

Dr. Roman Alther

Freshwater ecologist



Profile

My biological expertise covers topics such as aquatic ecology, community ecology and systematics of amphipods. I have sound faunistic knowledge and I'm familiar with planning and implementing ecological monitorings as well as with the subsequent analysis of the data (morphological identification, molecular methods, statistical analysis). Furthermore I know how to prepare and write scientific reports. Thanks to my ongoing scientific career I have personal contacts to various other experts in the field of aquatic ecology, such as people at the BAFU, CSCF, ecological consulting corporations, WWF, or Aqua Viva.

Work experience

- since 2023 **Wissenschaftlicher Mitarbeiter**
Dep. of Evolutionary Biology and Environmental Studies DEBES,
University of Zurich, Zürich
[Research group Prof. Dr. Florian Altermatt](#)
- 2022 – 2023 **Oberassistent**
DEBES, University of Zurich, Zürich
[Research group Prof. Dr. Florian Altermatt](#)
- 2018 – 2022 **Senior research assistant**
Dep. Aquatic Ecology, Eawag, Dübendorf
[Research group Prof. Dr. Florian Altermatt](#)

Education

- 2014 – 2018 **PhD in Ecology**
University of Zurich & Eawag, Dübendorf
[Research group Prof. Dr. Florian Altermatt](#)
Diversity and Distribution of Amphipods in Switzerland
- 2011 – 2013 **Master of Science** in Biology, Master in Ecology and Evolution;
ETH Zurich & Eawag, Dübendorf
[Research group Dr. Chris Robinson](#)
The contribution of tributaries to macroinvertebrate diversity in glacial catchments
[Research group Prof. Dr. Florian Altermatt](#)
Is the Killer Shrimp (Dikerogammarus villosus) invading tributary creeks of Lake Constance?
- 2008 – 2011 **Bachelor of Science** in Biology
University of Zurich
Minor subject: Environmental Sciences
- 2003 – 2007 **Matura**
Kantonsschule am Burggraben, St. Gallen
Natural science profile, with focus in biology and chemistry
- January 2007 **DELFL 1^{er} Degré** (Diplôme d'études en langue française)

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Website

www.romanalther.ch

Date of birth

14. November 1988

Bürgerort

St. Gallen

Civil status

Married
Two children
(Fabio, Jonas)

Interests

Aquatic Ecology
Entomology
Nature conservation
Cycling
Music

Publications

- Ilg C, **Alther R** (2024) *Ökologischer Zustand von Schweizer Bächen*. *Aqua & Gas* 104(4), 46–52
- Schneider AS, Knüsel M, **Alther R**, Altermatt F (2024) *Grundwasserbiodiversität: Makroinvertebraten in Schweizer Grundwasserökosystemen – Vorkommen, Vielfalt und Biomasse*. *Aqua & Gas* 104(3), 16–23
- Mammola S, Altermatt F, **Alther R**, Amorim IR, Băncilă RI, Borges PAV, Brad T, et al. (2024) *Perspectives and Pitfalls in Preserving Subterranean Biodiversity through Protected Areas*. *Npj Biodiversity* 3(2)
- Saccò M, Mammola S, Altermatt F, **Alther R**, Bolpagni R, Brancelj A, Brankovits D, et al. (2024) *Groundwater Is a Hidden Global Keystone Ecosystem*. *Global Change Biology* 30(1): e17077
- Couton M, Studer A, Hürlemann S, Locher N, Knüsel M, **Alther R**, Altermatt F (2023) *Integrating citizen science and environmental DNA metabarcoding to study biodiversity of groundwater amphipods in Switzerland*. *Scientific Reports* 13:18097
- Knüsel M, Borko Š, **Alther R**, Salussolia A, Flot J-F, Altermatt F, Fišer C, Stoch F (2023) *Phylogenetic Structure and Molecular Species Delimitation Hint a Complex Evolutionary History in an Alpine Endemic Niphargus Clade (Crustacea, Amphipoda)*. *Zoologischer Anzeiger* 306, 27–36
- Martin P, Knüsel M, **Alther R**, Altermatt F, Ferrari B, Vivien R (2023) *Haplotaxis gordioides (Hartmann in Oken, 1819) (Annelida, Clitellata) as a sub-cosmopolitan species: a commonly held view challenged by DNA barcoding*. *Zoosymposia* 23, 78–93
- Couton M, Hürlemann S, Studer A, **Alther R**, Altermatt F (2023) *Groundwater environmental DNA metabarcoding reveals hidden diversity and reflects land-use and geology*. *Molecular Ecology* 32 (13), 3497–3512
- **Alther R**, Krähenbühl A, Bucher P, Altermatt F (2023) *Optimizing laboratory cultures of Gammarus fossarum (Crustacea: Amphipoda) as a study organism in environmental sciences and ecotoxicology*. *Science of The Total Environment* 855, 158730
- **Alther R** (2022) *Flohkrebse*, in: *Gebietsfremde Arten in der Schweiz. Übersicht über die gebietsfremden Arten und ihre Auswirkungen*. 1. aktualisierte Auflage 2022. Erstausgabe 2006. Bundesamt für Umwelt, Bern. Umwelt-Wissen Nr. 2220: 62S.
- Jardim de Queiroz L, Doenz CJ, Altermatt F, **Alther R**, Borko Š, Brodersen J, Gossner MM, Graham C, Matthews B, McFadden IR, Pellissier L, Schmitt T, Selz OM, Villalba S, Rüber L, Zimmermann NE, Seehausen O (2022) *Climate, immigration and speciation shape terrestrial and aquatic biodiversity in the European Alps*. *Proceedings of the Royal Society B* 289: 20221020
- Studer A, Knüsel M, **Alther R**, Hürlemann S, Altermatt F (2022) *Erfassung der Grundwasserflohkrebse. Studie zur Artenvielfalt und Verbreitung im Einzugsgebiet der Töss*. *Aqua & Gas* 102(4), 19–22
- **Alther R**, Fronhofer EA, Altermatt F (2021) *Dispersal behaviour and riverine network connectivity shape the genetic diversity of freshwater amphipod metapopulations*. *Molecular Ecology* 30 (24), 6551–6565
- **Alther R**, Altermatt F (2021) *Die unterirdische Flohkrebbsfauna der Schweiz*. *Stalactite* 71(1), 72–81
- **Alther R**, Bongni N, Borko Š, Fišer C, Altermatt F (2021) *Citizen science approach reveals groundwater fauna in Switzerland and a new species of Niphargus (Amphipoda, Niphargidae)*. *Subterranean Biology* 39, 1–39
- Tabi A, Pennekamp F, Altermatt F, **Alther R**, Fronhofer EA, Horgan K, Mächler E, Pontarp M, Petchey OL, Saavedra S (2020) *Species multidimensional effects explain idiosyncratic responses of communities to environmental change*. *Nature Ecology & Evolution* 4 (8), 1036–1043
- **Alther R**, Bongni N, Borko Š, Fišer C, Altermatt F (2020) *Pilotstudie fördert Grundwasserfauna zutage*. *Aqua & Gas* 100 (7/8), 36–42
- Altermatt F, **Alther R**, Fišer C, Švara V (2019) *Amphipoda (Flohkrebse) der Schweiz*. *Fauna Helvetica* 32. info species CSCF & SEG, Neuchâtel, Switzerland.

Publications (continued)

- Mächler E, Little CJ, Wüthrich R, **Alther R**, Fronhofer EA, Gounand I, Harvey E, Hürlemann S, Walser JC, Altermatt F (2019) *Assessing different components of biodiversity across a river network using eDNA*. *Environmental DNA* 1 (3), 290–301
- **Alther R**, Thompson C, Lods-Crozet B, Robinson CT (2019) *Macroinvertebrate diversity and rarity in non-glacial Alpine streams*. *Aquatic Sciences* 81:42
- Falnioskwi A, Prevorčnik S, Delić T, **Alther R**, Altermatt F, Hofman S (2019) *Monophyly of the Moitessieriidae Bourguignat, 1863 (Caenogastropoda: Truncatelloidea)*. *Folia Malacologica* 27 (1), 61–70
- Pennekamp F, Pontarp M, Tabi A, Altermatt F, **Alther R**, Choffat Y, Fronhofer EA, Ganesanandamoorthy P, Garnier A, Griffiths JI, Greene S, Horgan K, Massie TM, Mächler E, Palamara GM, Seymour M, Petchey OL (2018) *Biodiversity increases and decreases ecosystem stability*. *Nature* 563, 109–112
- Fišer C, **Alther R**, Zakšek V, Borko Š, Fuchs A, Altermatt F (2018) *Translating Niphargus barcodes from Switzerland into taxonomy with a description of two new species (Amphipoda, Niphargidae)*. *ZooKeys* 760, 113–141
- **Alther R**, Altermatt F (2018) *Fluvial network topology shapes communities of native and non-native amphipods*. *Ecosphere* 9 (2): e02102
- **Alther R**, Fišer C, Konec M, Švara V, Altermatt F (2017) *Das Hölloch: Ein Flohkrebs-Hotspot in der Schweiz*. *Stalactite* 67 (1), 10–16
- **Alther R**, Fišer C, Altermatt F (2017) *Description of a widely distributed but overlooked amphipod species in the European Alps*. *Zoological Journal of the Linnean Society* 179 (4), 751–766
- Fišer C, Konec M, **Alther R**, Švara V, Altermatt F (2017) *Taxonomic, phylogenetic and ecological diversity of Niphargus (Amphipoda: Crustacea) in the Hölloch cave system (Switzerland)*. *Systematics and Biodiversity* 15 (3), 218–237
- Robinson CT, Thompson C, Lods-Crozet B, **Alther R** (2016) *Chironomidae diversity in high elevation streams in the Swiss Alps*. *Fundamental and Applied Limnology* 188 (3), 201–213
- Altermatt F, **Alther R**, Mächler E (2016) *Spatial patterns of genetic diversity, community composition and occurrence of native and non-native amphipods in naturally replicated tributary streams*. *BMC Ecology* 16:23, 1–11
- Robinson CT, **Alther R**, Leys M, Moran S, Thompson C (2015) *A note on the foodwebs of alpine streams in the Wind River Mountains, Wyoming, USA*. *Fundamental and Applied Limnology* 187 (1), 43–54
- Altermatt F, **Alther R**, Fišer C, et al. (2014) *Diversity and Distribution of Freshwater Amphipod Species in Switzerland (Crustacea: Amphipoda)*. *PLoS ONE* 9 (10): e110328

Presentations

- **Invited speaker: Seminar series in Groundwater Ecology** – “Diversity of subterranean amphipods in Switzerland” on January 15, 2024 in Vienna AT
- **Invited speaker: Symposium „Grundwassernutzung im Wandel“** – “Grundwasser als Lebensraum – Verborgene Vielfalt” on October 26, 2023 in Dübendorf CH
- **52nd GfÖ Annual Meeting** – “Generalization of a density dependent ecosystem function in dominant aquatic macroinvertebrates” on September 13, 2023 in Leipzig DE
- **Invited speaker: Virtuelle Vortragsreihe SGHL** – “Fließgewässer – Adern der Ökosysteme” on June 6, 2023 (online)
- **Invited speaker: Makrozoobenthos workshop 2023** – “Gebietsfremde Flohkrebse in der Schweiz - Eine Übersicht” on February 4, 2023 in Wädenswil CH
- **Invited speaker: Höhlenführerkurs SSH** – “Flohkrebse” on April 23, 2022 in Muotathal CH
- **Invited speaker: ProNatura Schweiz** – “Der Bachflohkrebs – Tier des Jahres” on October 30, 2021 in Dübendorf CH
- **Invited speaker: ProNatura St. Gallen** – “Klein aber oho – Der Bachflohkrebs” on June 9, 2021 in St. Gallen CH (Video: <https://www.youtube.com/watch?v=PI2drVf-0aY>)
- **Invited speaker: ProNatura Zürich GA 2021** – “Klein aber oho – Der Bachflohkrebs” on May 7, 2021 (online)
- **Eawag Symposium 2019** – “Establishing online identification tools and experimental assays for native and non-native amphipods” on September 13, 2019 in Dübendorf CH
- **The 18th International Colloquium on Amphipoda** – “Density-dependent leaf litter consumption in experimental amphipod communities” on August 29, 2019 in Dijon FR
- **Invited speaker: SVGW Fachaustausch** – “Amphipoden im Grundwasser – Wissenslücke und mögliche Forschungsrichtung” on April 25, 2019 in Biel CH
- **Invited speaker: Schwyzerische Naturforschende Gesellschaft** – “Flohkrebse - Eine Übersicht am Beispiel des Kantons Schwyz” on February 2, 2019 in Einsiedeln CH
- **COST Workshop: DNA-based groundwater biomonitoring** – “Combining eDNA and citizen science - Lessons learned from Swiss caves” on January 22, 2019 in Park Škocjanske jame SI
- **Invited speaker: SGHL workshop – Citizen Science** – “Von Bachflohkrebsen und Höhlenforschenden” on June 11, 2018 in Zurich CH
- **Invited speaker: Naturschule St. Gallen** – “Fließgewässer - Adern der Ökosysteme” on May 3, 2018 in St. Gallen CH
- **PhD defence** – “Diversity and Distribution of Amphipods in Switzerland” on February 2, 2018 in Dübendorf CH
- **Invited speaker: Seminar at Biotehniška fakulteta** – “Diversity and Distribution of Amphipods in Switzerland” on November 29, 2017 in Ljubljana SI
- **International Colloquium on Amphipoda:** “Diversity and systematics of amphipods in Swiss rivers: River network structure shapes community structure” on September 5, 2017 in Trapani IT
- **Invited speaker: eco.naturkongress 2017** – Workshop #8: “Wie Fließgewässer unsere Biodiversität beeinflussen” on March 31, 2017 in Basel CH
- **biology17** – The Annual Swiss Conference on Ecology, Evolution, Systematics, Biogeography and Conservation: “Fluvial network structure shapes amphipod communities of Switzerland” on February 2, 2017 in Berne CH
- **BES Annual Meeting 2016** – Community Ecology Session: “River network structure shapes communities of native and non-native amphipods” on December 12, 2016 in Liverpool UK

Presentations (continued)

- **biology16** – The Annual Swiss Conference on Ecology, Evolution, Systematics, Biogeography and Conservation: “*Distribution and biogeography of Gammarus lacustris in the Alps*” on February 11, 2016 in Lausanne CH
- **SEFS9** – Symposium for European Fresh Water Sciences 2015: “*Diversity and distribution of amphipods in Switzerland: An alpine perspective*” on July 6, 2015 in Geneva CH
- **Swiss Rivers Working Group** – Meeting in February 2015: “*Community ecology in river networks: a spatial perspective*” on February 10, 2015 in Dübendorf CH
- **Invited speaker: Schweizerische Gesellschaft für Höhlenforschung** – Wintertreffen 2015: “*Verbreitung und Diversität der Amphipoden in der Schweiz*” on February 7, 2015 in Lucerne CH

Scientific Reviews

Journals Aquatic Conservation: Marine and Freshwater Ecosystems, Aquatic Ecology, Biodiversity and Conservation, Biological Invasions, Diversity and Distributions, Ecology, Ecology & Evolution, Freshwater Biology, Global Ecology and Biogeography, Hydrobiologia, Journal of Biogeography, Journal of Experimental Marine Biology and Ecology, Limnologica, Limnology & Oceanography, Natura Slovenia, PeerJ, Subterranean Biology, The European Zoological Journal, Zoosystema

Teaching

- 2023 • **UWW210 Field Course in Biodiversity Assessment and Monitoring** (UZH): Co-teaching (preparation, supervision and field assistance)
- 2022 • **UWW210 Field Course in Biodiversity Assessment and Monitoring** (UZH): Course-leader (replacing Prof. Dr. Florian Altermatt, on sabbatical leave)
- 2021 • **UWW210 Field Course in Biodiversity Assessment and Monitoring** (UZH): Co-teaching (preparation, supervision and field assistance)
- 2020 • **UWW210 Field Course in Biodiversity Assessment and Monitoring** (UZH): Co-teaching
- 2019 • **UWW210 Field Course in Biodiversity Assessment and Monitoring** (UZH): Co-teaching
- **Certificate of Advanced Studies (CAS) in Makrozoobenthos** – Gewässerbeurteilung & Artenkenntnis (ZHAW Wädenswil): Introduction to amphipods
- 2018 • **UWW210 Field Course in Biodiversity Assessment and Monitoring** (UZH): Co-teaching
- 2016 • **Certificate of Advanced Studies (CAS) in Makrozoobenthos** – Gewässerbeurteilung & Artenkenntnis (ZHAW Wädenswil): Introduction to amphipods
- **Blockkurs Limnoökologie** (ETH & UZH): Student project on cryptic diversity within the *Gammarus fossarum* complex
- **Eco PhD Symposium 2016** (Eawag): Co-organisor; Symposium hosting international speakers (Dr. Tanja Schwander & Dr. David Reznick)
- **BIO128/BI S430 Vielfalt der Tiere** (UZH & PHZH): Student assistance in practicals
- **BIO141 Ökologie** (UZH): Student assistance in practicals & exam supervision
- 2015 • **MAT182 Analysis für die Naturwissenschaften** (UZH): Exam supervision

Supervision

- **PhD committee:**
 - 2020 – 2024: Mara Knüsel (Co-supervisor; Main supervisor: Prof. Dr. Florian Altermatt; Biology doctoral thesis) (UZH)
- **MSc thesis co-supervision:**
 - 2023 – 2024: Franziska Cremer (Quantitative Environmental Sciences master thesis) (UZH)
 - 2021 – 2022: Angela Studer (Biology master thesis) (UZH)
 - 2019 – 2020: Nicole Bongni (Environmental sciences master thesis) (UZH)
- **Other supervision:**
 - 2022: Nikola Vulin (Zivildienst) (Eawag): Main supervision
 - 2021: Anouk Petitpierre (UWW161 Berufspraktikum) (UZH): Main supervision
 - 2020: Sebastian Hartmaier (Zivildienst) (Eawag): Main supervision
 - 2018 – 2019: Angela Jenny (GEO 511 Master thesis) (UZH): Assistance in analysis and report writing, co-examinator.
 - 2018: Julian Stauffer (Research Internship, Ecology) (UZH): Supervision and assistance of fieldwork, analysis and report writing.
 - 2018: Olaf Rodriguez (UWW163 Semester Project) (UZH): Supervision and assistance of fieldwork, analysis and report writing.

Scientific boards & expert groups

- since 2023 • Fachausschuss Umsetzung Motion 22.3702 (Jauslin)
- 2021 – 2024 • SwissBOL steering committee member
- 2020 • Review Seed Grants for the Participatory Science Academy PWA
- since 2019 • Expert for amphipods in the working group Invasive Aquatic Macroinvertebrates (CSCF, IUCN)
- since 2019 • Expert for amphipod records evaluation infospecies, CSCF
- since 2019 • Macrozoobenthos expert Eawag for MSK (Modul-Stufen-Konzept BAFU)

External funding & Awards

- Biodiversa+ (Project DarCo; Proposal led by Stefano Mammola, with Florian Altermatt): 120,000.- CHF
- Forschungsfond Wasser (SVGW; Project AmphiWell; Proposal with Florian Altermatt): 50,000.- CHF
- BAFU (Project AmphiWell; Proposal with Florian Altermatt): 482,700.- CHF
- Eawag Discretionary Funds (Project AmphiWell; Proposal with Florian Altermatt): 259,512.- CHF
- Georges and Antoine Claraz Foundation: 2600.- CHF (Fieldwork funding 2015)
- Swiss Systematic Society: 500.- CHF (Travel funding for International Colloquium on Amphipoda 2017)
- Best student presentation – Eawag Symposium 2015: September 11, 2015

Outreach

3sat Nano, Aqua & Gas, Bieler Tagblatt, Berner Oberländer, Der Landbote, GfÖ Nachrichten, HOTSPOT, Pro Natura Magazin, La Liberté, SRF Kopf voran, N + L inside, die umwelt, Höllochnachrichten, Eawag YouTube channel, TeleBilingue

Professional experiences & Advanced training

- 2020 **Leadership Essentials** for Postdoctoral Researchers and Senior Assistants, BWI Beratungs- und Weiterbildungsinstitut AG and ETH Zürich
- 2016 **Workshop:** Basic course ornithology, BirdLife Zürich
- 2015 **Workshop:** Basic course reptiles of Switzerland, Koordinationsstelle für Amphibien- und Reptilienschutz in der Schweiz (karch)
- 2014 **Freelancer** for the editorial department of the Simply Science Foundation, Zurich: writing articles to inspire children for natural sciences.
- 2013 **Field assistant** at Western Wyoming Community College for a survey on the food webs of alpine streams in the Wind River Mountains, Wyoming, USA: horse trek of several days and conducting experiments in high alpine surrounding.
- 2013 **Scientific internship** at WSL, Birmensdorf (Research group of PD Dr. Anita Risch) and in the Swiss National Park, Zernez: Preparing and conducting experiments on the influence of herbivores on plant community structure: Living in the Park for several months.
- 2012 – 2013 **Scientific assistant** in Prof. Dr. Florian Altermatt's group at Eawag: Species identification IBCH/NAWA (Biodiversity Monitoring Switzerland)
- 2012 **Workshop:** Basic course fishes of Switzerland, Naturmuseum St. Gallen
- 2011 **Scientific internship** at Eawag in the Department of Aquatic Ecology: helping with surveys on alpine streams in the Swiss National Park
- 2010 **Environmental sciences internship** at Foundation SWO, Dübendorf in Public relations and Operation controlling
- 2007 – 2008 **Civilian service** at Foundation SWO, Dübendorf and at Cantonal Archaeology, St. Gallen

Volunteering

- 2007 – 2009 Collaboration in the managing group of the Jugendbeiz Talhof, St. Gallen (Jugendsekretariat Stadt St. Gallen)

Memberships

- Gesellschaft für Ökologie (GfÖ), The Ecological Society of Germany, Austria and Switzerland
- Swiss Systematics Society (SSS)
- Schweizerische Gesellschaft für Hydrologie und Limnologie (SGHL)
- Entomologische Gesellschaft Zürich (EGZ)
- St. Gallische Naturwissenschaftliche Gesellschaft (NWGSG)
- Pro Natura Schweiz
- Aqua Viva – Water ecosystems protection and environmental education
- Naturschutzverein Niederhasli (NV Niederhasli), a section of BirdLife Zürich
- World Wide Fund For Nature (WWF)
- Tiergarten-Gesellschaft Zürich (TGZ)
- 2016 – 2019: British Ecological Society (BES)

Professional skills

Scientific expertise

Ecological theory, statistics, amphipods of Switzerland, macroinvertebrates of Switzerland (EPT, IBCH), habitat connectivity, ecosystem functioning

Methodological skills

Fieldwork Design & implementation (Kicknet following the Modulstufenkonzept BDM), driving license

Analysis Familiar with morphological identification keys, morphometric analysis, molecular identification

Genetics DNA extraction, PCR, sequencing, molecular barcoding, database queries, phylogenetic analysis, population genetics

Informatics Data handling, processing, and statistical analysis in **R** (multivariate statistics, regression analysis), Bayesian stats in **STAN & WinBUGS**

Preparing scientific drawings in Adobe **Illustrator**, typesetting in Adobe **InDesign**, picture editing in Adobe **Photoshop**, text preparation in **LaTeX**

Database programming **PostgreSQL**, database queries and map generation in ESRI **ArcGIS** and **QGIS**

Social skills

Appearance Leadership of fieldwork teams, collaboration in international working groups, confident appearance in public, outreach skills of scientific topics

Languages **German:** Mother tongue

Englisch: Fluent / scientific writing

French: Good knowledge in written and spoken language, DELF 1er Degré diploma