

Bibiana Rojas, Ph.D.

Nationality: Colombian

Current place of residence: Vienna, Austria

Current position:

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Assistant Professor of Global Change Biology

Dept. of Interdisciplinary Life Sciences

Konrad Lorenz Institute for Ethology

University of Veterinary Medicine Vienna

Savoyenstraße1, 1160 Vienna, Austria

Education

- 2007-2012 PhD in Life and Environmental Sciences (Animal Behaviour and Sensory Ecology), Deakin University (Australia).
Dissertation: 'The apparent paradox of colour pattern variation in aposematic frogs'.
Advisor: Prof. John A. Endler (Oct 2007-Apr 2010 PhD student at the University of Exeter (UK), then transferred to Australia due to move of advisor)
- 2002-2005 MSc. in Biological Sciences - Biology (Behavioural Ecophysiology and Herpetology), University of Los Andes (Colombia)

Employment and research experience

- From 2021 Assistant Professor of Global Change Biology, University of Veterinary Medicine, Vienna, Austria
- 2021-2023 Research Associate, University of Jyväskylä, Finland
- 2018-2021 Academy of Finland Research Fellow, University of Jyväskylä, Finland
- 2017 Visiting Fellow, Evolutionary Ecology Lab, Macquarie University, Australia (2 months)
- 2012-2018 Postdoctoral researcher, Centre of Excellence in Biological Interactions, University of Jyväskylä, Finland
- 2007-2010 Exeter Graduate Fellow, TA, School of Psychology, University of Exeter, UK
- 2004 Guest Researcher (August-December), Konrad Lorenz Institute for Comparative Ethology (KLIVV), Vienna, Austria. Host: Prof. Richard Wagner.
- 2002-2006 Associate Researcher, Group of Behavioural Ecophysiology and Herpetology, University of Los Andes (Colombia)
- 1997-2005 Research Assistant, Group of Behavioural Ecophysiology and Herpetology, University of Los Andes (Colombia), PI: Adolfo Amézquita

Career break

Dec 2019 — Dec 2020 Maternity leave (one year).

Awards

- 2019 **Scientist of the Year 2019**, Department of Biology and Environmental Science, University of Jyväskylä
- 2018-2023 **Academy Research Fellowship**, Academy of Finland

- 2015 **'Scientific activity, public outreach and team spirit' award**, Centre of Excellence in Biological Interactions, University of Jyväskylä, Finland.
- 2012 **Rector's grant award** (for 'attracting exceptionally talented foreign postdocs'), University of Jyväskylä, Finland.
- 2010-2012 **HDR International Scholarship**. Deakin University, Australia.
- 2010 **Best poster prize**. ISBE Conference. Perth, Australia.
- 2007-2010 **Exeter Graduate Fellowship** (Competitively awarded PhD studentship). University of Exeter, UK.

Funding

Total obtained: ~€ 1'714,120

- 2024 **Standalone Project: "Cognitive-sensory biology of rainforest navigation in frogs"; Col** (PI, Dr. Andrius Pašukonis, Vilnius University); FWF (Austrian Science Fund) – University of Veterinary Medicine Vienna; €694,649.
- 2023 **ÖFFH (Austrian Research Fund for Herpetology) Grant: "Do changes in their home make males grumpier? Impacts of habitat alteration on the social behaviour of a critically endangered poison frog"; Joint PI** (with Dr. Mileydi Betancourth-Cundar, Universidad Distrital Francisco Jose de Caldas, COL); Austrian Herpetological Society - Vienna Zoo - University of Veterinary Medicine Vienna; €4,990.
- 2023 **Networking Seed Grant – SDG15: "Unveiling the impact of mercury contamination on the parental behaviour and tadpole health of a protected Amazonian frog"; Joint PI** (with Dr. Valeria Marasco, University of Veterinary Medicine Vienna); Internal Call, University of Veterinary Medicine Vienna; €25,081.
- 2018 **Nouragues Grant: "Ecology and evolution of pool choice strategies in phytotelm-breeding frogs"; Joint PI** (with Dr. Andrius Pašukonis, Stanford University, US). CNRS (National Centre for Scientific Research, France); € 10,000.
- 2018 **Academy Research Fellowship: "The silence of the Frogs: costs and benefits of cannibalism in a species threatened by a deadly disease"; PI.** Academy of Finland – University of Jyväskylä; approx. € 900,000.
- 2018 **'Species Spectrum Research Centre' (Macquarie University, Australia) funds: "Hotspotting plasticity – the juvenile enigma of metamorphosing animals"; Col** (PI, Dr. Matthew Bulbert, Macquarie University); approx. € 6,000 (~ AUD 10,000).
- 2016 **Mobility grant, Science Research Council: "Evolutionary ecology of human colour perception"; PI,** University of Jyväskylä. Funding to visit Dr. Darrell Kemp's laboratory at Macquarie University, Sydney, Australia (Spring 2017); approx. € 6,000
- 2015-2016 **Nouragues Grant: "Spatial ecology of a voiceless aposematic dendrobatid frog: a tracking study in Dendrobates tinctorius"; Joint PI** (with Dr. Andrius Pašukonis, University of Vienna, Austria), CNRS (National Centre for Scientific Research, France); € 10,000.
- 2013-2014 **Labex-CEBA Grant; "Aposematic polymorphism in the dyeing poison frog (Dendrobates tinctorius): A model vertebrate for the study of selection and speciation"; Col,** CNRS, France. (PI, Brice Noonan, University of Mississippi, USA and Antoine Fouquet, CNRS, France); € 20,000.
- 2013-2014 **ASAB research grant: "The simpler, the better: testing the effect of aposematic simplicity on predator avoidance learning"; PI,** Association for the Study of Animal Behaviour, UK); £2,980 (€ ~4,000)
- 2012 **Rector's grant award** (for 'attracting exceptionally talented foreign postdocs'), U. of Jyväskylä; €19,400
- 2012 **Conference grant-Faculty of Science and Technology,** Deakin University, Australia; funds to attend the 7th World Congress of Herpetology in Vancouver.

- 2012 **Conference grant-Faculty of Science and Technology**, Deakin University, Australia; funds to attend the 10th ISBE Meeting in Lund, Sweden.
- 2010 **ASAB conference grant**; funds to attend the ASAB winter meeting in London, UK.
- 2009 **Nouragues Grant**; *Colour patterns and visual communication in the dyeing poison frog* CNRS (National Centre for Scientific Research, France). PI € 6,300
- 2008 **Nouragues Grant**; *The role of coloration in the spatial distribution patterns and conflict resolution in males of Dendrobates tinctorius*, CNRS (National Centre for Scientific Research, France). PI € 6,700
- 2008 **ASAB conference grant**; funds to attend the ASAB Easter meeting in Edinburgh, UK.
- 2004 Support funds from the **Austrian Academy of Sciences**: “*The effect of sex ratio on inter-individual distances between males of the cichlid fish Neolamprologus caudopunctatus*”; guest researcher at the Konrad Lorenz Institute for Comparative Ethology, Vienna, Austria; € 900
- 2002 **Seed-grant, Faculty of Science**: “*Frequency matching and response symmetry of male phonotactic behaviour in the poison frog Epipedobates trivittatus*”; Col (PI Adolfo Amézquita). University of Los Andes, Bogotá, Colombia;
- 2002 **Seed-grant, Faculty of Science**: “*Toxicity in adult Dendrobates truncatus (Anura: Dendrobatidae): the role of body size and time in captivity*”; PI. University of Los Andes, Bogotá, Colombia;

Publications

51 peer-reviewed papers in scientific journals (17 as first or only author and 15 as a senior author) cited 1463 times (source: Google Scholar, 31.05.2024); h-index: 24. (*) corresponding authorship; underlined names denote supervised MSc students; ^{B/M}denotes supervised BSc students and mentees.

Journal articles (ORCID: [0000-0002-6715-7294](https://orcid.org/0000-0002-6715-7294)):

51. Dittrich C, Hölzl F, Smith S, Fouilloux C, Parker DJ, O’Connell LA, Knowles LS, Hughes M, Fewings A, Morgan R, **Rojas B**, & Comeault A. Genome assembly of the dyeing poison frog provides insights into the dynamics of transposable element and genome-size evolution. *Genome Biology and Evolution* DOI: [10.1093/gbe/evae109](https://doi.org/10.1093/gbe/evae109)
50. Vargas-Salinas F & **Rojas B***. 2024. Developments in the study of poison frog evolutionary ecology I: social interactions, life history and space use across space and ontogeny. *Evolutionary Ecology* DOI: [10.1007/s10682-024-10296-2](https://doi.org/10.1007/s10682-024-10296-2)
49. **Rojas B***, Dittrich C & Calhim, S. 2024. Testes size seen through the glass of amphibian care. *Trends in Ecology and Evolution* 39: 421-423. DOI: [10.1016/j.tree.2024.04.001](https://doi.org/10.1016/j.tree.2024.04.001)
48. Schlippe Justicia L, Lemaire J, Dittrich C, Mayer M, Bustamante P & **Rojas B***. 2024. Poison in the nursery: mercury contamination in the tadpole-rearing sites of an Amazonian frog. *Science of the Total Environment* 912:169450 DOI: [10.1016/j.scitotenv.2023.169450](https://doi.org/10.1016/j.scitotenv.2023.169450)
47. Ottocento C‡, **Rojas B‡**, Burdfield-Steel E, Furlanetto M, Nokelainen O & Mappes J. 2024. Diet influences resource allocation in chemical defence but not melanin synthesis in an aposematic moth. ‡Shared first authorship. Accepted for publication in the *Journal of Experimental Biology* 227: jeb245946. DOI: [10.1242/jeb.245946](https://doi.org/10.1242/jeb.245946)
46. Schlippe Justicia L, Mayer M, Lorient-Chevalier U, Dittrich C, **Rojas B** & Chouteau M. 2023. Intraspecific divergence in sexual size dimorphism and reproductive strategies in a polytypic poison frog. *Evolutionary Ecology*. DOI: [10.1007/s10682-023-10280-2](https://doi.org/10.1007/s10682-023-10280-2)
45. Ringler E, **Rojas B**, Stynoski J & Schulte LM What amphibians can teach us about the evolution of parental care. *Annual Review of Ecology, Evolution and Systematics*. Vol.54. DOI: [10.1146/annurev-ecolsys-102221-050519](https://doi.org/10.1146/annurev-ecolsys-102221-050519)

44. **Rojas B***, Lawrence JP & Márquez R. 2023. Amphibian Coloration: Proximate Mechanisms, Function, and Evolution. Pp. 219-258. In: G. Rueda-Moreno and M. Comas (Eds). *Evolutionary Ecology of Amphibians*. CRC Press.
43. Kikuchi, D.W., Allen, W.L., Arbuckle, K., Aubier, T.G., Briolat, E.S., Burdfield-Steel, E.R., Cheney, K.L., Daňková, K., Elias, M., Hämäläinen, L., Herberstein, M.E., Hossie, T.J., Joron, M., Kunte, K., Leavell, B.C., Lindstedt, C., Llorix Chevalier, U., McClure, M., McLellan, C.F., Medina, I., Nawge, V., Páez, E., Pal, A., Pekár, S., Penacchio, O., Raška, J., Reader, T., **Rojas B.**, Rönkä, K.H., Rößler, D.C., Rowe, C. Rowland, H.M., Roy, A., Schaal, K.A., Sherratt, T.N., Skelhorn, J., Smart, H.R., Stankowich, T., Stefan, A.M., Summers, K., Taylor, C.H., Thorogood, R., Umbers, K., Winters, A.E., Yeager, J. & Exnerová, A. The evolution and ecology of multiple antipredator defences. *Journal of Evolutionary Biology*. DOI: [10.1111/jeb.14192](https://doi.org/10.1111/jeb.14192)
42. ^BHernández T, Rueda LA, Valkonen J & **Rojas B**. 2023. Predator response to the coloured eyespots and defensive posture of Colombian four-eyed frogs. *Journal of Evolutionary Biology*. DOI: [0.1111/jeb.14193](https://doi.org/10.1111/jeb.14193)
41. Fouilloux C, Yovanovich C, Stynoski J & **Rojas B**. 2023. Visual environment of rearing sites affects larval response to perceived risk in poison frogs. *Journal of Experimental Biology* 226: jeb245822 DOI:[10.1242/jeb.245822](https://doi.org/10.1242/jeb.245822)
40. Lawrence JP, **Rojas B**, Blanchette A, Saporito R, Mappes J, Fouquet A & Noonan BP. 2023. Linking predator responses to alkaloid variability in poison frogs. *Journal of Chemical Ecology* DOI:[10.1007/s10886-023-01412-7](https://doi.org/10.1007/s10886-023-01412-7)
39. Ottocento C, Winters A, **Rojas B**, Mappes J & Burdfield-Steel E. Not just the sum of its parts: geographic variation and non-additive effects of pyrazines in the chemical defence of an aposematic moth. *Journal of Evolutionary Biology*. DOI: [10.1111/jeb.14142](https://doi.org/10.1111/jeb.14142)
38. Pašukonis A, ^MSerrano-Rojas SJ, Fischer MT, Loretto MC, Shaykevich DA, **Rojas B**, Max Ringler M, Roland A-B, Marcillo-Lara A, Ringler E, Rodríguez C, Coloma LA, O'Connell LA. 2022. Contrasting parental roles shape sex differences in poison frog space use but not navigational performance. *eLife* 11:e80483. DOI:[10.7554/eLife.80483](https://doi.org/10.7554/eLife.80483)
37. Schlippe-Justicia L, Fouilloux C & **Rojas B**. Poison frog social behaviour under global change: potential impacts and future challenges. *Acta Ethologica – Special Issue: "Impact of global change on social interactions: ecological and fitness implications"*. DOI: [10.1007/s10211-022-00400-6](https://doi.org/10.1007/s10211-022-00400-6) PDF
36. Fouilloux, C., Fromhage, L., Valkonen, J & **Rojas, B**. Size-dependent aggression towards kin in a cannibalistic species. *Behavioral Ecology* 33:582–591. doi.org/10.1093/beheco/arac020
35. Fouilloux C, Yovanovich C & **Rojas B**. Tadpole responses in visually challenging environments: what we (don't) know and perspectives for a sharper future. *Frontiers in Ecology & Evolution* 9:766725. doi.org/10.3389/fevo.2021.766725
34. ^MCarvajal-Castro, J. D., Vargas-Salinas, F., Casas-Cardona, S., **Rojas, B.** & Santos, J.C. Aposematism facilitates the diversification of parental care strategies in poison frogs. *Scientific Reports* 11:19047.
33. Fouilloux, C., ^MSerrano-Rojas, S. J.*, ^MCarvajal-Castro, J. D.*, Valkonen, J., Gaucher, P., Fischer, M.-T., Pašukonis, A.‡ & **Rojas, B.‡** Pool choice in a vertical landscape: tadpole rearing site flexibility in phytotelm-breeding frogs (‡ Equal contribution as senior authors). *Ecology & Evolution* 11: 9021– 9038.
32. Rönkä, K., Valkonen, J., Nokelainen, O., **Rojas, B.**, Gordon, S., Burdfield-Steel, E. & Mappes, J. Geographic mosaic of selection by avian predators on hindwing warning colour of a polymorphic aposematic moth. *Ecology Letters* 23: 1654-1663.
31. Fouilloux, C., Garcia, G. & **Rojas, B.**^ Visible implant elastomer (VIE) success in early larval stages of a tropical amphibian species. *PeerJ* 8:e9630.

30. Schulte, L. M., Ringler, E.‡, **Rojas, B.‡** & Stynoski, J. L.‡ 2020. Developments in amphibian parental care research: history, present advances and future perspectives. (‡Equal contribution; listed in alphabetical order). *Herpetological Monographs*, 34:71-97.
29. ^MCarvajal-Castro, J. D., López-Aguirre, Y., Ospina, A. M., Santos, J. C., **Rojas, B.** & Vargas-Salinas, F. 2020 Much more than a clasp: evolutionary patterns of amplexus diversity in anurans. *Biological Journal of the Linnean Society* 129:652-663.
28. Fouilloux, C., Ringler, E. & **Rojas, B.***. Cannibalism. Quick Guide. *Current Biology* 29: R1295-R1297.
27. **Rojas, B.*** & Pašukonis, A. 2019. From habitat use to social behavior: natural history of a voiceless poison frog, *Dendrobates tinctorius*. *PeerJ* 7: e7648.
26. Lawrence, J. P.*‡, **Rojas, B.*‡**, Fouquet, A., Mappes, J., Blanchette, A., Saporito, R., Bosque, R. J., Courtois, E., & Noonan, B. P. 2019. Weak warning signals can persist in the absence of gene flow. (‡Equal contribution). *PNAS* 116: 19037-19045.

Featured in: The New York Times, Science Daily, Phys.org, Cosmos Magazine, ELEMENT (Russia), GreenReport (Italy).
25. Pašukonis, A., Loretto, M. C. & **Rojas, B.** 2019. How far do tadpoles travel in the rainforest? Parent-assisted dispersal in poison frogs. *Evolutionary Ecology* 33: 613–623.

Featured in: Scientific American, GreenReport (Italy).
24. **Rojas, B.***, Mappes, J. & Burdfield-Steel, E. 2019. Multiple modalities in insect warning displays have additive effects against wild avian predators. *Behavioral Ecology and Sociobiology* 73:37.
23. Burdfield-Steel, E., Brain, M., **Rojas, B.** & Mappes, J. 2018. The price of safety: food deprivation in early life influences the efficacy of chemical defence in an aposematic moth. *Oikos* 128:245-253.
22. **Rojas, B.***, Burdfield-Steel, E., Gordon, S. P., De Pasqual, C., Hernández, L., Mappes, J., Nokelainen, O., Rönkä, K., Lindstedt, C. 2018. Multimodal aposematic signals and their emerging role in mate attraction. *Frontiers in Ecology and Evolution* 9:93.
21. Rönkä, K., Mappes, J., Kiviö, R., Salokannas, J., Michalis, C. & **Rojas, B.*** Can multiple-model mimicry explain warning signal polymorphism in the wood tiger moth, *Arctia plantaginis* (Lepidoptera: Erebidae)? *Biological Journal of the Linnean Society* 124: 237-260.
20. Henze, M. J., Lind, O., **Rojas, B.**, Mappes, J. & Kelber, A. 2018. An aposematic colour-polymorphic moth seen through the eyes of conspecifics and predators – sensitivity and colour discrimination in a tiger moth. *Functional Ecology* 32: 1797-1809.
19. Burdfield-Steel, E., Pakkanen, H., **Rojas, B.**, Galarza, J. A. & Mappes, J. 2018. *De novo* synthesis of chemical defences in an aposematic moth. *Journal of Insect Science* 18(2):28.
18. Rönkä, K., De Pasqual, C., Mappes, J., Gordon, S. P. & **Rojas, B.*** 2017. Colour alone matters: no predator generalisation among morphs of an aposematic moth. *Animal Behaviour* 135: 153–163.
17. **Rojas, B.*†**, Burdfield-Steel, E.†, Pakkanen, H., Suisto, K., Maczka, M., Schulz, S. & Mappes, J. 2017. How to fight multiple enemies: Target-specific chemical defences in an aposematic moth. *Proceedings of the Royal Society of London B*. 284: 20171424 (†equal contribution).

Featured in: Inside Science, Discover Magazine, Science Daily, Phys.org, Scientific American's 60 Seconds Science Podcast, 'Ciencia Café pa' Sumerché (Colombian initiative for scientific outreach), Biosphere Magazine.
16. White, T. E., **Rojas, B.**, Mappes, J., Rautiala, P. & Kemp, D. J. 2017. Colour and luminance contrasts predict the human detection of natural stimuli in complex visual environments. *Biology Letters* 13: 20170375.
15. **Rojas, B.*** 2017. Behavioural, ecological, and evolutionary aspects of diversity in frog colour patterns. *Biological Reviews* 92:1059-1080.
14. Stynoski, J. L.*†, Schulte, L. M.*† & **Rojas, B.*†** 2015. Poison frogs. Quick Guide. *Current Biology* 25:R1026–R1028 (†equal contribution).

13. **Rojas, B.*** 2015 Mind the gap: treefalls as drivers of parental tradeoffs. *Ecology & Evolution* 5: 4028-4036.

Featured in: Sciences et Avenir

12. **Rojas, B.*[†]**, Gordon, S. P.[†] & Mappes, J. 2015 Frequency-dependent display activity in the aposematic wood tiger moth, *Parasemia plantaginis*. *Current Zoology* 61:765-772 (invited contribution to a special issue on Anti-predator Colouration and Behaviour; [†]equal contribution).
11. Gordon, S. P., Kokko, H., **Rojas, B.**, Nokelainen, O. & Mappes, J. 2015 A colour polymorphism torn apart by both sexual and natural selection yet held together in space. *Journal of Animal Ecology* 84:1555-1564.

Featured in a Special Virtual Issue on Evolutionary Ecology (editor's choice) in the Journal of Animal Ecology (2016)

10. Exnerová, A., Jezová, D., Štys, P., Doktorovová, L., **Rojas, B.** & Mappes, J. 2015 Different reactions to aposematic prey in two geographically distant populations of great tits. *Behavioral Ecology* 26:1361-1370.
9. Hämäläinen, L., Valkonen, J., Mappes, J. & **Rojas, B.*[^]** 2015. Visual illusions in predator-prey interactions: birds find moving patterned prey harder to catch. *Animal Cognition* 18:1059-1068.
8. **Rojas, B.***, Valkonen, J. & Nokelainen, O. 2015 Aposematism. *Current Biology* 25:R350-R351.
7. **Rojas, B.***, Rautiala, P. & Mappes, J. 2014. Differential detectability of polymorphic warning signals under varying light environments. *Behavioural Processes* 109(B):164-172. Special issue on 'Animal Cognition in the Wild' (invited contribution).
6. **Rojas, B.***, Devillechabrolle, J. & Endler, J. A. 2014. Paradox lost: variable colour-pattern geometry is associated with differences in movement in aposematic frogs. *Biology Letters* 10:20140193.

Featured in: Phys.org, Science News, Daily Mail, Sydney Morning Herald, Nature World News

5. **Rojas, B.*** 2014 Strange parental decisions: fathers of the dyeing poison frog deposit their tadpoles in pools occupied by large cannibals. *Behavioral Ecology and Sociobiology* 68:551-559.

Featured in: Science Magazine, Science Daily, Phys.org, Springer Select, The Scientist magazine, Der Standard.

4. **Rojas, B.*** & Endler, J. A. 2013. Sexual dimorphism and intra-populational colour pattern variation in the aposematic frog *Dendrobates tinctorius*. Special Issue on the Evolutionary Ecology of Poison Frogs. *Evolutionary Ecology* 27:739-753. (BR invited contribution)

Featured by: The Australasian Society for Evolution.

3. Ringler, E., **Rojas, B.**, Ringler, M. & Hödl, W. 2012. Characterisation of nine polymorphic microsatellite loci in the dyeing poison frog *Dendrobates tinctorius* (Dendrobatidae), and their cross-species utility in two other dendrobatoid species. *Herpetological Journal* 22:265-267.
2. Endler, J. A. & **Rojas, B.** 2009. The spatial pattern of natural selection when selection depends on experience. *American Naturalist* 173:E62-E78.
1. **Rojas, B.**, Amézquita, A.* & Delgadillo, A. 2006. Matching and symmetry in the frequency recognition curve of the poison frog *Epipedobates trivittatus*. *Ethology* 112:564-571.

Other:

5. Bernal, X. E., **Rojas, B.**, Pinto-E, M. A., Mendoza-Henao, Á. M., Herrera-Montes, A., Herrera-Montes, M. I. and Cáceres Franco, A. del Pilar and 254 signatories. 2019. Empowering Latina scientists. *Science* 363:825.
4. **Rojas, B.** 2018. Comentario científico: Hacia un estudio integral del papel de los patrones de coloración en las interacciones entre depredadores y presas. *Boletín Colombiano de Biología Evolutiva* 6: 14-15.
3. **Rojas, B.*** & Burdfield-Steel, E. Predator Defense. 2017. In: J. Vonk & T. K. Shackelford (Eds.). *Encyclopedia of Animal Cognition and Behavior*. Springer International Publishing. DOI: 10.1007/978-3-319-47829-6_708-1

2. **Rojas, B.***, Nokelainen, O., & Valkonen, J. Aposematism. 2017. In: T. K. Shackelford & V. A. Weekes-Shackelford (Eds.). *Encyclopedia of Evolutionary Psychological Science*. Springer. DOI: 10.1007/978-3-319-16999-6_2669-1
1. Nokelainen, O., **Rojas, B.**, & Valkonen, J. Camouflage. 2017. In: T. K. Shackelford & V. A. Weekes-Shackelford (Eds.). *Encyclopedia of Evolutionary Psychological Science*. Springer. DOI: 10.1007/978-3-319-16999-6_2665-1

Student supervision & mentorship

PhD x 4: University of Veterinary Medicine (x1); University of Jyväskylä (x3) • **Masters x 10:** Erasmus Exchange Program, University of Veterinary Medicine Vienna-University of Århus (x1); Université de Paris Saclay (x1); Erasmus Exchange Program, University of Jyväskylä- University of Padova (x3); University of Vienna (x1); University of Jyväskylä (x3); University of Marseille (x1) • **Bachelors x 4:** University of Magdalena, Colombia (x2) Erasmus Exchange Program, University of Jyväskylä- University of Barcelona (x1); Erasmus Exchange Program Free University of Berlin- University of Veterinary Medicine Vienna • **Mentorship** of Latin American students: Juan David Carvajal Castro and Shirley Jennifer Serrano Rojas, currently PhD students at St. John's University, US and Stanford University, US, respectively. Other mentees: Ria Sonnleitner (Austrian), University of Veterinary Medicine, Vienna, Austria.

Teaching experience

Tertiary Education

- (2022) Lecture on 'Amphibian Global Decline' for the *Umwelt und Artenschutz im OneHealth Kontext* course for Masters students. University of Veterinary Medicine Vienna
Module on Evolutionary Ecology for the *Population Genetics and Evolutionary Ecology* course
- (Since 2018) *Ethics and Philosophy of Science* (BENJ1006) course for PhD Students. University of Jyväskylä (Finland).
- (2018) Lecture on Signal Evolution for the *Evolutionary Ecology and Life Histories* (EKOS1078) course for Masters students. University of Jyväskylä (Finland).
Field course "Tropical Ecology and Conservation", organized by the Organization for Tropical Studies (OTS). Las Cruces Research Station, Costa Rica, January 2018
- (2016) Lectures for the Ecology (EKO 101b) course for Masters students. University of Jyväskylä (Finland).
- (2007-2010) University of Exeter (UK), Teaching Assistant. *Undergraduate programs in Psychology and Animal Behaviour*: Biological Basis of Behaviour, Introduction to Animal Behaviour, Evolution of Behaviour, Ethological Methods, Sensory Ecology, Research methods in Psychology, Statistics. *Masters in Animal Behaviour and Welfare*: Behavioural Ecology, Ethological methods
- (2004) University of Vienna, Austria, through the Konrad Lorenz Institute for Comparative Ethology, teaching assistant: Practicals in Ethology.

Secondary education

- (2005-2007) Los Nogales School, Bogota, Colombia
Middle School (grades 5th through 8th): Basic Natural Sciences, High School (9th and 10th grades): Advanced Biology, High School (11th grade): Environmental Sciences
- (2001-2004) Science teacher for Middle School (grades 5th through 8th)

Teaching qualifications

(2014) Pedagogical Studies: 'Theoretical foundations of university teaching and learning' (5 ECTS credits) and 'Planning, practice and evaluation of teaching' (5 ECTS credits). August-December 2014, Faculty of Education, University of Jyväskylä, Finland.

(2009) Associate of the Higher Education Academy, April 2009, UK

Invited seminars & plenary/keynote lectures at conferences (*webinars)

(2024): Workshop on **Women in Evolutionary Biology**, Max Planck Institute for Evolutionary Biology, Plön, Germany, May 2024, **Keynote Speaker** • Symposium on "Global Perspectives on the Frontiers of Herpetology", **2024 Meeting of the Society for the Study of Amphibians and Reptiles (SSAR)** to be held in Ann Arbor, MI, US, July 2024, **Keynote Speaker** • Symposia on "Ecology, Evolution and Behavior of Phytotelm-Breeding Frogs" and "An Integrative Approach to Studying the Evolution of Visual Communication", 10th World Congress of Herpetology, to be Held in Kuching, Malaysia, August 2024, **Invited Speaker**.

(2023): **FINE Seminar series* (Cancelled due to illness) • **Max-Planck Institute for Chemical Ecology**, Seminar, Jena, Germany • **XVIII Latin American Congress of Herpetology**, Cochabamba, Bolivia, **Plenary Speaker** • Departmental Kolloquium, **Goethe University Frankfurt**.

(2022): **II Symposium on Tadpoles*, **III Colombian Congress of Herpetology**, Cali, Colombia, **Keynote Lecture** • ***Biology22-Conference of Organismal Biology**, Basel, Switzerland, **Plenary speaker** • **DBS Seminar Series*, **Auburn University**, USA (Cancelled due to illness).

(2021): **SLS Seminar Series*, **University of Lincoln**, UK • **Wilhelminenberg Seminar Series*, **Konrad Lorenz Institute of Ethology**, University of Veterinary Medicine Vienna • **I Symposium on Evolutionary Ecology*, **I Latin American Congress of Evolution**, **Keynote Lecture** • **Argentinian Congress of Herpetology*, organized by the Argentinian Society of Herpetology, **Plenary speaker** • **Centre for Behaviour and Evolution Seminar*, **University of Newcastle**, UK • **Department of Ecology and Evolution Seminar Series*, **University of Chicago**, USA • Animal Behaviour Twitter Conference, organized by **ASAB** (Association for the Study of Animal Behaviour) and **ABS** (Animal Behavior Society). **Plenary Presenter**.

(2020): **Ecology and Biodiversity Seminar Series*, **Hong Kong University**, Hong Kong.

(2019): *Max Planck Institute for Ornithology Seminar Series*, **Max Planck Institute for Ornithology**, Seewiesen, Germany; *Centre for Biological Diversity Seminar Series*, **University of St. Andrews**, St. Andrews, UK.

(2018): *I Symposium on Behaviour, Sensory Ecology and Reproductive Physiology of Neotropical Organisms*; **V Colombian Congress of Zoology**, Bogota, Colombia. **Keynote Lecture**; **National Museum of Natural Sciences**, Madrid, Spain.

(2017): *Hawkesbury Institute for the Environment Seminar*, **University of Western Sydney**, Sydney, Australia.

(2014): *Animal Behaviour Seminar Series*, **University of Exeter**, Exeter, UK; *Behaviour, Ecology and Evolution Seminar Series*, **University of Cambridge**, Cambridge, UK.

(2013): **Charles University**, Prague, Czech Republic

(2010): *CIRAD/CNRS Seminars*, **CNRS-Guyane**, Kourou, French Guiana.

OTHER INVITED TALKS

(2022): **Symposium on "Overcoming implicit bias in the tropical science community for better conservation research and practice"*, **ATBC (Association for Tropical Biology and Conservation) Meeting**, Cartagena, Colombia

(2021): **Cátedra Alfonso L. Herrera*, **Benemérita Universidad Autónoma de Puebla**, Mexico; **Café Virtual with G-Spot: Laboratory of Arthropod Behaviour and Evolution*, **University of São Paulo**, Brazil.

(2020): **Charlas del Grupo Herpetológico*, **Universidad del Quindío**, Colombia; *Denis Réale's Group*, **Université du Québec a Montréal**, Canada.

(2019): *KLIVV Coffee Talk*, **Konrad Lorenz Institute for Comparative Ethology-University of Veterinary Medicine**, Vienna, Austria

(2018): 'Role Model Seminars', within the 'Women in Biology Initiative' at the Faculty of Life Sciences, **University of Vienna**; *O'Connell Lab*, **Stanford University**, USA.

(2017): *Chemical Ecology Lab*, **University of Amsterdam**, The Netherlands; Symposia on *Colour and Genetics in Dendrobatid Poison Frogs* and *Women in Latin American Herpetology: challenges and achievements*, **XI Latin American Congress of Herpetology**, Quito, Ecuador; *The Lizard Lab*, **Macquarie University**, Sydney, Australia;

(2016): *Laboratoire d'Ecologie des Hydrosystèmes Naturels et Anthropisés*, **University of Lyon 1**, Lyon, France.

(2015): *Symposium on Amphibian Visual Ecology*. Vision Group, **Lund University**. Lund, Sweden.

(2014): *Communication Symposium*, **X Latin American Congress of Herpetology**, Cartagena, Colombia

(2013): *Department of Cognitive Biology*, **University of Vienna**. Vienna, Austria.

(2011): Invited lecturer for the *PhD Programme in Cognition and Communication*, **University of Vienna** (invited lecturer), Vienna, Austria.

(2008): *Pröhl's Lab*, **Veterinary University of Hannover**, Hannover, Germany.

Presentations at scientific meetings

20 oral (*) and 4 poster presentations at international scientific meetings, i.e. meetings organized by the **European Society for Evolutionary Biology (ESEB)**, the **International Society for Behavioral Ecology (ISBE)**, and the **Association for the Study of Animal Behaviour (ASAB)**, among others.

Tadpole communication: the neglected role of visual cues. *Behaviour* 2023, August 14th-19th, 2023. Bielefeld, Germany.

Shine bright like a cannibal: does feeding on conspecific tadpoles impact the quality of warning signals in an aposematic frog? Centenary Conference of the Society for Experimental Biology, July 4th – 8th 2023. Edinburgh, UK.

*Aposematism pay-offs: protection from predators and diversification of nurseries in Amazonian poison frogs. ESEB 2022 Congress, August 14th -19th, 2022. Prague, Czech Republic.

*Red or dead: imperfect Müllerian mimicry between burnet and red, not yellow, wood tiger moths. ESEB 2019 Congress, August 19th-24th, 2019. Turku, Finland.

Pool choice strategies and disease transmission potential in phytotelm-breeding frogs. *Symposium: Mitigating single pathogen and co-infections that threaten amphibian biodiversity*, Zoological Society of London, April 24th-25th, 2019. London, UK.

*Challenges to guarantee inclusion and equity to women in science: an intercultural approach (translated from its original title in Spanish). *I Colombian Symposium of Women in Science*. V Colombian Congress of Zoology, December 3rd-7th, 2018. Bogota, Colombia.

*Multimodal signals and a possible route to the origin and maintenance of polymorphisms in aposematic species. *I Symposium on Behaviour, Sensory Ecology and Reproductive Physiology of Neotropical Organisms*. V Colombian Congress of Zoology, December 3rd-7th, 2018. Bogota, Colombia. KEYNOTE LECTURE.

*First invaders are winners: poison frogs with simple aposematic colour patterns lead tree-fall gap invasions and have higher survival. 17th ISBE Conference, August 11th-16th, 2018. Minneapolis, USA.

*Evolution and maintenance of variation in anti-predator defences. *Symposium on the Evolution of Communication Signals*. ESEB 2017 Congress, August 20th-25th, 2017. Groningen, The Netherlands. KEYNOTE LECTURE.

*A possible route to the origin and evolution of polymorphic warning signals. *Symposium on Color and Genetics in Dendrobatid Poison Frogs*. XI Latin American Congress of Herpetology, July 24th – 28th, 2014. Quito, Ecuador. INVITED SPEAKER.

*How to dig up the evolutionary ecology of poison frogs as a female researcher and not die in the attempt: lessons from near and far. *Symposium on the Challenges and Achievements of Women in Latin American*

Herpetology. XI Latin American Congress of Herpetology, July 24th – 28th, 2014. Quito, Ecuador. INVITED SPEAKER.

*Chemical defences override visual signals in the multimodal warning display of an aposematic moth. 16th ISBE Conference. July 29th - August 4th, 2016. Exeter, UK.

*Multi-modal warning signals and target-specific secondary defences in a colour polymorphic, aposematic moth. 34th International Ethological Conference, August 9th-14th, 2015. Cairns, Australia.

*Multi-modal signaling and target-specific defences in the polymorphic, aposematic wood tiger moth. Graduate Seminar on Insect Evolutionary Ecology. University of Tartu. May 17th-19th, 2015. Kuke Talu, Estonia.

*The implication of parental decisions for the growth and survival of tadpoles of *Dendrobates tinctorius*. *Symposium on Parental Care in Anurans* (which I co-organised). X Latin American Congress of Herpetology, December 1st – 5th, 2014. Cartagena, Colombia.

*The frog of the gaps: differential detectability in the warning signals of *Dendrobates tinctorius* under varying light environments. *Communication Symposium*. X Latin American Congress of Herpetology, December 1st – 5th, 2014. Cartagena, Colombia. INVITED SPEAKER.

*Target-specific secondary defences and honest warning signals in a colour polymorphic, aposematic moth. 14th ISBE Conference. July 31st - August 5th, 2014. New York, USA.

Being complex can be safe: testing predator avoidance of varying aposematic signals in a novel environment. ESEB 2013 Congress, August 19th-24th, 2013. Lisbon, Portugal.

*Movement and differential occupation of disturbed habitats are correlated with colour pattern geometry in an aposematic frog. 14th ISBE Conference. August 12th - 17th, 2012. Lund, Sweden.

*Immediate invasion of tree-fall gaps by the poison frog *Dendrobates tinctorius*: a case of responsible parenthood. *Poison Frogs Symposium*. 7th World Congress of Herpetology. August 7th - 13th, 2012. Vancouver, Canada. INVITED SPEAKER.

Is the high variability in the colour patterns of the dyeing poison frog a constraint for aposematism? ASAB Winter Meeting. December 2nd -3rd, 2010. London, UK.

A potential role of colour patterns in intra-specific communication in the dyeing poison frog *Dendrobates tinctorius*? ISBE Conference. September 26th-October 1st, 2010. Perth, Australia. BEST POSTER PRIZE.

*Matching and symmetry in the frequency recognition curve of the poison frog *Epipedobates trivittatus*. ASAB Easter Meeting. April 2nd - 4th, 2008. Edinburgh, UK.

*Intrinsic determinants of the outcome of agonistic encounters in males of *Dendrobates lehmanni* (Anura: Dendrobatidae). VI Latin American Congress of Herpetology. January 19th - 23rd, 2003. Lima, Perú.

Main external collaborators

(1) Dr. Andrius Pašukonis, Stanford University, USA: Poison frog movement ecology and evolutionary ecology of phytotelm-breeding frogs; (2) Prof. Trenton Garner & Dr. Gonçalo de Rosa, Zoological Society of London, UK: Dynamics of disease transmission. (3) Prof. Johanna Mappes & Predator-Prey Interactions Group at the University of Helsinki, Finland: Evolution of warning signals.

Leadership and service

Since 2024: *Secretary*: International Society for Behavioral Ecology (ISBE)

Since 2022: *Associate Editor*: Animal Behaviour (flag journal of the Association for the Study of Animal Behaviour and the Association for Animal Behavior)

Since 2020: *Associate Editor*: Evolutionary Ecology; *Consulting Editor*: Animal Behaviour.

2019-2021: *Editorial board member*: Scientific Reports.

Since 2020: Member of PhD Thesis committee of Mileidy Betancourth, University of Los Andes, Colombia (2020-2022); Lisa Surber, University of Illinois, USA (2020-ongoing).

(2016-2020): Examiner of five MSc Thesis for University of Los Andes (Colombia), University of Jyväskylä (Finland) and Macquarie University (Australia).

(2017, 2021, 2022): Examination committee PhD Thesis (x 3), Lund University, University of Valencia, Sorbonne University, University of Los Andes.

(2015-2017): Departmental Seminar organiser, Department of Biology and Environmental Science, University of Jyväskylä.

(2013-2015): 'Darwin Meeting' organiser. Centre of Excellence in Biological Interactions, University of Jyväskylä.

2013-2019: Creator and administrator of Social Media for the Centre of Excellence in Biological Interactions and the Predator-Prey Interactions Group. University of Jyväskylä.

Since 2016: Member of the *Scientific Committee* of COLEVOL (Colombian Association of Evolutionary Biology).

Science Communication and outreach

My research has been covered by several different outlets, such as The New York Times, Science Daily, Discover Magazine, the 'Science Shot' section in Science Magazine, Forbes Magazine, Scientific American's '60 second science' podcast, The Scientist, Inside Science, Phys.Org, Biosphere Magazine, IFLScience!, Discover Magazine, among others. I have also contributed to Colombian science outreach project 'Ciencia Café Pa' Sumercé' (Science for You) (<https://cienciacafesumerce.wordpress.com/blog>), where I was interviewed to explain my findings on target-specific chemical defences in an aposematic moth to a lay audience. For further details about media coverage, please visit my personal website: www.bibianarojas.co/news

Professional Memberships

American Society of Naturalists; European Society for Evolutionary Biology (ESEB); Association for the Study of Animal Behaviour (ASAB); International society for Behavioral Ecology (ISBE); Society for the Study of Evolution (SSE); Asociación Colombiana de Herpetología (ACH).

Peer-review

Journal articles: Peer review of >100 papers for >50 journals such as PNAS; Science; Ecology Letters; American Naturalist; Proceedings of the Royal Society of London B; Functional Ecology; Evolution; Biology Letters; J Evolutionary Biology; J Animal Ecology; eLife; Animal Behaviour; Behavioral Ecology; Behavioral Ecology and Sociobiology; Evolutionary Ecology; J Chemical Ecology; Biological Journal of the Linnean Society; Ecology and Evolution; Oikos; Scientific Reports; Communications Biology; and Royal Society Open Science, among others.

Grants: **(2020)** Agence Nationale de Recherche, France; **(2018-2020)** "Botas al Campo (Boots on the Ground)" Research Grants, Colombian Herpetological Society (ACH), Colombia. **(2016)** "SDE/GWIS (Sigma Delta Epsilon/Graduate Women in Science) Fellowships", USA; "IKIAM Seed Funding", Universidad Regional Amazónica IKIAM, Ecuador.

Fieldwork experience

AUSTRIA: Wienerwald Biosphere Reserve (since 2022); COLOMBIA: Andean High-lands (1997-2002); Chingaza Natural Park (Paramo ecosystem, 1997-2002); Villavicencio (Piedmont ecosystem, 1999-2001); Leticia, Colombian Amazon (Tropical Rainforest: TRF, 2002 & 2003); Yotoco Private Reserve, Quibdó & Acandí (Biogeographic Chocó, TRF, 2004, 2005). UNITED KINGDOM: Lundy Island (2008 & 2009). COSTA RICA: Osa Península, Pacific coast (TRF, 2008). FRENCH GUIANA: Les Nouragues Research Station (TRF, 2009-2013; 2016; 2019); other localities (TRF, 2013). FINLAND: Central Finland (2013-2017). GEORGIA: Caucasian Alpine meadows, 2013-2018).

Languages

Spanish: Native speaker; English: Full proficiency; French: Intermediate level; German: Basic level.

Academic References

Prof. John A. Endler, Deakin University, *john.endler@deakin.edu.au*

Prof. Johanna Mappes, University of Jyväskylä, *johanna.mappes@jyu.fi*

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