David García-Callejas

Contact Information

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Google Scholar
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Research Interests

I am a community ecologist broadly interested in understanding the structure and dynamics of ecological assemblages, their spatiotemporal patterns, and their response to global change drivers. In particular, I study the role of biotic interactions in shaping local and regional patterns of diversity and coexistence. In approaching these themes, I aim to bridge theoretical approaches to fundamental questions with field experiments and observations.

Current Appointments

Postdoctoral researcher, University of Cadiz — February 2020 to present

Previous Appointments

Postdoctoral researcher, EBD-CSIC — January 2019 to November 2019

Doctoral researcher, CREAF-UAB — September 2014 to November 2018

Research technician, Imperial College — January 2014 to August 2014

Research technician, University of Évora — March 2013 to January 2014

Research technician, CREAF — September 2012 to February 2013

Education

Ph.D. in Terrestrial Ecology, Autonomous University of Barcelona — 11/2018

- Thesis Title: *Structure and dynamics of ecological networks with multiple interaction types*
- Advisors: Dr. Miguel B. Araújo, Dr. Roberto Molowny-Horas
- Qualification: *Magna Cum Laude* with International Doctorate Distinction.
- Associated stays: Integrative Ecology Lab, Univ. of Sherbrooke (Quebec), 09–12/2017, supervised by Prof. Dominique Gravel
- Thesis document and LaTeX template available at: https://github.com/garciacallejas/Thesis

M.Sc. in Terrestrial Ecology, Autonomous University of Barcelona — 09/2012

- Thesis Title: *Projecting the distribution and abundance of Mediterranean tree species under climate change: a demographic approach*
- Advisors: Prof. Javier Retana, Dr. Roberto Molowny-Horas
- 60 ECTS

B.S. in Environmental Sciences, University of Alcala — 07/2010

- 300 ECTS

B.S. in Computer Science, University of Granada — 09/2006

- 180 ECTS

Refereed Journal Publications

[1] Taheri, S., **García-Callejas, D.**, Araújo, M.B., 2021. Discriminating climate, land-cover and random effects on species range dynamics. *Global Change Biology*, 27:1306-1317. doi:10.1111/gcb.15483

[2] **García-Callejas, D.**, Godoy, O., Bartomeus, I. 2020. cxr: A toolbox for modelling species coexistence in R. *Methods in Ecology and Evolution*, 11:1221-1226.

doi:10.1111/2041-210X.13443
Associated R package: https://github.com/RadicalCommEcol/cxr

[3] **García-Callejas, D.**, De la Cruz Rot, M. 2020. Cómo crear paquetes de R. *Ecosistemas*, 29:1948.
doi:10.7818/ECOS.1948

[4] **García-Callejas, D.**, Molowny-Horas, R., Araújo, M.B., Gravel, D. 2019. Spatial cascades in communities connected by dispersal and foraging. *Ecology*, 100:e02820.
doi:10.1002/ecy.2820

[5] **García-Callejas, D.**, Torres, A. 2019. Restauración de interacciones ecológicas: medidas y consecuencias a escala de comunidad. *Ecosistemas*, 28:42-49.
doi:10.7818/ECOS.1748

[6] **García-Callejas, D.**, Molowny-Horas, R., Araújo, M.B. 2018. The effect of multiple biotic interaction types on species persistence. *Ecology*, 99:2327–2337.
doi:10.1002/ecy.2465

[7] **García-Callejas, D.**, Molowny-Horas, R., Araújo, M.B. 2018. Multiple interactions networks: towards more realistic descriptions of the web of life. *Oikos*, 127:5–22.
doi:10.1111/oik.04428 (Editor's choice)

[8] **García-Callejas, D.**, Molowny-Horas, R., Retana, J. 2017. Projecting the distribution and abundance of Mediterranean tree species under climate change: a demographic approach. *Journal of Plant Ecology*, 10:731–743.
doi:10.1093/jpe/rtw081 (Editor's choice)

[9] **García-Callejas, D.**, Araújo, M.B. 2016. The effects of model and data complexity on predictions from species distributions models. *Ecological Modelling*, 326:4–12.
doi:10.1016/j.ecolmodel.2015.06.002

Preprints and papers in Preparation

[10] Civantos-Gónzalez, I., Algarra, F. J., **García-Callejas, D.**, Galeano, J., Godoy, O., Bartomeus, I. Fine scale prediction of ecological community composition using a two-step sequential machine learning ensemble. *Manuscript under review*. Preprint available: *biorXiv*, 2021.03.24.436771
doi:10.1101/2021.03.24.436771

[11] Matias, M., Gravel, D., Chase, J.M., Cruz, C., **García-Callejas, D.**, Gilbert, T.P., Leibold, M., Pereira, C.L., Ramos, C., Raposeiro, P.M., Rozenfeld, A., Sroczynska, K., Vieites, D., Woodward, G., Araújo, M.B. PondNet – Towards a global network of experiments on the effects of climate change on aquatic ecosystems. *Manuscript under review*.

[12] Mestre, F., Gravel, D., **García-Callejas, D.**, Pinto-Cruz, C., Matías, M.G., Araújo, M.B. Disentangling environment food web relationships: a review with guidelines. *Manuscript under review*.

[13] **García-Callejas, D.**, Bartomeus, I., Godoy, O. Species-area relationships emerge from multiple coexistence mechanisms. *Manuscript under review*. Preprint available: *biorXiv*, 2021.04.02.438211
doi:10.1101/2021.04.02.438211

[14] Allen-Perkins, A., Hurtado, M., **García-Callejas, D.**, Godoy, O., Bartomeus, I. Individual-based plant-pollinator networks unveils pollen flow dynamics and plant reproductive success. *Manuscript under review*. Preprint available: *biorXiv*, 2021.04.23.441120
doi:10.1101/2021.04.23.441120

[15] **García-Callejas, D.**, Godoy, O., Bartomeus, I. Stability of multitrophic communities: more than the sum of its parts. *In preparation.*

[16] Leles, S., Almaraz, P., **García-Callejas, D.**, Godoy, O. Mixotrophy and the stability of ecological communities. *In preparation.*

[17] **García-Callejas, D.** On the variability of Species Abundance Distributions with trophic guild and community structure. Preprint available: *biorXiv*, 289348
doi:10.1101/289348

Conference Talks/Posters (as first author)

[18] Talk: **García-Callejas, D.**, Bartomeus, I., Godoy, O. Species-area relationships emerge from multiple coexistence mechanisms. In: *BES 2020 Meeting*, 14-18/12/2020.

[19] Talk: **García-Callejas, D.**, Bartomeus, I., Hurtado, M., Godoy, O. Variability of an ecological multilayer network across space and interaction types. In: *NetSci conference*, 20-24/08/2020.

[20] Talk: **García-Callejas, D.**, Godoy, O., Bartomeus, I. cxr: a toolbox for modelling species interactions and coexistence in R. In: *BES Quantitative Ecology Meeting*, 27-30/07/2020.

[21] Talk: **García-Callejas, D.**, Molowny-Horas, R., Araújo, M.B., Gravel, D. Spatial cascades in networks connected by dispersal and foraging. In: *SIBECOL*, Barcelona, 04–07/02/2019.

[22] Talk: **García-Callejas, D.**, Molowny-Horas, R., Araújo, M.B. Species persistence in networks with multiple interaction types. In: *NetSci conference*, Paris, 11–14/06/2018.

[23] Talk: **García-Callejas, D.** The influence of trophic position on Species Abundance Distributions. In: *Ecology across borders*, Ghent, 11–14/12/2017.

[24] Poster: **García-Callejas, D.**, Molowny-Horas, R., Araújo, M.B. Multiple interactions networks: towards more realistic descriptions of the web of life. In: *Community Ecology for the 21st Century*, Évora, 17–19/10/2016. (Best poster award)

Invited Talks

[25] **García-Callejas, D.**, Molowny-Horas, R., Araújo, M.B. Multiple interactions networks in community ecology: towards more realistic representations of the web of life. In: *Centre for Advanced Studies*, Blanes, 10/01/2019.

[26] **García-Callejas, D.**, Molowny-Horas, R., Retana, J. Distribution and abundance of tree species: A spatially explicit model for Peninsular Spain. In: *Forest sciences centre of Catalonia*, Solsona, 10/12/2012.

Teaching Experience

Centro de Estudios Andaluces 2020-2021

- Introduction to R
  - Duration: 16h each year
  - Materials: Github repository
- Reproducible analyses with R and RMarkdown
  - Duration: 16h each year
  - Materials: Github repository

Universidad de Huelva 2020-2021

- Advanced Statistical Methods for Conservation and Biodiversity (M.Sc. in Biodiversity)
  - Duration: 5h in 2020, 20h in 2021
  - Materials: Github repository

Universitat Autònoma de Barcelona 2015-2018

Field/practical courses

- Ecology (B.S. in Environmental Sciences) - 62h
- Ecology (B.S. in Biology) - 15h
- Analysis and of environmental cartography (B.S. in Env. Biology) - 19h
- Analysis and cartography of vegetation (B.S. in Biology) - 23h

Theoretical courses

- Statistics and environmental modelling (M.Sc. in Terrestrial Ecology) - 2h
- Conservation Biology (B.S. in Env. Biology) - 12h
- Forest Ecology (B.S. in Env. Biology) - 1h

Materials: https://garciacallejas.github.io/teaching/teaching/

CREAF 2018

Seminar: Introduction to Latex and Zotero

- 5h in 2 sessions

Rui Nabeiro Biodiversity Chair 2013

Course: Introduction to the R Language

- 12h in 3 sessions

Student Supervision

M.Sc. Theses:

- 2021 - David Diaz Mulero - *Diversity and structure of ecological networks in agricultural habitats* - Pablo de Olavide University (Sevilla, Spain) - co-supervised with Dr. Ignasi Bartomeus.
- 2021 - Laura Buonafede - *Ecological filtering of butterfly species associations by urban environments* - University of Firenze/CREAF - co-supervised with Dr. Yolanda Melero.

Projects

As Principal Investigator:

- 2021 - NETMAP: Advancing the biogeography of interaction networks - Funded by the Spanish Association for Terrestrial Ecology - 2500€

Awards

- Special Award for Doctoral Studies, 2018/19. Autonomous University of Barcelona, Spain.
- FPU Visiting researcher scholarship, 2017. Science and Education Ministry, Spain.
- FPU Ph.D. scholarship programme, 2014–2018. Science and Education Ministry, Spain.
- M.Sc. scholarship programme, 2011–2012. "Fundación Obra Social La Caixa", Spain.
- International scholarship programme, 2010. "Fundación Bancaja", Spain.

Organizational work

Organizing Committees:

- 1st Joint AEET-SFE2 Conference for Early Career Scientists - 09-11 June 2021 (full program here)

Languages

- First Language: Spanish.
- English: Proficient reading, speaking, writing.
- Catalan: Proficient reading, basic speaking and writing.
- Portuguese, Italian: Intermediate reading, basic speaking and writing.

Software skills

- Proficiency in R (statistical analyses, spatial and temporal analyses, data management and visualization, dynamic models, package development).
- Knowledge of Unix shell, software parallelization in HPC.
- Intermediate user of C++.
- Git user, expertise in Latex (e.g. developed an open template for Ph.D. thesis, available at https://github.com/garciacallejas/Thesis).
- Familiarity with QGIS and open source graphics software (GIMP, InkScape).

Evaluation and referee service

- Evaluator for the United States' National Science Foundation Grants Program (2020).
- Reviewer for scientific journals (since 2016): Global Ecology and Biogeography, Ecography, Journal of Ecology, Functional Ecology, Oikos, Ecology and Evolution, Journal of Animal Ecology, Journal of Environmental Informatics.

Selected media coverage

- Biodiversity in Doñana (in Spanish): Interview in Youtube
- News outlets on restoring species interactions (in Spanish): [1] [2] [3] [4] [5] [6]

References

- Dr. Ignasi Bartomeus - Doñana Biological Station - nacho.bartomeus@gmail.com
- Dr. Oscar Godoy - University of Cádiz - oscar.godoy@uca.es
- Prof. Miguel Araújo - National Museum of Natural History, Spain - maraujo@mncn.csic.es