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AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

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Nombre: ORTEGO LOZANO, JOAQUIN
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Título:

Factors and processes shaping genetic diversity and structure in natural populations

Resumen de la Memoria:

I am a researcher in evolutionary biology broadly interested in many aspects related with the study of genetic diversity in natural populations. I use a variety of molecular and analytical tools to study the factors determining genetic variation across space and time and address questions that can be mostly framed within the interconnected fields of population genetics, phylogeography and, more recently, phylogenetics. Most of my research also has an important applied standpoint and deals with problems that can be considered central to the multidisciplinary field of conservation genetics. My early research focused on the study of the association between individual genetic diversity and different components of fitness. My contribution to this field ranges from the development of new tools to improve multilocus estimates of heterozygosity to the study of the evolution of different life-history traits and behavioural mechanisms to avoid the negative consequences associated with reduced levels of genetic diversity. Part of my research has also focused on studying temporal changes of genetic variability in order to understand how different demographic factors impact the genetic composition of wild populations over short time scales. I have also developed different projects aimed to understand the genetic, evolutionary, and ecological consequences of population fragmentation using as study system organisms with both anthropogenically and naturally patchy distributions and showing idiosyncratic responses to population subdivision. My research has progressively expanded from within-population approaches to studies performed at large spatial scales and aimed to compare genetic patterns across several populations and species. This responds to the fact that my foremost intellectual motivation in the last years has been to expand my research into evolutionary biogeography. Despite I will keep actively working on all the above mentioned topics, most of my ongoing research stems from my current interest on the study of the factors governing the geographic distribution of genetic variability to understand the responses of organisms to environmental changes and how these changes have shaped their demographic and evolutionary trajectories. I address questions across different spatial scales, but my research now puts more emphasis on large phylogenetic/spatial levels and focuses on the study of entire species ranges and species complexes resulted from recent evolutionary radiations. The multidisciplinary integration of high-throughput sequencing technology, bioinformatics, phenotypic/ecological data, and spatial and demographic modelling is increasingly becoming more important for the development my research.

Resumen del Currículum Vitae:

I got my degree in Environmental Sciences (2003) at University of Castilla-La Mancha (Toledo, Spain), obtaining the Extraordinary Honor Prize to the most outstanding graduate. In 2004, I got a fellowship to conduct my MSc (2006) and PhD (2007) at University of Castilla-La Mancha (Ciudad Real, Spain). My PhD thesis focused on the study of the causes and consequences of genetic diversity in a wild vertebrate and several chapters were published in top journals like Mol. Ecol. (4 chapters), Proc. R. Soc. B (1 chapter), and Biol. Lett. (1 chapter). In 2008, I was awarded with a JAE-Doc postdoctoral fellowship at the National Museum of Natural Sciences-MNCN (Madrid, Spain) to develop a research project focused on the genetic consequences of population fragmentation. A few months after I got a contract as Lecturer in the Department of Environmental Sciences of University of Castilla-La Mancha (Toledo, Spain) to teach zoogeography and animal physiology, a position that I combined with my research activities at MNCN. In 2010 I visited the lab of Prof. Steeve D. Côté at University of Laval (Quebec, Canada), where I got involved in different research projects to study genetic variability in large mammals. In late 2010, I moved to University of California (Los Angeles, USA) with Prof. Victoria L. Sork to work on a project about landscape genetics and hybridization in oaks. In 2011, I got a Juan de la Cierva fellowship at the National Research Institute on Game Biology-IREC (Ciudad Real, Spain) where I started to develop a long-term project aimed to understand the factors promoting patterns of genetic diversification across different tax and spatiotemporal scales. Currently, I am a Visiting Scholar at University of Michigan (Ann Arbor, USA), where I collaborate with Prof. L. Lacey Knowles in a pioneering project aimed to integrate data generated by high-throughput sequencing and demographic/coalescent modelling techniques to test hypotheses about the factors structuring population genetic variation. I have actively participated in 16 research projects (10 national and 6 international) and I have been co-PI of one of them. I have authored 50 SCI papers, many of them published in top journals like Mol. Ecol., Proc. R. Soc. B., Divers. Distrib., and Nat. Clim. Change. I am first author in 32 of these peer-reviewed publications (>60%) and first or second author in 42 of them (>80%). The average impact factor of my top-ten publications as first author is 6.0 and all of them have been published in journals ranked within the first quartile of their corresponding discipline field. Despite most of my publications are recent contributions, they have already accumulated ~500 citations (h-index = 12). Outreach activities to disseminate my research to the general public include numerous popular science publications in magazines and regular press releases to different mass media. I have supervised three BSc theses and three MSc theses and I am currently supervising three PhD students and one Master student. I have served as reviewer for 44 different SCI journals. My academic services also include reviewing for different



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international funding agencies, including the Swiss National Science Foundation, Israel Science Foundation, Academy of Sciences of the Czech Republic, and National Research Foundation in South Africa.



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Nombre: LOGARES HAURIE, RAMIRO
Referencia: RYC-2013-12554
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Título:

Microbial Ecology and Evolution: moving ahead using Next-Generation Omics and Bioinformatics tools

Resumen de la Memoria:

I am a biologist investigating natural populations of microbes with the final aim of increasing our understanding of the links between microbial life and the functioning of ecosystems. Currently, my research is rather interdisciplinary, occurring in the interface between microbial molecular ecology, molecular evolution and computational biology. I combine Next-Generation omics techniques (e.g. genomics, metagenomics, single-cell genomics) with bioinformatics and High-Performance computing to answer questions that have scientific and societal importance. My career started in 2003 at Lund University, Sweden, where I got a PhD degree in Marine Ecology and Limnology in 2007. Afterwards, I moved to Uppsala University, Sweden, where I did a Post-Doc (2008-2010). After obtaining the Marie Curie fellowship, I moved, in 2010, to the Institute of Marine Sciences (ICM-CSIC) in Barcelona, where I continue now as a Juan de la Cierva fellow. Since 2003, I have published 30 papers (15 as first author; 9 of them in journals with ISI impact factors >8). I have also developed an extensive collaborative network with researchers in 18 countries (about 120 coauthors). I have participated in several EU and international projects, being Principal Investigator (PI) or Co-PI of three large projects (>100,000€ budget). Currently, I am the main supervisor of MSc students in Bioinformatics and of a Post-Doc researcher, and I co-supervise doctoral students in Norway and Spain. I have been actively involved in bioinformatics training in international and national postgraduate courses and workshops and I was invited as speaker to international and national conferences/workshops/seminars. Lastly, I have promoted and coordinated the deployment of a High-Performance computing platform for bioinformatics at my host institution (ICM-CSIC), thus contributing to technology & knowledge transfer. This Ramón y Cajal grant would allow me to continue establishing myself as an independent researcher as well as to develop a premium interdisciplinary research environment based on Next-Generation omic techniques that will produce high-quality research outcomes and rest upon pre-existing structures at my host institution (ICM-CSIC), contributing overall to its excellence as a center for microbial oceanomics research in Europe.

Resumen del Currículum Vitae:

Name: Ramiro Logares-Haurie

Born: 05/12/1976, Ciudad de Buenos Aires, Argentina

Nationality: Spanish and Argentinian

Degrees:

16/07/2003 : Master in Biological Sciences, Universidad Nacional del Comahue, Argentina

13/12/2007 : PhD in Marine Ecology & Limnology, Lund University, Sweden

Positions:

2003-2007 : PhD student, Lund University, Sweden

2008-2010 : Post-doc fellow, Evolutionary Biology Centre, Uppsala University, Sweden

2010-2012 : Post-doc fellow (Marie Curie, IEF), Instituto de Ciencias del Mar, CSIC, Spain

2012-2015 : Post-doc fellow (Juan de la Cierva), Instituto de Ciencias del Mar, CSIC, Spain

Languages:



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Spanish (native), English (very good), Portuguese (good), Swedish (basic)



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Título:

Carnivore biology and the ecological effects of biodiversity

Resumen de la Memoria:

I am an terrestrial ecologist with a research focus on predation processes, the biology and conservation of mammalian carnivores, and on functional aspects of biodiversity. I use a combination of empirical and theoretical methods to approach these topics. My research has resulted in a rather unique breadth of experience in the field of carnivore biology, where I have worked with a number of species across three continents (Africa, Europe, North America). During my PhD I explored carnivore sociality from the viewpoint of a solitary species. I highlighted that although most studies on carnivore sociality focused on finding adaptive explanations for the formation of social groups out of solitary societies, there is currently no empirical support for a directional evolution of carnivore sociality from solitary to group living societies. Instead, observations of captive wolverines supported an alternative evolutionary model, which suggest a radiation from a flexible base-line. Because hypotheses that attempt to explain why certain traits have evolved in specific ways are relying on a primary hypothesis of an evolutionary trajectory, I highlighted the necessity of evaluating such evolutionary trajectories before research is designed to explain them. During my period in South Africa, I expanded my work to include the influence of resource specialisation on mating system and parental investment in two insectivorous specialists, the bat-eared fox and the aardwolf. This work suggest that sex differences in behaviour and endocrine physiology relate more strongly to social associations than to sexual mating activities in a socially monogamous but sexually promiscuous species. This finding would cast doubt about the evolutionary significance of promiscuous behaviour. I have further expanded my horizon to explore the downstream ecological effects of large carnivore resource use, and how these impact conservation and management practices of carnivores and the ecosystems they inhabit. This work has resulted in recommendations for carnivore conservation priorities, both globally across continents but also in species priorities regionally. In particular, it has highlighted that in selecting species for conservation actions we may have to trade current ecosystem function against the potential for future ecosystem performance, since the same species do not necessarily contribute highly to both of these conservation targets simultaneously. I have recently expanded the taxonomic scope of my research to include the effects of environmental variables on functional aspects of biodiversity in organisms outside the mammalian order Carnivora. This work has lead to a series of collaborations on spatial variation in functional diversity and on ecological network structures, primarily in birds and ants, but also ungulates. This line of work is in early stages, but have already highlighted the complex interactions between species traits and community composition on ecosystem function.

Resumen del Currículum Vitae:

I am a terrestrial ecologist that is interested in the ecological significance of biodiversity and in carnivore biology and conservation. I have used both theoretical and empirical approaches to address questions related to these topics. I am a Swedish citizen and currently work with large carnivore management for the Swedish government, and I am also an adjunct lecturer at University of Pretoria, South Africa. I was until recently a research fellow with University of Pretoria (2009-2013) and previously a post-doc with University of Pretoria (2006-2008) and with University of Alberta, Canada (2005-2006). I did my PhD (Stockholm University, 2005) on wolverine biology in Alaska and my MSc (Stockholm University, 1998) on arctic fox ecology on Greenland. I collaborate with scientists from Australia, South Africa, Sweden, the UK and the USA. I have managed field projects in the USA and South Africa, and I have participated in international and national projects in Canada, Russia, USA, South Africa and Sweden, including high profile international expeditions to Greenland and the Beringia region in Siberia and Alaska. My PhD project involved collaborations with the United States National Park Service in Alaska. I have published 39 peer reviewed journal articles, of which 33% are in Q1 and 35% in Q2 journals, and 1 book chapter. My H-index is 9, and my publications have 436 citations in WOS. I am single or first author of 19 and corresponding author of an additional 9 publications. I am the last author on 8 of my 10 most recent publications, reflecting that these have been from projects where I was senior investigator. I have contributed to 42 presentations at scientific conferences, and given 20 invited seminars in Australia, Canada, USA, South Africa, Spain and Sweden. I have been teaching and supervised students in Sweden and South Africa, and also co-supervised students from Australia and the Netherlands.



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Área Científica: Biología Vegetal, Animal y Ecología
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Título:

EPIGENETICS OF HOST-PARASITE INTERACTIONS

Resumen de la Memoria:

My overall field of research covers the evolutionary ecology of host-parasite interactions. During my PhD thesis I mainly focused in patterns host-parasite costructure and the influence of host and parasite life-history traits in shaping such patterns. During my postdoctoral studies I went on to study the processes of parasite diversification (host-specialisation cascades), and consequences for the epidemiology of infectious diseases. The knowledge and the technical skills that I acquired thorough these studies, led me into the question about the evolutionary mechanisms involved in host-parasite adaptations, and the epigenetic bases of these changes. Thorough my investigations I chose to combine laboratory and field work and a diverse array of biological models (ecto- and endoparasites of vertebrates). My research has been always interdisciplinary (evolutionary ecology, parasitology, molecular biology and epidemiology), and highly collaborative.

Resumen del Currículum Vitae:

So far, my major scientific achievements could be summarize as follows: In terms of Publications I have published 30 articles in high quality scientific journals, i.e. first quartile of journal impact ranking of their area, and a total of 16 publications as a first or last author. As a summary statistics, I have an H index of 13 and the total number of cites is 440. My International Experience is remarkable including two post-doctoral stays: three years at the CNRS-IRD, France; and I am currently conducting a two-year postdoc at Emory University (Atlanta, United States). In terms of Research projects, I have participated so far in 12 research projects. Since I started my research career in 2003, I have competed successfully and gathered funding from various national and International research agencies and governmental entities (AGAUR, MINECO and European Commission). As a research highlight I got a Marie Curie postdoctoral Intra-European Fellowship and a Marie Curie Career Integration Grants (FP7, European Commission), both as a principal investigator. In terms of Communicating research I have presented my work in 35 international and national conferences, of those 3 invited talks and 10 oral contributions as first or last author, and organized one international symposium. Finally, in terms of Training I am co-supervising 2 PhD theses (University of Barcelona, Spain; University of Porto, Portugal), I have co-directed 2 MSc theses (University of Montpellier II, France), and one Undergraduate Project (Universitat Pompeu Fabra).



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Título:

Ecología Funcional de Plantas Leñosas

Resumen de la Memoria:

As a plant scientist, I am interested in the mechanisms displayed by plants to adjust their form and function to cope with the abiotic (climate, special substrates, fire, erosion) and biotic (herbivory) restrictions of the environment. These questions are crucial to understand the response of plant species to global change and its potential consequences on the functioning of ecosystems. In my research I use a combination of botanical (phenomorphology), ecological (functional traits) and ecophysiological tools (stable isotope tracing and labelling, N & C analyses) to address processes at the whole-plant level. I am specialized on mountain and semi-arid ecosystems, being an international reference on the effects of disturbance on the C cycling of plants and a leading expert on the adaptation of plants to gypsum soils.

I received my B.S. and M.S. degree in Biology and Plant Biology at the UB in 2001 and 2003, respectively. In 2006, I received my PhD on Plant Biology at the UB, under the supervision of G. Montserrat-Martí. In this study I conducted pioneering studies on the N and C cycling of Mediterranean sub-shrubs and identified several traits suitable for their functional classification. During my PhD I established collaborations with researchers in Australia and the U.K. The latter resulted in a post-doc fellowship to analyse the effect of browsing on the C and N cycling of trees. Before moving to the U.K., I led my own research project on the relationship between Mediterranean sub-shrubs response to disturbances and their N and C storage.

During my postdoctoral stage at the U.K., I specialized on the use of stable isotopes as ecological tracers, performing state-of-the-art labelling experiments. This research greatly contributed to the understanding of the effects of disturbance on the N and C cycling of trees. Back in Spain, I continued my postdoctoral experience at the IPE via a JAE-Doc and a Juan de la Cierva contract. These positions gave me the opportunity to fully develop my research on the functional ecology of plants. I deepened my studies on the effects of disturbance on the C-cycling of plants, and established collaborations with researchers in Switzerland, USA, Australia, U.K., Germany and Spain. I applied novel tools (FTIR spectroscopy, T-RFLP, 15N2 plant-soil incubations) to explore the mechanisms displayed by gypsum plants to exploit nutrients and cope with sulphate toxicity. These studies have rendered important advances on the ecological adaptations of gypsum plants. During the last two years I have led my own research projects to analyse the main sources of water of gypsum plants using stable isotope tracing. We have been able to provide evidence of the ability of plants to use crystallisation water of gypsum, describing a new water source for organisms. I am currently hired as a postdoctoral expert on plant functional ecology by a R&D project led by J.J. Camarero (IPE).

In the future, I plan to deepen my research on the ecological adaptations of gypsum plants, addressing the questions open by our recent findings. I also want to use my expertise on plant responses to disturbance to contribute to a sustainable development of biomass energy implementation in mountain areas of Europe. Both lines are compatible with EU funding schemes.

Resumen del Currículum Vitae:

I was awarded for outstanding results during my degree (Premio extraordinario fin de carrera) and marked with distinctions during my M.S. and PhD (Suma Cum Laude, European PhD. Mention).

Throughout my scientific career I have produced 32 SCI papers (3 of them under review, one in Nature), being first or second author in 84% of them. Most of these papers are in the top 25% journals of their category, including Biological Reviews (1), New Phytologist (2), Functional Ecology (1), Ecology (1), Biogeosciences (1), Annals of Botany (4), American Journal of Botany (1) or Tree Physiology (3). My h-index is 11 and my work has received 345 cites. I also co-authored 1 book chapter and 3 papers in peer-reviewed non-ISI journals and popular science magazines.

I have taken part in 18 R&D projects. Two of these projects were international and I was the IP in 3 of them, including an internationally funded grant by the British Ecological Society. I have also shown a high ability to obtain funds to cover my salary and travelling expenses throughout my career, being awarded 11 highly competitive fellowships and contracts, some founded by European agencies (COST Actions). I have supervised 3 M.S. students, several visiting students and I am currently supervising a PhD. student. I am frequently requested as an external expert, having reviewed research projects for the Israel Science Foundation, the Agence Nationale de la Recherche (ANR) (France), the Spanish National Evaluation and Foresight Agency (ANEP) and the Spanish Association for Terrestrial Ecology (AEET) and have been appointed as member of the evaluation committee of 3 PhD. theses. I am also a regular reviewer of 21 SCI Journals of my field, having reviewed 49 papers. Since 2013, I belong to the reviewer board of Tree Physiology.

I have 32.5 months of international research experience (27.5 of them as a postdoc) in prestigious research institutions from Australia, U.K., Switzerland and Germany. I believe in collaborative research and have worked together, and still keep collaborations, with colleagues



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in Australia, New Zealand, Norway, USA, Canada, Chile, Turkey, Switzerland, Germany, Albania and the U.K. I am fully involved in the main international and national scientific events of my field, having contributed 23 communications to national and international conferences, most of them oral and as first author. I have also organised two symposia in scientific conferences, one of them within the European Ecology Federation Meeting (12th EEF Meeting), and have been invited to give seminars in several scientific institutions in Europe and Australia.

I am involved in two postgraduate programs by the University of Saragossa (since 2006); and the University of Malaga (since 2013), and have been invited as lecturer in different international and national postgraduate courses.

I belong to two recognized scientific groups appointed by the Diputación General de Aragón (A 50; BOA 9/5/08 pp. 6986, since 2005), and the Junta de Andalucía (RNM 115). I am a member of the Spanish Association of Terrestrial Ecology (AEET), the British Ecological Society (BES) and the RIE, the Spanish Network for Stable Isotopes.



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Nombre: HERMOSO LOPEZ, VIRGILIO
Referencia: RYC-2013-13979
Área Científica: Biología Vegetal, Animal y Ecología
Correo Electrónico: virgilio.hermoso@gmail.com

Título:

Systematic conservation planning for freshwater ecosystems

Resumen de la Memoria:

My research career is centred on the study of ecology and management of freshwater ecosystems. My main interests are in improving our knowledge on how perturbations affect freshwater biodiversity, identify the key factors behind its decline and proposing cost-effective ways for addressing its conservation through novel approaches.

As part of my PhD completed at the University of Huelva in 2008, I developed a fish-based index to evaluate the ecological status of Mediterranean rivers and help implement the European Water Framework Directive in these systems. This index was later considered by the Spanish Ministry for the Environment as the raw model to be applied nationwide. I also started studying the effect of habitat degradation in conjunction with invasive species on native freshwater fish diversity, to try to identify the causes of the rapid decline experienced in the last decades. This should help guide conservation and management practice to address the poor conservation status of Mediterranean freshwater biodiversity.

I have spent the last 5 years of my career in two different research institutions in Australia. I spent a year working as a Postdoctoral Research Fellow at the Spatial Ecology Lab in the University of Queensland, led by Prof. Hugh Possingham. Since 2010 I have been enrolled as a Research Fellow at the Australian Rivers Institute (Griffith University), led by Prof. Stuart Bunn. During my postdoctoral experience I have contributed to the implementation of systematic approaches to conservation planning in freshwater ecosystems. This field had not been extensively explored before and gave me the opportunity to make a substantial contribution. I took the experience gained at the Spatial Ecology Lab and collaboration with Hugh Possingham to address key issues related to conservation planning in freshwater ecosystems at the Australian Rivers Institute. I have focused on demonstrating new ways of addressing the especial needs of freshwater ecosystems (e.g., ecosystem processes such as migrations, genes exchange and propagation of threats) and led the development of novel approaches to enhance the capacity of systematic conservation planning to identify priority areas that protect freshwater biodiversity. My contribution to this field has taken me to a leading role worldwide in collaboration with some other colleagues such as Dr Simon Linke (Griffith University), Jeanne Nel (CSIR, South Africa) and Michelle Thieme (WWF-US). My contribution to the field of conservation planning spans beyond pure academics as I have collaborated in multiple **on the ground** projects. For example, I worked with WWF-US in the identification of priority areas for the conservation of freshwater biodiversity in the Democratic Republic of Congo or analysed the capacity of the current reserve system in Northern Australia to adequately protect freshwater biodiversity.

Throughout these years I have developed an extended network of colleagues that I hope will help me continue working on cutting-edge science and give opportunity to get enrolled in stimulating projects.

Resumen del Currículum Vitae:

Since 2008 I have published 28 manuscripts in peer-reviewed journals, most of them in the upper quartile of their field (Diversity and Distributions, Fish and Fisheries, Journal of Applied Ecology or Biological Conservation), an indication of their quality. They have captured the attention of scientist in the field reflected by the number of citations (235 up to January 2014). Moreover, as an indicator of their impact, some of them have received recognition for their contribution to the field of conservation biogeography. I have also written 4 book chapters and participated in 29 presentations to conferences, co-supervised 3 PhD students and two undergraduate students and given lectures in two different universities (University of Huelva **Spain**-, and Griffith University **Australia**-).



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Título:

Unveiling the causes of biodiversity patterns and species geographic ranges

Resumen de la Memoria:

The main objective of my research is to get a better understanding of biodiversity patterns, and in concrete, of the causes of species distribution ranges and their relative importance. During my PhD at the Natural History Museum of Madrid (MNCN), I studied the causes of spider species richness, and the importance of different factors in determining species range borders using *Macrothele calpeiana* (Araneae: Hexathelidae) as a case study. As a result, I developed a rapid sampling protocol for spiders inventory in Mediterranean areas, and I significantly increase our knowledge about the endangered Iberian endemic species *M. calpeiana*. During my postdocs at the University of Kansas (USA) and at the University of Málaga, I delved into the conceptual and methodological grounds of species distribution models (SDMs), like the evaluation of models, the integration of biotic interactions in models, or the selection of an appropriate spatial scale of analysis, among others. At present, I have a JAE-DOC fellowship at the MNCN; I am studying theoretical models of geographic ranges - using individual based models -, and questions related to subterranean biology and biogeography. I am also still working on SDMs evaluation, a field in which I have made my most important contributions, like spotting flaws of the area under the ROC curve (AUC) and proposing alternatives, or making practical recommendations regarding how to convert a continuous map of habitat suitability into a binary map of presence/absence. These contribution have an outstanding number of citations, and I am only author of two of them. I have also described new species and I have published numerous new locality reports for butterflies, beetles, and mainly spiders, in an effort to increase our knowledge about biodiversity.

Resumen del Currículum Vitae:

Education: 2000, BSc in Biological Sciences, Universidad Autónoma de Madrid (UAM), Spain; 2002, MSc in Advanced Research Studies, Evolutionary Biology and Biodiversity, UAM; 2006, PhD in Biological Sciences, Evolutionary Biology and Biodiversity, UAM. * Grants/Academic Employment: 2000-2002 (24 months), Advanced Research Studies Scholarship, UAM; 2002-2006 (48 months), PhD Fellowship, Museo Nacional de Ciencias Naturales (MNCN, CSIC), Spain; 2008-2010 (24 months), MEC/Fulbright Postdoctoral Fellowship, University of Kansas, USA; 2010-2013 (36 months), Juan de la Cierva Research Associate, University of Málaga, Spain; 2013-2015 (24 months) JAE-DOC CSIC Research Associate, MNCN, Spain. * Visiting Researcher: 2006 (78 days), Depto. Ciências Agrárias, Universidade dos Açores, Portugal. * Research Projects and Management: Participant in 7 research projects funded by Spanish MEC, Comunidad de Madrid, Agencia de Obra Pública de la Junta de Andalucía (Consejería de Fomento y Vivienda) and Organismo Autónomo de Parques Nacionales; Project reviewer for FONCYT (Argentina) and NSF (USA). * Publications: 61 scientific publications (+ 2 unpublished technical documents), including 40 papers in journals listed in the SCI, 3 book chapters and 2 popular papers; 18 out of 40 SCI papers are published in Q1 journals (e.g., *Global Change Biol*, *PNAS*, *Global Ecol Biogeogr*, *J. Biogeogr*, *Ecography*); only author in 7 papers including 2 published in JCR-indexed journals (*Global Ecol Biogeogr*, *Biodiv Conserv*); first author in 39 papers, including 20 in journals listed in the SCI; h-index in Scopus = 18, 1418 total citations in Scopus. * Important (SCI) contributions: *Global Ecol Biogeogr* 21(4), 2012, only author, already with 31 citations in Scopus; *Diversity Distrib* 14(6), 2008, 161 citations in Scopus; *Global Ecol Biogeogr* 17(2), 2008, 441 citations in Scopus; *Acta Oecologica* 31(3), 2007, 168 citations in Scopus. * Scientific Contributions in Conferences: 19 communications in congresses and workshops, 1 as invited speaker. * Academic Experience: 284.9 teaching hours at university; Jury member at 2 PhD Thesis defense (Spain). * Editorial work: 2011-2013, Associated Editor, *Iberian Journal of Arachnology*; 2013-present, associated Editor, *Global Ecology and Biogeography*; Referee for over 30 scientific journals, including *Global Change Biology*, *Global Ecology and Biogeography*, *Ecology*, *Journal of Biogeography*, *Journal of Applied Ecology*, *Ecological Applications*, *Ecological Modelling*, *Biological Conservation*, *Ecography*, *Diversity and Distributions* and *Methods in Ecology and Evolution*, among others.



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Título:

An integrated approach to understand ecology and evolution of host-parasite interactions

Resumen de la Memoria:

The study of host-parasite interactions is a central issue in evolutionary ecology, with broad consequences for life histories and sexual selection, and with far-reaching repercussions regarding animal and human welfare. A proper understanding of host-parasite interactions requires an integrated approach combining the underlying physiological and immunological mechanisms involved in host defences against parasite infections, with the implications at the behavioural and ecological levels for life-history evolution of both hosts and parasites. I aim to continue merging the productive synergy of this research at the interface between functional and evolutionary approaches. To do this, I will focus my research mainly (but not exclusively) towards poorly known parasitic groups such as biting flies and bacteria, whose impact on hosts is significant. I will address the behavioural adaptations that parasites have evolved to exploit their hosts, with special emphasis on the sensory mechanisms involved in host detection. I will also explore the array of behavioural strategies displayed by hosts to minimize the impact of parasitism. In this line, I will investigate the importance of nests and nest building behaviours for the outcome of host-parasite interactions. In summary, I propose an integrated and multidisciplinary research plan that will make use of very innovative methodologies in diverse host-parasite systems to improve fundamental and applied knowledge on ecology and evolution of interactions between hosts and their parasites. I anticipate that these research avenues will continue to attract funding from the most competitive calls, will offer ample opportunities for developing subprojects by students, and will yield results of the highest scientific excellence and international impact. The research program will enable me to diversify my research skills in the framework of Behavioural Ecology and Evolutionary Biology, to strengthen my independency, and to continue my leadership within the top world scientists with interest in unveiling the marvelous intricacies of host-parasite interactions in nature.

Resumen del Currículum Vitae:

Gustavo Tomás began to acquire research skills when studying his BSc in Biology at the University of Valencia, when he was granted a research fellowship at the Cavanilles Institute for Biodiversity and Evolutionary Biology to conduct a research project and present his first scientific results at an international meeting. After graduating in 2000, he moved to the Museo Nacional de Ciencias Naturales (MNCN-CSIC, Madrid) for his PhD, where under supervision by Prof. Santiago Merino investigated the interrelations among immunity, parasitism and stress in wild bird populations. He obtained two PhD fellowships (one declined) in 2002 and completed his PhD thesis in 2005 (excellent cum laude, extraordinary award), with a stay in the US in Tom Martin's lab, and with chapters published in *J Anim Ecol*, *Anim Behav*, and *Funct Ecol* among others. Postdoctoral training was achieved through an I3P postdoctoral position at the MNCN, and international positions in the Netherlands Institute of Ecology (NIOO-KNAW, Centre for Terrestrial Ecology, 2 years), with Prof. C. (Kate) M. Lessells, and in the Universidad Nacional Autónoma de México (UNAM, Instituto de Ecología, 1 year), with Prof. Roxana Torres, where he studied different aspects of the functional significance of nests, and of sexually selected traits, also in relation to parasitism. He returned to Spain with a Juan de la Cierva contract, in the Estación Experimental de Zonas Áridas (EEZA-CSIC, Almería). There, with Prof. Juan J. Soler, he has included bacteria in the study of the relations between nest features and parasitism. His career has been uninterruptedly funded by 10 grants and contracts (5 as postdoc) awarded in national and international public competitive calls. He has refereed manuscripts for 20 of the leading SCI journals, including *Biol Lett*, *Behav Ecol*, *Funct Ecol*, *Oecologia*, *Evol Ecol*, and *J Anim Ecol*; and international scientific grant applications. He is currently supervising a PhD student (defence scheduled in 2015). He is member of the Editorial Boards of *ISRN Ecology* and *The Open Ornithology Journal*, both open access, international, peer-reviewed journals. He is also Founding Peer of *Peerage of Science*, and he has been appointed as Editor of the *Proceedings of Peerage of Science* after being scored within the 25 best reviewers in all areas in 2013. He has 54 scientific publications of which 48 are in peer-reviewed SCI journals, plus 6 more submitted and 4 in prep. Over 66% (32) are in journals ranked within the Q1 of their fields (22 with IF>3, 9 with IF>4). Among these, he has published 1 paper in *Biol Lett*, *Environ Res*, *Horm Behav*, *J Evol Biol*, *Ecology*, *PlosOne*, and *Proc R Soc B*, 2 in *Anim Behav*, 3 papers in *J Anim Ecol*, *Oecologia*, and *Behav Ecol*, 4 in *Funct Ecol*, and 5 in *J Avian Biol*. In addition, he has published 1 book chapter and 4 journal articles for the general public, and several of his SCI papers have been covered by the public media in many countries. The average citations per SCI article (excluding 2012 onwards to allow for time lag between publication and citation) are ca. 25. Overall, his publications have received over 1059 citations (ca. 200 in 2013) and he has been included in the ISI Highly cited researchers list (Thomson Reuters) in the field of Animal & Plant Sciences, which lists the top 1% of scientists in each field. Gustavo Tomás has an h-index of 21.



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Título:

Comunicación, cognición y conflicto sexual

Resumen de la Memoria:

The common thread in my career has been an insatiable curiosity and lifelong fascination for evolution and animal behaviour, which is reflected in the different lines of research I have embarked on from an early stage.

I devoted my PhD to studying the function of scent marks in *Podarcis* lizards, and provided evidence that scent marks act as complex social signals conveying much more complex information than hitherto suspected (i.e. rival competitive ability, territory quality, and individual identity -first evidence of true individual recognition in a reptile-), suggesting that scent marks in lizards are as complex and sophisticated social signals as those found in birds and mammals (Carazo et al. 2007, 2008, 2011). I completed my PhD with a series of theoretical analysis of some longstanding problems on the way we conceptualize communication, and thus the way we study animal signals. In a series of two companion papers (Carazo & Font, *J Evol Biol.* 2010; Font & Carazo, *Anim Behav* 2010), I rebated recent propositions suggesting that information transfer is a secondary factor in the evolution of animal signals (e.g. Scott-Phillips, 2008) by showing that information-free approaches are conceptually incomplete. I further proposed a theoretical framework of communication based on a purely functional definition of information, with important advantages over past propositions. Lately, I have expanded these analyses to the study of the evolution of signal unreliability and deception (Carazo & Font *Anim Behav* 2014). My work during my PhD merited the Extraordinary PhD Award of the University of Valencia in 2011. In parallel, I also conducted substantial work on sperm competition and chemical communication in *Tenebrio molitor*, leading to a series of important findings published in *Animal Behaviour* and *Proceedings of the Royal Society B* (Carazo et al. 2004, 2007).

I am also interested in the evolutionary aspects of cognition, and have made some relevant contributions in this area. In two papers published in 2009 and 2012 (Carazo et al. *Anim Cogn* 2009, *Front Psychol* 2012), I provided evidence that true quantity estimation, the foundation of higher numerical abilities, is present in invertebrates, and hence more evolutionary ancient than previously suspected. My most recent work has been on lizard cognition and the evolution of cognitive-personality syndromes, which I initiated in 2011 thanks to a 6-month Endeavour post doc at Dr. Martin Whiting's lab in Macquarie University (Australia), and which has already given rise to important findings published in *Biology Letters* (Noble, Carazo & Whiting, 2012) and *Proceedings of the Royal Society B* (Carazo et al. 2014). In June 2012, I initiated a Marie Curie ERG at Dr. Tommaso Pizzari's lab at the University of Oxford, where I am using a strongly experimental approach to address fundamental evolutionary questions concerning the interplay between ageing, sexual conflict and kin selection: a) Does kin selection modulate sexual conflict intensity and reproductive ageing? b) Does the intensity of interlocus conflict influence ageing rates and vice versa? and c) Does intralocus conflict constrain the evolution of sex-specific ageing rates? This line of research has crystallized in a series of ground-breaking findings that have just been published in *Nature* (Carazo et al., *Nature* 2014).

Resumen del Currículum Vitae:

Only 3 years and a half out of my PhD (that include 4 months of paternity leave in 2013), my research trajectory already showcases my maturity as an independently minded and creative researcher, and my potential to lead a highly promising and ambitious research line. I have a solid publication track regarding the quantity (1 paper as an undergraduate, 9 during my PhD, and 11 during my three years as a postdoc) and quality of my publications (>85% publications in journals ranked in top 25% of their area and all in journals ranked in top 50%), and its consistency across different research areas and research groups in Spain, Australia and the UK.

Similarly, I have repeatedly proven my ability to secure competitive national/international funding as an undergraduate (ASAB Undergraduate Research Project & Spanish Ministry of Science undergraduate grant), as a PhD student (4-year Spanish Ministry of Science pre-doctoral grant), and as a post-doc (Australian Endeavour Award & FP7-EU Marie Curie ERG), and throughout these stages I have participated in 8 competitive research projects funded via competitive calls by public/private bodies.

My independence, scientific maturity and leading potential are well reflected by my publication record as first (57% of total publications), second (29%), and corresponding (52%) author, by my mentoring of 9 undergraduate and 4 graduate students from different Universities (Valencia, Imperial College and Oxford), and by my experience as a scientific reviewer on 40 occasions for 18 different SCI journals (e.g. *Anim. Behav.*, *Behav. Ecol.*, *Biol.J.Linn.Soc.*, *Bio.Lett.*, *Biol.Rev.*, *Func.Ecol.*, *Proc.RSoc.Lond.B* or *PLoSone*), and the French (RBUCE-UP) and Dutch (NOW/ALW) Scientific National panels.

I have accumulated considerable teaching experience at both the Bachelor's level (310h of lectures) and at the graduate/master's level (42h of lectures).

I am currently engaged/initiating collaboration with colleagues at the Universities of Oxford, Macquarie (Australia), Union College (USA),



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Valencia (Spain), and at the CREAF research institute (Spain).

My on-going research at the University of Oxford has just crystalized in a publication as first author in Nature (Carazo et al. 2014. Nature. 505, 672-675), where we show that kin selection can modulate the intensity of sexual conflict. This finding (that merited an editorial commentary in the News & Views section of Nature; Pitnick & Pfennig. 2014. Nature. 505, 626-627) changes the way we think about the evolution of reproductive conflict and cooperation and opens a host of new avenues of research that I am currently exploring. Obtaining a Ramón y Cajal fellowship would enable me to set up my own group to further develop this line of research in Spain.

Overall, and despite the early stage in my career, I have consistently published in the best journals in my area and provided several key contributions in my fields of research, which, along with my rich research trajectory and the comprehensive nature of my profile (i.e. funding, teaching, divulgation, international collaborations, experience as reviewer) are the best possible advocates for my maturity and potential to acquire a leading position as a scientist.