

CAROLINA LOBATO

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Düsseldorf, North Rhine-Westphalia, Germany

EDUCATION

- **PhD. Molecular Biosciences and Biotechnology, defended with distinction** Apr 2021 - Mar 2025
Supervision: Univ.-Prof. Dipl.-Biol. Dr.rer.nat. Gabriele Berg
◦ Institute of Environmental Biotechnology – Graz University of Technology  Graz, Austria
- **MSc. Molecular Biomedicine** 2014 - 2016
Supervision: Prof. Dr. Gabriela Moura
◦ Institute of Biomedicine – University of Aveiro  Aveiro, Portugal
- **Internship LLLP-Erasmus** May - Sep 2013
Supervision: Prof. MVDr. Vladimír Celer, Ph.D.
◦ Infectious Diseases and Microbiology – University of Veterinary Sciences Brno  Brno, Czechia
- **BSc. Biotechnology** 2009 - 2013
Supervision: Prof. Dr. Paula Amador
◦ Higher School of Agriculture – Polytechnic University of Coimbra  Coimbra, Portugal

PROFESSIONAL EXPERIENCE

- **Postdoctoral Researcher** Jun 2025 - ongoing
Supervision: Prof. Dr. Björn Usadel
◦ Institute for Biological Data Science – Heinrich Heine University Düsseldorf  Düsseldorf, Germany
- **Graduate University Assistant** Jan 2021 - Dec 2024
Supervision: Univ.-Prof. Dipl.-Biol. Dr.rer.nat. Gabriele Berg
◦ Institute of Environmental Biotechnology – Graz University of Technology  Graz, Austria
- **Research Assistant** Apr - Dec 2020
Supervision: Univ.-Prof. Dipl.-Biol. Dr.rer.nat. Gabriele Berg & Dr. Tomislav Cernava
◦ Institute of Environmental Biotechnology – Graz University of Technology  Graz, Austria
- **Research Fellow** Apr 2018 - Nov 2019
Supervision: Prof. Dr. Leonor Morais-Cecílio
◦ Plant Science and Crop Production – ISA, University of Lisbon  Lisbon, Portugal
- **Research Fellow** May 2017 - Mar 2018
Supervision: Prof. Dr. José Carlos Rodrigues & Dr. Ana Alves
◦ Forest Ecology – ISA, University of Lisbon  Lisbon, Portugal
- **Graduate Research Intern** Sep 2013 - Jun 2014
Supervision: Dr. Sandra Gamboa
◦ CERNAS – Polytechnic University of Coimbra  Coimbra, Portugal

TEACHING & MENTORSHIP

- **Guest Lecturer "The Seed Microbiome"**
Environmental Microbiology Seminar (MOL.963UF)
Institute of Environmental Biotechnology
2023 & 2024
- **Teaching Assistant**
Laboratory Course Microbiome Analysis (MOL.972UF)
Institute of Environmental Biotechnology
2023 & 2024
Laboratory Course Environmental Biotechnology (MOL.935UF)
2023 & 2024
Biodiversity and Applied Microbiology Lecture (MOL.731UF)
2021 - 2024
Biodiversity and Applied Microbiology Lecture (PLA.221UF)
2021 - 2024
Laboratory Course Biotechnology (CHE.177UF)
2021 - 2024
Environmental Microbiology Seminar (MOL.963UF)
2021 & 2022
Laboratory Course Microbiology (MOL.209UF)
2022
Laboratory Course Bioinformatics (MOL.923UF)
2021
- **Undergraduate Preceptor**
Laboratory Course Genetic Engineering
Higher School of Agriculture
2013
- **Mentorship**
Institute of Environmental Biotechnology
◦ Daniel Shelegý (Bachelor) 2024
◦ Daniel Habich (Master) 2021-2023
◦ Daniela Dreisiebner (Master) 2021-2023
◦ Matevž Zlatnar (Bachelor) 2022
◦ Anna Mitterrutzner (Bachelor) 2021
◦ Magdalena Egger (Master) 2021
◦ Zahra Azizi (Bachelor) 2021
◦ Bettina Semler (Master) 2020

PROFESSIONAL DEVELOPMENT & SERVICE

- **Workshops & Training**
 - [CEPLAS workshop: Genome reconstruction from metagenomic data](#) Sep 2025
 - [Reproducible Research with R and quarto: Workflows for data, projects, and publications](#) Sep 2024
 - [Teaching Academy: University Didactics 1 & 2 \(Basic Module\)](#) Jul - Sep 2022
 - [Bacterial Metagenomics: from experimental design to data analysis](#) May 2021
 - [Code Academy: Learn the Command Line Course](#) Feb 2021
 - [Metagenomics applied to surveillance of pathogens and antimicrobial resistance](#) Feb 2020
 - [Programming Initiation Course for Biologists](#) Jan 2019
 - [Theoretical-practical course in Cytogenetics and Genomics in Diagnosis and Research](#) Sep 2018
- **Co-founder and Coordinator**
Seed Microbiome Working Group (SMWG) 
The group enables early-career researchers to present their work, receive feedback, and build a collaborative academic network to advance seed microbiome science. 2022-ongoing
- **Peer Review**
 - Environmental Microbiome Journal 2024 - ongoing
 - Scientific Reports 2025 - ongoing
- **Session Chair**
 - 10th Theodor Escherich Symposium on Microbiome Research (Graz) Jan 2024
 - 9th Theodor Escherich Symposium on Microbiome Research (Graz) Nov 2022

SCIENCE OUTREACH

- **Speaker**
TU Graz Science Day 2023: New Worlds in Production Sep 2023
Science communication seminar "Healthy seed microbiome, healthy Cannabis plants".
- **Organizer**
TU Graz Long Night of Research 2024 May 2024
Planned and coordinated public engagement activities showcasing microbiome research carried out at the Institute of Environmental Biotechnology.
[PEC 282 - Growth, Cellular Renovation, and Reproduction: From Theory to Practice](#) 2014
Engaging high school students through lectures and practical activities on recombinant DNA in bacteria, and in animal fertilization.
- **Blog Posts**
[Microbes and Molecules in Hidden Partnerships](#) 1 Oct 2025
Personal website
[Microbial Interactions and Culturability of Seed Bacteria](#) 16 Jun 2025
Personal website
[Recovering Lost Microbial Diversity in Cannabis](#) 18 Feb 2025
Institute of Environmental Biotechnology (TU Graz) website
[Microbes and Molecules in Hidden Partnerships](#) 1 Dec 2024
Personal website

RESEARCH OUTPUT

Peer-reviewed Publications

- Olimi E., Wuggenig R., Lobato C., Bickel S., Kusstatscher P., Wicaksono W. A., Battisti A., Coyne D., Adriko J., Cernava T. & Berg G., "[Insights into the *Mondia whitei* Microbiome Across Geographic Regions in Eastern Africa](#)" *Environmental Microbiology Reports*, 2025
*This paper characterizes the root microbiome and metabolome of the medicinal plant *Mondia whitei*, revealing strong location-specific microbial and chemical fingerprints. Key metabolites correlated with root-associated microbes highlight their bioprospecting potential and conservation value.*
- Lobato C., Abdelfattah A., Berg G. & Cernava T., "[Defining the Cultured and Uncultured Bacterial Fractions in Cannabis Seeds](#)" *Environmental Microbiome*, 2025
This study emphasizes the role of microbial abundance and interspecies interactions in seed microbiome culturing and the need for tailored strategies to retrieve seed microorganisms under laboratory conditions.
- Lobato C., Freitas J.M., Habich D., Kögl B., Berg G. & Cernava T., "[Wild Again: Recovery of a Beneficial Cannabis Seed Endophyte from Low Domestication Genotypes](#)" *Microbiome*, 2024
This study examines the bacterial seed microbiomes of 46 Cannabis genotypes spanning a spectrum of domestication levels and reveals that less domesticated genotypes harbor greater microbial diversity. The study also presents a concrete case of restoration of beneficial microbial alliances lost during domestication.
- Abdelfattah A., Tack A., Lobato C., Wassermann B. & Berg G., "[From Seed to Seed: The Role of Microbial Inheritance in the Assembly of the Plant Microbiome](#)" *Trends in Microbiology*, 2023
This paper proposes a three-stage framework of microbial inheritance, from plant to seed, through seed dormancy, to seedling, and highlights its key role in shaping plant evolutionary potential and host microbiome co-evolution while outlining critical factors influencing assembly at each stage.
- Inácio V., Lobato C., Graça J. & Morais-Cecílio L., "[Cork Cells in Cork Oak Periderms Undergo Programmed Cell Death and Proanthocyanidin Deposition](#)" *Tree Physiology*, 2021
This paper elucidates the cellular and molecular processes underlying first and wound-induced periderm formation in cork oak, revealing shared and distinct pathways of suberization, polyphenolic accumulation and programmed cell death that shape cork's unique protective and industrially valuable tissue.

Submitted Manuscripts

- Chen X., Olimi E., Lobato C., Berg G. & Cernava T., "The Tomato Seed Microbiome is Mainly Shaped by Host Genotype and Production Site" *mSystems*, 2025
This research paper demonstrated that plant genotype is the primary driver of the tomato seed microbiome, identifying a small core microbiome and predictive links between host traits, environment, and microbial composition.

Thesis

- Lobato C., "[The Microbiome of Cannabis Seeds: Insights into Microbiome-Driven Sustainability](#)" TU Graz diglib, 2025
- Lobato C., "[A Study of Alternative Initiation Codons in *Candida cylindracea*](#)" RIA, 2016

Oral Presentations

- Lobato C., Freitas J.M., Habich D., Kögl B., Berg G. & Cernava T., "Symbiotic Futures: Leveraging Seed Microbiomes for Sustainable Cannabis Cultivation", LANDSCAPE, Berlin 2024

Lobato C., Freitas J.M., Habich D., Berg G. & Cernava T., "Healthy *Cannabis* Seeds Harness a Geno- and Chemotype Specific Microbial Signature" Slovenian Microbiome Network Symposium (SMNS), Maribor 2023

Lobato C., Freitas J.M., Habich D., Berg G. & Cernava T., "Exploring the microbiome of *Cannabis* Seeds Through Domestication and Breeding Stages" 2nd Young AMICI Symposium, 2023 (online)

Lobato C., Cuadros-Patiño K., Cernava T. & Berg G., "[Characterization of the *Cannabis* Seed Microbiome for the Development of Improved Cultivation Strategies](#)" Virtual Cannabis Research Conference, 2021 (online)

Poster Presentations

Lobato C., Freitas J.M., Habich D., Kögl B., Berg G. & Cernava T., "Symbiotic Futures: Leveraging Seed Microbiomes for Sustainable *Cannabis* Cultivation", 5th Plant Microbiome Symposium (PMS), Amsterdam 2024

Lobato C., Freitas J.M., Habich D., Berg G. & Cernava T., "Uncovering *Cannabis* Seed Endophytic Diversity and Composition Across Varieties" 16th Symposium on Bacterial Genetics and Ecology (BAGECO), Copenhagen 2023

Lobato C., Cernava T. & Berg G., "Exploring the *Cannabis* Seed Microbiome" 10th ISS Congress & 3rd International Conference on Holobionts, Lyon 2022

Lobato C., Cernava T. & Berg G., "Exploring the *Cannabis* Seed Microbiome" miCROPe International Symposium, Vienna 2022

Lobato C., Cuadros-Patiño K., Cernava T. & Berg G., "Characterization of the *Cannabis* Seed Microbiome for the Development of Improved Cultivation Strategies" 8th Theodor Escherich Symposium on Medical Microbiome Research (TES) & 4th AMICI Symposium, Graz 2021

Inácio V., Lobato C., Graça J. & Morais-Cecílio L., "How cork cells differentiate: The Role of Programmed Cell Death and Proanthocyanidin Deposition in Cork Oak Periderm" PADiBa, Bonn 2019

Gamboa S., Lobato C., Oliveira H., Oom M.M. & Bahcevandziev K., "Flow Cytometry for the Assessment of Equine Sperm Chromatin" GTIE, Golegã 2015

ADDITIONAL INFORMATION

Languages: Portuguese (Native), English (Proficient), Spanish (Intermediate), German (A2)

Programming Languages: R (Experienced), Bash - Unix Shell (Experienced), Python (Beginner)

Driver's license: B1