

# Romain Boisseau

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## Current position

- 2023–Now **Postdoctoral researcher**, *The evolution of convergent wing phenotypes in stick insects*
- Advisor: Dr. Tanja Schwander
  - Funding: ERC consolidator grant to TS (2023-2024), SNSF postdoctoral fellowship (MSCA-PF equivalent) to RB (2025-present)

## Education

- 2016–2022 **PhD degree in Ecology & Evolution**, *University of Montana*, Missoula, MT, USA
- Advisor: Dr. Douglas Emlen.
  - Committee members: Dr Sven Bradler (University of Göttingen, Germany), Dr. Art Woods (Montana), Dr. Bret Tobalske (Montana), Dr Erick Greene (Montana).
  - Dissertation title: "The evolution of morphological diversity and sexual dimorphism in stick and leaf insects".
  - Defense date: October 5, 2022. Award date: December 16, 2022
- 2013–2016 **Master's degree in Ecology, Biodiversity, Evolution**, *Ecole Normale Supérieure & Sorbonne Université*, Paris, France, obtained with highest honors
- The *Ecole Normale Supérieure* is one of the most prestigious French institutions of higher education providing specialized training to students who will become professors and researchers in their field.
- 2012–2013 **Licence in Biology (equivalent to a Bachelor's degree)**, *Ecole Normale Supérieure & Sorbonne Université*, Paris, France, obtained with honors
- 2010–2012 **Classes Préparatoires in Biology, Chemistry, Physics, Geology**, *Lycée Clemenceau*, Nantes, France
- Classes Préparatoires* are a two-year intensive course preparing for highly competitive, national entrance examinations to French *Grandes Ecoles* (including engineering schools). Admitted to the *Ecole Normale Supérieure*, rank 14 over 700 applicants registered.

## Early Research Experience

- 2016 **Master's Research Project in Behavioral Ecology**, *University of Tours (François Rabelais)*, Tours, France
- Title: Metabolic costs of oviposition and female-female contests in *Eupelmus vuilleti*.
  - Laboratory: Cognitive Ecology (IRBI), supervised by Dr. Marlène Goubault and Dr. Art Woods (University of Montana).
  - Duration: 4 months.
- 2015 **Master's Research Project in Evolutionary Ecology**, *University of Montana*, Missoula, MT, USA
- Title: Physiological costs and mechanical strength limits of male weaponized hind legs in *Narnia femorata* and *Sagra femorata*.
  - Laboratory: Emlen lab, supervised by Dr. Douglas Emlen, Dr. Art Woods and Dr. Bret Tobalske.
  - Duration: 6 months.

- 2014 **Master's Research Project in Ethology**, *University of Toulouse (Paul Sabatier)*, Toulouse, France
- Title: Habituation in slime molds, *Physarum polycephalum*.
  - Laboratory: Research Center on Animal Cognition, supervised by Dr. Audrey Dussutour.
  - Duration: 5 months.
- 2014 **Master's Research Project in Behavioral Ecology**, *University of Sydney and Macquarie University*, Sydney, Australia
- Title: Sexual cannibalism and fitness implications in the redback spider, *Latrodectus hasselti*: female mating receptivity and offspring performance.
  - Laboratory: Insect mating systems group, supervised by Dr. Katherine Barry (Macquarie University) and Dr. Shawn Wilder (University of Sydney).
  - Awarded a grant from the Joyce W. Vickery Research Fund (The Linnean Society of New South Wales).
  - Duration: 5 months.
- 2013 **Undergraduate Research Project in Evolutionary Ecology (field work)**, *Muséum National d'Histoire Naturelle*, Paris, France
- Title: Understanding the role of predation in the evolution of genetic dominance in the wing color pattern of *Heliconius numata* in natural populations (Peru).
  - Laboratory: "Origine, structure et évolution de la biodiversité", supervised by Dr. Violaine Llaurens.
  - Field work in the tropical Andes (Tarapoto, Peru).
  - Duration: 3 months.
- 2012 **Undergraduate Research Project in Evolution**, *Institut Jacques Monod*, Paris, France
- Title: Evolution and development of asymmetries in *Drosophila* genitalia.
  - Laboratory: Drosophila Evolution lab, supervised by Dr. Virginie Orgogozo.
  - Duration: 3 weeks.

## Publications

- 2025 **Boisseau, R. P.**, Bradler, S., & Emlen, D. J. (2025). *Sexual selection and flight as predictors of sexual size and shape dimorphism in stick and leaf insects*. bioRxiv. <https://doi.org/10.1101/2025.11.25.690473>
- Boisseau, R. P.**, & Emlen, D. J. (2025). *Exaggerated male hindlegs function as pure weapons of male–male combat in thorny devil stick insects*. bioRxiv. <https://doi.org/10.1101/2025.11.21.689692>
- Schwander, T., Soldini, L., **Boisseau, R. P.**, Mérel, V., Toubiana, W. S., & Lavanchy, G. (2025). *On the Repeated Evolution of Parthenogenesis in Stick Insects*. EcoEvoRxiv.
- Boisseau, R. P.**, Bradler, S., & Emlen, D. J. (2025). *Divergence time and environmental similarity predict the strength of morphological convergence in stick and leaf insects*. Proceedings of the National Academy of Sciences, 122(1), e2319485121.
- 2024 **Boisseau, R. P.**, Woods, H. A. (2024). *Resource allocation strategies and mechanical constraints drive the diversification of stick and leaf insect eggs*. Current Biology, 34(13), 2880–2892.
- Buescher, T. H., **Boisseau, R. P.**, & Brock, P. D. (2024). *Junior homonymy warrants a replacement name for *Ramulus lineatus* (Liu & Cai, 1992) (Phasmatodea: Phasmatidae)*. Zootaxa, 5447(3), 449–450.
- 2023 Weber, J. N.\*, Kojima, W.\*, **Boisseau, R. P.\***, Niimi, T., Morita, S., Shigenobu, S., Gotoh, H., Araya, K., Lin, C.-P., Thomas-Bulle, C., et al. (2023). *Evolution of horn length and lifting strength in the Japanese rhinoceros beetle *Trypoxylus dichotomus**. Current Biology, 33(20), 4285–4297.

- 2022 **Boisseau, R. P.**, Büscher, T. H., Klawitter, L. J., Gorb, S. N., Emlen, D. J., & Tobalske, B. W. (2022). *Multi-modal locomotor costs favor smaller males in a sexually dimorphic leaf-mimicking insect*. *BMC Ecology and Evolution*, 22(1), 39.  
 Lebecq, A., Doumane, M., Fangain, A., Bayle, V., Leong, J. X., Rozier, F., del Marques-Bueno, M., Armengot, L., **Boisseau, R. P.**, Simon, M. L., et al. (2022). *The Arabidopsis SAC9 enzyme is enriched in a cortical population of early endosomes and restricts PI(4,5)P<sub>2</sub> at the plasma membrane*. *eLife*, 11, e73837.
- 2021 Del Sol, J. F.\*, Hongo, Y.\*, **Boisseau, R. P.\***, Berman, G. H., Allen, C. E., & Emlen, D. J. (2021). *Population differences in the strength of sexual selection match relative weapon size in the Japanese rhinoceros beetle, Trypoxylus dichotomus (Coleoptera: Scarabaeidae)*. *Evolution*, 75(2), 394-413.
- 2020 **Boisseau, R. P.**, Ero, M. M., Makai, S., Bonneau, L. J. G., & Emlen, D. J. (2020). *Sexual dimorphism divergence between sister species is associated with a switch in habitat use and mating system in thorny devil stick insects*. *Behavioural Processes*, 181, 104263.  
 Fea, M. P., **Boisseau, R. P.**, Emlen, D. J., & Holwell, G. I. (2020). *Cybernetic combatants support the importance of duels in the evolution of extreme weapons*. *Proceedings of the Royal Society B*, 287(1928), 20200254.
- 2019 O'Brien, D. M., **Boisseau, R. P.**, et al. (2019). *Muscle mass drives cost in sexually selected arthropod weapons*. *Proceedings of the Royal Society B*, 286(1905), 20191063.
- 2018 O'Brien, D. M., & **Boisseau, R. P.** (2018). *Overcoming mechanical adversity in extreme hindleg weapons*. *PLOS ONE*, 13(11), e0206997.
- 2017 **Boisseau, R. P.**, Woods, H. A., & Goubault, M. (2017). *The metabolic costs of fighting and host exploitation in a seed-drilling parasitic wasp*. *Journal of Experimental Biology*, 220(21), 3955–3966.  
**Boisseau, R. P.**, Wilder, S. M., & Barry, K. L. (2017). *Sexual and nonsexual cannibalism have different effects on offspring performance in redback spiders*. *Behavioral Ecology*, 28(1), 294–303.
- 2016 Arias, M., Le Poul, Y., Chouteau, M., **Boisseau, R. P.**, Rosser, N., Théry, M., & Llaurens, V. (2016). *Crossing fitness valleys: empirical estimation of a fitness landscape associated with polymorphic mimicry*. *Proceedings of the Royal Society B*, 283(1829), 20160391.  
**Boisseau, R. P.**, Vogel, D., & Dussutour, A. (2016). *Habituation in non-neural organisms: evidence from slime moulds*. *Proceedings of the Royal Society B*, 283(1829), 20160446.

## Awards and Grants

- 2024 **SNSF Swiss Postdoctoral Fellowship** – “The evolution of convergent wing phenotypes in stick insects” – Tanja Schwander’s group, University of Lausanne. 2 years. 225'000 CHF
- 2020 **George W. Gilchrist Student Research Award** – American Society of Naturalists. “The convergent evolution of extreme hindlegs in tree lobster stick insects” – Collaborators: Dr. Michael Magrath (Melbourne zoo) and Dr. Theresa Jones (University of Melbourne). \$2'000
- 2020 **Bertha Morton Scholarship** – Awarded to the top five percent of the graduate students of the University of Montana in academic performance, research and creative activities. \$3'000

2018	<b>National Geographic Society, Early Career Grant</b> – “The evolution of extreme sexually dimorphic hindlegs in the stick insect <i>Eurycantha calcarata</i> ” – Collaborators: Dr. Luc Bonneau and Dr. Mark Ero (Dami Oil Palm Research Station, Papua New Guinea Oil Palm Research Association).	\$10'000
2018, 2019, 2020	<b>Drollinger-Dial Travel Award</b> , awarded to graduate students in the Ecology & Evolution program at the University of Montana.	\$3'500
2018	<b>International Society for Behavioral Ecology Travel Award</b> – ISBE meeting in Minneapolis, MN.	\$500
2015	<b>Joyce W. Vickery Scientific Research Award</b> – The Linnean Society of NSW, Australia.	\$500
2012–2016	<b>Normalien stipend</b> , École Normale Supérieure, Paris – Four-year publicly funded salary.	€83'000

## Teaching

- Spring 2023, 2024, 2025 **Guest Lecturer**, *Invertebrate faunistics*, [30 students], The University of Lausanne, Switzerland  
*Lecturer 4h/year*
- Spring 2020 **Principal Instructor**, *Entomology (BIOO 462)*, [4 CR, 35 students], The University of Montana, Missoula, MT, USA  
*Lecturer (3h/week), office hours, writing and grading of exams*
- Fall 2019 **Teaching Assistant**, *Behavior and Evolution (BIOE 409)*, [4 CR, 60 students], The University of Montana, Missoula, MT, USA  
*Discussion section leader (2h/week), grading of essays*
- Fall 2016, 2017, 2018, 2020, 2022 **Teaching Assistant**, *Principles of Living Systems (BIOB 160)*, [4 CR, ~220 students], The University of Montana, Missoula, MT, USA  
*Lab leader (4h/week), lecturer, office hours, assessment creator, supervising research projects, grading*
- Spring 2017, 2018, 2019, 2021 **Teaching Assistant**, *Genetics and Evolution (BIOB 272)*, [4 CR, ~400 students], The University of Montana, Missoula, MT, USA  
*Recitation leader (3h/week), lecturer, office hours, grading and head TA (2019, 2021)*

## Mentorship

- Master [2] Margherita Zgheib (UL), Ismaël Kerdli (UL)
- Undergraduates [13] Lexi Klawitter (UM), Makena Carlberg (UM), Madeline Kleeman (UM), Garret Jolma (UM), Madeline Mueller (UM), Chelsey Caldwell (UM), Josey MacDonald (UM), Nathan Barton (UM), Jacob Kleemann (UM), Morgan Radtke (UM), Andrew Engellant (UM), Andrea Newbrough (UM), Devin Hunt (UM)

## Outreach

- April 2024 **Public outreach presentation**, *Brussels international stick insect meeting* (Royal Belgian Institute of Natural Sciences), “The function of male exaggerated hindlegs in *Eurycantha*”
- April 2023 **Public outreach presentation**, *Brussels International Stick Insect Meeting* (Royal Belgian Institute of Natural Sciences), “The convergent evolution of body form in stick and leaf insects”

- May 2019 **Public outreach presentation, Missoula Butterfly House and Insectarium, Missoula, MT, USA** (*Bugs and Brews evening lecture series*), "The hidden world of stick and leaf insects"
- 2018–2022 **Guided visits, Missoula Butterfly House and Insectarium, Missoula, MT, USA**, Biweekly guided tours of insect breeding rooms to visitors and donors
- 2018–2019 **Podcast, Big Biology**, Part of the early team launching a podcast telling the stories of scientists tackling unanswered questions in biology, <https://bigbiology.org>  
Strategic meetings, website design, episode editing

## Service

- 2019–2020 **EE Graduate Student Social Coordinator**, *Ecology and Evolution program, University of Montana*, Head organizer of graduate student social events
- 2018–2019 **Prospective Student and Super Speaker Committee**, *Ecology and Evolution program, University of Montana*

## Paper Reviews

I have reviewed scientific papers for the following journals:

- Proceedings of the Royal Society B (4)
- Journal of Experimental Biology (1)
- Animal Behaviour (5)
- Evolutionary Ecology (1)
- Ecology and Evolution (1)
- Scientific Reports (2)
- Behavioural Ecology and Sociobiology (1)
- Biological Journal of the Linnean Society (2)
- Journal of Insect Behavior (1)
- Zoology (2)
- New Zealand Journal of Zoology (1)
- ZooKeys (1)
- Malagasy Nature (1)

## Conferences

- Aug 2025 **Congress of the European Society for Evolutionary Biology (ESEB) 2025 in Barcelona, Spain**, Presentation: "Divergence time and environmental similarity shape the repeatability of morphological evolution"
- Feb 2025 **Biology 25 in Lausanne, Switzerland**, Presentation: "Convergent evolution of large hindlegs and squeezing strength in tree lobster stick insects"
- Sep 2024 **International Society for Behavioral Ecology (ISBE) meeting in Melbourne, Australia**, Presentation: "The functions of male exaggerated weaponry in a giant stick insect"
- Jul 2023 **Society of Molecular Biology and Evolution (SMBE) meeting in Ferrara, Italy**, Poster: "How does divergence time affect convergent evolution at the phenotypic and molecular level?"
- Jul 2020 **The Animal Behavior Society (ABS) virtual meeting**, Presentation: "Moving like a leaf: male size-mobility trade-offs in a leaf insect (*Phasmatodea: Phylliidae*)"

- Jun 2019 **Evolution (SSE) meeting in Providence, USA**, Presentation: "*Giants in a world of dwarves: the evolution of extreme hindlegs and body size in male tree lobster stick insects*"
- Aug 2018 **International Society for Behavioral Ecology (ISBE) meeting in Minneapolis, USA**, Presentation: "*The Evolution of Exaggerated Sexually Dimorphic Hindlegs in the Stick Insect *Eurycantha calcarata**"
- Jun 2016 **18<sup>th</sup> Colloque de Biologie de l'Insecte in Tours, France**, Poster: "*Metabolic costs of oviposition and fights in a seed-drilling parasitic wasp*", Member of the organizing committee

## Invited talks

- Feb 2025 **Invited seminar, Division of Evolutionary Ecology, University of Bern, Switzerland**; invited by Dr. Catherine Peichel, "*Repeated morphological evolution in stick and leaf insects*"
- Nov 2024 **Invited seminar, Melbourne Zoo, Australia**; invited by Dr. Michael Magrath and Rohan Cleave, "*The functions of male exaggerated weaponry in tree lobster stick insects*"
- Nov 2024 **Invited seminar, Department of Entomology, Melbourne Museum, Australia**; invited by Dr. Ken Walker, "*The functions of male exaggerated weaponry in tree lobster stick insects*"
- Sep 2023 **Invited seminar to a stick insect workshop, Department of Biology, University of Göttingen, Germany**; invited by Dr. Sven Bradler, "*The Phasmid Trait Database*"
- Oct 2022 **Invited seminar to undergraduates, Department of Biology, Gonzaga University, Spokane, WA, USA**; invited by Dr. Brook Swanson, "*The evolution of body form in stick and leaf insects*"
- Oct 2022 **Invited seminar, Faculty of Biology, Bielefeld University, Bielefeld, Germany**; invited by Dr. Volker Dürr, "*The evolution of body morphology and sexual dimorphism in stick and leaf insects*"
- Apr 2022 **Invited seminar, College of Biological Sciences, UC Davis, Davis, CA, USA**; invited by Dr. Alexis Simon and Dr. Graham Coop, "*The evolution of body morphology and sexual dimorphism in stick and leaf insects*"
- Nov 2018 **Invited seminar, Oil Palm Research Association, Dami, WNB, Papua New Guinea**, invited by Dr. Luc Bonneau, "*The Evolution of Exaggerated Sexually Dimorphic Hindlegs in the Stick Insect *Eurycantha calcarata**"
- Jan 2018 **Invited seminar, Department of Biology, University of Göttingen, Germany**, invited by Dr. Sven Bradler, "*The Evolution of Sexual Dimorphism in Stick Insects*"

## Media Coverage

### PhD work:

- These insects keep evolving to look like sticks. Why? *LiveScience* (December 24, 2024)
- Extraordinary Power Of Natural Selection: Convergent Evolution Found In Hundreds Of Stick Insect Species. *IFLScience* (December 31, 2024)
- Les phasmes peuvent prendre 20 formes corporelles qui se répètent à travers l'évolution. *GEO* (December 30, 2024)
- Thorny devils grow giant legs to pin rivals. *Science* (June 25, 2019), doi:10.1126/science.aay5210

### Master's work:

- Superparasitism is a price worth paying for parasitic wasps. *Inside JEB, Journal of Experimental Biology* (November 1, 2017)

### Earlier work:

More than 80 journals, newspapers, radios and popular science youtube channels around the world featured my research on habituation learning in slime molds (2016, Proc. B). Here are a few examples:

- Single-celled life can learn. *Nature* 533, 10 (May 5, 2016)
- This weird, slimy single-cell organism can learn — without a brain. *Washington Post* - April 30, 2016
- Even with no brain, slime molds quickly learn bitter lessons. *Los Angeles Times* - April 27, 2016
- Brainless Slime Mold Can Learn. *Quickly Newsweek* - April 28, 2016
- A single-celled organism capable of learning. *Science Daily* - Apr. 27, 2016
- No Brain? No Problem! Slime Mold Can Learn. *Discovery Magazine* - April 27, 2016
- Slime Mold: A Brainless Blob that Seems Smart [video]. *Sci Show* [youtube channel] - July 27, 2017

## Languages

French **Mother tongue**

English **Bilingual**

- TOEFL scores (2015): 110/120 (Writing: 28, Speaking: 26, Reading: 28, Listening: 28).

Spanish **Intermediate level**

- Internship in Peru (3 months, 2013)

## Relevant Skills for Research

Coding R, Bash/Unix, HTML/CSS, SQL, Matlab, LaTeX

Software Trinity, DeepLabCut, Raven Pro, BORIS, BEAST2, Autodesk CFD, Adobe Suite

Omics RNAseq (short reads): transcriptome assembly, differential expression, WGCNA

Laboratory Skills Insect dissections; insect husbandry; microtomy & histological preparation; sound & video recording of animals; flow-through respirometry

Field Work South Korea (2022, 1 month: sampling of rhinoceros beetles); USA/California (2022, 2 weeks: sampling of stick insects); Papua New Guinea (2018, 2 months: behavioral observations of stick insects); Peru (2013, 3 months: butterfly field experiment)

## Personal interests

- Wildlife photography and backpacking
- Insect husbandry: phasmids, beetles, mantids and butterflies (20+ years)
- Badminton, hiking, skiing

## Extra

- Driving license (France, 2010)
- Motorbike license (Peru, 2013)