

# Amruta Rajarajan, PhD (she/her)

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## Research experience and education

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### Postdoctoral researcher

Dept. of Evolutionary and Integrative Ecology, Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB Berlin)

PI: Prof. Dr. Justyna Wolinska ..... **June 2023-present**

### Subject Matter Editor (General Ecology)

[Ecosphere](#) (ISSN: 2150-8925), Ecological Society of America

Editor-in-Chief: Prof. Dr. Sunshine Van Bael ..... **Aug 2024-present**

**Academic Guest** at Swiss Federal Institute of Aquatic Science and Technology (Eawag), Dübendorf, Switzerland

Host: PD Piet Spaak ..... **Jan 2023-May 2023**

### Doctoral researcher

Dept. of Aquatic Ecology, Eawag Dübendorf, Switzerland

Enrolled at Dept. of Environmental Systems Science, [ETH Zürich](#)

Supervisors: PD Piet Spaak, Prof. Dr. Justyna Wolinska ..... **Sep 2018-Dec 2022**

### International Scholar

Katholieke Universiteit te Leuven (KU Leuven, Campus Kulak), Belgium

Host: Prof. Dr. Ellen Decaestecker ..... **Mar 2022-July 2022**

**Master student** (BS-MS dual degree in the biological sciences)

Indian Institute of Science Education and Research (IISER) Mohali, Punjab, India

Awarded [DST-INSPIRE Scholarship for Higher Education](#) by the Ministry of Human Resource Development (MHRD), Govt. of India

Supervisor: Dr. Rhitoban Raychoudhary ..... **Aug 2013-May 2018**

## Publications

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- Host genotype and infection status interact to shape microbiomes in *Daphnia magna*, *Parasitology* ([in press](#))  
**Rajarajan, A.\***, Decaestecker, E., Walser, J., Bulteel, L., Spaak, P., Wolinska, J., 2024
- [Host-associated bacterial communities vary between genotypes but not by host genetic distance in \*Daphnia galeata\*](#), *Microbial Ecology*  
**Rajarajan, A.\***, Wolinska, J., Walser, J., Dennis, S. R., Spaak, P. 2023
- [Infection by a eukaryotic gut parasite in wild \*Daphnia\* sp. associates with a distinct bacterial community](#), *FEMS Microbiology Ecology*  
**Rajarajan, A.\***, Wolinska, J., Walser, J., Mäder, M., Spaak, P. 2022
- *Daphnia*-associated bacterial communities are influenced by diet quantity, environmental conditions and epidemic size across natural outbreaks ([in revision](#))  
**Rajarajan, A.\***, Wolinska, J., Walser, J., Tardent, N., Käser, S., Keller, E., Spaak, P.
- Warming increases richness and shapes species assemblages of eukaryotic parasitic plankton ([in prep](#))  
**Rajarajan, A.\***, Cerbin, S., Beng K. C., Monaghan, M. T., Wolinska, J.

\*corresponding author

## Research skills (laboratory, field and analytical)

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- DNA metabarcoding library preparation & sequencing
- Bacterial cell culture and *in vivo* fungal parasite culture maintenance
- Maintenance of crustacean and insect laboratory cultures (water fleas, beetles, wasps, flies) and axenic animal models (*Daphnia*)
- Experiment design in ecology
- 16S, 18S and 28S bioinformatics and multivariate statistics
- Univariate statistics & hypothesis-testing
- Unix, high performance computing (HPC) environments
- Metagenomic assemblies and pipelines
- Collection of aquatic zooplankton samples from the wild
- Setup-design and execution of insect behaviour assays

## Peer review experience in scientific publishing

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Served as anonymous peer-reviewer for 16 manuscripts submitted to the following journals (2019-present):

- [Microbiology Spectrum](#)
- [Functional Ecology](#)
- [Parasitology](#)
- [Journal of Animal Ecology](#)
- [Hydrobiologia](#)
- [Journal of Plankton Research](#)
- [Oikos](#)
- [Limnology & Oceanography](#)
- [Molecular Ecology](#)
- [Environmental Science & Pollution Research](#)
- [Freshwater Biology](#)
- [Ecology & Evolution](#)
- [Royal Society Open Science](#)

## Invited contributions to international audiences

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- Poster presentation “Impact of warming on parasite diversity: comparative metagenomics of *Daphnia cucullata*” at Verbania, Italy ([Cladocera XII](#)) ..... **Oct 2024**
- Invited seminar at “Evolutionary Bioinformatics and Next-Generation Sequencing” series BeGenDiv Friday seminar, Freie Universität Berlin, Germany ..... **Dec 2023**
- Talk at SIL100 (International Society for Limnology) Berlin, Germany ..... **Aug 2022**
- Poster at [ESEB2022](#) (European Society for Evolutionary Biology) Prague, Czech Republic ..... **Aug 2022**
- Invited seminar talk at “Ecology, Evolution & Conservation” series KU Leuven, Belgium ..... **June 2022**
- Talk at [Biology22](#) Basel, Switzerland ..... **Feb 2022**
- Talk at [ASLO2021](#) (online conference due to COVID) ..... **Aug 2021**

## Students mentored

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- PhD student Vanderville Villegas (IGB Berlin) ..... **July 2024-present**  
Mr. Villegas is investigating the role of the water flea microbiome in tolerance to nanoplastics
- Past undergraduate students: Lisa Hostettler, Dale Hager, Jasmine Tschan, Andres Grolimund, Romy Möll, Alyssa Müller as part of [Aquatic Ecology block course](#) (ETH Zürich) ..... **2020, 2021, 2022**
- Undergraduate intern Minea Mäder (Eawag) ..... **Oct 2020-Mar 2021**
- Teaching assistant for Evolutionary Genetics (BIO211, IISER Mohali) ..... **Sep 2017-Mar 2018**

## Detailed Research Experience

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### Postdoctoral research ("Paradapt" - ongoing)

- Analysed two eDNA metabarcoding datasets targeting eukaryotic plankton (18S and 28S)
- Developed a semi-automated, bioinformatics and NCBI web-scraping pipeline to identify parasite sequences in eDNA metabarcoding data
- Wrote one manuscript - for Paradapt project - 1 ([in prep](#))
- Designed and executed a bioinformatics pipeline for processing of *Daphnia* metagenome sequencing data for Paradapt project – 2 ..... **Aug 2024**

### PhD research

- Conceived, planned and executed four high throughput sequencing experiments (16S rRNA gene sequencing) investigating host-associated bacterial communities of the water flea *Daphnia*
- Performed 16S rRNA metabarcoding data analysis for multiple projects
- Wrote four manuscripts (two published, one in press, one in revision) ..... **Aug 2024**

### Visiting PhD collaboration

- Initiated an international collaboration with Prof. Ellen Decaestecker (KU Leuven) to investigate host-microbiome and host-parasite interaction in *Daphnia magna*
- Conceived and executed a laboratory experiment to create axenic *Daphnia*, manipulate microbiome and fungal parasite exposure and measure fitness effects ..... **July 2022**
- Wrote one manuscript ([in prep.](#)) ..... **Aug 2024**

### Master's project

- Investigated female mate choice behaviour in the jewel wasp sister species *Nasonia oneida* and *N. giraulti* (IISER Mohali, India)
- Administered antibiotics to wasps to cure *Wolbachia* infections
- Designed and set up forward-genetics experiments (F2 backcrosses)
- Recorded and analysed videos of mating assays ..... **Aug 2017-May 2018**

## Selected post-graduate level courses taken

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Infectious Disease Dynamics (701-1708-00L, ETH Zürich), Microbial Physiology and Microbial Genetics (BIO402, IISER Mohali), Advanced Evolutionary Biology (BIO403, IISER Mohali), Biostatistics (BIO606, IISER Mohali), Bioinformatics (BIO411, IISER Mohali), Cell and Molecular Basis of Immune Response (BIO404, IISER Mohali), Developmental Neurobiology (BIO613, IISER Mohali), Principles Underlying Instrumental Biomacromolecular Analyses (BIO453, IISER Mohali)

## Selected undergraduate internships

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### Developmental genetics of zebrafish

- Studied the influence of individual ploidy level on developmental genetics in *Danio rerio*
- Conducted RNA *in situ* hybridization studies to assess the spatial and temporal expression of genes involved zebrafish embryonic development (axis-specification)  
Tata Institute of Fundamental Research (TIFR Mumbai, India) ..... **May-July 2017**

### Source of gut microbiota in flour beetles

- Investigated sterile versus natural diet on the survival of *Tribolium castaneum*
- Plated homogenates on four different agar-media to isolate and establish lab cultures of gut bacterial strains  
National Centre for Biological Sciences (NCBS Bangalore, India) ..... **May-July 2015**