EMILIO BERTI

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SUMMARY

I am a theoretical ecologist with a passion for math and computing. I have a strong quantitative background, with expertise in mathematical and statistical modelling of complex systems using big databases at large spatio-temporal scales. I have worked in many different fields of biology, from molecular muscle physiology to macroecology and biogeography. I am very open minded to other cultures and societies: I am Italian, my wife is Bulgarian, we met in Denmark, and we live in Germany. I am an avid reader of ancient history and I love sumo.

PROFESSIONAL EXPERIENCE

PostDoctoral researcher *01/10/2020 – Present*
Theory in Biodiversity Science, German Centre for Integrative Biodiversity Research (iDiv), Leipzig, Germany

Scientific consultant *01/05/2020 – 31/07/2020*
Department of Bioscience, Aarhus University, Aarhus, Denmark

Teaching assistant *01/02/2017 – 30/04/2020*
Department of Biology, Aarhus University, Aarhus, Denmark

EDUCATION

PhD *01/02/2017 – 29/06/2020*
Section of Ecoinformatics and Biodiversity, Department of Biology, Aarhus University, Aarhus, Denmark.
Title of dissertation: *Megafauna extinctions, allometric scaling and biotic interactions: ecological effects and restoration opportunities through rewilding.*

Visiting PhD student *15/09/2018 – 12/12/2018*
Department of Ecology and Evolution, University of Chicago, Chicago, IL

MSc in Biology *01/09/2013 – 31/04/2016*
Department of Ecology and Evolution, University of Florence, Florence, Italy
Title of dissertation: *Analysis of the movement and aggressive interactions between two species of ants of the Genus Lasius (Hymenoptera: Formicidae) through mathematical models.*

BSc in Biology *01/09/2009 – 31/09/2012*
Department of Physiology, University of Florence, Florence, Italy
Title of dissertation: *The effects of myopalladin on the contraction mechanics of muscle fibers.*

SKILLS

I have developed an outstanding mathematical and theoretical skill set and successfully applied it to investigate macroecological and biogeographical drivers of biodiversity. I also have experience with lab and field work, especially on vegetation surveys of Mediterranean plant and ant species.

Languages Italian (native), English (fluent), German (A1), French (A1)
Programming R (expert), python (expert), bash (expert), C/C++ (advanced), Stan (advanced), javascript (mostly for Google Earth Engine, proficient), SQL (postgres flavor; advanced), GIS (expert), High Performance Computing (expert)
Software Linux/GNU, QGIS, Anaconda, RShiny, Jupyter Notebooks, LaTeX, Git, GitHub
Methods network theory, mathematical modeling, geographic information systems (GIS), geoinformatics, geomatics, biostatistics, data science, statistics, Bayesian inference, ordination and classification, optimization, machine learning, species distribution models (SDMs), environmental niche modeling, community assembly, climate analyses, automation.
Relevant courses Plant biodiversity (focused on Mediterranean ecosystems; MSc), Ecophysiology and climate changes (MSc), Applied plant physiology (MSc), Statistics for experimental research (MSc), Mixed models (PhD).

SCIENTIFIC PUBLICATIONS

First authorship

1. **Berti, E.**, Rosenbaum, B., Brose, U., & Vollrath, F. (2023). Energy landscapes direct the movement preferences of elephants. Under review in *Journal of Animal Ecology*. https://doi.org/10.22541/au.168373276.62196439/v1

2. Bauer, B., **Berti, E.**, ... & Brose, U. (2022). Biotic filtering by species' interactions constrains food-web variability across spatial and abiotic gradients. *Ecology letters*.https://doi.org/10.1111/ele.13995. (`Shared first authorship`)
3. **Berti, E.**, Davoli, M., ... & Vollrath, F. (2021). The r package enerscape: A general energy landscape framework for terrestrial movement ecology. *Methods in Ecology and Evolution*. https://doi.org/10.1111/2041-210X.13734
4. **Berti, E.**, Monsarrat, S., Munk, M., Jarvie, S. & Svenning, J.C. (2020). Body size is a good proxy for vertebrate charisma. *Biological Conservation*. https://doi.org/10.1016/j.biocon.2020.108790
5. **Berti, E.** & Svenning, J.C. (2020). Megafauna extinctions have reduced biotic connectivity worldwide. *Global Ecology and Biogeography*. https://doi.org/10.1111/geb.13182

Last authorship

6. Gauzens, B., Brose, U., Delmas, E., & **Berti, E**. (2023). ATNr: Allometric Trophic Network models in R. *Methods in Ecology and Evolution*. https://doi.org/10.1111/2041-210X.14212

Co-authorship with supporting role

7. Antunes, A. C., **Berti, E.**, ... & Gauzens, B. (2023). Linking biodiversity and nature's contributions to people (NCP): a macroecological energy flux perspective. *Trends in Ecology and Evolution*. https://doi.org/10.1016
8. Wei, S., **Berti, E.**, ... & Yue, K. (2023). Global patterns and drivers of lead concentration in inland waters. *Journal of Hazardous Materials*. https://doi.org/10.1016/j.jhazmat.2023.132455
9. Amyntas, A., **Berti, E.**, ... & Brose, U. (2023). Niche complementarity among plants and animals can alter the biodiversity–ecosystem functioning relationship. *Functional Ecology*. https://doi.org/10.1111/1365-2435.14419
10. Dyer, A., Brose, U., **Berti, E.**, Rosenbaum, B., & Hirt, M. R. (2023). The travel speeds of large animals are limited by their heat-dissipation capacities. *Plos Biology*. https://doi.org/10.1371/journal.pbio.3001820
11. Vogel, S. M., ..., **Berti, E.**, ... & Svenning, J. C. (2023). Identifying sustainable coexistence potential by integrating willingness-to-coexist with habitat suitability assessments. *Biological Conservation*. https://doi.org/10.1016/j.biocon.2023
12. Grenié, M, **Berti, E.**, ... & Marten, W. (2022). Harmonizing taxon names in biodiversity data: a review of tools, databases, and best practices. *Methods in Ecology and Evolution*. https://doi.org/10.1111/2041-210X.13802

CONFERENCE TALKS

1. Bauer, B., **Berti, E.**, . . . , & Brose, U. (2022). From regional to local scale: biotic interactions shape multilayer food-webs. *SFE-GFO-EEF biannual meeting, Metz, France*. Invited talk
2. **Berti, E.**, & Svenning, J.C. (2022). State-space models show that functional replacements of extinct megafauna have distinct habitat preference in a European rewilding area. *SFE-GFO-EEF biannual meeting, Metz, France*
3. Grenié, M., **Berti, E.**, Carvajal-Quintero, J., Winter, M., & Sagouis (2021). Matching Species Names Across Biodiversity Databases: Sources, tools, pitfalls and best practices for taxonomic harmonization. *TDWG annual meeting, online*
4. **Berti, E.** & Svenning, J.C. (2019). Megalinkers extinction and the decrease of ecosystem connectivity. *ESA annual meeting, Louisville, KY*
5. **Berti, E.**, Jarvie, S. W., & Svenning, J.C. (2018). Rewiring food webs via trophic rewilding. *BES annual meeting, Belfast, UK*

TEACHING & ORGANIZED WORKSHOPS

Introduction to scientific programming and tidyverse (2022) – slides. Introduction to git and GitHub for a fool-proof programming (2022) – course. Theoretical Population Ecology (2023). Meta-analyses for Biodiversity (2021). Statistical and Geospatial Modelling (2019). Behavioural Biology (2018, 2019). Geographic Information System (2017). Cleaning online repository data for use in biogeography and macroecology (2019). Running a species distribution model in R (2019). A (very) gentle introduction to Linux (2019).

COLLABORATIONS

I have moved several times to pursue my career dreams and, being a friendly person, I established personal and professional ties with the people I met. My network of current collaborators include:

- Prof. Jens-Christian Svenning, Aarhus University, Aarhus, Denmark.
- Prof. Ulrich Brose, Jena University, Jena, Germany.
- Prof. Daniel Reuman, Kansas University, Lawrence, KS, USA.
- Prof. Giacomo Santini, Università degli Studi di Firenze, Florence, Italy.
- Prof. Kai Yue, Fujian Normal University, Fuzhou, China.
- Prof. Neil Carter, University of Michigan, Ann Arbor, MI, USA.
- Ass. Prof. Susanne Vogel, Open University of the Netherlands, Heerlen, Netherlands.
- Prof. Fritz Vollrath, University of Oxford, Oxford, UK.