Curriculum Vitae – Dr Katharina Ruthsatz

Date of Birth	02/09/1989, age: 34		
Nationality	German	*Email*	katharinaruthsatz@gmail.com
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Work address	Mendelssohnstr. 4, D-38106 Braunschweig	*Language*	German (native), English (fluent), Spanish (basics)
Institution	Technical University of Braunschweig, Germany	*ORCID*	0000-0002-3273-2826
		Twitter	@KRuthsatz

I am a **conservation ecophysiologist** with a vast and complementary expertise in **experimental biology** broadly interested in the effects of environmental variation on fitness-related traits and the potential of adaptability to changing environments in **animals with complex life-cycles**, particularly **amphibians**. Using **field, experimental, and theoretical approaches**, I investigate how **environmental stressors** associated with global change affect animal development, health, and physiology and how these might cope with novel environments by exhibiting **phenotypic plasticity.** I am particularly interested in the **underlying mechanisms** of life-stage specific responses to stressful environments as well as possible **across life-stage effects** of environmental variation and amphibian conservation.

EDUCATION

01/10/2015 – 14/12/2018 **PhD in Biology with great honors** – University of Hamburg (GER)
Thesis (cumulative): Amphibians in a changing world: an ecophysiological perspective on amphibian metamorphosis (graduated with *magna cum laude*)
• Supervisors: Prof Dr Kathrin H Dausmann, Prof Dr Myron A Peck
• Articles published: 3 (refs *1, 2, 3* in my Publication List)
• Further articles submitted: 3 (refs *4, 6, 7* in my Publication List)

01/10/2012 – 31/01/2015 **Master of Education –** University of Hamburg (GER)
Biology, German philology (teacher training degree program)
Thesis: Food quality induces plasticity in intestinal morphology of tadpoles of the common frog (*Rana temporaria*) (ref *5* in my Publication List)
• Supervisor: Dr Julian Glos, Prof Dr Jörg Ganzhorn

01/10/2009 – 30/09/2012 **Bachelor of Science –** University of Hamburg (GER)
Biology, German philology (teacher training degree program)
Thesis: An overview on the biology of egg-laying mammals
• Supervisor: Dr Oliver Hallas, Prof Dr Jörg Ganzhorn

SCIENTIFIC CAREER

01/07/2020 – currently **Research Associate and Junior Research Group Leader, Technical University of Braunschweig (GER)**
Zoological Institute, Evolutionary Biology (Prof Dr Miguel Vences)

2022/2023 **Visiting Researcher, Doñana Biological Station, Seville (ESP)**
29/05/2023 – 14/08/2023
13/09/2022 – 04/11/2022
06/06/2022 – 01/07/2022
Ecology, Evolution, and Development Group (Dr Ivan Gomez-Mestre)
(funded by the German Research Foundation, no. 459850971; 5 months in total)

01/07/2019 – 30/06/2020 **Postdoctoral Researcher, University of Hamburg (GER)**
The Institute of Animal Cell and Systems Biology
Animal Ecology and Conservation (funded by *PostDoc1st*)

01/01/2019 – 30/06/2019 **Postdoctoral Researcher/Research Associate, University of Hamburg (GER)**
The Institute of Animal Cell and Systems Biology
Animal Ecology and Conservation (Prof Dr Jörg Ganzhorn)
Deputy position for Dr Julian Glos

01/10/2015 – 30/09/2018	**Doctoral Researcher, University of Hamburg (GER)** The Institute of Animal Cell and Systems Biology Functional Ecology (Prof Dr Kathrin Dausmann)
01/10/2012 – 30/06/2019	**Research Assistant, University of Hamburg (GER)** The Institute of Animal Cell and Systems Biology (IZS) Short-term contracts to conduct laboratory work and assist in teaching.

AWARDS, GRANTS & COMPETETIVE FUNDING

2023	**The Company of Biologists,** Scientific Meeting Grant EA735* – £1722 *co-organized and acquired with Patrice Pottier and Dr Nicolas Wu
2023	**The Company of Biologists,** Small Meeting Grant B100 – £350 Workshop at the University of Glasgow (UK) with Prof Dr Shaun Killen
2021-2024	**German Research Foundation DFG,** Research Grant – €241.000 A new perspective on amphibians and global change: Detecting sublethal effects of environmental stress as agents of silent population declines (no. 459850971)
2019	**German Academic Exchange Service DAAD,** Short-term fellowship (6 months) for postdoctoral researchers, University of Massachusetts in Boston (USA) with Prof Dr Douglas Woodhams – €10.446 (i.e., monthly support of 1,741€) *Research stay has not yet taken place due to Covid-19 pandemic-related travel restrictions.*
2019-2020	**University of Hamburg,** PostDoc1st advancement award of the Department of Biology for an excellent doctoral thesis – ca. €59.700 (4.500€ for research, 1-year full time postdoc position)
2017 & 2016	**University of Hamburg,** Travel Fellowship for Early Career Researchers and Students – each €500

TEACHING AND STUDENT SUPERVISION

Teaching – I am an enthusiastic teacher with great commitment for both basic and advanced courses and I have taken on teaching and supervisory roles and tasks whenever possible since my days as a Master student. Thereby, I greatly benefit from my degree in educational science and didactics that make my educational background quite unique. I have conducted all the courses and lectures listed below independently, on my own responsibility and in a responsible manner, and I designed the teaching material such as slides and scripts. I have taught and supervised in both English and German.

University of Glasgow (UK)

2023 – ongoing	*Dissecting the tree of life: from hands-on examinations to digital open-access resources for zoologists*	Workshop	9 h/year

TU Braunschweig (GER)

2019 – ongoing	BD02 *Organismic Zoology*	Lecture and practical course	6 ECTS points
2021 – ongoing	BD08 *Vertebrate Morphology*	Lecture and practical course	9 ECTS points
2020	GE25 *Phylogenetics*	Practical course	12 ECTS points
2021 – ongoing	GEA UA/BAU STD 44 *Biodiversity and Evolution*	Lecture and field trip	8 ECTS points
2021 – ongoing	NAT00 *Aspects of Modern Biology*	Lecture, field trip, and practical course	5 ECTS points
2022 – ongoing	*Interdisciplinary Climate Change Seminar*	Seminar	1 ECTS point
2023 – ongoing	NAT01 *Theoretical Biology/Math for Biologists*	Lecture and practical course	5 ECTS points

University of Hamburg (GER)

2015 – 2020	61-012/61-706 *Organismic Zoology*	Lecture and practical course	6 ECTS points
2019	61-029 *Ecology and Biostatistics*	Lecture and practical course	2.5 ECTS points
2018 – 2019	61-759 *Experimental Biology for Teachers*	Practical course	5 ECTS points
2018 – 2019	61-910/61-911 *Organismic Zoology and Evolution*	Lecture and practical course	6 ECTS points
2018 – 2020	61-026/61-028/61-032 *Biostatistics*	Lecture and practical course	3 ECTS points

Lectureships – In addition to my positions at the University of Hamburg and the Technical University of Braunschweig, I was regularly holding lectureships.

12/2015 – 03/2016	**University of Hamburg** The Institute of Animal Cell and Systems Biology (IZS) Course: 61-012/61-706 Organismic Zoology (28 hours of teaching in total)
04/2017 – 09/2017	**University of Hamburg** The Institute of Animal Cell and Systems Biology (IZS) Course: Organismic Zoology (13.5 hours of teaching in total)
04/2017 – 06/2019	**University of Hamburg** The Institute of Animal Cell and Systems Biology (IZS) Course: Organismic Zoology (58.5 hours of teaching in total)
10/2019 – 02/2020	**Technical University of Braunschweig** Zoological Institute BD 02 Organismic Zoology (64.5 hours of teaching in total)

Supervision of researchers in early career phases (since 2016) – For me, training and instruction of young researchers, biologists but also prospective teachers through mentorship, supervision, and teaching is one of the most fulfilling facets as a researcher.

Bachelor's theses	**20** (of which 4 are ongoing)
Master's theses	**9** (of which 2 ongoing)
Postdoc	**1,** *Dr Paula C. Eterovick* at the TU Braunschweig, GER
Turing Scheme	**1**, co-supervision of *Colette Martin* (post-graduate; University of Glasgow, UK) at the EBD with *Dr Pablo Burraco* (CSIC- Estación Biológica de Doñana, Spain)

OTHER ACADEMIC ACHIEVEMENTS

Committee involvement/organization of academic events

Session organizer	**Society for Experimental Biology** Centenary Conference (Edinburgh, UK, July 2023) • Session: A11 "*Plasticity and resilience of developmental stages to climate stage*" • Funding acquired through the Company of Biologists (Scientific Meeting Grant, EA735)
Symposium organizer	**Societas Europaea Herpetologica** 22nd European Congress of Herpetology (Wolverhampton, UK, September 2023) • Symposium: "*Adapting to a changing climate*" • Member of the scientific committee

Workshop organizer	**University of Glasgow** • Workshop: "*Dissecting the tree of life: from hands-on examinations to digital open-access resources for zoologists*" • Funding acquired through the Company of Biologists (Small Scientific Meeting Grant, B100)

Invited seminars – *University of Leipzig* (Prof Sebastian Steinfartz, GER – 06/2022); *Lund University* (Prof Andreas Nord, SWE – 03/2023); *University of Glasgow* (Prof Shaun Killen, UK – 03/2023); *CSIC-EBD* (Dr Ivan Gomez-Mestre, ESP – 06/2023); *3Landesmuseen Braunschweig* (Dr Mike Reich, GER – 09/2023, upcoming); *IPHC-DEPE* (Prof Antoine Stier, FRA – 10/2023, upcoming); *Universität Bayreuth* (Prof Heike Feldhaar, GER – 11/2023, upcoming); *University of Veterinary Medicine* (Assist Prof Bibiana Rojas, AUS – 12/2023, upcoming).

Editorial work – *Salamandra* (**Managing Editor**, since 12/2021), *Journal of Thermal Biology* (**Editorial Board Member**, since 03/2023), *Conservation Physiology* (**Associate Editor**, since 09/2023).

Review tasks – **Peer-reviewed journals:** *Amphibia-Reptilia, Aquaculture,, Biological Journal of the Linnean Society, Chemosphere, Ecological Indicators, Environmental Pollution, Frontiers in Zoology, Frontiers in Ecology and Evolution, Herpetozoa, ISME Communications, Journal of Comparative Physiology B, Journal of Experimental Biology, Journal of Experimental Zoology Part A, Journal of Thermal Biology, Journal of Zoology, Molecular and Cellular Endocrinology, OIKOS, Salamandra, Scientific Reports*; **Foundations:** *Alexander von Humboldt Foundation* (since 03/2022-present); *German Research Foundation DFG* (since 12/2022-present)

COMMUNICATION AT CONFERENCES

- **09/2023**. *Toads on ice: winter climate change affects the physiology of Bufo bufo during reproductive season.* Oral presentation. SEH European Congress of Herpetology (Wolverhampton, UK).
- **07/2023**. *Toads on ice: physiological responses to changing winter climate in amphibians.* Oral presentation. Society of Experimental Biology Centenary Conference (Edinburgh, UK). **Invited speaker** for session AC1.
- **10/2022.** *A new actor on the stage of global change: Effects of microplastics pollution throughout amphibian metamorphosis.* Oral presentation. Society of Experimental Biology Early Career Researcher Symposium (Hanko, Finland).
- **09/2022.** *Microplastics have sublethal effects on amphibian larvae and lead to post-metamorphic carry-over effects: A study with polyethylene microplastics and Xenopus laevis.* Oral presentation. *Timing of parental breeding influences pollution sensitivity in the European common frog (Rana temporaria).* Poster presentation. SEH European Congress of Herpetology (Belgrade, SER).
- **09/2021.** *Ontogenetic thermal tolerance and acclimation capacity in Rana temporaria.* Poster presentation. 113th Annual Meeting of the German Zoological Society, DZG (virtual meeting).
- **01/2021.** *Potential of thermal tolerance plasticity as a coping mechanism with global warming in amphibians.* Oral presentation. Society of Comparative and Integrative Biology, Annual Meeting (virtual meeting).
- **01/2020.** *Endocrine disruption alters developmental body condition, energy allocation, and juvenile performance in Rana temporaria.* Oral presentation. *Endocrine disruption affects the physiological ontogeny of a wide-spread European anuran.* Poster presentation. *Energetic efficiency of metamorphosis in Rana temporaria.* Poster presentation. World Congress of Herpetology Dunedin (Dunedin, NZL)**.**
- **09/2019.** *Energetic efficiency of metamorphosis in Rana temporaria.* Oral presentation. SEH European Congress of Herpetology (Milan, I).
- **11/2018.** *Environmental temperature and developmental plasticity of the common frog (Rana temporaria).* Oral presentation. International Conference of the German Herpetological Society. DGHT (Münster, GER).

- **09/2018.** *Altered thyroid hormone levels and developmental temperature affect the capacity for physiological acclimation in tadpoles of Rana temporaria and Xenopus laevis.* Oral presentation. Annual Meeting of the German Zoological Society (Greifswald, GER)**.**
- **09/2017.** *Environmental stress as an endocrine disrupter in tadpoles of Xenopus laevis and Rana temporaria.* Oral presentation. SEH European Congress of Herpetology (Salzburg, AUT)
- **09/2015.** *Food quality induces plasticity in oral and intestinal morphology in larval amphibians.* Oral presentation. Annual Meeting of the German Zoological Society (Graz, AUT)**.**

SELECTED PUBLIC OUTREACH ACTIVITIES

Anatomy Insights – An **educational YouTube channel** aimed at anyone interested in comparative anatomy, morphology, and evolution. We provide videos in English language that give a brief overview of the taxonomy, biology, and ecology of the respective taxa and a step-by-step manual for dissection, thereby not only offering a comfortable possibility to refresh this knowledge whenever it is needed for both students and (university) teachers but also making content and knowledge available to the public that used to be reserved for university students. We plan to expand this project by raising money from external funds to improve the quality of the videos as well as to expand this project through contributions of national and international researchers and institutes. As a first step in this direction, I recently raised funding for a workshop at the University of Glasgow that focused on placing the individual body plans in a comparative eco-evolutionary context to better understand the taxon-specific sensitivity to global warming. In the long-term, **we aim to reduce the usage of animals** in high school and university teaching by providing a comprehensive collection of videos on a variety of taxa but also on various systems such as the circulatory system.

https://www.youtube.com/c/AnatomyInsights.

Social media – Twitter (@KRuthsatz, 880 follower; @AnatomyInsights, 46 follower), **Instagram** (katharina.ruthsatz, 2102 follower; anatomy.insights, 215 follower).

Others – Global Women in Herpetology Project, https://www.womeninherpetology.com/, book chapter "Metamorphosis", **United Nations Sustainable Development Goals, Green Office TU Braunschweig** (SDG Sponsorship, Representative (SDG 15, Life on Land), https://www.tu-braunschweig.de/greenoffice/sdg/sdg-15; **"Komm, mach MINT!"**, Representative; https://www.komm-mach-mint.de/schuelerinnen/erfahrungsberichte/interviews/katharina3.

OTHER INFORMATION

Professional skills – Laboratory: DNA/RNA extraction and amplification with PCR, gel electrophoresis. Corticosterone extraction (water-borne and tissue samples), enzyme-linked immunosorbent assay. Analytics: R programming language, SPSS, PAST, ImageJ. EthoVision®. *Genomics* (Illumina MiSeq: *e.g.*, Qiime2, Deblur, Mothur, LEfSE), *Transcriptomics* (RNAseq: *e.g.*, Trinity, Bowtie, DRAP, Blast+). Graphic design: Adobe Creative Suite, film cutting and editing. Other skills: Microdissections, amphibian husbandry.

Animal Experimentation Licence (EU function A, B, C, and D) obtained in Germany.

Professional memberships – Society for Experimental Biology (SEB), Societas Europaea Herpetologica (SEH), German Zoological Society/Deutsche Zoologische Gesellschaft (DZG), German Society for Herpetology and Herpetoculture /Deutsche Gesellschaft für Herpetologie und Terrarienkunde (DGHT).

Main collaborators and references – Prof Miguel Vences, Prof Myron Peck, Dr Ivan Gomez-Mestre, Dr Mariana L. Lyra, Dr Karolin Engelkes, Prof Kathrin H. Dausmann, Dr Julian Glos, Dr Ashiwini V Mohan, Dr Mark D. Scherz, Dr Claudia Drees, Prof Dr Flemming Dahlke, Dr Sylke Wohlrab, Prof Shaun Killen, Dr Katharina Alter, Dr Natasha Kruger, PD Dr MO Rödel, Dr Paula C. Eterovick, Dr Pablo Burraco, Dr Joana Sabino-Pinto.

SCIENTIFIC PUBLICATIONS

https://scholar.google.com/citations?user=N1ogDPIAAAAJ&hl=de (211 citations, h-index=10)

Peer reviewed articles

22. **Ruthsatz K**, Rico-Millan R, Eterovick PC & Gomez-Mestre I (2023). Water-borne corticosterone is strongly associated with tissue content of the hormone, enabling its use as a reliable non-invasive indicator for natural populations. *Conservation Physiology*. DOI: 10.1093/conphys/coad070.
21. **Ruthsatz K**, Schwarz A, Gomez-Mestre I, Meyer R, Domscheit M, Bartels F, Schaeffers SM & Engelkes, K. (2023). Life in plastic, it's not fantastic: Sublethal effects of polyethylene microplastics ingestion throughout amphibian metamorphosis**.** *Science of The Total Environment* 885, 163779. DOI:10.1016/j.scitotenv.2023.163779
20. Gonçalves IM, Kloh JS, **Ruthsatz K**, Figueredo CC & Eterovick PC (2023). Description and shaping factors of diet and feeding ecology of neotropical tadpoles: A case study and a comprehensive review. *Austral Ecology* 00, 1-13. DOI:10.1111/aec.13302
19. **Ruthsatz K**, Eterovick PC, Bartels F & Mausbach J (2023). Contributions of water-borne corticosterone as one non-invasive biomarker in assessing nitrate pollution stress in tadpoles of *Rana temporaria*. *General and Comparative Endocrinology* 331, 114164. DOI:10.1016/j.ygcen.2022.114164
18. Bethge J, Fietz J, Razafimampiandra JC, **Ruthsatz K** & Dausmann KH (2022). Season and reproductive activity influence cortisol levels in the Malagasy primate *Lepilemur edwardsi*. *Journal of Experimental Zoology Part A: Ecological and Integrative Physiology* 337, 994-1001. DOI:10.1002/jez.2658
17. Vences M, Schulz V, Heldt L, Kamprad F, **Ruthsatz K**, Preissler K, Müsken M & Steinfartz S (2022). Comparative abundance of cutaneous bacteria in Central European amphibians**.** *SALAMANDRA* 58, 275-288.
16. **Ruthsatz K**, Rakotoarison A, Razafimampiandra JC, Randriamahefa VS, Rabemananjara FCE, Rakotondraparany F, Bletz MC & Vences M (2022). Field body temperatures in Malagasy rainforest frogs. *Herpetology Notes* 15, 565-578.
15. **Ruthsatz K**, Bartels F, Stützer D & Eterovick PC (2022). Timing of parental breeding shapes sensitivity to nitrate pollution in the common frog *Rana temporaria*. *Journal of Thermal Biology* 108, 103296. DOI:10.1016/j.jtherbio.2022.103296
14. **Ruthsatz K**, Domscheit M, Engelkes K & Vences M (2022). Microplastics ingestion induces plasticity in digestive morphology in larvae of *Xenopus laevis*. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*, 111210. DOI:10.1016/j.cbpa.2022.111210
13. **Ruthsatz K**, Dausmann KH, Peck MA & Glos J (2022). Thermal tolerance and acclimation capacity in the European common frog (*Rana temporaria*) change throughout ontogeny. *Journal of Experimental Zoology Part A: Ecological and Integrative Physiology*, 1-14. DOI:10.1002/jez.2582
12. Sinai N, Glos J, Mohan AV, Lyra ML, Riepe M, Thöle E, Zummach C & **Ruthsatz, K** (2022). Developmental plasticity in amphibian larvae across the world: investigating the roles of temperature and latitude. *Journal of Thermal Biology*, 106: 103233. DOI:10.1016/j.jtherbio.2022.103233
11. **Ruthsatz K**, Scherz MD & Vences M (2021). Dissecting the tree of life: the prospect of open-access digital resources in morphology, anatomy and taxonomy in training the next generation of zoologists. *Zootaxa* 5016, 448-450. DOI:10.11646/ZOOTAXA.5016.3.10
10. **Ruthsatz K**, Lyra ML, Lambertini C, Belasen AM, Jenkinson TS, da Silva Leite D, Becker CG, Haddad CFB, James TY, Zamudio KR, Toledo LF & Vences M (2020). Skin microbiome correlates with bioclimate and *Batrachochytrium dendrobatidis* infection intensity in Brazil's Atlantic Forest treefrogs. *Scientific Reports* 10, 1-15. DOI:10.1038/s41598-020-79130-3

9. Glos J, **Ruthsatz K**, Schröder D & Riemann JC (2020). Food source determines stable isotope discrimination factors ΔN and ΔC in tadpoles. *Amphibia-Reptilia* 1, 1-7. DOI:10.1163/15685381-bja10020
8. **Ruthsatz K**, Dausmann KH, Reinhardt S, Robinson T, Sabatino NM, Peck MA & Glos J (2020). Post-metamorphic carry-over effects of altered thyroid hormone level and developmental temperature: physiological plasticity and body condition at two life stages in *Rana temporaria*. *Journal of Comparative Physiology B* 190:297-315. DOI:10.1007/s00360-020-01271-8
7. **Ruthsatz K**, Dausmann KH, Drees C, Becker LI, Hartmann L, Reese J, Reinhardt S, Robinson T, Sabatino NM & Glos J (2020). Altered thyroid hormone levels affect the capacity for temperature-induced developmental plasticity in larvae of *Rana temporaria* and *Xenopus laevis*. *Journal of Thermal Biology*, 90, 102599. DOI:10.1016/j.jtherbio.2020.102599
6. **Ruthsatz K**, Dausmann KH, Paesler K, Babos P, Sabatino NM, Peck MA & Glos, J (2020). Shifts in sensitivity of amphibian metamorphosis to endocrine disruption: the common frog (*Rana temporaria*) as a case study. *Conservation Physiology* 8, 1-20. DOI:10.1093/conphys/coaa100
5. **Ruthsatz K**, Giertz LM, Schröder D & Glos J (2019). Chemical composition of food induces plasticity in digestive morphology in larvae of *Rana temporaria*. *Biology Open* 8, 1-8. DOI:10.1242/bio.048041
4. **Ruthsatz K**, Dausmann KH, Reinhardt S, Robinson T, Sabatino NM, Peck MA & Glos J (2019). Endocrine disruption alters developmental energy allocation and performance in *Rana temporaria*. *Integrative and Comparative Biology* 59, 70-88. DOI:10.1093/icb/icz041
3. **Ruthsatz K**, Dausmann KH, Peck MA, Drees C, Sabatino NM, Becker LI, Reese J, Hartmann L & Glos J (2018). Thyroid hormone levels and temperature during development alter thermal tolerance and energetics of *Xenopus laevis* larvae. *Conservation Physiology* 6, 1-15. DOI:10.1093/conphys/coy059
2. **Ruthsatz K**, Dausmann KH, Drees C, Becker LI, Hartmann L, Reese J, Sabatino NM & Glos J (2018). Altered thyroid hormone levels affect body condition at metamorphosis in larvae of *Xenopus laevis*. *Journal of Applied Toxicology*, 38, 1416-1425. DOI:10.1002/jat.3663
1. **Ruthsatz K**, Peck MA, Dausmann KH, Sabatino NM & Glos J (2018). Patterns of temperature induced developmental plasticity in anuran larvae. *Journal of Thermal Biology* 74, 123-132. DOI:10.1016/j.jtherbio.2018.03.005

Book chapter

Ruthsatz K, Glos J (Jan 2024). Effects of Pollutants on the Endocrine System of Tadpoles. In: E Alves de Almeida & J Silberschmidt Freitas (Eds.), Toxicology of Amphibian Tadpoles. CRC Press.

Ruthsatz K (2023). Metamorphosis. In: U Arifin, IW Caviedes Solis & S Poo (Eds.), Women in Herpetology. 50 stories around the world. 335 pages. https://www.womeninherpetology.com/