zaragoza, 1993; VII Simposio Nacional-III Ibérico sobre Nutrición Mineral de las plantas. Madrid 1998; XIV Simposio Hispano-Luso de Nutrición Mineral de las Plantas. Madrid 2012

President of the organizing committee 18th ISINIP 2016. May-Jun 2016. Madrid.

Member of the steering international committee for the organization of the ISINIP since 2012

1998-present: Member of the expert committee on fertilizers. Spanish Ministry of Agriculture; 2000-present Member AENOR Committee AEN/CTN-142 for standardization of fertilizers and liming materials.

2002-2019 Convenor of the CEN/TC 260/WG 5 "Chelated trace Elements".

Since 2002 Unofficial Advisor for the EC, DG GROW D.2, (formerly DG Enterprise and Industry, Unit F2)

C.7 Honors and Awards

National Prize "Chemistry and Environment" of the RSEQ and DuPont2008.

NATO Senior Grant 1994.// Fulbright Grant 1987-1988

C.8 Dissemination

30 papers in dissemination journals (Phytoma, Vida rural, Agricultura,Tierras..)