Akshay Mohan

INTEGRATIVE ECOLOGIST · PhD

Postdoctoral Researcher | University of Innsbruck
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Google Scholar · University profile · LinkedIn

Research profile

I study how organisms respond to changing conditions, how their interactions shape what happens next, and what we can reliably predict. My work connects experiments on multiple stressors and animal behaviour with conceptual frameworks, ecological forecasting and models of resource use and evolutionary change.

Research appointments

Postdoctoral Researcher · University of Innsbruck, Austria

Aug 2026–present

Predator–parasite ecology, behaviour, ecological forecasting and inference, and developing consumer–resource theory.

Postdoctoral Researcher · University of Jyväskylä, Finland

Feb–Aug 2026

Collaborative conceptual work on feedbacks in multiple-stressor ecology.

Doctoral Researcher · University of Jyväskylä, Finland

February 2022–February 2026

Experiments on fungicide pathways, predator risk, heatwaves and recovery in *Asellus aquaticus*. Image/video measurements and reproducible R workflows. Microbiome analysis and integration of microbial, chemical and invertebrate mesocosm data.

Research experience · IISER Thiruvananthapuram, India

July 2018–July 2021

Life-history trade-offs in *Melanitis leda* (2020–2021). Earlier microbiology and molecular laboratory work on lysosomal-protein localisation (2018–2020).

Education

PhD · Biological & Environmental Sciences

University of Jyväskylä, Finland · Feb 2022–Feb 2026

Multi-stressor interactions in freshwater ecosystems: fungicide impacts on a keystone detritivore, and conceptual advances. Supervisors: Katja Räsänen and Blake Matthews.

Integrated BS–MS · Biology

IISER Thiruvananthapuram, India · Jul 2016–Jul 2021

Evolutionary ecology and life-history trade-offs in *Melanitis leda*. Supervisor: Ullasa Kodandaramaiah.

Publications & teaching

Peer-reviewed journal articles

Mohan, A., Matthews, B., & Räsänen, K. (2026). Past Pollution Can Shape Future Climatic Vulnerability: Fungicide Exposure Alters Detritivore Performance During Heatwaves and Recovery. Freshwater Biology, 71(6), e70248. https://doi.org/10.1111/fwb.70248

Mohan, A., Matthews, B., & Räsänen, K. (2026). Predation risk magnifies fungicide-driven suppression of keystone shredder feeding and behaviour, slowing freshwater leaf-litter degradation. Environmental Pollution, 390, 127490. https://doi.org/10.1016/j.envpol.2025.127490

Mohan, A., Matthews, B., & Räsänen, K. (2024). Direct and indirect effects of chemical pollution: Fungicides alter growth, feeding, and pigmentation of the freshwater detritivore *Asellus aquaticus*. Ecotoxicology and Environmental Safety, 285, 117017. https://doi.org/10.1016/j.ecoenv.2024.117017

Teaching & mentoring

• Developed and taught the undergraduate laboratory course Research Methods in Environmental and Water Sciences, covering experimental design and R-based statistics (2024).

• Contributed to course development and teaching for Research methods for natural resources and environment with Katja Räsänen (2022 and 2023).

• Co-supervised three MSc projects and advised four additional BSc/MSc students on image analysis and statistical workflows (2022–2025).

Selected methods

Experiments through time

Factorial designs, exposure sequences, recovery measurements, climate chambers and freshwater mesocosms.

Behaviour and performance

Image-based phenotyping with Phenopype and ImageJ; video tracking with AnimalTA; feeding, growth and survival assays; aquatic respirometry.

Analysis and modelling

Reproducible R workflows, mixed-effects and survival models, data visualisation, and developing consumer–resource and invasion analyses.

Evidence across scales

Literature synthesis, microbiome analysis and integration of microbial, chemical and invertebrate datasets.

Scientific community & outreach

Selected presentations

2025 · Fungicide Fallout: Stressor Interactions with Predation and Heatwaves on a Freshwater Keystone Species

Oral presentation · 10th Plant Litter Processing in Freshwaters Meeting, Landau, Germany

2025 · Chemical Stressor Interactions with Predators and Heatwaves on a Freshwater Keystone Species

Oral presentation · Finnish Conference for Environmental Science, Helsinki, Finland

2025 · Fungicides and Heatwaves: Impacts on a Key Freshwater Detritivore

Oral presentation · OIKOS Finland, Jyväskylä, Finland

2024 · Predators and Pollutants: Investigating the Behavioural Responses of *A. aquaticus* to Multiple Stressors

Oral presentation · British Ecological Society Annual Meeting, Liverpool, United Kingdom

2024 · Predators and Pollutants: Exploring Multi-stressor Responses of a Keystone Detritivore

Invited talk · Friday Seminar Series, Hólar University, Iceland (online)

2023 · Direct and Indirect Effects of Fungicides on Freshwater Detritivores

Oral presentation · OIKOS Finland, Helsinki, Finland

Service & professional activities

Reviewer for Water Research and Scientific Reports.

Memberships: British Ecological Society and Finnish Oikos Society.

Grants & awards

JYU Research Mobility Grant, 2024: conference presentation at the British Ecological Society Annual Meeting.

JYU Research Mobility Grant, 2022: research visit and image-analysis training at Eawag, Switzerland, and the Controversies in Ecology autumn school.

INSPIRE fellowship, Department of Science and Technology, India, 2016–2021.

Science communication

Founder of Toxic Tales: infographics and videos translating ecological and ecotoxicological research for broader audiences. The research archive provides links to original papers and explains the limits of their findings.

Instagram: @toxic_tales_eco · Toxic Tales research archive

Presenter at European Researchers' Night in 2023 and 2024.

Languages

English, Hindi and Malayalam (fluent); German (beginner).