

SCIENTIST SPOTLIGHT

Bárbara B. Calegari, Ph.D.

CURRENT APPOINTMENT

2021–present: Postdoctoral Researcher, Institute of Ecology and Evolution, University of Bern, Bern, Switzerland; Research Associate: Fish Ecology and Evolution, EAWAG, Kastanienbaum, Switzerland and Wyss Academy for Nature, Bern, Switzerland

EDUCATION & PREVIOUS APPOINTMENTS

2003–2007: B.Sc., Biological Sciences, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil

2008–2010: M.Sc. (Zoology), Department of Biological Sciences, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil; Roberto E. Reis (advisor)

2011–2015: Ph.D. (Zoology), Department of Biological Sciences, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil and National Museum of Natural History (NMNH) of Smithsonian Institution; Roberto E. Reis and Richard P. Vari (advisors)

2017–2019: Postdoctoral Fellow (Molecular and cellular Biology), Department of Biological Sciences, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil; Clarice Alho (PI)

2019–2021: Project Manager of National Institute of Forensic Sciences (INCT), Brazil

Tell us a little about your research.—I’ve always been fascinated by the diversity and evolution of freshwater fishes, especially from the Neotropics and Europe. My research centers around understanding their evolutionary history, taxonomy, and biogeography. I am currently working on a large scale project of Wyss Academy for Nature entitled “Preventing the loss of freshwater biodiversity under climate change,” coordinated by Ole Seehausen and sponsored by Canton Bern and Federal Office for the Environment (FOEN). Key components of the project include accurate fish species identification, description of new species, and building species distribution models to predict how climate change and other anthropogenic factors will affect biodiversity in the future. By identifying species’ sensitivity to these factors, we aim to determine the most critical biotic and abiotic factors for species persistence and select optimal areas for restoration and conservation. In my role, I am responsible for the biodiversity aspect of the project, which includes taxonomy, mapping species distributions, and untangling tricky European fish species complexes—like *Barbatula barbatula*, *Phoxinus phoxinus*, *Cottus gobio*, and *Gobio gobio*—using integrative taxonomy to formally recognize and describe new species.

My investigation combines morphology, genetics, and a lot of time in the field and scientific collections, but always with a deep basis in anatomy through analysis of osteology. In parallel, I continue the research I began during my Ph.D.,



Fig. 1. Bárbara Calegari at a fieldwork site in the Rhine drainage, Switzerland, December of 2021; migratory Brown Trout project. Photo by Conor Waldo.

exploring macroevolutionary patterns in Neotropical fishes. I use the driftwood catfishes (Auchenipteridae) as a model to study how ecological and morphological traits drive diversification across evolutionary timescales. In short, my work is all about discovering the hidden diversity of freshwater fishes and understanding the evolutionary forces that have shaped it.

How do you identify as a scientist?—I am an evolutionary biologist and taxonomist with a strong foundation in morphology, passionate about fishes and their natural life history. As a scientist I seek not only to discover new organisms but how they live and the processes that contribute to forming such diverse forms in aquatic ecosystems.

What personal identity/ies do you hold that are underrepresented/marginalized in ichthyology or herpetology? How do these identities and experiences enrich your relationship with your science?—As a woman in ichthyology, I belong to a group that has been historically underrepresented in the field, particularly in taxonomy and museum collections, despite some improvement in the scenario nowadays. Coming from the Global South (Brazil) and now living and working in Western Europe adds another layer to my experience. Growing up and starting my career in a developing country such as Brazil, where the resources for conducting studies are very limited, taught me resilience, creativity, and how to do science with economic constraints. Moving to Europe offered new and exciting research opportunities, but it also highlighted difficult challenges—from confronting different academic cultures and educational

standards to dealing with implicit biases about where “good science” comes from. I am constantly working to “gain credibility” with my peers and collaborators, and I find having a voice within Western culture quite difficult sometimes. Women in science are still fighting for space on fieldwork expeditions, to be recognized in first coauthor positions on a paper, and to simply be invited to give talks are examples of some day-to-day challenges.

These experiences have shaped the professional I am in science today, and how to be supportive and engaged with minorities and those less privileged, including students. I am now more committed to advocating for more equitable space and access to opportunities in academia and to emphasize the value of diverse perspectives in research. As part of the Diversity and Inclusion Committee of the Ichthyology Brazilian Society, and through initiatives like Ictiomulheres (Brazilian ichthyology women’s association) and the Red Latinoamericana de Ictiólogas, I hope to help create spaces where others from underrepresented backgrounds feel seen, supported, and empowered.

I have learned that my background enriches my work by offering a different perspective to understanding biodiversity, and by highlighting how global scientific knowledge, especially in the past, has largely been built upon the contributions and resources of local and often exploited communities in the Global South. Science for me isn’t just about discovery—it’s about making sure the process itself reflects the diversity and richness of the world we study.

Of your scientific experiences: What do you wish others of your identity knew? What do you wish ichthyologists/herpetologists not of your identity knew?—For peers who share a similar background to mine, especially those from the Global South, I’d say this: don’t be ashamed of your accent or of struggling to express yourself with the level of fluency or precision you’d like when speaking a non-native language. Language barriers can be real challenges, but they don’t define the quality of your knowledge or the value of your contributions. When joining new teams or starting positions, be proud of your background and make your nationality and experiences visible—this helps others understand your journey, respect your perspective, and give you the time and space needed to grow and develop your skills.

To the broader community, I wish more people would reflect on their own behaviors and practices, especially when it comes to avoiding microaggressions and creating inclusive environments. Inclusion isn’t just about hiring people from underrepresented backgrounds—it’s about ensuring they have the tools, support, and confidence to participate fully. That means giving space for less privileged voices to be heard, genuinely considering their points of view, and involving them in decision-making processes. Without this, the environments we build will continue to reflect the same biases we’re trying to dismantle.

What research (or other accomplishment) are you most proud of?—Undoubtedly, one of the things I’m most proud of in my career is the fieldwork and expeditions I’ve had the privilege to carry out in nature. Exploring such a vast range of habitats—from the Cerrado, Pampas, Amazon, Pantanal, and coastal marine islands to the Swiss Alps—has offered me a kind of raw, unbiased knowledge that no book can truly convey. These experiences have deeply shaped my understanding of biodiversity and life itself.

But I can’t leave out what I consider one of the biggest accomplishments of my career: studying the systematics, osteology, and astonishing morphological diversity of the entire family of driftwood catfishes, the Auchenipteridae. This work allowed me to contribute significantly to the scientific understanding of this remarkable group, and it opened many doors—enabling me to share knowledge with students, collaborate with renowned researchers, and engage with stakeholders at multiple levels. I’m deeply grateful for the opportunity to have developed such a meaningful and enriching project during my Ph.D., which continues to influence my career journey today.

What sparked your interest in fishes and/or herps? When was this in your life?—This is quite an emotional question for me, as it’s deeply connected to my father. He was always passionate about fish and fishing, and ever since I was five years old, we would go on fishing trips together, especially in Argentina, and often with family and friends. I grew up surrounded by the diversity of fish, observing where they lived, and sometimes even helping clean the catch, which gave me my first glimpse into their internal anatomy. It fascinated me, but fishing was always a joyful activity—I never imagined I would work with fish professionally.

That changed during the final year of my undergraduate studies, when I began studying fish reproductive ecology. To complete my seasonal samples, I did monthly fieldwork, and in the lab, I had to identify every specimen collected. It was during this time that I realized how much I enjoyed the identification process, passing through reading the literature, comparing morphological features, to discovering differences between species—it was unexpectedly exciting. I found myself more drawn to taxonomy than to ecology. That realization led me to pursue an internship in the fish systematics lab at MCP museum (PUCRS), and I’ve been working in this field ever since. Looking back, it feels like since my childhood experiences and curiosity to first practices in the lab came together to reveal the path I was truly meant to follow.

What is your favorite publication in an ASIH journal or memorabilia JMIH presentation/interaction?—In terms of publications, one that caught my attention as a student, and helped spark my interest in catfish systematics, was “The Catfish Genus *Tetranematichthys* (Auchenipteridae)” by Richard P. Vari and Carl J. Ferraris Jr. (2006). It served as both inspiration and a model for my own studies.

However, I can’t forget to mention a particularly memorable milestone: my first oral presentation, which also happened to be the first time I shared results from the large phylogeny of auchenipterids developed during my Ph.D. This took place at the JMIH (Joint Meeting of Ichthyologists and Herpetologists) in 2016 in New Orleans. It was a real challenge—my first time presenting in English to a large international audience—but at the same time, it was incredibly rewarding to see so many amazing ichthyologists from ASIH being supportive and endorsing my work. Their positive feedback gave me confidence and reinforced my passion for this field.

Who has had the most impactful influence on you?—My professional career, research line, and core values have been deeply influenced and shaped by two incredible mentors: Roberto E. Reis and Richard P. Vari. They taught me so much, not only as outstanding scientists and educators but also as exceptional

human beings. Through their example, I learned not just about fish biology and scientific interpretation, but also about the importance of ethical conduct, humility, and respectful dialogue in science. They showed me how to express different scientific perspectives and even disagreements with professionalism and empathy, without dismissing others' views. Their collaborative way of doing science, always sharing and building knowledge across countries and institutions have profoundly impacted and inspired me, and I carry these principles with me to guide the way I have worked since.

How do you balance personal life and work? What is (are) the major challenge(s) for balancing personal and professional life?—Balancing personal life and work is a continuous challenge, especially in academia, and something I'm always trying to improve. In my experience, what makes it so difficult is also what makes it fulfilling—the passion we have for our work. When you love what you do, it's easy to lose track of time and forget there's a life beyond the lab.

One thing that's helped me is shifting my mindset away from constant urgency. I try not to pressure myself to finish everything in a single day or expect perfection with every deliverable. It is ok to have some delays or not to have the best answer/thought for everything, and having room for not feeling guilty has made a huge difference in my well-being. It's important to remember that slowing down doesn't mean we're less committed to something.

As for most people, physical activity is also important for me, because it gives my mind a break and helps me to reset. And especially as an expat, investing in a social life with friends outside of work has been essential. The balance I perceive, it's about making sure both have space in my life to thrive.

TO LEARN MORE

<https://www.barbara-calegari.com>

About us: Dr. Bárbara Borges Calegari—Aquatic Ecology & Evolution: https://www.aqua.iee.unibe.ch/about_us/team/brbara_borges_calegari/dr_borges_calegari_brbara/index_eng.html