David Díez-del-Molino

PhD in Population Genetics. Research Associate at University College London

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Hello! That's me.

Contact

Mail: diez.molino@gmail.com, d.molino@ucl.ac.uk.

Facebook: https://www.facebook.com/Daviddiez

Twitter: https://twitter.com/IndianaDiez

LinkedIN: http://www.linkedin.com/pub/david-diez-del-molino/2b/711/66

Research Interests

I am interested in the study **of animal and human populations** through a wide range of mechanisms including **population genetics, evolutive biology and computational genomics**. For my thesis I have been studying evolutionary processes related to **invasive species** and their success in novel environments and I have acquired a wide range of skills useful for analyzing population genetics of almost any organism. I am currently involved in discovering the **evolutionary processes** that have contributed to shape the genomes of invaders and how these populations evolve from native to invaded environments. Nowadays my research is moving towards using **genomic tools** to investigate the **origin and history of European human populations** through looking up to their genomes and modelling ancient DNA.

Skills

- Languages: Spanish/English/Catalan
- Wet-lab work: techniques related to molecular markers such as microsatellite loci, SNPs, mtDNA, and NGS.
- Software (Plink, ADMIXTURE, TreeMix, etc...) and analyses (FST, He, IBD, Tajima's D, PSMC, etc...) related with population genetics/genomics.
- Genomic data analysis: from handling big sequence files to variant calling, processing and filtering.
- Computer simulations and modelling of ancient DNA data using either custom scripting or standard software such as *ms* or *FastSimCoal2*.
- R (scripting and plotting), Python (scripting) and the GNU/Linux environment (including shell and cluster scripting).
- Experience supervising undergraduate and master students.

- Experience in writing projects and technical reports, communicating results in conferences and publishing in journals.

Education and training

2014—present: **Postdoctoral Research Associate at the MACE lab**. University College London.

2010—2015: **Ph.D. in Population Genetics.** University of Girona.

2008—2009: **Master in Biological Conservation.** The Complutense University of Madrid.

2003—2008: **Degree in Biological Sciences.** University of Salamanca.

Other Training/ Recent Courses

- 2013—*Next-Generation Sequencing data analysis* (38 hours). COMAV/Polytechnic University of Valencia, Valencia, Spain.
- 2014—*Introduction to High Performance High Throughput Computing.* ISD/University College London. London, UK. (2 days)
- 2015—*Genomic data analysis using Hapmap and the 1000 Genomes projects.* Transmitting Science. Sabadell, Spain (5 days)
- 2015—*Variant Analysis with GATK.* The Broad Institute/University of Cambridge. Cambridge, UK (2 days)
- 2015—*Population Genetics and Demographic History: model-based approaches.* Instituto Gulbenkian de Ciência. Oeiras, Portugal (4 days)

Teaching Experience

2013/2014: **Adjunct Professor.** University of Girona.

- *Integrated Scientific Techniques (46.5 hours)*
- *Conservation Genetics (7.5 hours)*
- *Genetics* (35 hours)
- *Population Genetics* (7.5 hours)

Research Projects

2010-2012: **River invasibility of introduced freshwater fish: population structure of the introduced *Gambusia holbrooki*.** PI: Jose-Luis García-Marín. Spanish Ministry of Science and Innovation (MICINN) CGL2009-12877-C02-02

2014-2016: **Bridging European and Anatolian Neolithic (BEAN) - International Training Network**. PI: Mark G. Thomas. The 7th Framework Program of the European Commission. Code 289966. FP7-PEOPLE-2011-ITN

Awards and scholarships

- 2010 - 2013: **Ph.D. Scholarship** from the University of Girona (BR12/2010)
- 2013: **Travel grant** to visit Bryan Neff's Laboratory at the University of Western Ontario in London, Ontario, Canada, for 3 months. University of Girona.

Publications

- **DÍEZ-DEL-MOLINO D**, CARMONA-CATOT G, ARAGUAS RM, VIDAL O, GARCÍA-BERTHOU E, SANZ N, GARCÍA-MARÍN JL (2013) Gene flow and maintenance of genetic diversity in invasive mosquitofish (*Gambusia holbrooki*). *PLoS ONE* 8(12): e82501. doi:10.1371/journal.pone.0082501
- SANZ N, ARAGUAS, RM, VIDAL O, **DÍEZ-DEL-MOLINO D**, FERNÁNDEZ-CEBRIAN R, GARCÍA-MARIN JL. (2013) Genetic characterization of the invasive mosquitofish (*Gambusia* spp.) introduced to Europe: population structure and colonization routes. *Biological Invasions*. doi:10.1007/s10530-013-0456-5
- VIDAL O, SANZ N, ARAGUAS RM, FERNÁNDEZ-CEBRIÁN R, **DÍEZ-DEL-MOLINO D**, GARCÍA-MARÍN JL. (2012) SNP diversity in introduced populations of the invasive *Gambusia holbrooki*. *Ecology of Freshwater Fish*. 21:100-108.

- **DÍEZ-DEL-MOLINO D**, GARCÍA-BERTHOU E, ARAGUAS RM, VIDAL O, ALCARAZ C, SANZ N, GARCÍA-MARÍN JL. Effects of water pollution on the genetic population structure of invasive mosquitofish. (Under review)
- VERA M, **DÍEZ-DEL-MOLINO D**, GARCÍA-MARÍN JL. Genomic data provide insights on the evolutionary changes of the invasive mosquitofish (*Gambusia holbrooki*). (Under review)
- **DÍEZ-DEL-MOLINO D**, ARAGUAS RM, VERA M, VIDAL O, SANZ N, GARCÍA-MARÍN JL. Temporal genetic dynamics among mosquitofish (*Gambusia holbrooki*) populations in invaded watersheds. (In preparation)
- **DÍEZ-DEL-MOLINO D**, ZENG Y, ARAGUAS RM, VIDAL O, SANZ N, GARCÍA-MARÍN JL. The role of multiple paternity and family structure in the mosquitofish (*Gambusia holbrooki)* invasion success. (In preparation)

Workshops and Conferences

- [Symposium organizer] SMBE15: The Annual Meeting of the Society for Molecular Biology and Evolution. **SMBE**. Vienna, 2015.
- [Conference organizer] BEAN Workshop 'Simulating the Neolithic'. **University College London/Institute of Archaeology**. London, 2015.
- [Attendance] I Workshop on Bioinformatics and Computational Biology. **Bioinformatics Barcelona (BIB)**. Barcelona, 2013.
- [Conference organizer & poster] Temporal genetic dynamics in invasive populations of mosquitofish (*Gambusia holbrooki*). **XXXIX Congress of the Spanish Society of Genetics (SEG)**. Girona, 2013.

- [Poster] Comparative genetic diversity patterns of mosquitofish populations among invaded watersheds. **VII European Conference on Biological Invasions (NEOBIOTA2012)**. Pontevedra, 2012.
- [Poster] Population structure of mosquitofish (*Gambusia holbrooki*) along a highly polluted river. **IV Iberian Workshop of Ichthyology (SIBIC)**. Girona, 2012. *Best poster award*
- [Oral communication] Population structure of *Gambusia holbrooki* along a highly polluted river. **XIX Workshop in Population Genetics and Evolution (SEGPE)**. Orduña, 2012.
- [Poster] Population structure of the invasive species *Gambusia holbrooki* in rivers of the Iberian Peninsula. **XXVIII Congress of the Spanish Society of Genetics (SEG)**. Murcia, 2011.
- [Poster] Colonization patterns of the northeastern Spanish watersheds for the invasive mosquitofish (*G. holbrooki*). **Symposium for European Freshwater Science (SEFS)**. Girona, 2011.

Scientific societies and other roles

- Spanish Society for Conservation and Study of Mammals (SECEM), Spanish Society of Genetics (SEG), Iberian Society of Ichthyology (SIBIC), Society for Molecular Biology and Evolution (SMBE)
- 2011-2015: Ph.D. students' representative at the University of Girona.
- Reviewer for JCR journals: PLoS ONE

Science outreach

2013-2015: Social media strategy coordinator of the profiles of the Laboratory of Genetic Ichthyology in Twitter (https://twitter.com/LIG_UdG) and Facebook (https://www.facebook.com/lig.genetica.udg)
2013-2015: Creator and editor of the Laboratory of Genetic Ichthyology's blog (http://coolgenes.wordpress.com/)

Additional information can be supplied upon request