

Matthias Grenié

Postdoctoral Researcher

Curriculum Vitae
April 2023

📍 German Centre for Integrative Biodiversity Research (iDiv), Halle-Jena-Leipzig
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Academic Education

2016-2020	PhD in Ecology Montpellier, France ➤ Supervised by Pr. François Munoz and Dr. Cyrille Violle Title: 'Outside the norm: deviation from ecological optimality and functional originality'	École Doctorale 584 GAIA, Univ. Montpellier
2013-2015	MSc. in General Biology Lyon, France	École Normale Supérieure de Lyon
2012-2013	Bsc. in General Biology Lyon, France	École Normale Supérieure de Lyon
2010-2012	Prep. Classes for 'Grandes Écoles' Paris, France ➤ Biology, Geology, Mathematics, Physics, and Chemistry	Lycée Saint-Louis

Academic Experience

Oct. 2020-present	Postdoctoral Researcher Leipzig, Germany ➤ Supervised by Dr. Marten Winter on the functional biogeography of alien plants	German Center for Integrative Biodiversity Research (iDiv) / Leipzig University
2016-2020	PhD Student Montpellier, France ➤ Supervisors: Pr. François Munoz and Dr. Cyrille Violle . Independent PhD funding	Univ. Montpellier / CEFE
Feb. 2015-June 2015	Master Intern Kourou, French Guiana, France ➤ Supervisor: Dr. Bruno Hérault on intraspecific variability in tropical trees growth in function of functional traits	EcoFOG
Sept. 2014-Dec. 2014	Master Intern Montpellier, France ➤ Supervisor: Dr. Ophélie Ronce on matrix population models	ISEM, University of Montpellier
Feb. 2014-July 2014	Master Intern Bloomington, IN, USA ➤ Supervised by Dr. Jean-François Goût in Michael Lynch's lab on trait motifs in the <i>Paramecium</i> complex	Indiana University
June 2013-Aug. 2013	Bachelor Intern Paris, France ➤ Supervisors: Dr. Éric Baptiste and Prof. Philippe Lopez on sequence similarity networks of the metabolic pathways of <i>Chlamydomonas reinhardtii</i> in function of their origin	Université Pierre et Marie Curie Paris 6

Scientific Supervision

2022-present	Member of the PhD Advisory Committee of Rachel Souza Ferreira
Apr. 2019 - June 2019	Co-supervised First year Master's Student Nathan Mazet Internship on global dietary strategies for birds, main supervisor: Pr. Jean-Yves Barnagaud

Apr. 2018 - May 2018 **Supervised First year Master's Student Charlotte Guérineau**

Internship on functional rarity of diverse taxonomic groups (birds, plants, fishes, and soil bacteria) over France

Scientific Service

- 2022-now **Software reviewer for rOpenSci**
For the [npi package](#)
- 2017-now **Reviewer for Scientific Journals (see Publons profile)**
For *Ecology Letters*, *Functional Ecology*, *Biological Reviews*, *PeerJ*, *Biological Conservation*, *New Phytologist*, *Journal of Applied Ecology*, and *Journal of Biogeography*
- 2022-now **Co-founder and active member of iCode**
Coding club of iDiv. Group for exchanges about R and programming practices at iDiv
- 2022-now **Post-doctoral researchers representative (130 people)**
[iDiv Council](#), the main advisory council of iDiv
- 2021-now **Organizer of the biweekly sDiv lab meetings**
sDiv team
- 2018-2020 **Representative of PhD students (70 people)**
CEFE lab council, the main governing body of the lab
- 2018 **Co-organizer of half-day workshop on Open Access Practices**
An event on how to make your articles accessible, organized for ~50 people of the CEFE in Montpellier
- 2017 **Co-organizer of Junior Conference 'Models in Ecology and Evolution'**
A junior conference organized yearly in Montpellier with ~100 people attending from Masters to Post-docs
- 2016-2020 **Founder and main coordinator of the CEFE R User Group**
Monthly meeting for people who are using R at CEFE with presentations and practical examples

Scientific Projects

- 2022-now **IMPACTS group** CESAB (French Biodiversity Synthesis Centre)
➤ Synthesis group on the temporal trends and drivers of terrestrial biodiversity in France. Group member. Co-head of data management
- 2017-now **Functional Rarity in Ecology and Evolution group (FREE)** CESAB
➤ Core member of the group as the developer of the `funrar` package that computes functional rarity indices. Author of several core papers for the group. Led 3 papers attached within the group
- 2021-now **Global Naturalized Alien Flora (GloNAF)** GloNAF
➤ Contributor to the regular meetings. Currently leading one article for the group.

Scientific Contributions

📖 14 publications (5 as first author). 🗨️ 457 citations (Google Scholar). 📊 h-index 10 (Google Scholar). 📦 6 R packages

Publications

Accepted

- Munoz, F., Klausmeier, C., ..., **Grenié, M.**, Loiseau, N., Mahaut, L., Maire, A., Mouillot, D., Violle, C., & Kraft, N. (2023). The ecological causes of functional distinctiveness in communities. *Accepted in Ecology Letters*. <https://doi.org/10.22541/au.166488862.28762630/v1>

Published

- Cutts, V., Hanz, D. M., Barajas-Barbosa, M. P., Schrod, F., Steinbauer, M. J., Beierkuhnlein, C., Denelle, P., Fernández-Palacios, J. M., Gaüzère, P., **Grenié, M.**, Irl, S. D. H., ... Algar, A. C. (2023). Links to rare climates do not translate into distinct traits for island endemics. *Ecology Letters*, n/a(n/a). <https://doi.org/10.1111/ele.14169>
- Grenié, M.**, & Gruson, H. (2023). Fundiversity: A modular R package to compute functional diversity indices. *Ecography*, n/a(n/a), e06585. <https://doi.org/10.1111/ecog.06585>
- Gaüzère, P., Denelle, P., Fournier, B., **Grenié, M.**, Delalandre, L., Münkemüller, T., Munoz, F., Violle, C., & Thuiller, W. (2022). The functional trait distinctiveness of plant species is scale dependent. *Ecography*, in press.
- Grenié, M.**, Berti, E., Carvajal-Quintero, J., Dädlow, G. M. L., Sagouis, A., & Winter, M. (2022). Harmonizing taxon names in biodiversity data: A review of tools, databases and best practices. *Methods in Ecology and Evolution*, 2041–210X.13802. <https://doi.org/10.1111/2041-210X.13802>
- Jurburg, S. D., Buscot, F., Chatzinotas, A., Chaudhari, N. M., Clark, A. T., Garbowski, M., **Grenié, M.**, Hom, E. F. Y., Karakoç, C., Marr, S., Neumann, S., ... Heintz-Buschart, A. (2022). The community ecology perspective of omics data. *Microbiome*, 10(1), 225. <https://doi.org/10.1186/s40168-022-01423-8>

6. Mouillot, D., Loiseau, N., **Grenié, M.**, Algar, A. C., Allegra, M., Cadotte, M. W., Casajus, N., Denelle, P., Guéguen, M., Maire, A., Maitner, B., ... Auber, A. (2021). The dimensionality and structure of species trait spaces. *Ecology Letters*, 24(9), 1988–2009. <https://doi.org/10.1111/ele.13778>
7. **Grenié, M.**, Violle, C., & Munoz, F. (2020). Is prediction of species richness from stacked species distribution models biased by habitat saturation? *Ecological Indicators*, 111, 105970. <https://doi.org/10.1016/j.ecolind.2019.105970>
8. Loiseau, N., Mouquet, N., Casajus, N., **Grenié, M.**, Guéguen, M., Maitner, B., Mouillot, D., Ostling, A., Renaud, J., Tucker, C., Velez, L., ... Violle, C. (2020). Global distribution and conservation status of ecologically rare mammal and bird species. *Nature Communications*, 11(1, 1), 5071. <https://doi.org/10.1038/s41467-020-18779-w>
9. Barnagaud, J.-Y., Mazet, N., Munoz, F., **Grenié, M.**, Denelle, P., Sobral, M., Kissling, W. D., Sekercioglu, Ç. H., & Violle, C. (2019). Functional biogeography of dietary strategies in birds. *Global Ecology and Biogeography*, 28(7), 1004–1017. <https://doi.org/10.1111/geb.12910>
10. Joffard, N., Massol, F., **Grenié, M.**, Montgelard, C., & Schatz, B. (2019). Effect of pollination strategy, phylogeny and distribution on pollination niches of Euro-Mediterranean orchids. *Journal of Ecology*, 107(1), 478–490. <https://doi.org/10.1111/1365-2745.13013>
11. **Grenié, M.**, Mouillot, D., Villéger, S., Denelle, P., Tucker, C. M., Munoz, F., & Violle, C. (2018). Functional rarity of coral reef fishes at the global scale: Hotspots and challenges for conservation. *Biological Conservation*, 226, 288–299. <https://doi.org/10.1016/j.biocon.2018.08.011>
12. Munoz, F., **Grenié, M.**, Denelle, P., Taudière, A., Laroche, F., Tucker, C., & Violle, C. (2018). Ecolottery: Simulating and assessing community assembly with environmental filtering and neutral dynamics in R. *Methods in Ecology and Evolution*, 9(3), 693–703. <https://doi.org/10.1111/2041-210X.12918>
13. **Grenié, M.**, Denelle, P., Tucker, C. M., Munoz, F., & Violle, C. (2017). Funrar: An R package to characterize functional rarity. *Diversity and Distributions*, 23(12), 1365–1371. <https://doi.org/10.1111/ddi.12629>
14. Violle, C., Thuiller, W., Mouquet, N., Munoz, F., Kraft, N. J. B., Cadotte, M. W., Livingstone, S. W., **Grenié, M.**, & Mouillot, D. (2017). A Common Toolbox to Understand, Monitor or Manage Rarity? A Response to Carmona et al. *Trends in Ecology & Evolution*, 32(12), 891–893. <https://doi.org/10.1016/j.tree.2017.10.001>

R packages

- **funrar** (main creator and maintainer)
computes functional originality indices central for CESAB FREE group analyses
[published paper](#) – [CRAN](#) – [GitHub](#)
- **ecolottery** (co-creator)
simulates community assembly processes cleverly with both niche and neutral processes
[published paper](#) – [CRAN](#) – [GitHub](#)
- **fundiversity** (co-creator and maintainer)
a fast and modular package to compute functional diversity indices
[published paper](#) – [CRAN](#) – [GitHub](#)
- **rromeo** (co-creator and maintainer)
accesses the [Sherpa/RoMEO API](#) that indexes the open access policies of journals
[published by rOpenSci](#) – [CRAN](#) – [GitHub](#)
- **funbiogeo** (co-creator and maintainer)
helps create functional biogeography workflows, developed in the context of the FREE CESAB group
[GitHub](#)
- **rtaxref** (creator and maintainer)
accesses the French Taxonomic Referential (TAXREF) API
[GitHub](#)
- Significant contributions to other packages: [taxize](#), [ggfortify](#), and [traitdataform](#)

Conference Proceedings

1. **Grenié, M.**, Berti, E., Carvajal-Quintero, J., Winter, M., & Sagouis, A. (2021). Matching Species Names Across Biodiversity Databases: Sources, tools, pitfalls and best practices for taxonomic harmonization. *Biodiversity Information Science and Standards*, 5, e75359. <https://doi.org/10.3897/biss.5.75359>

Invited Talks

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|---------------|---|
| December 2021 | Holger Kreft's regular lab seminar on 'Navigating the landscape of taxonomic harmonization'
University of Göttingen |
| May 2022 | Invited talk at the 3rd meeting of Data to Knowledge in Agronomy and Biodiversity (D2KAB) on 'Taxonomic Databases of Plants and Animals'
Paris/Online |

Talks

September 2022	A barrier to global plant invasion ecology: gaps in trait availability for alien species Neobiota 2022, Tartu, Estonia
July 2022	A barrier to global plant invasion ecology: gaps in trait availability for alien species BES Macro 2022, Online
April 2022	A barrier to global plant invasion ecology: gaps in trait availability for alien species iDiv Conference 2022, Leipzig, Germany
August 2021	Navigating the landscape of taxonomic harmonization: data, tools, and best practices GfÄ– conference (German Speaking Ecological Society Meeting) 2021
July 2021	Navigating the landscape of taxonomic harmonization: data, tools, and best practices BES Macro 2021, Online
October 2018	Functional rarity of coral reef fishes at the global scale: Hotspots and challenges for conservation French Ecological Society Meeting (SFÄ‰cologie) 2018, Rennes, France
July 2018	Predicting Species Richness with unicorns or why should we discuss the use of thresholds? BES Macro (British Ecological Society Macroecology Special Interest Group Meeting) 2018, Saint-Andrews, Scotland
February 2017	Functional rarity of coral reef fishes across space (Best Presentation Award) Young Natural History Scientistsâ€™ Meeting, Paris, France
September 2016	A case study of Functional Rarity: worldwide coral reef fishes EcoSummit 2016, Montpellier, France

Blogposts

1. Grenié, M. (2022, December 6). How to Save Ggplot2 Plots in a targets Workflow? Retrieved February 3, 2023, from <https://ropensci.org/blog/2022/12/06/save-ggplot2-targets/>
2. Salmon, M., Grenié, M., & Gruson, H. (2022, June 16). Why You Should (or Shouldn't) Build an API Client. Retrieved February 16, 2023, from <https://ropensci.org/blog/2022/06/16/publicize-api-client-yes-no/>
3. Grenié, M., Berti, E., Carvajal-Quintero, J., Dädlow, G. M. L., Sagouis, A., & Winter, M. (2022, March 2). Best practices for taxonomic harmonization, an overlooked yet crucial step in biodiversity analyses. Retrieved May 27, 2022, from <https://methodsblog.com/2022/03/02/best-practices-for-taxonomic-harmonization-an-overlooked-yet-crucial-step-in-biodiversity-analyses/>
4. Grenié, M., & Gruson, H. (2020, July 15). Community Captioning of rOpenSci Community Calls. Retrieved May 27, 2022, from <https://ropensci.org/blog/2020/07/15/subtitles/>
5. Grenié, M., & Gruson, H. (2019, June 4). Access Publisher Copyright & Self-Archiving Policies via the 'SHERPA/RoMEO' API. Retrieved May 27, 2022, from <https://ropensci.org/blog/2019/06/04/rromeo/>

Teaching Experience

I taught 100+ hours on Ecology, Biodiversity Statistics, and R programming from 2nd year of Bachelor to PhD students (detail below).

I am a certified [Carpentries](#) instructor, focusing on **R programming** and **Data Visualization**.

I also founded the R User Group at the Center for Functional and Evolutionary Ecology in Montpellier. There, I organized regular 1h meet-ups on various R topics (plotting with ggplot2, mapping with sf, project organization with RStudio, workflow organization with drake, parallelization with future).

Teaching detail

Course Name	Year(s)	Level	Total time
Descriptive Statistics with R (UM)	2016/2017	Bachelor's (2nd yr)	50h
Functional Biogeography with R (UM, material)	2017/2018	Master's (2nd yr)	8h
Guest Lecture on Biodiversity Facets (UL)	2021/2022	Master's (1st yr)	4h
Biodiversity Facets with R (UL, material)	2021/2022	Master's (1st yr)	12h
Group project on Biodiversity Facets (UL)	2021	Master's (1st yr)	20h
Introduction to git and GitHub (UL/iDiv, material)	2022	Masters, PhD students, and postdocs	10h
Workshop on Functional Diversity and Rarity, (@CESAB, material)	2022	Masters, PhD students, postdocs, & reseachers	3.5h
Guest Lecture on Taxonomic Harmonization @NFDI4Biodiversity Winter School on Data Management in Ecology and Evolution	2022	Masters, PhD students, and postdocs	2h

UM: University of Montpellier; UL: University of Leipzig






Skills

Languages

Level estimates are given following the [Common European Framework of Reference for Languages \(CEFR\)](#)

French [native speaker]; English [C2, fluent speaker]; Spanish [B1-B2]; German [A2-B1]; Chinese [A2-B1]; Japanese [A2]

Programming languages

-  **R** language • Best Package Development Practices (test that unit tests, pkgdown website, Continuous Integration/Continuous Deployment, submission to CRAN) • data visualization (advanced ggplot2 and extension packages) • spatial data manipulation [terra rasters, sf vectors, PostGIS database, and interactions]
-  **SQL** interaction with databases • high-performance query • interaction with R • PostgreSQL/PostGIS spatial database
-  **High Performance Computing** job submission on SLURM/SGE • complex array jobs
- **git** version control • git flow framework • collaborative development through  GitHub
- Basic knowledge of  **Python** and **Julia**

Other

Digital Photography, Film Photography, Hiking