



## **José Ramón Acosta Motos**

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## Summary of CV

This section describes briefly a summary of your career in science, academic and research; the main scientific and technological achievements and goals in your line of research in the medium -and long- term. It also includes other important aspects or peculiarities.

My professional experience begins as an internal student for two years (2006-2007 and 2007-2008) in the Department of Plant Physiology at the Universidad de Murcia (UM) under the supervision of Professors Don José Sánchez Bravo and Don Manuel Acosta Echeverría. I finished my career in 2008 studying two specialties (biosanitary and biotechnology). During a year (2008-2009) I was collaborating with the GENZ group, belonging to the Department of Biochemistry and Molecular Biology of the Universidad de Murcia (UM), supervised by professors Francisco García Cánovas, José Neptuno Rodríguez López and José Tudela.

In 2009 I was awarded with an FPI grant, for 4 years, to perform my PhD at the Centro de Edafología y Biología Aplicado del Segura (CEBAS-CSIC) under the direction of Jose Antonio Hernández Cortés and María Jesús Sánchez Blanco. I carried out a study of two ornamental plants (myrtle and eugenia), to evaluate their morphological, physiological and biochemical responses to different types of water. During the period of Scholarship I made a stay of 3 months in the Department of Agrarian Sciences and the Natural Environment at the Universidad Jaume I de Castellón (UJI) under the supervision of Professor Aurelio Gómez Cadenas. Related with this stay I have published a scientific paper and sent two communications to congress. Between September 2013 and September 2015 (two years) I obtained the title of Doctor (7/10/2014) with a note of "Sobresaliente Cum laude" (with mention of quality).

Regarding to my international experience I have enjoyed a postdoctoral stay from October 2015 to June 2016 (9 months) at the Lancaster Environment Center (LEC) under the supervision of Professors Ian Dodd and Hao Zhang. I have worked in the cultivation of rice plants studying their response to different irrigation strategies by combining it with soils with a high and low concentration of phosphorus. To date I have made an oral communication for Congress and a course entitled " Global Food Security: Addressing the Challenge" and I am preparing a very advanced version as a future publication titled "Alternate wetting and drying irrigation increases water and phosphorus efficiency of vegetative rice plants independent of soil phosphorus status".

I have finished 2 MSc: 1) In Advanced Techniques in Agrarian and Food Development at the Universidad Politécnica de Cartagena (UPCT-ETSIA); 2) In Current Techniques in Statistics applied through the Universidad de Educación a Distancia (UNED). Currently I am doing a third MSc in Bioinformatics and Biostatistics carried out through the Universitat Oberta de Catalunya (UOC) and the Universidad de Barcelona (UB).



I am currently working at the Catholic University of Murcia (UCAM) as part of the Scientific Committee of the UCAM-Santander Chair. Entrepreneurship in the agri-food sector. I perform coordination, teaching and dissemination tasks. In addition, my collaboration with the Institute of BioEngineering of the Miguel Hernández University in Elche continues under the supervision of Professor José Manuel Pérez-Perez, performing analysis and interpretation of statistical analyzes. Two communications to Congresses have already been presented. Also, a very advanced version of a future publication entitled "Integration of phenotypic, metabolomic and genetic data to identify novel regulators of roots adventicias development" is being prepared.

## General quality indicators of scientific research

This section describes briefly the main quality indicators of scientific production (periods of research activity, experience in supervising doctoral theses, total citations, articles in journals of the first quartile, H index...). It also includes other important aspects or peculiarities.

It is important to highlight the relevance of the international journals in which most of the results have been published: *Planta*; *Agronomy*; *Physiology and Biochemistry*; *Journal of Plant Physiology*, all of them belonging to the first quartile and of high impact factor. As well as, *Journal of Horticultural Science Biotechnology* and *Acta Horticulturae* within the publications related with Horticulture. The selection as oral communications of several contributions to scientific meetings and their presentation in an international context (Portugal, France, Italy) gives more relevance to the results.

### Research items:

- 17 articles (9 Q1 according to JCR), 15 articles as the first author.
- 2 book chapters, one of them under review
- 3 technical documents
- 21 participations in national and international conferences

We recently received an award for the journal *agronomy* as the most cited and most read paper: "Plant Responses to Salt Stress: Adaptive Mechanisms" during the year 2017. Related Links with this paper: <https://bit.ly/2wrBfD4> (Award-Agronomy-Europapress), <https://bit.ly/2wpV122> (Award-Agronomy-20 minutos), <https://bit.ly/2Nq7JVP> (Award-Agronomy-La Opinión de Murcia), <https://bit.ly/2TqQXlt> (Award-Agronomy-Antioxidantsgroup), <https://bit.ly/2VtqX0S> (Award-Agronomy-Ciencia CEBAS'S Blog), <https://bit.ly/2MCK906> (Award-Agronomy-La Vanguardia).

### Links of interest related with my research:

<https://bit.ly/2xbT3m6> (Researchgate), <https://bit.ly/2VwkVwt> (LinkedIn), <https://bit.ly/2xbrLNm> (Loopfrontiers), <https://bit.ly/2OnEraE> (Mendeley), <https://bit.ly/2Ngol6p> (Scholar Google Citations), <https://bit.ly/2p91FXa> (PhD-Abstract), <https://bit.ly/2p8cSHh> (PhD-El Click Verde), <https://bit.ly/2QxrK86> (PhD-Dialnet), <https://bit.ly/2OjfEV5> (PhD-Kitaro-Programa de radio), <https://bit.ly/2Mwf4S5> (PhD-Murcia.com), <https://bit.ly/2F7uZHq> (PhD-La Verdad de Murcia), <https://bit.ly/2Olaubb> (PhD-iagua), <https://bit.ly/2zYKVYN> (Water Shortage-UCAM), <https://bit.ly/2CH7UKo> (Water Shortage-FanpageFacebook), <https://bit.ly/2NuD1tR> (Water Shortage-Video Popular TV), <https://bit.ly/2CammfM> (Water Shortage-La Vanguardia), <https://bit.ly/2zYcKQV> (Water Shortage-Murciaeconomia), <https://bit.ly/2ON8ig7> (Water Shortage-Murcia.com), <https://bit.ly/2CCdz4H> (Water Shortage-Mundo Cooperativo), <https://bit.ly/2NziZ1b> (Water Shortage-20 minutos), <https://bit.ly/2RTz05m> (Water Shortage-Cope Radio), <https://bit.ly/2Vv0bFx> (Water Shortage- Europapress), <https://bit.ly/2QBFBA5> (Water Shortage-La Opinión de Murcia), <https://bit.ly/2E8bLBK> (Water Shortage-Novaciencia), <https://bit.ly/2NvLYTq> (Water Shortage-La Verdad de Murcia), <https://bit.ly/2NvLYTq>



bit.ly/2P35rM7 (Gastrolab-UCAM), <https://bit.ly/2C2MpRx> (Gastrolab-Murcia.com), <https://bit.ly/2SAB4PF> (Gastrolab-La Verdad de Murcia), <https://bit.ly/2scy1BS> (Gastrolab-Mundo Cooperativo), <https://bit.ly/2FENcgN> (Gastrolab-La Opinión de Murcia),

**José Ramón Acosta Motos**

Surname(s): **Acosta Motos**  
 Name: **José Ramón**  
 DNI: **48497175L**  
 ORCID: **0000-0001-5828-6177**  
 ScopusID: **35758441000**  
 ResearcherID: **B-2255-2017**  
 Date of birth: **14/11/1981**  
 Gender: **Male**  
 Nationality: **Spain**  
 Country of birth: **Spain**  
 Aut. region/reg. of birth: **Region of Murcia**  
 Contact province: **Region of Murcia**  
 City of birth: **Murcia**  
 Contact address: **Avenida Juan Carlos I**  
 Postcode: **30008**  
 Contact country: **Spain**  
 Contact aut. region/reg.: **Region of Murcia**  
 Contact city: **Murcia**  
 Land line phone: **(+34) 968233685**  
 Email: **jracosta@ucam.edu**  
 Mobile phone: **(+34) 608848972**

**Current professional situation**

**Employing entity:** Universidad Católica San Antonio de Murcia

**Department:** Cátedra UCAM-Santander. Emprendimiento en el ámbito agroalimentario, Cátedra UCAM-Santander. Emprendimiento en el ámbito agroalimentario

**Professional category:** Post Doctoral Research

**Start date:** 20/11/2017

**Type of contract:** Freelance

**Dedication regime:** Part time

**Primary (UNESCO code):** 310000 - Agricultural Sciences

**Secondary (UNESCO code):** 241714 - Plant genetics; 241717 - Plant nutrition; 241719 - Plant physiology

**Performed tasks:** I am currently working at the Catholic University of Murcia (UCAM) as part of the Scientific Committee of the UCAM-Santander Chair. Entrepreneurship in the agri-food sector. I perform coordination, teaching and dissemination tasks.

**Identify key words:** Agriculture

**Previous positions and activities**

	<b>Employing entity</b>	<b>Professional category</b>	<b>Start date</b>
<b>1</b>	Lancaster Environment Center (LEC)	Postdoctoral Researcher	12/10/2015
<b>2</b>	Centro de Edafología y Biología Aplicada del Segura	Postdoctoral Researcher	02/09/2013

	Employing entity	Professional category	Start date
3	Centro de Edafología y Biología Aplicada del Segura	FPI Fellow	01/09/2009
4	Universidad de Murcia	Researcher in training	01/09/2008
5	Universidad de Murcia	Internal Student	01/09/2006

**1 Employing entity:** Lancaster Environment Center (LEC)

**Department:** Lancaster Environment Centre (LEC)

**City employing entity:** Lancaster, Lancashire, United Kingdom

**Professional category:** Postdoctoral Researcher

**Start-End date:** 12/10/2015 - 30/04/2016

**Duration:** 7 months

**Type of contract:** Grant-assisted student (pre or post-doctoral, others)

**Dedication regime:** Full time

**Primary (UNESCO code):** 310300 - Agronomy

**Secondary (UNESCO code):** 241719 - Plant physiology

**Performed tasks:** The combined effect of alternate wetting and drying and phosphorus status was studied in rice. Growth measurements were made on the radicular part and the aerial part of the plants. Also physiological measures such as stomatal conductance, evapotranspiration and leaf water potential. Hormonal profile in leaves. Measures of the concentration and phosphorus content in the plant and in the soil.

**Identify key words:** Plant physiology; Nutritional sciences

**Field of management activity:** University

**Applicability in teaching and/or research:** Alternate Wetting and Drying (AWD) is a promising water-saving method that is being widely adopted in Bangladesh but it is not known why it improves crop water-use efficiency, if it is sustainable, if its adoption will reduce the exposure of the population to arsenic (As) poisoning or if genetic variation for adaptation to this new regime exists in rice. A panel of 300 rice landraces will be produced and sequenced using next generation sequencing to produce approx. 3 million SNP markers. This will be grown in Bangladesh in field experiments comparing AWD to conventional flooding. Shoot and grain samples will be analysed for 17 elements including all macro nutrients plus important micro nutrients and elements As, Fe, Zn, Se and Cd. Genome wide association studies (GWAS) will identify quantitative trait loci (QTLs) and candidate genes for agronomic traits associated with adaptation to AWD and nutrient uptake and translocation to grain. At the same time, detailed soil chemistry, plant hormones and gene expression will be assessed during the wetting/drying cycle to provide understanding of the likely chemical limitations to the sustainability of the method and the underlying plant physiology and genetics that determines adaptation and improved water use efficiency. All of the data gathered will be employed to develop a genome-scale metabolic model based on the RiceCyc database that will identify biochemical pathways and individual enzymes implicated in adaptation to AWD and nutrient uptake. The applicants form a multi-disciplinary team of world-leading experts who have the scientific knowledge and connections to get the work done and pipeline to maximise the impact of the findings. The project will produce a genomic tool with great potential for the identification of QTLs and genes for tolerance to a range of constraints (drought, heat) and the findings will have application in maximising nutrient and water use efficiency in all crops.

**2 Employing entity:** Centro de Edafología y Biología Aplicada del Segura

**Type of entity:** State agency

**Department:** Centro de Edafología y Biología Aplicada del Segura

**City employing entity:** Murcia, Region of Murcia, Spain

**Professional category:** Postdoctoral Researcher

**Start-End date:** 02/09/2013 - 09/10/2015

**Duration:** 2 years - 1 month

**Type of contract:** Temporary employment contract

**Field of management activity:** General State Administration



- 3** **Employing entity:** Centro de Edafología y Biología Aplicada del Segura **Type of entity:** State agency  
**Department:** Centro de Edafología y Biología Aplicada del Segura  
**City employing entity:** Murcia, Region of Murcia, Spain  
**Professional category:** FPI Fellow  
**Start-End date:** 01/09/2009 - 31/08/2012 **Duration:** 4 years  
**Type of contract:** Permanent employment contract  
**Field of management activity:** General State Administration
- 4** **Employing entity:** Universidad de Murcia **Type of entity:** University  
**Department:** Departamento de Bioquímica y Biología Molecular A (GENZ), Facultad de Veterinaria  
**City employing entity:** Murcia, Region of Murcia, Spain  
**Professional category:** Researcher in training  
**Start-End date:** 01/09/2008 - 31/08/2009 **Duration:** 1 year
- 5** **Employing entity:** Universidad de Murcia **Type of entity:** University  
**Department:** Departamento de Biología Vegetal I (UCM), Facultad de Biología  
**City employing entity:** Murcia, Region of Murcia, Spain  
**Professional category:** Internal Student  
**Start-End date:** 01/09/2006 - 29/08/2008 **Duration:** 2 years  
**Field of management activity:** University





## Education

### University education

#### 1st and 2nd cycle studies and pre-Bologna degrees

- 1 University degree:** Higher degree  
**Name of qualification:** MsC in Bioinformatics and Biostatistics  
**Degree awarding entity:** Universitat Oberta de Catalunya and University de Barcelona  
**Date of qualification:** 26/09/2019  
**Type of entity:** University Centres and Structures and Associated Bodies
- 2 University degree:** Higher degree  
**Name of qualification:** MsC in Current Applied Statistics Techniques  
**Degree awarding entity:** Universidad Nacional de Educación a Distancia  
**Date of qualification:** 30/09/2015  
**Average mark:** Excellent  
**Type of entity:** University
- 3 University degree:** Higher degree  
**Name of qualification:** MsC in Advanced Techniques in Food and Agricultural Research and Development  
**Degree awarding entity:** Universidad Politécnica de Cartagena  
**Date of qualification:** 26/10/2009  
**Type of entity:** University
- 4 University degree:** Higher degree  
**Name of qualification:** Bachelor of Biology Specialty Agri-Food Biology and Biotechnology  
**Degree awarding entity:** Universidad de Murcia  
**Date of qualification:** 2008  
**Type of entity:** University

#### Doctorates

**Doctorate programme:** Advanced Techniques in Food and Agricultural Research and Development  
**Degree awarding entity:** Universidad Politécnica de Cartagena y Escuela Técnica Superior de Ingenieros Agrónomos (ETSIA)  
**City degree awarding entity:** Cartagena, Region of Murcia, Spain  
**Date of degree:** 07/10/2014  
**DEA awarding entity:** Escuela Técnica Superior de Ingeniería Agronómica  
**European doctorate:** Yes  
**Date of certificate:** 07/10/2014  
**Thesis title:** Utilización de aguas regeneradas para el riego de dos especies de la familia de las mirtáceas (*Myrtus communis* L. y *Eugenia myrtifolia* L.). Respuesta morfológica, fisiológica y bioquímica a distintos niveles de salinidad.  
**Thesis director:** María Jesús Sánchez Blanco  
**Thesis co-director:** Jose Antonio Hernández Cortés  
**Obtained qualification:** Sobresaliente Cum Laude



Recognition of quality: Yes

## Specialised, lifelong, technical, professional and refresher training (other than formal academic and healthcare studies)

- 1 Training title:** Asistencia al III Symposium Internacional del Sector Agroalimentario de la Vega Baja  
**Awarding entity:** Universidad Miguel Hernández de Elche  
**End date:** 23/11/2018  
**Type of entity:** University  
**Duration in hours:** 16 hours
- 2 Training title:** Realización del Curso Economía Circular Residuo Cero, Vertido Cero, Ecodiseño y Ciclo de Vida  
**Awarding entity:** Ilustre Colegio Oficial de Químicos de Murcia  
**End date:** 19/11/2018  
**Duration in hours:** 15 hours
- 3 Type of training:** Course  
**Training title:** Asistencia a Jornada Agroalimentaria. Claves y oportunidades del sector en la Región de Murcia.  
**City awarding entity:** Murcia, Region of Murcia, Spain  
**Awarding entity:** Periódico La Verdad de Murcia, Mercadona, Caixabank  
**End date:** 26/09/2018  
**Type of entity:** Associations and Groups  
**Duration in hours:** 6 hours
- 4 Training title:** Asistencia a Conferencia: Analysis of Best Management Practices Implementation in Cedar Creek WaterShed. Differences and Similarities with Campo de Cartagena"  
**Awarding entity:** Universidad Católica San Antonio de Murcia  
**End date:** 13/07/2018  
**Duration in hours:** 3 hours
- 5 Training title:** Asistencia a Presentación: "Libro Blanco de la Economía del AGUA"  
**Awarding entity:** Confederación Hidrográfica del Segura, Foro de la Economía del Agua, Grupo Cajamar  
**End date:** 27/06/2018  
**Duration in hours:** 3 hours
- 6 Training title:** Taller Repsol "Hacia Dónde Vas"  
**Awarding entity:** Universidad Católica San Antonio de Murcia  
**End date:** 21/06/2018  
**Type of entity:** University  
**Duration in hours:** 2 hours
- 7 Training title:** VII Jornada Agua y Sostenibilidad. "Una Mirada Global sobre el Mar Menor"  
**Awarding entity:** Universidad de Murcia  
**End date:** 11/05/2018  
**Type of entity:** University  
**Duration in hours:** 5 hours
- 8 Training title:** II Foro Futuro en Español en Murcia; Recursos Hídricos: Innovación y Desafíos  
**Awarding entity:** Ayuntamiento de Murcia, Periódico La Verdad de Murcia, Región de Murcia, Aguas de Murcia, Esamur, Caja Mediterráneo  
**End date:** 10/05/2018  
**Duration in hours:** 5 hours
- 9 Training title:** Aquaforum Murcia: Retos de la escasez estructural del agua  
**Awarding entity:** Periódico La Opinión de Murcia, Prensa Ibérica  
**End date:** 24/04/2018  
**Duration in hours:** 5 hours



- 10 Training title:** Social Media Networker  
**Awarding entity:** Universidad Católica San Antonio de Murcia  
**End date:** 14/03/2018  
**Type of entity:** University  
**Duration in hours:** 30 hours
- 11 Training title:** Seminario: "Join us in exploring the exciting world of RNA using microarrays"  
**Awarding entity:** Universidad de Murcia  
**End date:** 15/11/2017  
**Type of entity:** University  
**Duration in hours:** 3 hours
- 12 Training title:** Seminario: "MARCO DE RESPONSABILIDADES EN LA INTEGRACION DE LA PREVENCIÓN DE RIESGOS LABORALES"  
**Awarding entity:** FREMAP  
**End date:** 31/10/2017  
**Duration in hours:** 3 hours
- 13 Training title:** 12º CURSO INTERNACIONAL DE TECNOLOGÍA POSTCOSECHA Y PROCESADO MÍNIMO HORTOFRUTÍCOLA  
**Awarding entity:** Universidad Politécnica de Cartagena  
**End date:** 13/03/2017  
**Type of entity:** University  
**Duration in hours:** 45 hours
- 14 Training title:** Global Food Security: Addressing the Challenge  
**Awarding entity:** Lancaster University  
**End date:** 30/10/2016  
**Type of entity:** University Research Institute  
**Duration in hours:** 24 hours
- 15 Training title:** Theoretical-practical course: Instrumental analytical techniques applied to the control of water quality from different sources.  
**Awarding entity:** Ilustre Colegio Oficial de Químicos de Murcia  
**End date:** 29/10/2014  
**Type of entity:** Foundation  
**Duration in hours:** 15 hours
- 16 Training title:** Technical Conference: "The creation of technology-based companies by researchers: services and support from the CSIC and the CEEIM  
**Awarding entity:** Centro de Edafología y Biología Aplicada del Segura  
**End date:** 20/11/2012  
**Type of entity:** State agency  
**Duration in hours:** 2 hours
- 17 Training title:** VIII Technical Conference: "Sanitation and Debugging": Management of urban wastewater. Situations and perspectives  
**Awarding entity:** Consejería de Agricultura y Agua  
**End date:** 15/11/2012  
**Type of entity:** Public Research Body  
**Duration in hours:** 24 hours
- 18 Training title:** III Course Introduction to Scientific Experimentation  
**Awarding entity:** Vicerrectorado de Desarrollo Estratégico y Formación de la Universidad de Murcia.  
**End date:** 03/03/2012  
**Type of entity:** University Research Institute  
**Duration in hours:** 40 hours
- 19 Training title:** BioMur. Technical Conference: "The Phyto regulators in Agriculture" Biological foundations, technology of use and regulations.  
**Awarding entity:** FUNDACION SENECA AGENCIA DE CIENCIA Y TECNOLOGIA DE LA REGION DE MURCIA  
**End date:** 13/05/2011  
**Type of entity:** Foundation  
**Duration in hours:** 48 hours



- 20 Training title:** Eppendorf. Seminar: "Liquid management"  
**Awarding entity:** Eppendorf Ibérica. Departamento de Aplicaciones  
**Type of entity:** Business  
**End date:** 27/10/2010  
**Duration in hours:** 4 hours
- 21 Training title:** III Workshop BioMur. New trends in in vitro cultivation of superior plants: micropropagation and production of secondary metabolites.  
**Awarding entity:** FUNDACION SENECA AGENCIA DE CIENCIA Y TECNOLOGIA DE LA REGION DE MURCIA  
**Type of entity:** Foundation  
**End date:** 2008  
**Duration in hours:** 48 hours
- 22 Training title:** IV Workshop BioMur. Bioinformatic for users I, II, III  
**Awarding entity:** FUNDACION SENECA AGENCIA DE CIENCIA Y TECNOLOGIA DE LA REGION DE MURCIA  
**Type of entity:** Foundation  
**End date:** 2008  
**Duration in hours:** 48 hours
- 23 Training title:** The fartet in the Region of Murcia: Biology and Conservation.  
**Awarding entity:** Dirección General del Medio Natural. Consejería del Desarrollo Sostenible y Ordenación del Territorio.  
**End date:** 2007  
**Duration in hours:** 25 hours
- 24 Training title:** Aquaculture I. Marine Biology: Reproduction and Development.  
**Awarding entity:** Universidad Internacional del Mar. Universidad de Murcia.  
**End date:** 2004  
**Duration in hours:** 40 hours
- 25 Training title:** Studies of Large Cetaceans (BALAENA)  
**Awarding entity:** Universidad Complutense de Madrid (Facultad de Veterinaria)  
**Type of entity:** University  
**End date:** 2001  
**Duration in hours:** 13 hours

## Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
English	B1	B1	B1	B1	B1
Spanish					

## Teaching experience

### General teaching experience

**Name of the course:** Contrato Profesor de Biología en academia  
**University degree:** Bachelor of Biology Specialty Agri-Food Biology and Biotechnology  
**Start date:** 15/04/2017  
**End date:** 15/06/2017  
**Entity:** Academia de estudios Eureka  
**Type of entity:** Academia



## Scientific and technological experience

### Research and development groups/teams

- 1** **Name of the group:** Cátedra UCAM-Santander. Emprendimiento en el ámbito agroalimentario.  
**Aims of the group:** Cátedra UCAM-Santander. Emprendimiento en el ámbito agroalimentario.  
**Type of collaboration:** Co-authorship of publications  
**Affiliation entity:** Universidad Católica San Antonio de Murcia **Type of entity:** University  
**Start date:** 01/11/2017
- 2** **Name of the group:** Department of Applied Biology  
**Affiliation entity:** Universidad Miguel Hernández de Elche **Type of entity:** University  
**Start date:** 03/07/2017
- 3** **Name of the group:** Lancaster Environment Centre (LEC)  
**Type of collaboration:** Co-authorship of projects and their development  
**Affiliation entity:** Lancaster University **Type of entity:** University Research Institute  
**Start date:** 12/10/2015 **Duration:** 9 months
- 4** **Name of the group:** Department of Plant Improvement. Fruit Biotechnology Group  
**Type of collaboration:** Co-authorship of publications  
**Affiliation entity:** Centro de Edafología y Biología Aplicada del Segura **Type of entity:** State agency  
**Start date:** 2013 **Duration:** 3 years
- 5** **Name of the group:** Department of Agricultural Sciences and the Natural Environment  
**Type of collaboration:** Co-authorship of publications  
**Affiliation entity:** Universidad Jaime I **Type of entity:** University  
**Start date:** 05/05/2012 **Duration:** 3 months - 91 days
- 6** **Name of the group:** Irrigation Department  
**Type of collaboration:** Co-authorship of projects and their development  
**Affiliation entity:** Centro de Edafología y Biología Aplicada del Segura **Type of entity:** State agency  
**Start date:** 2009 **Duration:** 4 years
- 7** **Name of the group:** GENZ-UMU: Enzymology Research Group  
**Standardised code:** E006-05 **Type of collaboration:** Co-authorship of publications  
**Affiliation entity:** Universidad de Murcia **Type of entity:** University  
**Start date:** 2008 **Duration:** 1 year



## Scientific or technological activities

### R&D projects funded through competitive calls of public or private entities

- 1** **Name of the project:** Comparative genomics of adventitious root formation in tomato and carnation  
**Entity where project took place:** Universidad Miguel Hernández de Elche **Type of entity:** University  
**City of entity:** Elche, Valencian Community, Spain  
**Start-End date:** 2016 - 2018
- 2** **Name of the project:** A genetic dissection of traits required for sustainable water use in rice using Genome Wide Association Studies (GWAS)  
**Identify key words:** Plant physiology; Plant growth; Plant nutrition; Water management; Agricultural statistics  
**Type of project:** Research and development, including transfer **Geographical area:** European Union  
**Degree of contribution:** Researcher  
**Entity where project took place:** Lancaster University **Type of entity:** University Research Institute  
**City of entity:** Lancaster, Lancashire, United Kingdom  
**Name principal investigator (PI, Co-PI...):** Hao Zhang; William Davies; Ian Dodd  
**Nº of researchers:** 3  
**Type of participation:** Team member  
**Name of the programme:** BBSRC  
**Code according to the funding entity:** (BB/J003336/1)  
**Start-End date:** 2015 - 2016 **Duration:** 7 months  
**Total amount:** 156.000 €  
**Applicant's contribution:** Alternate Wetting and Drying (AWD) is a promising water-saving method that is being widely adopted in Bangladesh but it is not known why it improves crop water-use efficiency, if it is sustainable, if its adoption will reduce the exposure of the population to arsenic (As) poisoning or if genetic variation for adaptation to this new regime exists in rice. A panel of 300 rice landraces will be produced and sequenced using next generation sequencing to produce approx. 3 million SNP markers. This will be grown in Bangladesh in field experiments comparing AWD to conventional flooding. Shoot and grain samples will be analysed for 17 elements including all macro nutrients plus important micro nutrients and elements As, Fe, Zn, Se and Cd. Genome wide association studies (GWAS) will identify quantitative trait loci (QTLs) and candidate genes for agronomic traits associated with adaptation to AWD and nutrient uptake and translocation to grain. At the same time, detailed soil chemistry, plant hormones and gene expression will be assessed during the wetting/drying cycle to provide understanding of the likely chemical limitations to the sustainability of the method and the underlying plant physiology and genetics that determines adaptation and improved water use efficiency. All of the data gathered will be employed to develop a genome-scale metabolic model based on the RiceCyc database that will identify biochemical pathways and individual enzymes implicated in adaptation to AWD and nutrient uptake. The applicants form a multi-disciplinary team of world-leading experts who have the scientific knowledge and connections to get the work done and pipeline to maximise the impact of the findings. The project will produce a genomic tool with great potential for the identification of QTLs and genes for tolerance to a range of constraints (drought, heat) and the findings will have application in maximising nutrient and water use efficiency in all crops.
- 3** **Name of the project:** Irrigation management with marginal waters in the nursery production of ornamental plants and in the maintenance of the urban plant landscape  
**Type of project:** Research and development, including transfer **Geographical area:** National



**Degree of contribution:** Researcher  
**Entity where project took place:** Centro de Edafología y Biología Aplicada del Segura  
**City of entity:** Murcia, Region of Murcia, Spain  
**Name principal investigator (PI, Co-PI....):** María Jesús Sánchez Blanco  
**Type of participation:** Team member  
**Name of the programme:** CICYT  
**Code according to the funding entity:** AGL 2011-30022-C02-01-02  
**Start-End date:** 2013 - 2014

**4 Name of the project:** Optimization of regenerated wastewater management with different levels of salinity through the use of mycorrhized plants for ornamental purposes adapted to the Mediterranean climate.

**Type of project:** Research and development, including transfer  
**Geographical area:** National

**Degree of contribution:** Researcher  
**Entity where project took place:** Centro de Edafología y Biología Aplicada del Segura  
**City of entity:** Murcia, Spain  
**Name principal investigator (PI, Co-PI....):** María Jesús Sánchez Blanco  
**Type of participation:** Team member  
**Name of the programme:** Proyecto Séneca  
**Code according to the funding entity:** 15356/PI/10  
**Start-End date:** 2011 - 2013

**5 Name of the project:** Establishment of the level of tolerance to salinity by studying the water relations of Mediterranean ornamental plants

**Type of project:** Research and development, including transfer  
**Geographical area:** National

**Degree of contribution:** Researcher  
**Entity where project took place:** Centro de Edafología y Biología Aplicada del Segura  
**City of entity:** Murcia, Region of Murcia, Spain  
**Type of participation:** Team member  
**Name of the programme:** CICYT  
**Code according to the funding entity:** AGL2008-05258-CO2-01  
**Start-End date:** 2008 - 2011

**6 Name of the project:** Hydric economy and hormonal requirements in plant development. Postharvest conservation and rooting of carnation cuttings

**Type of project:** Research and development, including transfer  
**Geographical area:** National

**Degree of contribution:** Current university student  
**Entity where project took place:** Universidad de Murcia  
**City of entity:** Murcia, Region of Murcia, Spain  
**Name principal investigator (PI, Co-PI....):** José Sánchez Bravo; Manuel Acosta Echeverría  
**Nº of researchers:** 2  
**Type of participation:** Team member  
**Name of the programme:** MICYT/FEDER  
**Code according to the funding entity:** AGL2004-07902/AGR  
**Start-End date:** 2004 - 2007



## Scientific and technological activities

### Scientific production

**H index:** 9

**Date of application:** 04/01/2019

### Publications, scientific and technical documents

- 1** José Ramón Acosta Motos; Shane A. Rothwell; Hannah R. Wright; Alfonso Albacete; Hao Zhang; Ian C. Dodd. Alternate wetting and drying irrigation increases water and phosphorus efficiency of vegetative rice plants independent of soil phosphorus status. *Plant and Soil*. 2019.

**Type of production:** Scientific paper **Format:** Journal

**Corresponding author:** Yes

**Relevant results:** Abstracts: Sustainable approaches to rice cultivation that require less resource inputs such as irrigation and chemical fertilisers are required to increase crop resource use efficiency. Although alternate wetting and drying (AWD) has been widely promoted as a water-saving irrigation technique, its interactions with phosphorus (P) nutrition have attracted little attention. Therefore rice plants were grown with two phosphorus levels, fertilised (HP) or un-fertilised (LP) and either continuous flooding (CF) or alternate wetting and drying (AWD) irrigation. Plant and soil water and nutrient relations were measured, along with the effects of drying and re-flooding on foliar phytohormone status. The effects of decreased P status on shoot growth (biomass, leaf area) depended on the irrigation treatment (significant P x irrigation interaction), since low P decreased shoot growth under continuous flooding, but had no significant effect on plants grown under AWD. Although AWD attenuated the reduction in DGT-P (Diffusive Gradients in Thin films - measuring plant available P) during the experiment, this was more likely due to diminished P uptake of AWD plants than the drying and re-flooding cycles enhancing soil P availability. Although AWD increased maximal root length (especially at low P), root P concentrations were 25% lower than in CF plants, suggesting that AWD enhanced partitioning of P to the shoots. Although AWD decreased stomatal conductance and leaf water potential compared to CF plants which was associated with increased foliar ABA concentration, re-flooding greatly increased stomatal conductance, which was associated with decreased ABA concentrations. Low P increased ACC and JA concentration, but decreased GA4 concentrations but this is independent of soil water dynamics. While further measurements of whole plant photosynthesis are needed in field trials with soils of different P status, compensatory carbon gain following re-flooding seems important in attenuating AWD's effects on shoot growth. Thus combining low phosphorus fertiliser rates and AWD may enhance both crop water and P use efficiencies.
- 2** Sara Álvarez Martín; María José Gómez Bellot; José Ramón Acosta Motos; María Jesús Sánchez Blanco. Changes in Water Use Efficiency and Plant Quality of *Phyllirea Angustifolia* in Response to Deficit Irrigation. *Agricultural Water Management*. 2019.

**Type of production:** Scientific paper **Format:** Journal
- 3** José Ramón Acosta Motos; María Fernanda Ortuño Gallud; Sara Álvarez Martín; Jose Antonio Hernández Cortés; María Jesús Sánchez Blanco. The use of reclaimed water is a viable and safe strategy for the irrigation of myrtle plants in a scenario of climate change. *Water Supply*. 2019.

**Type of production:** Scientific paper **Format:** Journal

**Corresponding author:** Yes
- 4** Daniel Cantabella; Abel Piqueras; José Ramón Acosta Motos; Agustina Bernal Vicente; José Antonio Hernández Cortés; Pedro Díaz Vivancos. Salt-tolerance mechanisms induced in *Stevia rebaudiana* Bertoni: Effects on mineral nutrition, antioxidative metabolism and steviol glycoside content. *Plant Physiology and Biochemistry*. 115, pp. 484 - 496. Elsevier, 01/06/2017.



**Type of production:** Scientific paper**Format:** Journal

**Relevant results:** Abstract: In order to cope with challenges linked to climate change such as salinity, plants must develop a wide spectrum of physiological and molecular mechanisms to rapidly adapt. *Stevia rebaudiana* Bertoni plants are a case in point. According to our findings, salt stress has no significant effect on plant growth in these plants, which accumulate sodium (Na<sup>+</sup>) in their roots, thus avoiding excessive Na<sup>+</sup> accumulation in leaves. Furthermore, salt stress (NaCl stress) increases the potassium (K<sup>+</sup>), calcium (Ca<sup>2+</sup>), chloride ion (Cl<sup>-</sup>) and proline concentrations in *Stevia* leaves, which could contribute to osmotic adjustment. We also found that long-term NaCl stress does not produce changes in chlorophyll concentrations in *Stevia* leaves, reflecting a mechanism to protect the photosynthesis process. Interestingly, an increase in chlorophyll b (Chlb) content occurred in the oldest plants studied. In addition, we found that NaCl induced reactive oxygen species (ROS) accumulation in *Stevia* leaves and that this accumulation was more evident in the presence of 5 g/L NaCl, the highest concentration used in the study. Nevertheless, *Stevia* plants are able to induce (16 d) or maintain (25 d) antioxidant enzymes to cope with NaCl-induced oxidative stress. Low salt levels did not affect steviolbioside and rebaudioside A contents. Our results suggest that *Stevia* plants induce tolerance mechanisms in order to minimize the deleterious effects of salt stress. We can thus conclude that saline waters can be used to grow *Stevia* plants and for Steviol glycosides (SGs) production.

- 5 José Ramón Acosta Motos; José Antonio Hernández Cortés; Sara Álvarez Martín; Gregorio Barba Espín; María Jesús Sánchez Blanco. The long-term resistance mechanisms, critical irrigation threshold and relief capacity shown by *Eugenia myrtifolia* plants in response to saline reclaimed water. *Plant Physiology and Biochemistry*. 111, pp. 244 - 256. Elsevier, 01/02/2017.

**Type of production:** Scientific paper**Format:** Journal

**Relevant results:** Abstract: Salts present in irrigation water are serious problems for commercial horticulture, particularly in semi-arid regions. Reclaimed water (RW) typically contains, among others elements, high levels of salts, boron and heavy metal. Phytotoxic ion accumulation in the substrate has been linked to different electric conductivities of the treatments. Based on these premises, we studied the long-term effect of three reclaimed water treatments with different saline concentrations on *Eugenia myrtifolia* plants. We also looked at the ability of these plants to recover when no drainage was applied. The RW with the highest electric conductivity (RW3, EC = 6.96 dS m<sup>-1</sup>) provoked a number of responses to salinity in these plants, including: 1) accumulation and extrusion of phytotoxic ions in roots; 2) a decrease in the shoot/root ratio, leaf area, number of leaves; 3) a decrease in root hydraulic conductivity, leaf water potential, the relative water content of leaves, leaf stomatal conductance, the leaf photosynthetic rate, water-use efficiency and accumulated evapotranspiration in order to limit water loss; and 4) changes in the antioxidant defence mechanisms. These different responses induced oxidative stress, which can explain the damage caused in the membranes, leading to the death of RW3 plants during the relief period. The behaviour observed in RW2 plants was slightly better compared with RW3 plants, although at the end of the experiment about 55% of the RW2 plants also died, however RW containing low salinity level (RW1, EC = 2.97 dS m<sup>-1</sup>) can be effective for plant irrigation.

- 6 José Ramón Acosta Motos; María Fernanda Ortuño Gallud; Sara Álvarez Martín; María Fernanda López Climent; Aurelio Gómez Cadenas; María Jesús Sánchez Blanco. Changes in growth, physiological parameters and the hormonal status of *Myrtus communis* L. plants irrigated with water with different chemical compositions. *Journal of Plant Physiology*. 191, pp. 12 - 21. Elsevier, 01/02/2016.

**Type of production:** Scientific paper**Format:** Journal

**Relevant results:** Abstract: *Myrtus communis*, an important Mediterranean ornamental shrub, was used to study the effect of irrigation water with different chemical compositions in the plant response. A treatment with NaCl was used to establish the plant resistance to high salinity at long term. Plants were subjected to four irrigation treatments with drainage for three months: Control (0.8 dS m<sup>-1</sup>); two treatments using reclaimed water (RWs): RW1 (2.0 dS m<sup>-1</sup>) and RW2 (5.0 dS m<sup>-1</sup>); and NaCl (10.0 dS m<sup>-1</sup>). High levels of electric conductivity of RWs not affected plant growth, while NaCl decreased leaf dry weight. Coinciding with the accumulation of Na<sup>+</sup> and Cl<sup>-</sup> in the roots, soil water potential decreased, which hinders the mobilization of water to the leaves, decreasing leaf water potential. The osmotic adjustment in the NaCl treatment was due to Na<sup>+</sup> and Cl<sup>-</sup> ions, although the proline could contribute as an Osmo compatible solute, increasing the turgor plants. Also changes in cell walls rigidity minimize the negative effects on the water balance; however, a higher lipid peroxidation was observed in these plants. Stomatal closure was associated with a decrease in K<sup>+</sup> and an increase in abscisic acid. NaCl produced an increase in salicylic acid and did not affect jasmonic acid contents at the end of the experiment. Similar behavior in soil and leaf water potentials, although less pronounced than in NaCl, was shown in RW2 plants. The abscisic acid

increased in the RW2 with respect to the control and a decrease in stomatal conductance was observed at the end of the experiment. Plants irrigated with RW1 behaved similarly to the control.

- 7** José Ramón Acosta Motos; Pedro Díaz Vivancos; Sara Álvarez Martín; Nieves Fernández García; María Jesús Sánchez Blanco; José Antonio Hernández Cortés. Physiological and biochemical mechanisms of the ornamental *Eugenia myrtifolia* L. plants for coping with NaCl stress and recovery. *Planta*. 242, pp. 829 - 846. Springer, 01/10/2015.

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: Different physiological and biochemical changes in *Eugenia myrtifolia* L. plants after being subjected to NaCl stress for up to 30 days (Phase I) and after recovery from salinity (Phase II) were studied. *Eugenia* plants proved to be tolerant to NaCl concentrations between 44 and 88 mM, displaying a series of adaptative mechanisms to cope with salt-stress, including the accumulation of toxic ions in roots. Plants increased their root/shoot ratio and decreased their leaf area, leaf water potential and stomatal conductance in order to limit water loss. In addition, they displayed different strategies to protect the photosynthetic machinery, including the limited accumulation of toxic ions in leaves, increase in chlorophyll content, changes in chlorophyll fluorescence parameters, leaf anatomy and antioxidant defence mechanisms. Anatomical modifications in leaves, including an increase in palisade parenchyma and intercellular spaces and decrease in spongy parenchyma, served to facilitate CO<sub>2</sub> diffusion in a situation of reduced stomatal aperture. Salinity produced oxidative stress in *Eugenia* plants as evidenced by oxidative stress parameters values and a reduction in APX and ASC levels. Nevertheless, SOD and GSH contents increased. The post-recovery period is detected as a new stress situation, as observed through effects on plant growth and alterations in chlorophyll fluorescence and oxidative stress parameters.

- 8** María José Gómez Bellot; Marco Castillo Campohermoso; Sara Álvarez Martín; José Ramón Acosta Motos; Juan José Alarcón Cabañero; Sebastián Bañón Arias; María Fernanda Ortuño Gallud; María Jesús Sánchez Blanco. Effect of different quality irrigation water on the growth, mineral concentration and physiological parameters of *Viburnum tinus* plants. *Acta horticulturae*. 01/09/2015.

**DOI:** 10.17660/ActaHortic.2015.1099.58

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: Treated wastewater may be considered an alternative source of water and fertilizer nutrients for landscape plants. However, NaCl, the principal compound in this water, can be detrimental to plants. *Viburnum tinus* plants were submitted for 4 months to 4 irrigation treatments from different sources: control (Control) (EC <0.9 dS m<sup>-1</sup>); NaCl solution (NaCl) (EC = 4 dS m<sup>-1</sup>); irrigation water normally used in the area (IW) (EC = 1.2-1.8 dS m<sup>-1</sup>) and reclaimed water (RW) (EC = 4 dS m<sup>-1</sup>). During a recovery period of two months, all plants were irrigated with the control water. The results showed that both leaf area, plant height and biomass were different among plants of NaCl, IW and RW treatments, and decreased at the end of the saline period. These changes were more pronounced in the NaCl treatment. The growth alterations evident after the recovery period indicate that salts continued to be present in the substrate. Compared with the control, NaCl and RW plants showed a greater rate of Na<sup>+</sup> and Cl<sup>-</sup> absorption by roots. Stem water potential was mainly affected by the NaCl treatment, which was the only treatment that did not recover their stomatal conductance and photosynthesis rate values at the end of the experiment. Plants of the IW treatment showed slight changes in gas exchange with respect to the control. Hence, using different sources of water with similar EC, it is important to know the exact composition, since the toxic effects produced by high concentrations of Na<sup>+</sup> and Cl<sup>-</sup> might be offset by the effect of other ions like magnesium, potassium and phosphorus. In the physicochemical analysis of water, the highest concentrations of these ions were observed in RW and as consequence, their concentrations in plants were not reduced by the Na<sup>+</sup> and Cl<sup>-</sup> effect; phosphorus even increased, improving the plant nutritional balance.

- 9** José Ramón Acosta Motos; Pedro Díaz Vivancos; Sara Álvarez Martín; Nieves Fernández García; María Jesús Sánchez Blanco; José Antonio Hernández Cortés. NaCl-induced physiological and biochemical adaptative mechanism in the ornamental *Myrtus communis* L. plants. *Journal of Plant Physiology*. 183, pp. 41 - 51. Elsevier, 01/07/2015.

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: Physiological and biochemical changes in *Myrtus communis* L. plants after being subjected to different solutions of NaCl (44, and 88 mM) for up to 30 days (Phase I) and after recovery from the salinity period (Phase II) were studied. Myrtle plants showed salinity tolerance by displaying a series of adaptative mechanisms to cope with salt-stress, including controlled ion homeostasis, the increase in root/shoot ratio, the reduction of water potentials and stomatal conductance to limit water loss. In addition, they displayed different

strategies to protect the photosynthetic machinery, including limiting toxic ion accumulation in leaves, increase in chlorophyll content, and changes in chlorophyll fluorescence parameters, leaf anatomy and increases in catalase activity. Anatomical modifications in leaves, including a decrease in spongy parenchyma and increased intercellular spaces, allow CO<sub>2</sub> diffusion in a situation of reduced stomatal aperture. In spite of all these changes, salinity produced oxidative stress in myrtle plants as monitored by increases in oxidative stress parameter values. The post-recovery period is perceived as a new stress situation, as observed through effects on plant growth and alterations in non-photochemical quenching parameters and lipid peroxidation values.

- 10** José Ramón Acosta Motos; Sara Álvarez Martín; Gregorio Barba Espín; José Antonio Hernández Cortés; María Jesús Sánchez Blanco. Salts and nutrients present in regenerated waters induce changes in water relations, antioxidative metabolism, ion accumulation and restricted ion uptake in *Myrtus communis* L. plants. *Plant Physiology and Biochemistry*.85, pp. 41 - 50. Elsevier, 15/12/2014.

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: The use of reclaimed water (RW) constitutes a valuable strategy for the efficient management of water and nutrients in landscaping. However, RW may contain levels of toxic ions, affecting plant production or quality, a very important aspect for ornamental plants. The present paper evaluates the effect of different quality RWs on physiological and biochemical parameters and the recovery capacity in *Myrtus communis* L. plants. *M. communis* plants were submitted to 3 irrigation treatments with RW from different sources (22 weeks): RW1 (1.7 dS m<sup>-1</sup>), RW2 (4.0 dS m<sup>-1</sup>) and RW3 (8.0 dS m<sup>-1</sup>) and one control (C, 0.8 dS m<sup>-1</sup>). During a recovery period of 11 weeks, all plants were irrigated with the control water. The RW treatments did not negatively affect plant growth, while RW2 even led to an increase in biomass. After recovery, only plants irrigated with RW3 showed some negative effects on growth, which was related to a decrease in the net photosynthesis rate, higher Na accumulation and a reduction in K levels. An increase in salinity was accompanied by decreases in leaf water potential, relative water content and gas exchange parameters, and increases in Na and Cl uptake. Plants accumulated Na in roots and restricted its translocation to the aerial part. The highest salinity levels produced oxidative stress, as seen from the rise in electrolyte leakage and lipid peroxidation. The use of regenerated water together with carefully managed drainage practices, which avoid the accumulation of salt by the substrate, will provide economic and environmental benefits.

- 11** José Ramón Acosta Motos; Sara Álvarez Martín; José Antonio Hernández Cortés; María Jesús Sánchez Blanco. Irrigation of *Myrtus communis* plants with reclaimed water: morphological and physiological responses to different levels of salinity. *Journal of Horticultural Science and Biotechnology*. 89, pp. 487 - 494. Taylor and Francis, 01/05/2014.

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: The influence of irrigation with different sources of reclaimed water on physiological and morphological changes in *Myrtus communis* plants was investigated to evaluate their adaptability to such conditions. *M. communis* plants, growing in a growth chamber, were subjected to four irrigation treatments over 4 months (120 d): a control [tap water (0.8 dS m<sup>-1</sup>), leaching 10% (v/v) of the applied water] and three reclaimed water irrigation treatments, namely 1.5 dS m<sup>-1</sup> leaching 25% (v/v) of the applied water (RW1), 4.0 dS m<sup>-1</sup> leaching 40% (v/v) of the applied water (RW2), and 8.0 dS m<sup>-1</sup> leaching 55% (v/v) of the applied water (RW3). After treatment, all plants were irrigated with tap water, as for the control plants, for a further 2 months (60 d). At the end of the first period (4 months), none of the myrtle plants showed any adverse change in biomass and the average total dry weight (DW) increased by 53% in treatment RW2. However, at the end of the treatment and recovery period (180 d), accumulations of Cl<sup>-</sup> ions, and especially Na<sup>+</sup> ions, negatively affected the growth of all RW3 plants. Plants irrigated with all three reclaimed water samples had increased difficulty in taking-up water from the substrate (i.e., they had lower leaf water potential and relative water content values). RW2 plants showed a better response in their gas exchange parameters. The use of reclaimed water decreased leaf K<sup>+</sup>/Na<sup>+</sup> and Ca<sup>2+</sup>/Na<sup>+</sup> ratios, but no chlorosis or necrosis were observed. The three reclaimed water samples had different effects on the myrtle plants depending on the specific chemical properties of the water. Leaching was found to be important to minimise the negative effects of salinity in the irrigation water.

- 12** Sara Álvarez Martín; Marco Antonio Castillo Campohermoso; José Ramón Acosta Motos; Alejandra Navarro; María Jesús Sánchez Blanco. Photosynthetic response, biomass distribution and water status changes in *Rhamnus alaternus* plants during drought. *Acta Horticulturae*. 937, pp. 853 - 860. 03/12/2013.

**DOI:** 10.17660/ActaHortic.2012.937.104

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: *Rhamnus alaternus* is used as an ornamental plant in Mediterranean regions. The objective of this research was to analyse the ability of *R. alaternus* to overcome water stress in terms of adjusting its physiology and morphology. For this, potted plants were grown in a greenhouse and subjected to water stress by reducing irrigation water by 50% compared with the control (irrigated to container capacity). The water stress produced the smallest plants at the end of the experiment. After ten months of drought, the leaf area, leaf number, total dry biomass and height had decreased, although the root/shoot ratio and succulence were not affected. Total root length decreased with water stress, a reduction observed for all sizes of root. Biomass distribution in the different parts of the plant (root, shoot and leaf) was similar in both treatments. An improvement in water use efficiency was seen in water deficit plants. Throughout the experiment, leaf color, chlorophyll, fluorescence (Fv/Fm) and ion leakage (membrane damage) were not affected by deficit treatment. Water stress lowered the predawn and midday leaf water potentials, although the decrease in the latter parameter was more affected by the climatic conditions. It is concluded that water deficit leads to morphological changes in this species as an adaptation to Mediterranean conditions.

- 13** José Luis Muñoz Muñoz; Francisco García Molina; José Ramón Acosta Motos; Ramón Varón; Pedro Antonio García Ruíz; Jose Tudela; Francisco García Cánovas; José Neptuno Rodríguez López. Indirect inactivation of tyrosinase in its action on tyrosine. *Acta Biochimica Polonica*. 58, pp. 477 - 488. 2011.

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: Under aerobic conditions, tyrosinase is inactivated by dopa as a result of suicide inactivation, and, under anaerobic conditions, as a result of irreversible inactivation. However, tyrosine protects the enzyme from being inactivated by dopa under anaerobic conditions. This paper describes how under aerobic conditions the enzyme acting on tyrosine is not directly inactivated but undergoes a process of indirect suicide inactivation provoked by reaction with the o-diphenol originated from the evolution of o-dopaquinone and accumulated in the reaction medium.

- 14** José Luis Muñoz Muñoz; José Ramón Acosta Motos; Francisco García Molina; Ramón Varón; Pedro Antonio García Ruíz; José Tudela; Francisco García Cánovas; José Neptuno Rodríguez López. Tyrosinase inactivation in its action on dopa. *Biochimica et Biophysica Acta*. 1804, pp. 1467 - 1475. Elsevier, 2010.

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: Under aerobic or anaerobic conditions, tyrosinase undergoes a process of irreversible inactivation induced by its physiological substrate L-dopa. Under aerobic conditions, this inactivation occurs through a process of suicide inactivation involving the form oxy-tyrosinase. Under anaerobic conditions, both the met- and deoxy-tyrosinase forms undergo irreversible inactivation. Suicide inactivation in aerobic conditions is slower than the irreversible inactivation under anaerobic conditions. The enzyme has less affinity for the isomer d-dopa than for L-dopa but the velocity of inactivation is the same. We propose mechanisms to explain these processes.

- 15** Francisco García Molina; José Luis Muñoz Muñoz; José Ramón Acosta Motos; María García Molina; José Tudela; Francisco García Cánovas; José Neptuno Rodríguez López. Melanogenesis inhibition by tetrahydropterines. *Biochimica et Biophysica Acta – Protein and Proteomics*. 1794, pp. 1766 - 1774. Elsevier, 2009.

**Type of production:** Scientific paper

**Format:** Journal

**Relevant results:** Abstract: There is controversy in the literature concerning the action of tetrahydropterines on the enzyme tyrosinase and on melanogenesis in general. In this study, we demonstrate that tetrahydropterines can inhibit melanogenesis in several ways: i) by non-enzymatic inhibition involving purely chemical reactions reducing o-dopaquinone to L-dopa, ii) by acting as substrates which compete with L-tyr and L-dopa, since they are substrates of tyrosinase; and iii) by irreversibly inhibiting the enzymatic forms met-tyrosinase and deoxy-tyrosinase in anaerobic conditions. Three tetrahydropterines have been kinetically characterised as tyrosinase substrates: 6-R-L-erythro-5,6,7,8-tetrahydrobiopterin, 6-methyl-5,6,7,8-tetrahydropterine and 6,7-(R,S)-dimethyl-5,6,7,8-tetrahydropterine. A kinetic reaction mechanism is proposed to explain the oxidation of these compounds by tyrosinase.

- 16** José Ramón Acosta Motos; Pedro Díaz Vivancos; Manuel Acosta; José Antonio Hernández Cortés. Effects of bioestimulants in the plant responses and tolerance to salt stress. 2019.

**Type of production:** Book chapter

**Format:** Book

**Relevant results:** Abstract: The depletion of conventional water resources, either due to the lack of precipitations or to pollution and overexploitation of aquifers, forces the use of water of a lower quality characterized mainly by

higher salt concentrations. Salinity is one of the abiotic stress factors that most limits crop production. Plants have to activate different physiological, biochemical and molecular mechanisms in order to cope with salt stress. These changes include water relations, photosynthesis, respiration, hormone profile, ion compartmentation, changes in the metabolism or in gene expression. In addition to the known osmotic stress and ion toxicity constraints, salt stress also induced an oxidative stress contributing to its deleterious effects. In order to delay the negative effects of salt stress on plants, it is recommended to use plant biostimulants as one of the most innovative and promising solutions. Biostimulants are natural substances produced by the plants themselves capable of interacting with their metabolism in order to improve their responses to any type of stress that may even affect their survival. By these reasons, different studies have demonstrated that pre-treatments with various biostimulants such as humic acids, certain aminoacids (such as proline and glycine-betaine), polyamines, H<sub>2</sub>O<sub>2</sub>, salicylic acid, melatonin as well as the use of other strategies such as the inoculation of arbuscular mycorrhizal fungi can improve the plant response to salt stress. The aim of this chapter is to provide information about the effect of these treatments in the alleviation of salt-induced damage in plants.

- 17** Sara Álvarez Martín; Sebastián Bañón Arias; José Ramón Acosta Motos; María Jesús Sánchez Blanco. Crecimiento, relaciones hídricas y parámetros ornamentales de plantas de callistemon con bajas disponibilidades hídricas y regadas con agua salina. *Horifloricultura Mediterránea*. 60, pp. 536 - 540. 20/06/2013.

**Type of production:** Book chapter

**Format:** Book

**Relevant results:** Resumen: La mayoría de las especies de *Callistemon* presentan cierto grado de tolerancia a los estreses ambientales. Por ello, estas especies han tenido un éxito considerable como arbusto de flor para su uso en jardines y paisajismo en el área mediterránea. Sin embargo, pueden sufrir estrés por falta de agua y/o por el uso de agua de baja calidad. Conocer la respuesta de esta especie a distintos niveles de estrés hídrico y salino es interesante para su utilidad como planta ornamental. Plantas de *callistemon citrinus*, creciendo en condiciones de invernadero, fueron sometidas durante un año a cuatro tratamientos de riego: un control regado diariamente a capacidad de campo (CE; 1dS m<sup>-1</sup>), dos tratamientos deficitarios, (RDM y RDS), que corresponden al 50 y 25% de la cantidad aportada al control, y un tratamiento regado como el control pero con agua salina (CE; 4 dS m<sup>-1</sup>). Al finalizar el ensayo, el diámetro del tallo fue reducido de forma similar en ambos tratamientos de riego deficitario, mientras que la biomasa solo se redujo en las plantas que recibieron menos agua. Las plantas del tratamiento control y las regadas con sal son las que alcanzaron mayor altura. El riego deficitario severo redujo la floración y tuvieron hojas de un color más mate. Tanto el riego deficitario como con agua salina produjo una reducción de los valores de conductancia estomática. El efecto osmótico también se reflejó en los valores del potencial hídrico foliar, sin embargo las sales no alteraron significativamente la tasa de fotosíntesis. El riego deficitario moderado y el riego con agua salina (4 dS m<sup>-1</sup>) podrían usarse de forma satisfactoria en la producción de plantas de *callistemon*, ya que éstas mantienen una buena calidad global en su valor ornamental.

- 18** José Ramón Acosta Motos; María José Gómez Bellot; María R. Conesa; José Antonio Hernández Cortés; Pedro Díaz Vivancos; Josefa M. Navarro; Juan Gabriel Pérez Pérez; Cosuelo Penella. Promoting strategies for a sustainable agriculture: Biostimulants as plant protectors under drought and salinity challenges. *Agronomy*. 2019.

**Type of production:** Review

**Format:** Journal

**Corresponding author:** Yes

**Relevant results:** Abstract: Climate change, associated with extreme environmental situations and the increasingly unsustainable use of water (contamination and aquifer exploitation) compels to look for new agronomic approaches that should be properly addressed. Drought, along with salinity, is one of the most important causes of low yields worldwide. Particularly, water availability already poses a problem in many parts of the world, and the situation is likely to deteriorate. In fact, it is known as the most important factor for the development of different crops included the most important for human consumption (rice, wheat, maize and barley). In arid and semiarid regions, which are often characterized by a competition for resources, restriction on water for agriculture is forcing the search of unconventional water resources. On the other hand, soil salinity affects about 800 million hectares of arable lands turning salinity is one of the most significant environmental challenges limiting plant productivity. This important abiotic stress constraint on agriculture has worsened over the last 20 years due to the increase in irrigation requirements in arid and semi-arid regions, such as the Mediterranean area. In the face of this changing climate and the expected population increase, the contribution of a better and sustainable agriculture is one of the most relevant challenges to ensure a future global food security. Using plant biostimulants is one of the most innovative and promising solutions with the goal of modifying physiological processes in plants to improve productivity, mitigating negative effects of environmental stresses and resource optimization. Nowadays, there has been much research interest in plant biostimulants and thereby an increase number of commercial plant biostimulants in several crops. Some reviews have discussed specific aspects of



growth promotion by plant biostimulants, however, their influence under abiotic stress have not been reported. The objective of this review is to assess the role of arbuscular mycorrhizal fungi (AMF), ascorbic acid, certain amino acids such as proline and glycine betaine, melatonin, natural moisturizing agents, oils from vegetable extracts, phytohormones, plant growth-promoting rhizobacteria (PGPR), polyamines and reactive oxygen and nitrogen species (ROS and RNS) as natural substances that protect plants under drought and salinity conditions.

- 19** José Ramón Acosta Motos; María Fernanda Ortuño Gallud; Agustina Bernal Vicente; Pedro Díaz Vivancos; María Jesús Sánchez Blanco; José Antonio Hernández Cortés. Plant Responses to Salt Stress: Adaptive Mechanisms. *Agronomy*. 7 - 1, MDPI, 23/02/2017.

**Type of production:** Review

**Format:** Journal

**Relevant results:** Abstract: This review deals with the adaptive mechanisms that plants can implement to cope with the challenge of salt stress. Plants tolerant to NaCl implement a series of adaptations to acclimate to salinity, including morphological, physiological and biochemical changes. These changes include increases in the root/canopy ratio and in the chlorophyll content in addition to changes in the leaf anatomy that ultimately lead to preventing leaf ion toxicity, thus maintaining the water status in order to limit water loss and protect the photosynthesis process. Furthermore, we deal with the effect of salt stress on photosynthesis and chlorophyll fluorescence and some of the mechanisms thought to protect the photosynthetic machinery, including the xanthophyll cycle, photorespiration pathway, and water-water cycle. Finally, we also provide an updated discussion on salt-induced oxidative stress at the subcellular level and its effect on the antioxidant machinery in both salt-tolerant and salt-sensitive plants. The aim is to extend our understanding of how salinity may affect the physiological characteristics of plants.

- 20** José Ramón Acosta Motos; Begoña Cerdá Martínez-Pujalte; Antonio Cerdá Cerdá; Borja Ferrández Gómez; Estrella Núñez Delicado. ALIMENTOS DE LA REGIÓN DE MURCIA: PIMIENTO. 20/12/2018.

**Type of production:** Scientific-technical report

- 21** José Ramón Acosta Motos; Begoña Cerdá Martínez-Pujalte; Antonio Cerdá Cerdá; Borja Ferrández Gómez; Estrella Núñez Delicado. ALIMENTOS DE LA REGIÓN DE MURCIA: BRÓCOLI. 16/11/2018.

**Type of production:** Scientific-technical report

**Format:** Book

- 22** Javier Sierra; Antonio Cerdá Cerdá; José Ramón Acosta Motos; Estrella Núñez Delicado. EL AGUA EN EL SECTOR AGRARIO DE LA REGIÓN DE MURCIA. Recursos de la cuenca, superficie demandantes, consumos y déficit. 02/10/2018.

**Type of production:** Scientific-technical report

**Format:** Book

## Works submitted to national or international conferences

- 1** **Title of the work:** Integration of phenotypic, metabolomic and genetic data to identify novel regulators of adventitious root development in carnation

**Name of the conference:** XV Simposio de Fitohormonas de la Sociedad Española de Fisiología Vegetal

**City of event:** Valencia, Valencian Community, Spain

**Date of event:** 13/12/2018

**End date:** 14/12/2018

**Organising entity:** Sociedad Española de Fisiología Vegetal

**City organizing entity:** Toledo, Castile-La Mancha, Spain

José Ramón Acosta Motos; María Salud Justamante; Joan Villanova; Virginia Birlanga; Antonio Cano; Emilio Cano; Manuel Acosta; José Manuel Pérez Pérez.

- 2** **Title of the work:** Changes in Water Use Efficiency and Plant Quality of *Phyllirea Angustifolia* in Response to Deficit Irrigation

**Name of the conference:** XIV SIMPOSIO INTERNACIONAL HISPANO-PORTUGUÉS DE RELACIONES HÍDRICAS EN LAS PLANTAS

**City of event:** Madrid, Community of Madrid, Spain



**Date of event:** 03/10/2018

**End date:** 05/10/2018

**Organising entity:** Escuela Técnica Superior de Ingeniería Agronómica, Alimentaria y de Biosistemas (ETSIAAB) de la Universidad Politécnica de Madrid (UPM). **Type of entity:** University

**City organizing entity:** Madrid, Community of Madrid, Spain

Sara Álvarez; María José Gómez Bellot; José Ramón Acosta Motos; María Jesús Sánchez Blanco.

**3 Title of the work:** Differences in nutrient uptake, physiological and biochemical parameters in eugenia and myrtle plants under salt stress

**Name of the conference:** XIV SIMPOSIO INTERNACIONAL HISPANO-PORTUGUÉS DE RELACIONES HÍDRICAS EN LAS PLANTAS

**City of event:** Madrid, Community of Madrid, Spain

**Date of event:** 03/10/2018

**End date:** 05/10/2018

**Organising entity:** Escuela Técnica Superior de Ingeniería Agronómica, Alimentaria y de Biosistemas (ETSIAAB) de la Universidad Politécnica de Madrid (UPM). **Type of entity:** University

**City organizing entity:** Madrid, Community of Madrid, Spain

José Ramón Acosta Motos; José Antonio Hernández Cortés; María Jesús Sánchez Blanco.

**4 Title of the work:** Hormonal crosstalk regulates adventitious root formation in diverse carnation genotypes

**Name of the conference:** XIV Reunión de Biología Molecular de Plantas

**City of event:** Salamanca, Castile and León, Spain

**Date of event:** 04/07/2018

**End date:** 06/07/2018

**Organising entity:** INSTITUTO HISPANO-LUSO DE INVESTIGACIONES AGRARIAS (CIALE) UNIVERSIDAD DE SALAMANCA **Type of entity:** University

**City organizing entity:** Salamanca, Castile and León, Spain

María Salud Justamante; Joan Villanova; Antonio Cano; Emilio A. Cano; José Ramón Acosta Motos; Manuel Acosta; José Manuel Pérez Pérez.

**5 Title of the work:** The use of reclaimed water is a viable and safe strategy for the irrigation of myrtle plants in a scenario of climate change

**Name of the conference:** IWA REGIONAL CONFERENCE OF WATER REUSE AND SALINITY MANAGEMENT

**City of event:** Murcia, Region of Murcia, Spain

**Date of event:** 11/06/2018

**End date:** 15/06/2018

**Organising entity:** Centro de Edafología y Biología Aplicada del Segura; The International Water Association (IWA)

**City organizing entity:** Murcia, Region of Murcia, Spain

José Ramón Acosta Motos; María Fernanda Ortuño; Sara Álvarez; José Antonio Hernández Cortés; María Jesús Sánchez Blanco.

**6 Title of the work:** Physiological impacts of soil phosphorus status and alternate wetting and drying on rice plants.

**Name of the conference:** XVI Simposio Hispano-Luso de Nutrición Mineral de las Plantas

**Corresponding author:** Yes

**City of event:** San Pedro del Pinatar- Murcia, Region of Murcia, Spain



**Date of event:** 25/09/2016

**End date:** 28/09/2016

**Organising entity:** Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario

**Type of entity:** Investigación

**City organizing entity:** San Pedro del Pinatar- Murcia, Region of Murcia, Spain

José Ramón Acosta Motos; Shane A. Rothwell; Hannah R. Wright; Hao Zhang; Ianc C. Dodd.

**7 Title of the work:** Differential adaptative mechanisms developed in *Myrtus communis* L. and *Eugenia myrtifolia* L. in response to NaCl stress

**Name of the conference:** 12th International Conference on Reactive Oxygen and Nitrogen Species in Plants: from model systems to field.

**Corresponding author:** Yes

**City of event:** Verona, Veneto, Italy

**Date of event:** 2015

**End date:** 2015

**Organising entity:** Plant Oxygen Group (POG)

**City organizing entity:** Verona, Veneto, Italy

José Ramón Acosta Motos; Pedro Díaz Vivancos; Sara Álvarez Martín; Nieves Fernández García; María Jesús Sánchez Blanco; José Antonio Hernández Cortés.

**8 Title of the work:** Mechanisms of tolerance developed by *Myrtus communis* L. and *Eugenia myrtifolia* L. plants at several salinity levels.

**Name of the conference:** VI Jornadas Ibéricas de Horticultura Ornamental.

**Corresponding author:** Yes

**City of event:** Valencia, Valencian Community, Spain

**Date of event:** 01/10/2014

**End date:** 03/10/2014

**Organising entity:** Instituto Valenciano de Investigaciones Agrarias

**Type of entity:** R&D Centre

**City organizing entity:** Valencia, Valencian Community, Spain

José Ramón Acosta Motos; Pedro Díaz Vivancos; Sara Álvarez Martín; Nieves Fernández García; María Jesús Sánchez Blanco; José Antonio Hernández Cortés.

**9 Title of the work:** Water status and biochemical changes in *Myrtus communis* L. plants to cope with saline conditions.

**Name of the conference:** XX Reunión de la Sociedad Española de Fisiología Vegetal. XIII Congreso Hispano-Luso de Fisiología Vegetal.

**Corresponding author:** Yes

**City of event:** Lisboa, Lisboa, Portugal

**Date of event:** 24/07/2013

**End date:** 28/07/2013

**Organising entity:** ITQB-UNL

**City organizing entity:** Lisboa, Lisboa, Portugal

José Ramón Acosta Motos; Sara Álvarez Martín; María Fernanda López Climent; Matías Manzí; Aurelio Gómez Cadenas; María Jesús Sánchez Blanco.

**10 Title of the work:** Water status and biochemical changes in *Myrtus communis*

**Name of the conference:** II Workshop en Investigación Agroalimentaria - WiA13

**Corresponding author:** Yes

**City of event:** Cartagena, Region of Murcia, Spain

**Date of event:** 2013

**End date:** 2013





**Organising entity:** Universidad Politécnica de Cartagena

**Type of entity:** University

**City organizing entity:** Cartagena, Region of Murcia, Spain

José Ramón Acosta Motos; Sara Álvarez Martín; María Fernanda López Climent; Matías Manzí; Aurelio Gómez Cadenas; María Jesús Sánchez Blanco.

**11 Title of the work:** Evaluation of the photosynthetic and hydric response during the day and ionic concentration of evonym plants irrigated with regenerated water with high levels of salinity.

**Name of the conference:** XI Simposio Hispano- Portugués de Relaciones Hídricas en las Plantas.

**Corresponding author:** No

**City of event:** Sevilla, Andalusia, Spain

**Date of event:** 17/09/2012

**End date:** 20/09/2012

**Organising entity:** Instituto de Recursos Naturales y **Type of entity:** State agency  
Agrobiología de Sevilla

**City organizing entity:** Sevilla, Andalusia, Spain

María José Gómez Bellot; Pedro Antonio Nortés; Karoline Gonçalves; José Ramón Acosta Motos; María Fernanda Ortuño Gallud; María Jesús Sánchez Blanco.

**12 Title of the work:** Effect of different quality irrigation water on the growth, mineral concentration and physiological parameters of Viburnum tinus plants.

**Name of the conference:** II Symposium on Horticulture in Europe

**Corresponding author:** No

**City of event:** Angers, France

**Date of event:** 01/07/2012

**End date:** 05/07/2012

**Organising entity:** AGROCAMPUS OUEST-Centre **Type of entity:** Technological Centre  
d'Angers (INHP)

**City organizing entity:** Angers, France

María José Gómez Bellot; Marco Antonio Castillo Campo-Hermoso; Sara Álvarez Martín; José Ramón Acosta Motos; Juan José Alarcón Cabañero; María Fernanda Ortuño Gallud; Sebastián Bañón Arias.

**13 Title of the work:** Growth, water relations and ornamental parameters of callistemon plants with low water availability and irrigated with saline water.

**Name of the conference:** XIII Congreso Nacional de Ciencias Hortícolas "Convergencia de las Tecnologías Hortofrutícolas"

**Corresponding author:** No

**City of event:** Almería, Andalusia, Spain

**Date of event:** 2012

**End date:** 2012

**Organising entity:** SOCIEDAD ESPAÑOLA DE CIENCIAS HORTICOLAS

**City organizing entity:** Almería, Andalusia, Spain

Sara Álvarez Martín; Sebastián Bañón Arias; José Ramón Acosta Motos; María Jesús Sánchez Blanco.

**14 Title of the work:** Effect of moderate and severe deficit irrigation in the quality and efficiency in the water use of callistemon plants in nursery conditions.

**Name of the conference:** V Jornadas Ibéricas de Horticultura Ornamental.

**Corresponding author:** No

**City of event:** Faro, Algarve, Portugal

**Date of event:** 13/10/2011

**End date:** 15/10/2011

**Organising entity:** SOCIEDAD ESPAÑOLA DE CIENCIAS HORTICOLAS



**City organizing entity:** Faro, Algarve, Portugal

Sara Álvarez Martín; José Ramón Acosta Motos; Sebastián Bañón Arias; María Jesús Sánchez Blanco.

**15 Title of the work:** Reuse of reclaimed water for irrigation of *Myrtus communis* plants: Morphological and physiological response to the different levels of salinity.

**Name of the conference:** XIX Reunión de la Sociedad Española de Fisiología Vegetal. XII Congreso Hispano-Luso de Fisiología Vegetal.

**Corresponding author:** Yes

**City of event:** Castelló de la Plana, Valencian Community, Spain

**Date of event:** 21/06/2011

**End date:** 24/06/2011

**Organising entity:** Universidad Jaime I

**Type of entity:** University

**City organizing entity:** Castelló de la Plana, Valencian Community, Spain

José Ramón Acosta Motos; Gregorio Barba Espín; Fernando Broetto; María José Gómez Bellot; Marco Antonio Castillo Campo-Hermoso; Sara Álvarez Martín; Sebastián Bañón Arias; María Jesús Sánchez Blanco.

**16 Title of the work:** Morphological modifications and ion accumulation in three Mediterranean species with different tolerance to water deficit and salinity.

**Name of the conference:** XIX Reunión de la Sociedad Española de Fisiología Vegetal. XII Congreso Hispano-Luso de Fisiología Vegetal

**Corresponding author:** No

**City of event:** Castelló de la plana, Valencian Community, Spain

**Date of event:** 21/06/2011

**End date:** 24/06/2011

**Organising entity:** Universidad Jaime I

**Type of entity:** University

**City organizing entity:** Castelló de la plana, Valencian Community, Spain

Marco Antonio Castillo Campo-Hermoso; Fernando Broetto; María José Gómez Bellot; José Ramón Acosta Motos; Sara Álvarez Martín; Sebastián Bañón Arias; María Jesús Sánchez Blanco.

**17 Title of the work:** Effect of irrigation with regenerated waters on the development, mineral composition and water status of plants of *Eugenia myrtifolia* L.

**Name of the conference:** X Simposium Hispano-Portugués de Relaciones Hídricas en las Plantas. Herramientas para un uso eficiente del agua.

**Corresponding author:** Yes

**City of event:** Cartagena, Region of Murcia, Spain

**Date of event:** 06/10/2010

**End date:** 08/10/2010

**Organising entity:** Centro de Edafología y Biología Aplicada del Segura

**Type of entity:** State agency

**City organizing entity:** Murcia, Region of Murcia, Spain

José Ramón Acosta Motos; Marco Antonio Castillo Campo-Hermoso; Sara Álvarez Martín; Sebastián Bañón Arias; Francisco Pedrero Salcedo; María José Gómez Bellot; María Jesús Sánchez Blanco.

**18 Title of the work:** Photosynthetic Response, Biomass Distribution and Water Status Changes in *Rhamnus Alaternus* Plants during Drought.

**Name of the conference:** 28th Congreso Internacional de Horticultura de Lisboa. International Horticultural Congress - Lisboa 2010

**Corresponding author:** No

**City of event:** Lisboa, Lisboa, Portugal

**Date of event:** 22/08/2010

**End date:** 27/08/2010



**Organising entity:** SOCIEDAD ESPAÑOLA DE CIENCIAS HORTICOLAS

**City organizing entity:** Community of Madrid, Spain

Sara Álvarez Martín; Marco Antonio Castillo Campo-Hermoso; José Ramón Acosta Motos; Alejandra Navarro; María Jesús Sánchez Blanco.

**19 Title of the work:** Biomass, hydraulic conductivity and stem growth of mastic plant irrigated with water of different salinity levels

**Name of the conference:** XVIII Reunión de la Sociedad Española de Fisiología Vegetal (SEFV); XI Congreso Hispano-Luso de Fisiología Vegetal.

**Corresponding author:** No

**City of event:** Zaragoza, Aragon, Spain

**Date of event:** 2009

**End date:** 2009

**Organising entity:** Estación Experimental de Aula Dei      **Type of entity:** State agency

**City organizing entity:** Zaragoza, Aragon, Spain

Marco Antonio Castillo Campo-Hermoso; Fernando Broetto; Pedro Rodríguez; José Ramón Acosta Motos; María Jesús Sánchez Blanco.

**20 Title of the work:** Generation of hydrogen peroxide in the melanin biosynthesis pathway.

**Name of the conference:** 34th FEBS Congress

**City of event:** Praga, Praha, Czech Republic

**Date of event:** 2009

**End date:** 2009

**Organising entity:** FEDERACION EUROPEA DE BIOTECNOLOGIA

**City organizing entity:** Community of Madrid, Spain

José Luis Muñoz Muñoz; Francisco García Molina; José Ramón Acosta Motos; Mónica García Molina; Jose Tudela; Francisco García Canovas; José Neptuno Rodríguez López.

**21 Title of the work:** Stereospecificity of the suicide inactivation of tyrosinase. A kinetic study.

**Name of the conference:** 34th FEBS Congress

**Corresponding author:** Yes

**City of event:** Praga, Praha, Czech Republic

**Date of event:** 2009

**End date:** 2009

**Organising entity:** FEDERACION EUROPEA DE BIOTECNOLOGIA

**City organizing entity:** Community of Madrid, Spain

José Ramón Acosta Motos; José Luis Muñoz Muñoz; Francisco García Molina; Monica García Molina; José Tudela; Francisco García Canovas; José Neptuno Rodríguez López.

## R&D management and participation in scientific committees

### Scientific, technical and/or assessment committees

**Committee title:** CÁTEDRA UCAM-SANTANDER DE EMPRENDIMIENTO EN EL ÁMBITO AGROALIMENTARIO

**Affiliation entity:** Universidad Católica San Antonio de Murcia

**Start date:** 01/11/2017

### Organization of R&D activities

- Title of the activity:** Organization of the seminar: Agua, energía y agricultura de precisión en la Región de Murcia. Nuevos desarrollos tecnológicos aplicados

**Type of activity:** Outreach activities

**Convening entity:** Universidad Católica San Antonio de Murcia

**Start-End date:** 26/11/2018 - 26/11/2018      **Duration:** 1 day
- Title of the activity:** Organization and presentation of the gastrolab: "Presentación de informes brócoli y pimiento. Cata de recetas de brócoli y pimiento con un toque técnico e innovador

**Type of activity:** Outreach activities

**Convening entity:** Universidad Católica San Antonio de Murcia

**Start-End date:** 16/11/2018 - 16/11/2018      **Duration:** 1 day
- Title of the activity:** Creation, monitoring and daily update of a blog and a facebook page with news of interest on agriculture and food. The links to the blog and the page are respectively: <https://bit.ly/2PYafDJ> and <https://bit.ly/2IA19NK>

**Type of activity:** Follow-up tasks and evaluation of reports within the UCAM-Santander Chair      **Geographical area:** Regional

**Convening entity:** Universidad Católica San Antonio de Murcia      **Type of entity:** University

**Start-End date:** 01/11/2017 - 01/11/2018      **Duration:** 1 year
- Title of the activity:** Organization and presentation of the technical report: "El Agua en el Sector Agrario de la Región de Murcia. Recursos de la Cuenca, Superficies Demandantes, Consumos y Déficit.

**Type of activity:** Outreach activities      **Geographical area:** Regional

**Convening entity:** Universidad Católica San Antonio de Murcia      **Type of entity:** University

**Start-End date:** 02/10/2018 - 02/10/2018      **Duration:** 1 day
- Title of the activity:** Organization and presentation of the technical report: Analysis of Best Management Practices Implementation in Cedar Creek Watershed. Differences and Similarities with Campo de Cartagena

**Type of activity:** Outreach activities

**Convening entity:** Universidad Católica San Antonio de Murcia      **Type of entity:** University

**Start-End date:** 13/07/2018 - 13/07/2018      **Duration:** 1 day



- 6** **Title of the activity:** Science Week  
**Type of activity:** Informative activity  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2015 - 2015  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 7** **Title of the activity:** Science Week  
**Type of activity:** Informative activity  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2014 - 2014  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 8** **Title of the activity:** Night of Researchers  
**Type of activity:** Informative activities  
**Convening entity:** Centro de eDA  
**Start-End date:** 2013 - 2013  
**Geographical area:** Regional  
**Duration:** 7 days
- 9** **Title of the activity:** Science Week  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2013 - 2013  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 10** **Title of the activity:** Visit of IDIES high school students  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2013 - 2013  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 11** **Title of the activity:** Night of Researchers  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2012 - 2012  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 12** **Title of the activity:** Science Week  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2012 - 2012  
**Geographical area:** Regional  
**Type of entity:** State agency
- 13** **Title of the activity:** Visit of IDIES high school students  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2012 - 2012  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 14** **Title of the activity:** Night of Researchers  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2011 - 2011  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days



- 15** **Title of the activity:** Science Week  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2011 - 2011  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 16** **Title of the activity:** Visit of IDIES high school students  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2011 - 2011  
**Type of entity:** State agency  
**Duration:** 7 days
- 17** **Title of the activity:** Night of Researchers  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2010 - 2010  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 18** **Title of the activity:** Science Week  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2010 - 2010  
**Geographical area:** Regional  
**Type of entity:** State agency  
**Duration:** 7 days
- 19** **Title of the activity:** Visits of IDIES high school students  
**Type of activity:** Informative activities  
**Convening entity:** Centro de Edafología y Biología Aplicada del Segura  
**Start-End date:** 2010 - 2010  
**Type of entity:** State agency  
**Duration:** 7 days

## R&D management

**Name of the activity:** Cátedra UCAM-Santander. Entrepreneurship in the agri-food sector  
**Type of management:** Management of organised events  
**Entity:** Universidad Católica San Antonio de Murcia  
**Start date:** 01/11/2017  
**Type of entity:** University  
**Duration:** 1 year

## Evaluation and revision of R&D projects and articles

- 1** **Name of the activity:** Referee  
**Performed tasks:** I have been a referee for journals within Plant Science. Specifically, for Plant Physiology and Biochemistry, Journal of Plant Physiology, Scientia Horticulturae. I have also been referee for journals within Horticulturae as journal of horticultural science & biotechnology  
**Entity where activity was carried out:** Centro de Edafología y Biología Aplicada del Segura  
**Start date:** 2018  
**Type of entity:** State agency



- 2 Name of the activity:** Technical Expert Evaluator of Projects in EQA  
**Performed tasks:** Periodically I receive projects of my specialty to evaluate its viability, quality and its correct development and approach  
**Entity where activity was carried out:** Centro de Edafología y Biología Aplicada del Segura      **Type of entity:** State agency  
**Start date:** 2018

## Other achievements

### Stays in public or private R&D centres

- 1 Entity:** Lancaster University      **Type of entity:** University Research Institute  
**Faculty, institute or centre:** Lancaster Environment Centre (LEC)  
**City of entity:** Lancaster, Lancashire, United Kingdom  
**Start-End date:** 20/11/2017 - 03/12/2017      **Duration:** 14 days  
**Goals of the stay:** Post-doctoral  
**Provable tasks:** Invitado a participar en el Alternate Wetting & Drying (AWD) Workshop
- 2 Entity:** Lancaster University      **Type of entity:** University Research Institute  
**Faculty, institute or centre:** Lancaster Environment Centre (LEC)  
**City of entity:** Lancaster, Lancashire, United Kingdom  
**Start-End date:** 06/03/2017 - 19/03/2017      **Duration:** 14 days  
**Goals of the stay:** Post-doctoral  
**Provable tasks:** Escritura del trabajo del arroz que se ha enviado a la revista Journal of Experimental Botany para su publicación en 2018
- 3 Entity:** Lancaster University      **Type of entity:** University Research Institute  
**Faculty, institute or centre:** Lancaster Environment Centre  
**City of entity:** Lancaster, Lancashire, United Kingdom  
**Start-End date:** 12/10/2015 - 30/04/2016      **Duration:** 7 months  
**Goals of the stay:** Post-doctoral  
**Provable tasks:** Benefits of controlled soil drying on crop yields. Since there was high variability in concentrations of other phytohormones, we implemented a controlled environment AWD system to investigate leaf growth and stomatal dynamics throughout several AWD cycles, along with leaf sampling the day before and day after re-flooding the soil (to encompass the maximum range of physiological responses). Phytohormone analysis is ongoing and will be completed within the duration of the no-cost extension.
- 4 Entity:** Universitat Jaume I de Castellón      **Type of entity:** University Research Institute  
**Faculty, institute or centre:** Departamento de Ciencias Agrarias y del Medio Natural de la Universitat Jaume I de CastellónC  
**City of entity:** Castelló de la plana, Valencian Community, Spain  
**Start-End date:** 05/05/2012 - 04/08/2012      **Duration:** 3 months - 91 days  
**Goals of the stay:** Doctorate  
**Provable tasks:** Hormonal signaling in plants under conditions of abiotic stress. The objective of the stay is the learning of techniques related to hormonal signaling in abiotic stress. It is intended to use liquid chromatography associated with mass spectrometry (LC-MS) to measure concentrations of abscisic acid (ABA), jasmonic acid (JA), salicylic acid (SA) and indoleacetic acid (IAA) in leaf of ornamental plants grown under conditions of salinity. The concentrations of these hormones in leaves of plants irrigated with good quality and low quality water will be measured in order to establish the different degrees of tolerance to salinity.



- 5** **Entity:** Universidad Miguel Hernández de Elche      **Type of entity:** University  
**Faculty, institute or centre:** Instituto de Bioingeniería (IB)  
**City of entity:** Elche, Valencian Community, Spain  
**Start date:** 02/01/2017      **Duration:** 1 year  
**Goals of the stay:** Post-doctoral  
**Provable tasks:** Desde Enero de 2017 visitas periódicas para realizar tareas de análisis estadísticos de resultados relacionados con el fenotipado del Clavel

### Other types of collaboration with researchers or technologists

- 1** **Type of relationship:** Confirmed publications  
**Name principal investigator (PI, Co-PI....):** Ian C. Dodd; Hao Zhang; Shane A. Rothwell  
**Description of the collaboration:** International collaboration with a researcher  
**Duration:** 8 months
- 2** **Type of relationship:** Confirmed publications  
**Name principal investigator (PI, Co-PI....):** Aurelio Gómez Cadenas  
**Description of the collaboration:** National collaboration with a researcher  
**Duration:** 3 months - 91 days