DAVID HUDRY

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EDUCATION

2022-2024 **University of Amsterdam**
Master of Biological Sciences (Ecology & Evolution track) **GPA: 8.14/10**

Quantifying Morphological Convergence in Snakes Across Ecological Niches: a multivariate comparative approach

Understand the extent of morphological convergence between snakes that have radiated to exploit different ecological niches (arboreal, terrestrial, fossil, aquatic). I quantified head, body, and tail shape in 437 snake species in 3 main European natural history museums. By examining specimens from different families and ecological groups, I seek to understand whether snakes with similar ecological adaptations exhibit convergent morphological traits. I used comparative phylogenetic methods to analyze the morphological data, assess morphological disparity within habitat-use groups, evaluate phylogenetic signal in the data and test convergence models using specialized statistical packages. This thesis has lead to the publication of 2 major papers in high-standard international journals **[1][4]**.

2019-2022 **University of Paris-Saclay**
Bachelor of Biology of Organisms & Ecology **GPA: 6.75/10**

Snake swimming : balance between endurance and physical perfomance

Analyzed swimming kinematics in five snake species (*N. helvetica, N. maura, V. aspis, H. viridiflavus, and Z. longissimus*) to investigate inter- and intra-specific differences in locomotor patterns. High-speed overhead recordings (Sony DSC-RX0M2G) were collected from individuals swimming in a controlled 12 m × 0.6 m swim lane. Each snake performed 10 consecutive trials, generating up to 20 video recordings per individual for quantitative kinematic analysis. Videos were processed using a dedicated R workflow to extract key kinematic variables, including head and tail amplitude, undulation frequency, undulation period, and centre-of-mass velocity. I then quantified variation across species and individuals using non-parametric statistical tests (Kruskal–Wallis & Dunn post-hoc comparisons). Additionally, each individual's maximal pulling force was measured with a calibrated force gauge to link muscular performance with swimming behaviour. This study has lead to the publication of one major paper in high-standard international journal **[3]**.

PUBLICATIONS

[1] Hudry, D. & Herrel, A. (2025). Divergent Paths, Convergent Heads: Morphological Adaptation of Head Shape to Habitat Use and Diet in Snakes. *Journal of Morpholy*, 286(11):1-14. DOI: 10.1002/jmor.70100

[2] Hudry, D. & Herrel, A. (2025). Extending the depth range of the Marine File Snake, *Acrochordus granulatus* (Schneider1799): First known record below 30 m. *Reptiles & Amphibians,* 32(1): e23719. DOI: 10.17161/randa.v32i1.23719

[3] Fosseries, G., Herrel, A., Godoy-Diana, R., Gautreau, E., Maroun, K., Traore, P., Lekayi, N., Fox, T., Lombardo, S., **Hudry, D.,** Patau, L., Aguilera, F., Heleno, S.A., Chateau, O., Gossuin, H., Bonnet, X. (2025). Intraspecific and interspecific variations in the swimming characteristics of snakes according to their lifestyle. *Zoological Research*, 46(6): 1339-1350. DOI: 10.24272/j.issn.2095-8137.2025.113

[4] Hudry, D. & Herrel, A. (2025). From head to tail: does habitat use drive morphological variation in snakes? *Journal of Evolutionary Biology* (under review)

SCHOLARSHIPS AND AWARDS

2023 **Madeleine Julie Vervoort Fonds -** Selected by the Travel Grant Committee of the Amsterdam University Fund for field survey on sea snakes in New Caledonia

CONFERENCE PROCEEDINGS

2024 World Congress of Herpetology WCH10, Congress, Kuching, Malaysia; oral presentation: *Morphological convergence of body and head shape in snakes*

2025 European Congress of Herpetology SEH, Congress, Bonn, Germany; oral presentation: *Ecological constraints and morphological diversity in snakes*

RESEARCH SKILLS

- **Advanced statistical analysis using RStudio**
- **Geometric morphometrics: tpsDig, tpsUtil, MorphoJ, SlicerMorph**
- **Herpetology expertise**
- **Capture–Mark–Recapture (CMR) field expertise**
- **Measurements on live snakes: calipers, assessment of sexual maturity, feces analysis, individual identification**
- **Experience with the GelSight tactile imaging technique**

LANGUAGE AND IT SKILLS

Languages Fluent in French; advanced English suitable for scientific translation

IT Regular use of MS Word, Excel & PowerPoint; Canva; Zotero; Rstudio

INTERESTS AND ACTIVITIES

2012 Level 1 of scuba-diving (ANMP)
2016 Level 2 of scuba-diving (FFESSM)
2020-2021 Clematis association office member (secretary in 2020; vice-president in 2021)
2022 The Biologist Association of Orsay office member (vice-president)
2022 Level 3 of scuba-diving (FFESSM)
2022 Society of the Study of Amphibian & Reptiles member (SSAR)
2023 Sea krait population monitoring in New Caledonia for 1 month (Nov; Literature Review)
2025 Dive guide; Dive Instructor MF1 (FFESSM)

REFEREES

Dr. Anthony Herrel (thesis supervisor)
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Dr. Xavier Bonnet
CEBC, Centre d'étude Biologiques de Chizé, UMR7372, CNRS, La Rochelle University, France
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