



Léo LABORIEUX

U. MICHIGAN EEB



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CURRICULUM

2024

Harvard University, USA

MEME PROGRAMME — S4

- Biomechanics of euarthropod enrollment, functional paleontology of paleozoic euarthropods (*see below*)

2023-2024

LMU Munich | Universidad del Rosario, Colombia

MEME PROGRAMME — S3

- Behavioural research on *Heliconius* butterflies (*see below*)

2023

Université de Montpellier, France

MEME PROGRAMME — S2

- Modeling
- Advanced inference in population genomics
- Statistics

2022-2023

Rijksuniversiteit Groningen, The Netherlands

MEME PROGRAMME — S1

- Advanced evolutionary theory
- Genomics
- Advanced population genetics

2019-2022

Aix-Marseille Université

BIODIVERSITY & ECOLOGY BSc

Summa cum laude

- Fundamental concepts of ecology
- Field work techniques
- Behavioural ecology

RESEARCH & FIELD EXPERIENCE

GENOMIC SIGNATURES OF HOST-PLANT SHIFTS IN A COMPLEX OF PEST WEEVILS

CBGP: Centre pour la Biologie et la Gestion des Populations, France

Under the supervision of R. ALLIO, J. HARAN & C. PERRIER

April — June 2023 | October 2024 — Present

- South African *Phlyctinus* weevils
 - **Objective:** Investigation of cryptic species & genome-wide signatures of selection following host-plant shifts
 - Processing of next-generation sequencing data : preprocessing, alignment, cleaning, and variant calling
 - Phylogeny reconstruction, species delimitation and population structure analyses
 - Nuclear and mitochondrial genome annotation
 - Genome scans to detect selection hotspots
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DECIPHERING EUARTHROPOD ENROLLMENT WITH MICRO-CT

Harvard University, Department of Organismic and Evolutionary Biology, Ortega-Hernández Lab

Under the supervision of J. O. HERNÁNDEZ, S. R. LOSSO & B. WERTHEIM

May — September 2024

- **Objective:** Investigation of the biomechanical basis of defensive enrollment in fully volvatory euarthropods (armadillidiid isopods, oniscomorph diplopods)
 - Reconstruction of high fidelity, 3D models of the armadillidiid and oniscomorph trunk musculatures from micro-computed tomography scans
 - Assessment of soft tissue preservation in decades-old, chemically fixed natural history museum specimens
-

GILL FUNCTION IN PALEOZOIC ARTHROPODS

Harvard University, Department of Organismic and Evolutionary Biology, Ortega-Hernández Lab

Under the supervision of J. O. HERNÁNDEZ, S. R. LOSSO & B. WERTHEIM

March — May 2024 — On hold

- **Objective:** Comparative characterization of gill function in extinct paleozoic arthropods, as informed by exceptionally preserved specimens
 - Development of frameworks and workflows for the 3D modelling of arthropod gills
 - Creation of various (projected: 10+) gill models spanning different paleozoic groups (e.g. Trilobites, Fuxianhuiids..)
 - Purpose: 3D—Computational Fluid Dynamics (3D—CFD) and inference of respiratory characteristics
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SOUTH AMERICA'S FIRST SPITTING SCORPION, AND TWO NEW BUTHID SPECIES

Independent. Supported by Universidad del Rosario, Colombia

December 2023 — April 2024

- *Tityus (Atreus) icarus* **sp. nov.** & *Tityus (Tityus) achilles* **sp. nov.** @ JCM Research Station, La Vega, Colombia
- **Objective :** Description of both taxa and characterization of venom spraying in *Tityus (Tityus) achilles* **sp. nov.**
 - Sampling of specimens for taxonomic and behavioural research
 - Morphological description, ultra-high resolution photography
 - High-frame-rate video capture of venom spraying and frame-by-frame analyses (see below)

ECOLOGICAL RELEVANCE OF VISUAL ACUITY DIFFERENCES BETWEEN TWO SISTER BUTTERFLY SPECIES

LMU München — Behaviour and Speciation Research Group | Universidad del Rosario, Colombia
Under the supervision of R. MERRILL & J. BORRERO

September 2023 — March 2024

- *Heliconius cydno* & *Heliconius melpomene* @ JCM Research Station, La Vega, Colombia
- **Objective:** Identifying selection pressures underlying adaptive divergence in visual acuity between the two sister taxa
 - *In situ* evaluation of habitat complexity based on self-collected photographic data
 - Behavioural assays under distinct levels of spatial complexity
 - *In situ* collection of wild butterfly individuals & associated morphometric/behavioural data
 - Advanced statistical modeling using generalized linear mixed models
 - Daily participation to the operation of a *Heliconius* breeding facility

CO-DESCRIPTION OF A NEW SPECIES OF BUTHID SCORPION

Independent work

In collaboration with E. YTHIER

June 2021 — November 2022

- *Buthus balmensis* **sp. nov.**
 - Discovery and characterisation of an isolated population of European yellow scorpions (genus *Buthus*) bearing unusual biogeographical characteristics
 - Taxonomic evaluation and description of the new species in collaboration with French arachnologist Eric Ythier

LOCAL MATE COMPETITION IN PARASITOID WASPS

University of Groningen, The Netherlands

Under the supervision of L. BEUKEBOOM

October 2022

- *Nasonia vitripennis* wasps
- **Objective:** Investigation of the effect of intraspecific and interspecific competition on sex allocation
 - Developed, designed, conducted and analysed experiments exposing wasps to different levels of competition (interspecific/intraspecific/mixed)
 - Developed and designed experiments to disentangle the effect of various olfactory mechanisms on perceived competition and sex allocation

EFFECT OF SPATIAL GROUP STRUCTURE ON TIME ALLOCATION IN A GREGARIOUS BIRD

University of Groningen, The Netherlands

In collaboration with R. PALLAGATTI, L. CHAUHAN and E. KIKODZE | Under the supervision of J. KOMDEUR

September — October 2022

- Graylag geese
- **Objective:** Investigation of the effect of group structure on time allocation to foraging, vigilance, and resting.
 - Study design development
 - *In situ* data collection (Schiermonnikoog island, The Netherlands)
 - Statistical analysis
 - Production of a manuscript-format report

FUNCTIONAL ECOLOGY OF DISTURBED MARINE ECOSYSTEMS: PORTS & HARBOURS

IMBE: Institut Méditerranéen de Biodiversité et d'Ecologie, France

Under the supervision of C. LEJEUSNE

April — May 2022

- Marseille-Fos port and surrounding infrastructure
- *Objective:* Investigation of community-level functional gradients in ports
 - *In situ* sampling campaign on submerged docks
 - Sample handling / processing, including taxonomic determination of all sampled specimens
 - Statistical analysis of the community-level spatial structure

MONITORING OF THE SOUTHERNMOST POPULATION OF A NEAR- THREATENED ALPINE BUTTERFLY : THE CLOUDED APOLLO

IMBE: Institut Méditerranéen de Biodiversité et d'Ecologie, France

Under the supervision of G. NEVE

June 2021

- *Parnassius mnemosyne*
- *Objective:* Monitoring of a relictual *P. mnemosyne* population found in the *Parc Naturel Régional de la Sainte Baume*, Var department, France in the context of conservation efforts
 - Location scouting & capture, handling and marking of live individuals
 - Demographic estimation using mark-recapture methods

PEER - REVIEWED PUBLICATIONS

- **In Press | Laborieux, L.** (2024). *Biomechanics of venom delivery in South America's first toxungen-spraying scorpion*. Zoological Journal of the Linnean Society. <https://doi.org/10.1093/zoolinnean/zlae161>
- **Laborieux, L.** (2024). A new species of *Tityus* Koch, 1836 (Scorpiones: Buthidae), from the Cordillera Oriental (Colombia). *Faunitaxys*, 12(41), 1 – 9. [http://doi.org/10.57800/faunitaxys-12\(41\)](http://doi.org/10.57800/faunitaxys-12(41))
- Ythier, E., & **Laborieux, L.** (2022). The genus *Buthus* Leach, 1815 (Scorpiones: Buthidae) in France with description of a new species from the Sainte-Baume Massif. *Faunitaxys*, 10(47), 1–13. [https://doi.org/10.57800/faunitaxys-10\(47\)](https://doi.org/10.57800/faunitaxys-10(47))

AWARDS / HONORS

- **34th European Congress of Arachnology**. Rennes, France, August 2024. **Poster** “Biomechanics of venom delivery in South America's first spitting scorpion” awarded first place. <https://doi.org/10.13140/RG.2.2.21463.28325>
- **34th European Congress of Arachnology**. Rennes, France, August 2024. **Photograph** “*Buthus occitanus* in the heat of a French summer” elected second place in the Macrophotography category.

RESEARCH TALKS

- “Science on a Budget: A story about scorpions”. Léo Laborieux. Ss. Cyril and Methodius University of Skopje, North Macedonia, September 2024.
- “Biomechanics of venom delivery in South America’s first spitting scorpion”. Léo Laborieux. 34th European Congress of Arachnology, Rennes, France, August 2024. *Poster presentation*.
- “Biomechanics of venom delivery in South America’s first spitting scorpion”. Léo Laborieux. Groningen, The Netherlands, August 2024.
- “Micro-CT imaging reveals the euarthropod enrollment musculature”. Léo Laborieux. Supervised by Pr. Dr. Javier Ortega-Hernández, Dr. Sarah Losso, and Pr. Dr. Bregje Wertheim. *Online*.
- “Investigating the ecological basis of divergent visual evolution between two *Heliconius* butterflies”. Léo Laborieux. Supervised by Pr. Dr. Richard Merrill and José Borrero. *Online*.
- “Species delimitation should not be about species”. Léo Laborieux. Supervised by Pr. Dr. Bregje Wertheim. Uppsala, Sweden, August 2023.
- “Effect of DTP vaccination on infant mortality : Analysis of long-term data from Burkina Faso”. Léo Laborieux, Rowan Stanforth, Ruthvik Pallagatti, and Yoni Renous. Supervised by Dr. Henning Nottebrock. Université de Montpellier, France, 2023.
- “Hot topics: Epigenetics”. Lecture (1h30min). Léo Laborieux, Ruthvik Pallagatti. Supervised by Dr. Oliver Kaltz and Dr. Philippe Jarne. Université de Montpellier, France, 2023.
- “Venomics”. Lecture (30min). Léo Laborieux, under the supervision of Pr. Dr. Bregje Wertheim. University of Groningen, The Netherlands, 2023.
- “Flash talk: Pangenomics”. Laetitia Britschgi and Léo Laborieux. Supervised by Thomas Hackl. University of Groningen, The Netherlands, 2023.
- Commentary on Genomic Impact of Whaling in North Atlantic Fin Whales (Wolf et al., 2022). Anke Posma, Ekaterine Kikodze, Jessica Bainbridge and Léo Laborieux. Supervised by Pr. Dr. Per Palsboll. University of Groningen, The Netherlands, 2022.
- “Spatial Group Structure as a Determining Factor for Time Allocation in Greylag Geese”. Ekaterine Kikodze, Lakshya Chauhan, Léo Laborieux, and Ruthvik Pallagatti. Supervised by Pr. Dr. Jan Komdeur, Pr. Dr. Leo Beukeboom, Dr. Thomas Verschut and Dr. Mirjam Borger. University of Groningen, The Netherlands, 2022.
- “Biodiversité des Invertébrés Benthiques : Comparaison du Benthos de Deux Rivières de la Région PACA, la Torse et le Grand Torrent”. Emma Prevost, Léo Laborieux, Manon Sabathé and Vincent Mercadiel. Aix-Marseille Université, France, 2021.

OTHER SCIENTIFIC INVOLVEMENT

- Radio talks (e.g. France Bleu Provence) following the description of *Buthus balmensis*, going over the context of the discovery as well as the importance of French invertebrate assemblages.
- June 2023: TV appearance (TV5 Monde — L’écologie en action) on the same topic.
- *Myriafrance* fellow since 2019. *Myriafrance* is the French society of myriapodology, presided over by Jean-Jacques Geoffroy (MNHN, France).
- Volunteering work at the *Château-Musée des Papillons* in Tourette Levens, Alpes Maritimes department, France. Taxonomy and maintenance work on the entomological collections. Under the supervision of Lionel Carles.
- 2012 — Present : Captive rearing and breeding of various arthropod taxa — Scorpiones, Mantodea and Scolopendridae. 2019: first fully-documented captive breeding program for the Mediterranean banded centipede, *Scolopendra cingulata*