

# Matthias Grenié

Postdoctoral Researcher

Curriculum Vitae  
February 2023

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

2016-2020	<b>PhD in Ecology</b> Montpellier, France ➤ Supervised by <b>Dr. Cyrille Violle</b> and <b>Pr. François Munoz</b> . ➤ PhD title: 'Outside the norm: deviation from ecological optimality and functional originality'	CEFE / Montpellier University
2013-2015	<b>MSc. in General Biology</b> Lyon, France	École Normale Supérieure de Lyon
2012-2013	<b>Bsc. in General Biology</b> Lyon, France	École Normale Supérieure de Lyon

## Academic Experience

Oct. 2020-now	<b>Postdoctoral Researcher</b> Leipzig, Germany ➤ Working with <b>Dr. Marten Winter</b> on the functional biogeography of alien plants	German Center for Integrative Biodiversity Research (iDiv) / Leipzig University
2016-2020	<b>PhD Student</b> Montpellier, France	Montpellier University
Feb. 2015-June 2015	<b>Master Intern</b> Kourou, French Guiana, France ➤ Supervised by <b>Dr. Bruno Hérault</b> on intraspecific variability in tropical trees growth in function of functional traits	EcoFOG
Sept. 2014-Dec. 2014	<b>Master Intern</b> Montpellier, France ➤ Supervised by <b>Dr. Ophélie Ronce</b> on matrix population models	ISEM, University of Montpellier
Feb. 2014-July 2014	<b>Master Intern</b> Bloomington, IN, USA ➤ Supervised by <b>Dr. Jean-François Goût</b> in Michael Lynch's lab on trait motifs in the <i>Paramecium</i> complex	Indiana University

## Scientific Supervision

Apr. 2018 - May 2018	<b>Supervised First year Master's Student Charlotte Guérineau</b> Internship on functional rarity of diverse taxonomic groups (birds, plants, fishes, and soil bacteria) over France
Apr. 2019 - June 2019	<b>Co-supervised First year Master's Student Nathan Mazet</b> Internship on global dietary strategies for birds, main supervisor: Jean-Yves Barnagaud

## Scientific Service

2017-now	<b>Reviewer for Scientific Journals (see Publons profile)</b> For <i>Ecology Letters</i> , <i>Functional Ecology</i> , <i>Biological Reviews</i> , <i>PeerJ</i> , <i>Biological Conservation</i> , and <i>Journal of Biogeography</i>
2022-now	<b>Software reviewer for rOpenSci</b> For the <a href="#">npi package</a>
2022-now	<b>Post-doctoral researchers representative</b> <a href="#">iDiv Council</a> , an advisory council of iDiv
2021-now	<b>Organizer of the biweekly sDiv lab meetings</b> sDiv team

2022-now	<b>Member of PhD Advisory Committee of <a href="#">Rachel Souza Fereira</a></b>
2018-2020	<b>Representative of PhD students in the CEFE lab council</b> CEFE lab council, the main governing body of the lab
2018	<b>Co-organizer of half-day workshop on Open Access Practices</b> An event on how to make your articles accessible, organized for ~50 people of the CEFE in Montpellier
2017	<b>Co-organizer of Junior Conference 'Models in Ecology and Evolution'</b> A junior conference organized yearly in Montpellier with ~100 people attending from Masters to Post-docs

## Scientific Projects

2017-now	<b>Functional Rarity in Ecology and Evolution group (FREE)</b> <span style="float: right;">CESAB (French Biodiversity Synthesis Centre)</span> <ul style="list-style-type: none"> <li>► Core member of the group as the developer of the <code>funrar</code> package that computes functional rarity indices. Author of several core papers for the group. Led 3 papers attached to the work of the group.</li> </ul>
2021-now	<b>Global Naturalized Alien Flora (GloNAF)</b> <span style="float: right;">GloNAF</span> <ul style="list-style-type: none"> <li>► Contributor to the regular meetings. Currently leading one article for the group.</li> </ul>
2022-now	<b>IMPACTS group</b> <span style="float: right;">CESAB</span> <ul style="list-style-type: none"> <li>► Scientific Contributor to the group. Co-head of data management for the group. First meeting November 2022.</li> </ul>

## Scientific Contributions

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

### Publications

#### Accepted

1. Grenié, M., & Gruson, H. (2023). Fundiversity: A modular R package to compute functional diversity indices.
2. Cutts, V., Hanz, D., Barajas, P., Schrod, F., Steinbauer, M., Beierkuhnlein, C., Denelle, P., Fernández-Palacios, J.-M., Gaüzère, P., Grenié, M., Irl, S., ... Algar, A. (2022). Links to rare climates do not translate into distinct traits for island endemics. *Ecology Letters*, in press.

#### Preprints

1. Munoz, F., Klausmeier, C., ..., Grenié, M., Loiseau, N., Mahaut, L., Maire, A., Mouillot, D., Violle, C., & Kraft, N. (2022). *The ecological causes of functional distinctiveness in communities*. <https://doi.org/10.22541/au.166488862.28762630/v1>

#### Published

1. 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.
2. 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*, n/a(n/a). <https://doi.org/10.1111/2041-210X.13802>
3. 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>
4. 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>
5. 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>
6. 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), 5071. <https://doi.org/10.1038/s41467-020-18779-w>
7. Barnagaud, J.-Y., Mazet, N., Munoz, F., Grenié, M., Denelle, P., Sobral, M., Kissling, W. D., Şekercioğlu, 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>
8. 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>

9. **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>
10. 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>
11. **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>
12. 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  
[online preprint](#) – [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

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

### Talks

- |                |  |
|----------------|--|
| September 2016 | <b>A case study of Functional Rarity: worldwide coral reef fishes</b><br>EcoSummit 2016, Montpellier, France   |
| February 2017  | <b>Functional rarity of coral reef fishes across space (Best Presentation Award)</b><br>Young Natural History Scientists' Meeting, Paris, France   |
| July 2018      | <b>Predicting Species Richness with unicorns or why should we discuss the use of thresholds?</b><br>BES Macro (British Ecological Society Macroecology Special Interest Group Meeting) 2018, Saint-Andrews, Scotland |
| October 2018   | <b>Functional rarity of coral reef fishes at the global scale: Hotspots and challenges for conservation</b><br>French Ecological Society Meeting (SFÉcologie) 2018, Rennes, France                                   |
| July 2021      | <b>Navigating the landscape of taxonomic harmonization: data, tools, and best practices</b><br>BES Macro 2021, Online  |

August 2021	<b>Navigating the landscape of taxonomic harmonization: data, tools, and best practices</b> GfÖ conference (German Speaking Ecological Society Meeting) 2021
April 2022	<b>A barrier to global plant invasion ecology: gaps in trait availability for alien species</b> iDiv Conference 2022, Leipzig, Germany
July 2022	<b>A barrier to global plant invasion ecology: gaps in trait availability for alien species</b> BES Macro 2022, Online
September 2022	<b>A barrier to global plant invasion ecology: gaps in trait availability for alien species</b> Neobiota 2022, Tartu, Estonia

## Blogposts

1. Grenié, M. (2022). How to Save Ggplot2 Plots in a targets Workflow? Retrieved from <https://ropensci.org/blog/2022/12/06/save-ggplot2-targets/>
2. Grenié, M., Berti, E., Carvajal-Quintero, J., Dädlow, G. M. L., Sagouis, A., & Winter, M. (2022). Best practices for taxonomic harmonization, an overlooked yet crucial step in biodiversity analyses. Retrieved from <https://methodsblog.com/2022/03/02/best-practices-for-taxonomic-harmonization-an-overlooked-yet-crucial-step-in-biodiversity-analyses/>
3. Grenié, M., & Gruson, H. (2020). Community Captioning of rOpenSci Community Calls. Retrieved from <https://ropensci.org/blog/2020/07/15/subtitles/>
4. Grenié, M., & Gruson, H. (2019). Access Publisher Copyright & Self-Archiving Policies via the 'SHERPA/RoMEO' API. Retrieved 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, <a href="#">material</a> )	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, <a href="#">material</a> )	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, <a href="#">material</a> )	2022	Masters, PhD students, and postdocs	10h
Guest Lecture on Taxonomic Harmonization <a href="#">@NFDI4Biodiversity Winter School on Data Management in Ecology and Evolution</a>	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