

CURRICULUM VITAE

ANGEL VALVERDE PORTAL

Associate Professor
University of the Free State

PERSONAL INFORMATION

Born: 26th April 1970.

Nationality: Spanish, Permanent resident in South Africa.

Home address: 14 Blue ridge, Chiante Crescent, Lilyvale, Bloemfontein 9300

Work address: Department of Microbial, biochemical and food biotechnology (Room A6), University of the Free State, 205 Nelson Mandela Drive, Park West, Bloemfontein 9300, South Africa.

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EDUCATION

2003 PhD in Microbiology. University of Salamanca (Spain).

1993 BSc in Biology. University of Salamanca (Spain).

PROFESSIONAL EXPERIENCE

6/2018-present

Associate professor. Department of Microbial, Biochemical and Food Biotechnology. University of the Free State, South Africa.

7/2017-5/2018

Senior Researcher. Department of Microbial, Biochemical and Food Biotechnology. University of the Free State, South Africa.

6/2012-6/2017

Research Fellow. Centre for Microbial Ecology and Genomics (CMEG). University of Pretoria, South Africa.

3/2011-5/2012

Post-Doctoral Research Associate. Institute for Microbial Biotechnology and Metagenomics (IMBM). University of Western Cape, South Africa.

4/2007-2/2011

Post-Doctoral Researcher. Institute for Natural Resources and Agrobiolgy (IRNASA). Spanish National Research Council, Spain.

2/2005-1/2007

Post-Doctoral Fellow. Faculty of Agriculture. The Hebrew University of Jerusalem, Israel.

5/2003-12/2004

Post-Doctoral Researcher. Institute for Natural Resources and Agrobiology (IRNASA). Spanish National Research Council, Spain.

CITATION ANALYSIS AND NRF RATING

Orcid ID:

orcid.org/0000-0003-0439-9605

Scopus (May 2018): number of citations: 1466; H index: 24

<http://www.scopus.com/authid/detail.uri?authorId=7005337772>

Google Scholar (May 2018): number of citations: 2361; H index: 28

<https://scholar.google.co.za/citations?user=z0FNnWkAAAAJ&hl=en>

NRF Rating: C2 (2014-2018)

CURRENT RESEARCH TOPICS AND INTERESTS

My research covers different aspects of microbial biodiversity, especially in the fields of taxonomy, phylogenetics and “omics”. Using a system biology approach, my main interest is to better understand how abiotic and biotic factors shape the dynamics of microbial communities in space and time. These insights will undoubtedly increase our ability to predict and manage microbial communities to achieve desired outcomes. For instance, the bioremediation of contaminated water and soil.

TEACHING

Lectures

Microbial ecology and environmental microbiology (MCBE3724). University of the Free State (2018-present)

Bacteriology (MBY251). Metabolic diversity of microorganisms. Undergraduate course. University of Pretoria (2107).

Training

Marker-gene metagenomics data analysis. Postgraduate course. University of the Free State (2018-present).

Bioinformatics: analysing microbial diversity. Postgraduate course. Université de la Manouba, Tunisia (2016).

R for microbial diversity analyses. Postgraduate course. University of Pretoria (2013, 2014).

Statistical regression in microbial ecology. Postgraduate course. University of Pretoria (2013).

Analysis of microbial diversity: MOTHUR. Postgraduate course. National University of San Martin, Argentina (2013).

Biotechnological Applications of Microorganisms. Postgraduate course. University of Salamanca, Spain (2009).

Microorganisms and Biotechnology for future agriculture. Postgraduate course. University of Salamanca, Spain (2008-2009).

SUPERVISION OF STUDENTS

PhD

Karabelo Moloantoa. “Denitrification: A metagenomics and kinetic study of bacterial consortia from nitrate contaminated sites”. University of the Free State, South Africa (2017-present).

Maleke Maleke. “Insights into Rare Earth Metal microbe interactions using a known metal resistant bacterium and a site-specific isolate”. University of the Free State, South Africa (2017-present).

Jou-An Chen. “Scoping and quantification study of emerging contaminants in the Free State and Eastern Cape regions: effects on bacterial diversity and potential fate of compounds”. University of the Free State, South Africa (2017-present).

Abidemi Ojo. “Characterization of the sequential degradation of chloroethene compounds by a site specific mixed bacterial consortium”. University of the Free State, South Africa (2017-present).

Joel Dube. “Root-associated microorganisms in crop productivity”. University of Pretoria, South Africa (2014-present).

Casper Kamutando. “Plant invasions and the role of mutualistic microbes”. University of Pretoria, South Africa (2015-2018).

Tanzelle Oberholster. “Unravelling the sorghum root microbiome: a route to enhancing crop performance”. University of Pretoria, South Africa (2015-2018).

Josephine Zimudzi. “Occurrence, causal agents and management of atypical potato skin blemishes in South Africa and Zimbabwe”. University of Pretoria, South Africa (2014-2017).

María Victoria Quiroga. “Peat bogs: temporal and spatial diversity of bacterial communities”. National University of San Martin, Argentina (2013-2014).

Gaston Aziz. “Phosphate solubilizing bacteria in soils under crop-pasture rotations”. IRNASA-CSIC, Spain (2010-11).

Marisol Medina-Sierra. “Microbiological characterization of a prairie soil under different management regimes”. University of Salamanca, Spain (2008-11).

Anat Lerner. “Phenotypic variation in *Azospirillum brasilense*”. The Hebrew University of Jerusalem, Israel (2005-7).

MSc

Corinne Fourie. “Novel insights into precipitation and interactions of copper with *Desulfosporosinus* sp. and *Rhodanobacter* sp.”. University of the Free State, South Africa (2017-present).

Gerhard Potgieter. “Anthropogenic arsenic biological management: characterization of arsenic hyper-resistance in bacterial consortia”. University of the Free State, South Africa (2017-present).

Teboho Rankoroane. “Characterization of biofilms from a natural desalination system: exploring microbial carbonation in natural and engineered environments”. University of the Free State, South Africa (2017-present).

Pieter Bowman. “Analysis of the bacterial microbiome from prostate tissue of South African men”. University of Pretoria, South Africa (2015-present).

Percy Mutseka. “Distribution and diversity of rhizobial populations associated with *Acacia dealbata* in South Africa”. University of Pretoria, South Africa (2016-2018).

Linda Nhukarume. “Microbial community structure of soil from potato fields”. University of Pretoria, South Africa (2014-2015).

Jarishma K Gokul. “Micro-eukaryotic diversity in Antarctic hypolithons”. University of Western Cape, South Africa (2011-12).

Honours

Lebo Duba. “The cold shock production of a single chain variable fragment against human tissue factor in *E. coli* Shuffle using 5L Bioreactors”. University of the Free State, South Africa (2017).

Happiness P. January. “Diversity and function of bacterial communities during AMD treatment by the BDAS system”. University of the Free State, South Africa (2017).

Bhaveni B. Kooverjee. “Are Antarctic soil microbial communities resistant and resilient to increased nitrogen input?”. University of Pretoria, South Africa (2016).

Derya Bozkale. “Microbial ecology, contamination and pathogen transport in the Olifants River, Kruger National Park”. University of Pretoria, South Africa (2016).

Felix Oloo. “Bacterial phylogenetic and functional diversity in Sub-Antarctic peatlands from Tierra del Fuego, Argentina”. University of Pretoria, South Africa (2015).

Tsakani M. Miyambo. “Unveiling endophytic bacterial communities in the Fynbos biome”. University of Pretoria, South Africa (2014).

GRANTS RECEIVED

USAID grant. “African soil microorganisms as a critical resource for agriculture and biotechnology”. R6,900,000. Period: 2016-2018. Co-Investigator

Foundational biodiversity information programme (FBIP-NRF). “What are the impacts of global change on arid soil microbial communities?” R170,000. Period: 2016. Co-investigator.

Genomic research institute programme (GRI, UP). “Bacterial phylogenetic and functional diversity in Sub-Antarctic peatlands from Tierra del Fuego (Argentina)”. R60,000. Period: 2015. Principal investigator.

Competitive programme for rated researchers (NRF). “Plant invasions and the role of mutualistic microbes: *Acacia dealbata* as a case study”. R1,048,700. Period: 2015-2017. Principal investigator.

Research and technology fund 2014 (NRF). “Root-associated microorganisms in crop productivity”. R250,000. Period: 2014. Co-investigator.

Incentive funding for rated researchers (NRF). R240,000. Period: 2014-2019.

Thuthuka programme (NRF): “Ecosystem functioning: hypolithic communities as a model system”. R558,400. Period: 2014-2016. Principal investigator.

CRP-ICGEP research grant (CRP-ICGEP): “Unravelling the sorghum root microbiome: a route to enhancing crop performance”. R794,000. Period: 2014-2016. Co-investigator.

Research development programme (UP): “Effects of cyanobacterial diversity of food web structure in a desert ecosystem”. R150,000. Period: 2013-2015. Principal investigator.

Foundational biodiversity information programme (FBIP-NRF): “Unveiling endophytic bacterial communities in the Fynbos biome”. R100,000. Period: 2014. Principal investigator.

Ministry of Science and Innovation (Spanish Government): “Optimization of the diversity-carbon balance linkage through agro-pastoral management strategies”. €120,000. Period: 2009-2011. Principal investigator.

ACADEMIC RECOGNITION

Society Membership

South African Society for Microbiology, American Society for Microbiology.

National Responsibilities

Member, Foundational Biodiversity Information Programme (FBIP) Steering Committee (2018-2021).

Grant Reviewing

Regular reviewer for National Evaluation and Foresight Agency (ANEP, Spain), Israel Science Foundation (ISR, Israel) and National Research Foundation (NRF, South Africa).

Peer-Review Journals

Editorial board: *Frontiers in Microbiology*.

Regular reviewer for *ISME Journal*, *Molecular Ecology*, *Microbial Ecology*, *FEMS Microbiology Ecology*, etc.

PhD examinations

Examiner for PhD's from the Universities of:

Salamanca (2008-2010).

Pretoria (2016-2017).

Other Examining

Internal Examiner for Genetics Honours program, University of Pretoria (2014-2016).

External Examiner for Microbiology MSc degrees, University of Venda (2017).

PUBLICATIONS

Articles in international, peer-reviewed, journals

62. Cason ED, Vermeulen J-G, Müller W, van Heerden E, **Valverde A.** (2018) Aerobic and anaerobic enrichment cultures highlight the pivotal role of facultative anaerobes in soil hydrocarbon degradation. Under review.
61. Moloantoa K, Atangana A, Cason ED, Coetsee-Hugo E, **Valverde A.**, van Heerden E, Castillo JC. (2018) Responses of a sulphate-reducing bacterial consortium to high pH, temperature and zinc concentrations. Under review.
60. Zimudzi J, van der Waals JE, Coutinho TA, Cowan DA, **Valverde A.** (2018) Temporal shifts of fungal communities in the rhizosphere and on tubers in potato fields. Under review.
59. Kamutando CN, Vikram S, Kamgan-Nkuekam G, Makhalanyane TP, Greve M, Le Roux JJ, Richardson DM, Cowan DA, **Valverde A.** (2018) The functional potential of the rhizospheric microbiome of an invasive tree species, *Acacia dealbata*. *Microb Ecol.* In press.
58. Kamgan-Nkuekam G, **Valverde A.**, Cowan DA. (2018) Arable agriculture changes soil microbial communities in the South African grassland biome. *S Afr J Sci.* In press.
57. Oberholster T, Vikram S, Cowan DA, **Valverde A.** (2018) Key microbial taxa in the rhizosphere of sorghum and sunflower grown in crop rotation. *Sci Total Environ.* 624: 530-539.
56. Van Goethem MW, Makhalanyane TP, Cowan DA, **Valverde A.** (2017) Cyanobacteria and alphaproteobacteria may facilitate cooperative interactions in niche communities. *Front Microbiol.* 8: 2099.
55. Kamutando CN, Vikram S, Kamgan-Nkuekam G, Makhalanyane TP, Greve M, Le Roux JJ, Richardson DM, Cowan DA, **Valverde A.** (2017) Soil nutritional status and biogeography influence rhizosphere microbial communities associated with the invasive tree *Acacia dealbata*. *Sci Rep.* 7: 6472.
54. Medina-Sierra M, Igual-Arroyo M, Restrepo-Betancur F, **Valverde A.**, Santa-Regina I (2017) Relationship between plant species diversity and plant biomass of orchard grass and lucerne sown in different ratios in the province of Salamanca, Spain. *Open J For.* 7: 336-351.

53. **Valverde A**, Gonzalez-Tirante M, Medina-Sierra M, Rivas R, Santa-Regina I, Igual JM. (2017) Culturable bacterial diversity from the chestnut (*Castanea sativa* Mill.) phyllosphere and screening of antagonism against the fungi causing the chestnut blight and ink diseases. *AIMS Microbiol.* 3: 293-314.
52. Miyambo T, Makhalanyane TP, Cowan D, **Valverde A**. (2016) Plants of the Fynbos biome harbour host species-specific bacterial communities. *FEMS Microbiol Lett.* 363: fnw122.
51. Van Goethem MW, Makhalanyane TP, **Valverde A**, Cary SC, Cowan DA. (2016) Characterization of bacterial communities in lithobionts and soil niches from Victoria Valley, Antarctica. *FEMS Microbiol Ecol.* 92: fiw051.
50. Armstrong A, **Valverde A**, Ramond JB, Makhalanyane TP, Jansson J, Hopkins HW, Aspray TJ, Seely M, Trindade MI, Cowan DA. (2016) Temporal dynamics of hot desert microbial communities reveal structural and functional responses to water input. *Sci Rep.* 3: 34434.
49. Oloo F*, **Valverde A***, Quiroga MV, Vikram S, Cowan D, Mataloni G. (2016) Habitat heterogeneity and connectivity shape aquatic microbial communities in South American peatlands. *Sci Rep.* 6: 25712.
- *These authors contributed equally to this work
48. **Valverde A**, De Maayer P, Oberholster T, Henschel J, Louw MK, Cowan DA. (2016) Specific microbial communities associate with the rhizosphere of *Welwitschia mirabilis*, a living fossil. *PLoS ONE* 11: e0153353.
47. Makhalanyane TP, **Valverde A**, Gunnigle E, Frossard A, Ramond J-B, Cowan DA. (2015) Microbial ecology of hot desert edaphic systems. *FEMS Microbiol Rev.* 39: 203-221.
46. Quiroga MV*, **Valverde A***, Mataloni G, Cowan DA. (2015) Understanding diversity patterns in bacterioplankton communities from a Sub-Antarctic peatland. *Env Microbiol Rep.* 7: 547-553.
- *These authors contributed equally to this work
45. Makhalanyane TP, **Valverde A**, Velazquez D, Gunnigle E, Van Goethem MW, Quesada A, Cowan DA. (2015) Ecology and biogeochemistry of cyanobacteria in soils, permafrost, aquatic and cryptic polar habitats. *Biodiv Conserv.* 24: 819-840.
44. **Valverde A**, Makhalanyane TP, Seely M, Cowan DA. (2015) Cyanobacteria drive community composition and functionality in rock-soil interface communities. *Mol Ecol.* 24: 812-821.
43. **Valverde A**, Makhalanyane TP, Cowan DA. (2014) Contrasting assembly processes in a bacterial metacommunity along a desiccation gradient. *Front Microbiol.* 5: 668.
42. Sanchez-Juanes F, Ferreira L, Alonso P, **Valverde A**, Leon-Barrios M, Rivas R, Mateos PF, Martinez-Molina E, Gonzalez-Buitrago JM, Trujillo ME, Velazquez E. (2013) MALDI-TOF Mass Spectrometry as a tool for differentiation of *Bradyrhizobium* species: application to the identification of *Lupinus* nodulating strains. *Syst Appl Microbiol.* 36: 565-571.
41. Cowan DA, Rybicki E, Tuffin M, **Valverde A**, Wingfield MJ. (2013) Biodiversity: so much more than legs and leaves. *S Afr J Sci.* 109: 1-9.

40. Makhalanyane TP, **Valverde A**, Birkeland NK, Cary SG, Tuffin MI, Cowan DA. (2013) Evidence for successional development in Antarctic hypolithic bacterial communities. *ISME Journal*. 7: 2080-2090.
39. Ramos E, Ramirez-Bahena MH, **Valverde A**, Velazquez E, Zuñiga D, Velezmoro C, Peix A. (2013) *Pseudomonas punonensis* sp. nov., isolated from straw. *Int J Syst Evol Microbiol*. 63: 1834-1839.
38. Roychoudhury AN, Cowan DA, Porter D, **Valverde A**. (2013) Dissimilatory sulphate reduction in hypersaline coastal pans: an integrated microbiological and geochemical study. *Geobiology* 11: 224-233.
37. Flores-Felix JD, Carro L, Velazquez E, **Valverde A**, Cerda-Castillo E, Garcia-Fraile P, Rivas R. (2013) *Phyllobacterium endophyticum* sp. nov., isolated from nodules of *Phaseolus vulgaris*. *Int J Syst Evol Microbiol*. 63: 821-826.
36. Makhalanyane TP, **Valverde A**, Lacap DC, Pointing SB, Tuffin MI, Cowan DA. (2013) Evidence of species recruitment and development of hot desert hypolithic communities. *Environ Microbiol Rep*. 5: 219-224.
35. Gokul JK, **Valverde A**, Tuffin M, Cary SC, Cowan DA. (2013) Micro-eukaryotic diversity in hypolithons from Miers Valley, Antarctica. *Biology* 2013: 331-340.
34. Stomeo F*, **Valverde A***, Pointing SB, Tuffin M, Cowan DA. (2013) Hypolithic and soil microbial community assembly along an aridity gradient in the Namib Desert. *Extremophiles* 17: 329-337.
- *These authors contributed equally to this work
33. Stomeo F, Makhalanyane TP, **Valverde A**, Pointing SB, Stevens MI, Cary CS, Tuffin MI, Cowan DA. (2012) Abiotic factors influence microbial diversity in permanently cold soil horizons of a maritime-associated Antarctic Dry Valley. *FEMS Microbiol Ecol*. 82: 326-340.
32. Azziz G, Bajsa N, Haghjou T, Taule C, **Valverde A**, Igual JM, Arias A. (2012) Abundance, diversity and prospecting of culturable phosphate solubilizing bacteria on soils under crop-pasture rotations in a no-tillage regime in Uruguay. *Appl Soil Ecol*. 61: 320-326.
31. Carro-Garcia L, Rivas R, Leon-Barrios M, Gonzalez-Tirante M, Velazquez E, **Valverde A**. (2012) *Herbaspirillum canariense* sp. nov., *Herbaspirillum aurantiacum* sp. nov. and *Herbaspirillum soli* sp. nov., isolated from volcanic mountain soil, and emended description of the genus *Herbaspirillum*. *Int J Syst Evol Microbiol*. 62: 1300-1306.
30. **Valverde A**, Tuffin M, Cowan DA. (2012) Biogeography of bacterial communities in hot springs: a focus on the actinobacteria. *Extremophiles* 16: 669-679.
29. Perez T, Balcazar JL, Peix A, **Valverde A**, Velazquez E, de Blas I, Ruiz-Zarzuela I. (2011) *Lactococcus lactis* subsp. *tructae* subsp. nov., isolated from the intestinal mucus of brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*). *Int J Syst Evol Microbiol*. 61: 1894-1898.
28. Salazar S, Sanchez LE, Alvarez J, **Valverde A**, Galindo P, Igual JM, Peix A, Santa-Regina I. (2011) Correlation among soil enzyme activities under different forest system management practices. *Ecol Eng*. 37: 1123-1131.

27. **Valverde A**, Gonzalez-Tirante M, Medina-Sierra M, Santa-Regina I, Garcia-Sanchez A, Igual JM. (2011) Diversity and community structure of culturable arsenic-resistant bacteria across a soil arsenic gradient at an abandoned tungsten-tin mining area. *Chemosphere* 85: 129-134.
26. **Valverde A**, Velazquez E, Igual JM, van Berkum P. (2011) Evidence for an American origin of the genes for symbiosis in *Rhizobium lusitanum*. *Appl Environ Microbiol.* 77: 5665-5670.
25. Velazquez E, **Valverde A**, Rivas R, Gomis V, Peix A, Gantois I, Igual JM, Leon-Barrios M, Willems A, Mateos PF, Martinez-Molina E. (2010) Strains nodulating *Lupinus albus* on different continents belong to several new chromosomal and symbiotic lineages within *Bradyrhizobium*. *Antonie van Leeuwenhoek* 97: 363-376.
24. **Valverde A**, Fterich A, Mahdhi M, Ramirez-Bahena MH, Caviedes MA, Mars M, Velazquez E, Rodriguez-Llorente ID. (2010) *Paenibacillus prosopidis* sp. nov., isolated from the nodules of *Prosopis farcta*. *Int J Syst Evol Microbiol.* 60: 2182-2186.
23. Lerner A, **Valverde A**, Castro-Sowinski S, Lerner H, Okon Y, Burdman S. (2010) Phenotypic variation in *Azospirillum brasilense* exposed to starvation. *Environ Microbiol Rep.* 2: 577-586.
22. Lerner A, Castro-Sowinski S, **Valverde A**, Lerner H, Dror R, Okon Y, Burdman S. (2009) The *Azospirillum brasilense* Sp7 noeJ and noeL genes are involved in extracellular polysaccharide biosynthesis. *Microbiology-Sgm* 155: 4058-4068.
21. Delvasto P, Ballester A, Muñoz JA, Gonzalez F, Blazquez ML, Igual JM, **Valverde A**, Garcia-Balboa C. (2009) Mobilization of phosphorus from iron ore by the bacterium *Burkholderia caribensis* FeGL03. *Miner Eng.* 22: 1-9.
20. Alvarez-Martinez ER, **Valverde A**, Ramirez-Bahena MH, Garcia-Fraile P, Tejedor C, Mateos PF, Santillana N, Zuniga D, Peix A, Velazquez E. (2009) The analysis of core and symbiotic genes of rhizobia nodulating *Vicia* from different continents reveals their common phylogenetic origin and suggests the distribution of *Rhizobium leguminosarum* strains together with *Vicia* seeds. *Arch Microbiol.* 191: 659-668.
19. Yishay M, Burdman S, **Valverde A**, Luzzatto T, Ophir R, Yedidia I. (2008) Differential pathogenicity and genetic diversity among *Pectobacterium carotovorum* ssp *carotovorum* isolates from monocot and dicot hosts support early genomic divergence within this taxon. *Environ Microbiol.* 10: 2746-2759.
18. **Valverde A**, Peix A, Rivas R, Velazquez E, Salazar S, Santa-Regina I, Rodriguez-Barrueco C, Igual JM. (2008) *Paenibacillus castaneae* sp nov., isolated from the phyllosphere of *Castanea sativa* Miller. *Int J Syst Evol Microbiol.* 58: 2560-2564.
17. Ramirez-Bahena MH, Garcia-Fraile P, Peix A, **Valverde A**, Rivas R, Igual JM, Mateos PF, Martinez-Molina E, Velazquez E. (2008) Revision of the taxonomic status of the species *Rhizobium leguminosarum* (Frank 1879) Frank 1889(AL), *Rhizobium phaseoli* Dangeard 1926(AL) and *Rhizobium trifolii* Dangeard 1926AL. *R. trifolii* is a later synonym of *R. leguminosarum*. Reclassification of the strain *R. leguminosarum* DSM 30132 (= NCIMB 11478) as *Rhizobium pisi* sp nov. *Int J Syst Evol Microbiol.* 58: 2484-2490.
16. Delvasto P, **Valverde A**, Ballester A, Munoz JA, Gonzalez F, Blazquez ML, Igual JM, Garcia-Balboa C. (2008) Diversity and activity of phosphate

- bioleaching bacteria from a high-phosphorus iron ore. *Hydrometallurgy* 92: 124-129.
15. **Valverde A**, Hubert T, Stolov A, Dagar A, Kopelowitz J, Burdman S. (2008) Assessment of genetic diversity of *Xanthomonas campestris* pv. *campestris* isolates from Israel by various DNA fingerprinting techniques. *Plant Pathol.* 56: 17-25.
 14. Stolov A*, **Valverde A***, Ronald P, Burdman S. (2008) Purification of soluble and active RaxH, a transmembrane histidine protein kinase from *Xanthomonas oryzae* pv. *oryzae* required for AvrXa21 activity. *Mol Plant Pathol.* 8: 93-101.
*These authors contributed equally to this work
 13. Peix A*, **Valverde A***, Rivas R, Igual JM, Ramirez-Bahena MH, Mateos PF, Santa-Regina I, Rodriguez-Barrueco C, Martinez-Molina E, Velazquez E. (2007) Reclassification of *Pseudomonas aurantiaca* as a synonym of *Pseudomonas chlororaphis* and proposal of three subspecies, *P. chlororaphis* subsp. *chlororaphis* subsp. nov., *P. chlororaphis* subsp. *aureofaciens* subsp. nov., comb. nov. and *P. chlororaphis* subsp. *aurantiaca* subsp. nov., comb. nov. *Int J Syst Evol Microbiol.* 57: 1286-1290.
*These authors contributed equally to this work
 12. Velazquez E, Rivas R, del Villar M, **Valverde A**, Peix A, Mateos PF, Martinez-Molina E. (2006) A new approach for separating low-molecular-weight RNA molecules by staircase electrophoresis in non-sequencing gels. *Electrophoresis* 27: 1732-1738.
 11. **Valverde A**, Okon Y, Burdman S. (2006) cDNA-AFLP reveals differentially expressed genes related to cell aggregation of *Azospirillum brasilense*. *FEMS Microbiol Lett.* 265: 186-194.
 10. **Valverde A**, Igual JM, Peix A, Cervantes E, Velazquez E. (2006) *Rhizobium lusitanum* sp nov. a bacterium that nodulates *Phaseolus vulgaris*. *Int J Syst Evol Microbiol.* 56: 2631-2637
 9. **Valverde A**, Delvasto P, Peix A, Velazquez E, Santa-Regina I, Ballester A, Rodriguez-Barrueco C, Garcia-Balboa C, Igual JM. (2006) *Burkholderia ferrariae* sp nov., isolated from an iron ore in Brazil. *Int J Syst Evol Microbiol.* 56: 2421-2425.
 8. **Valverde A**, Burgos A, Fiscella T, Rivas R, Velazquez E, Rodriguez-Barrueco C, Cervantes E, Chamber M, Igual JM. (2006) Differential effects of coinoculations with *Pseudomonas jessenii* PS06 (a phosphate-solubilizing bacterium) and *Mesorhizobium ciceri* C-2/2 strains on the growth and seed yield of chickpea under greenhouse and field conditions. *Plant Soil* 287: 43-50.
 7. Igual JM, **Valverde A**, Velazquez E, Regina IS, Rodriguez-Barrueco C. (2006) Natural diversity of nodular microsymbionts of *Alnus glutinosa* in the Tormes River basin. *Plant Soil* 280: 373-383
 6. Delvasto P, **Valverde A**, Ballester A, Igual JM, Munoz JA, Gonzalez F, Blazquez ML, Garcia C. (2006) Characterization of brushite as a re-crystallization product formed during bacterial solubilization of hydroxyapatite in batch cultures. *Soil Biol Biochem.* 38: 2645-2654.
 5. **Valverde A**, Velazquez E, Fernandez-Santos F, Vizcaino N, Rivas R, Mateos PF, Martinez-Molina E, Igual JM, Willems A. (2005) *Phyllobacterium trifolii* sp

- nov., nodulating *Trifolium* and *Lupinus* in Spanish soils. *Int J Syst Evol Microbiol.* 55: 1985-1989.
4. **Valverde A**, Velazquez E, Gutierrez C, Cervantes E, Ventosa A, Igual JM. (2003) *Herbaspirillum lusitanum* sp nov., a novel nitrogen-fixing bacterium associated with root nodules of *Phaseolus vulgaris*. *Int J Syst Evol Microbiol.* 53: 1979-1983.
 3. Igual JM, **Valverde A**, Rivas R, Mateos PF, Rodriguez-Barrueco C, Martinez-Molina E, Cervantes E, Velazquez E. (2003) Genomic fingerprinting of *Frankia* strains by PCR-based techniques. Assessment of a primer based on the sequence of 16S rRNA gene of *Escherichia coli*. *Plant Soil* 254: 115-123.
 2. Rivas R, Velazquez E, **Valverde A**, Mateos PF, Martinez-Molina E. (2001) A two primers random amplified polymorphic DNA procedure to obtain polymerase chain reaction fingerprints of bacterial species. *Electrophoresis* 22: 1086-1089.
 1. Igual JM, **Valverde A**, Cervantes E, Velazquez E. (2001) Phosphate-solubilizing bacteria as inoculants for agriculture: use of updated molecular techniques in their study. *Agronomie* 21: 561-568.

Book Chapters

7. Igual JM, **Valverde A**. Multivariate analysis in microbial ecology. In preparation.
6. Cowan DA, Adriaenssens E, De Maayer P, Lebre P, Makhalanya TP, Ramond JB, Trindade M, Vikram S, **Valverde A**. Metagenomics of extreme environments (Methods and Applications). Under review.
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