

Dr. Paul J. Huxley

Google Scholar

RESEARCH INTERESTS

I am a Postdoctoral Researcher in the Department of Statistics at Virginia Tech. I use statistical and mathematical models to better understand and predict patterns of covariation between life history traits in arthropods. I am generally interested in ecology across scales – understanding how current patterns of biodiversity reflect environmental conditions as well as historical patterns of evolution. Specifically, I am interested in advancing a mechanistic understanding of how thermal adaptation in arthropod disease vectors could affect VBD transmission risk and vector control effectiveness.

EDUCATION

2016 - 2021	PhD in Life Sciences, Imperial College London <i>Effects of resource availability on the temperature dependence of mosquito population fitness.</i> Supervised by Drs Kris Murray, Lauren Cator and Samraat Pawar.
2012 - 2015	MSc with Distinction in Biodiversity, Wildlife and Ecosystem Health University of Edinburgh. <u>Research project</u> : <i>Spatiotemporal range expansion of an invasive non-native species of bamboo in Satoyama agricultural systems</i>
2004	Certificate Trinity TESOL, Manchester College of Arts and Technology
1998 - 2002	BA Hons with 2:1 in History and Sociology, Staffordshire University Research project: <i>Indirect rule in British West African colonies</i> Received the Ray Jenkins Memorial Award for Outstanding Historical Research

RESEARCH SKILLS

Databases	Curated and contributed to the design and development of <u>VecTraits</u> – a fully open database that contains ecological trait data on arthropods.
Coding	R (extensive experience), <u>GitHub</u> (competent), Jupyter Notebooks (basic)
Computational ecology	Statistical and mathematical modelling of biological and ecological data on arthropods in R (e.g., the continuous-time and matrix projection models, non-linear thermal response fitting using NLLS and Bayesian approaches). Used high-resolution imaging to generate data for allometric analyses. Used aerial photographs, ERDAS Imagine, ArcGIS and binomial GLMs to map and analyse the spatiotemporal range expansion of a non-native invasive bamboo in Japanese agricultural systems.
Laboratory work	Designed and executed experiments to investigate the effects of resource availability and larval competition on the temperature dependence of population-level fitness in <i>Aedes aegypti</i> .
Fieldwork	Conducted field experiments to measure mosquito abundance and assist rainforest regeneration and invasive species initiatives in the Wet Tropics.

PUBLICATIONS

1. Pawar S, **Huxley PJ** *et al.* 2024. Variation in temperature of peak trait performance constrains adaptation of arthropod populations to climatic warming. *Nat. Ecol. Evol.* DOI: [10.1038/s41559-023-02301-8](https://doi.org/10.1038/s41559-023-02301-8)
2. Shocket MS, Caldwell JM, **Huxley PJ** *et al.* 2023. Modelling the effects of climate and climate change on transmission of vector-borne disease. In *Planetary health approaches to understand and control vector-borne diseases* (pp. 253-318). Wageningen Academic. DOI: [10.3920/9789004688650_012](https://doi.org/10.3920/9789004688650_012)
3. **Huxley PJ**, Murray KA, Pawar S, Cator LJ. 2022. Competition and resource depletion shape the thermal response of population fitness in *Aedes aegypti*. *Commun. Biol.* 5: 66. DOI: [10.1038/s42003-022-03030](https://doi.org/10.1038/s42003-022-03030)
4. **Huxley PJ**, Murray KA, Pawar S, Cator LJ. 2021. The effect of resource limitation on the temperature dependence of mosquito population fitness. *Proc. R. Soc. B.* 288: 20203217. DOI: [10.1098/rspb.2020.3217](https://doi.org/10.1098/rspb.2020.3217)
5. Shah HA, **Huxley P**, Elmes J, Murray KA. 2019. Agricultural land-uses consistently exacerbate infectious disease risks in Southeast Asia. *Nat. Commun.* 10, 4299. DOI: [10.1038/s41467-019-12333-z](https://doi.org/10.1038/s41467-019-12333-z)
6. **Huxley PJ** and Johnson LR. Thermal adaptation in aphids (*In preparation*).
7. **Huxley PJ**, Johnson LR, Cator LJ, Pawar S. Utility of the Euler-Lotka equation for predicting the temperature-and resource-dependence of population fitness in a disease vector (*In preparation*).

PRESENTATIONS

Invited talks and seminars

- 2023: [External] *Predictive Ecology Gordon Research Conference, USA*
Talk: Mechanistic vs. phenomenological models
- 2023: [Internal] *Department of Entomology, Virginia Tech, USA*
Seminar: Trait-based approaches to understanding thermal adaptation in arthropods
- 2022: [External] *MRC Unit The Gambia - Virtual*
Talk: Competition and resource depletion shape the thermal response of fitness in *Aedes aegypti*
- 2020: [Internal] *MRC Centre for Global Infectious Disease Analysis seminar, Imperial College London*
Talk: Resource limitation modulates the temperature-dependence of *Aedes aegypti* fitness

International conferences

- 2023: *British Ecological Society Annual Meeting – ICC Belfast*
Talk: Evaluating species- and population-level evidence for thermal adaptation in aphids
- 2021: *The Ecological Society of America Annual Meeting - Virtual*
Talk: Competition in depleting resource environments shapes the thermal response of mosquito fitness
- 2020: *British Ecological Society Annual Meeting – Virtual*
Poster: The effects of juvenile competition on the temperature-dependence of mosquito fitness
- 2020: *The Ecological Society of America Annual Meeting – Virtual*
Talk: [The effects of resource limitation on the temperature-dependence of mosquito fitness](#)
- 2019: *British Ecological Society Annual Meeting – ICC Belfast*
Talk: Nutritional limitation modulates the thermal dependence of fitness in *Aedes aegypti*

EMPLOYMENT AND TEACHING

- 2021 – present Postdoctoral Researcher, Department of Statistics, Virginia Tech, USA
- 2021 Research Associate, Life Sciences, Imperial College London, UK
- 2016 - 2021 Pre-sessional EAP Teacher, Centre for Academic English, Imperial College London, UK
- 2010 - 2015 Tutor of English for Academic Purposes, Ritsumeikan Asia Pacific University, Japan

AWARDS

- 2023 Virginia Tech Postdoc Travel Award (\$500) to give talk at BES Annual Meeting

OUTREACH AND PUBLIC ENGAGEMENT

- 2019 - 2020 Volunteer STEM Tutor for victims of the Grenfell Tower fire