EMILIO BERTI

(+45) 266 54 662 ◇ emilio.berti90@gmail.com

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

In my current PostDoc position, I focus on theoretical ecology, community assembly, animal movement, and species' distribution models.

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

During these three months, I started developing a mechanistic model to assess areas of conservation priorities in Denmark using the national biodiversity database.

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

I taught one course every semester to fulfill the requirements of my PhD program. Teaching varied from lab support to lectures preparation and presentation.

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 acquired a very complementary set of skills through my career. I have developed an outstanding mathematical and theoretical skill set through personal training and successfully applied it to investigate macroecological and biogeographical drivers of biodiversity. I try to get the best from each experience; I have failed many times and will fail again, but this is also an opportunity to learn new things and incorporate them into my personal and professional growth.

Languages
Italian (native), English (fluent), Danish (beginner), German (beginner)
Programming
R (expert), python (expert), bash (expert), C/C++ (advanced), javascript (mostly for Google Earth Engine, proficient), SQL (postgres flavor; advanced), GIS (expert), High Performance Cluster (HPC, SLURM flavor; expert)
Software
Linux/GNU, QGIS, Anaconda, RShiny, Jupyter Notebooks, LaTeX, Git, GitHub
Methods
Network analysis, mathematical modeling, geographic information systems (GIS), geoinformatics, data science, statistics, ordination and classification, optimization, machine learning, species distribution

models (SDMs), climate analyses, environmental niche modeling, high performance clusters, automation.

SCIENTIFIC PUBLICATIONS

First authorship

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

Bauer, B., **Berti, E.**, ... & Brose, U. (2022). Biotic filtering by species' interactions constrains food-web variability across spatial and abiotic gradients. *Ecology letters*. DOI: 10.1111/ele.13995. (`Shared first authorship`).

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*. DOI: 10.1111/2041-210X.13734.

Berti, E., Monsarrat, S., Munk, M., Jarvie, S. & Svenning, J.C. (2020). Body size is a good proxy for vertebrate charisma. *Biological Conservation*. DOI: 10.1016/j.biocon.2020.108790.

Berti, E. & Svenning, J.C. (2020). Megafauna extinctions have reduced biotic connectivity worldwide. *Global Ecology and Biogeography*. DOI: 10.1111/geb.13182.

Last authorship

Gauzens, B., Brose, U., Delmas, E., & **Berti, E**. (2023). ATNr: Allometric Trophic Network models in R. Methods in Ecology and Evolution.

Co-authorship with supporting role

Wei, S., **Berti, E.**, ... & Yue, K. (2023). Global patterns and drivers of lead concentration in inland waters. Journal of Hazardous Materials, 132455.
I performed the analyses to investigate the drivers of lead concentration.

Amyntas, A., **Berti, E.**, Gauzens, B., Albert, G., Yu, W., Werner, A. S., ... & Brose, U. (2023). Niche complementarity among plants and animals can alter the biodiversity–ecosystem functioning relationship. Functional Ecology.
I advice on the assembly model and wrote the R package used to generate community data.

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, 21(4), e3001820.
I helped developing the theoretical mathematical model for the optimal travel speed of animals.

Vogel, S. M., Vasudev, D., Ogutu, J. O., Taek, P., **Berti, E.**, Goswami, V. R., ... & Svenning, J. C. (2023). Identifying sustainable coexistence potential by integrating willingness-to-coexist with habitat suitability assessments. Biological Conservation, 279, 109935.
I advised on the analyses and ran preliminary species occupancy models.

Terlau, J., Brose, U., Antunes, A. C., **Berti, E.**, Boy, T., Gauzens, B., ... & Hirt, M. R. (2022). Integrating trait-based movement into mechanistic predictions of thermal performance.
I performed the analysis to reconstruct the climatic niche of the species.

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*. DOI: 10.1111/2041-210X.13802.
I developed the pipeline to harmonize taxonomic information used as case study and contributed substantially to the conceptual and practical recommendation for taxonomic harmonization.

PEER REVIEW

As of July 2022, I have reviewed 6 papers for: Ecography (2), Ecology Letters (2), GigaScience (1), and Scientia Agricola (1). You can find more at my WoS profile.

CONFERENCE TALKS

Invited talk: 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.*

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*

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*

Berti, E. & Svenning, J.C. (2019). Megalinkers extinction and the decrease of ecosystem connectivity. *ESA annual meeting, Louisville, KY*

Berti, E., Jarvie, S. W., & Svenning, J.C. (2018). Rewiring food webs via trophic rewilding. *BES annual meeting, Belfast, UK*

SUPERVISION AND MENTORING

I am helping and informally mentoring two PhD students at iDiv: Angelos Amyntas, whose work focuses on biodiversity-ecosystem functioning, and Ana Carolina Antunes, whose work focuses on the impacts of humans on α-diversity using camera trap data. I am formally co-supervising the PhD candidate Jingyi Li, who is developing a novel mathematical approach for functional responses based on information theory. In addition to supervision, I also provide theoretical, computational, and statistical advice to several members of the TiBS working group at iDiv as well as individual mentoring for PhD students, advising especially on transferable skills and alternative career paths outside academia.

TEACHING & ORGANIZED WORKSHOPS

During my PhD, I taught one course every semester, as part of my salary was paid by Aarhus University on the basis of teaching. I have thus a relatively long teaching experience for my career stage. I also regularly organize lab workshops to teach reproducible research and open data principles.

Teaching
Introduction to scientific programming and tidyverse (2022) – slides
Introduction to git and GitHub for a fool-proof programming (2022) – course
Teaching Assistant
Theoretical Population Ecology (2023) Meta-analyses for Biodiversity (2021)

Statistical and Geospatial Modelling (2019)
Behavioural Biology (2018, 2019)
Geographic Information System (2017)

Organized Workshops

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.

I also collaborate with Dr. Sophie Monsarrat, rewilding manager at the NGO Rewilding Europe (Nijmegen, Netherlands), and veterinary doctor Agnese Santi (Prato, Italy), with whom I am developing a new concept of "wildness" that can be applied to feral and semi-domesticated horses in Europe and that can lead to the identification of existing horse populations that promote biodiversity and ecosystem services.

EXTERNAL LINKS

- Google Scholar profile
- Personal website
- ORCiD
- LinkedIn
- GitHub
- Publons