

Ming Liu

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Education

University of Oxford

DPHIL IN ZOOLOGY, THESIS TITLE: EVOLUTION OF PHENOTYPIC DIVERSITY

• Supervisors: Prof Stuart A. West and Dr Guy A. Cooper

Oxford, United Kingdom

Oct. 2019 - Sep. 2023

National Taiwan University

MSC IN ENTOMOLOGY, THESIS TITLE: MULTITASKING AND THE EVOLUTION OF OPTIMAL CLUTCH SIZE IN FLUCTUATING ENVIRONMENT

• Supervisors: Prof Sheng-Feng Shen and Prof Chun-Che Chang

Taipei, Taiwan

Feb. 2016 - Feb. 2018

National Taiwan University

BSC (WITH HONS) IN ENTOMOLOGY

• Undergrad member of Insect Neurobiology Lab (Prof En-Cheng Yang; 2013-2015) and Insect Population Lab (Prof Toshinori Okuyama; 2015-16)
• Best in class for: Insect Taxonomy & Lab(ENT 2010), Microbiology(PPM1007), Genetics(ENT2002), and Mathematics for Life Scientists(LS5073)

Taipei, Taiwan

Sep. 2011 - Jan. 2016

Publication

1. **Liu, M.***, Wild, G., West, S. A. (2023). Equilibria and oscillations in cheat-cooperator dynamics. *Evolution Letters* 7 (5), 339-350. Link.
 2. Shen, S.-F.*, Reeve, H. K., Emlen, S. T., **Liu, M.**, Rubenstein, D. R. (2023). Group size and the resolution of insider-outsider conflict in animal societies. *Animal Behaviour* 205, 107-116. Link.
 3. Tsai, C.-Y.*, Huang, H.-T., **Liu, M.**, ..., Wu, C.-J., Liu, W.-T.* (2023). Associations of fine particulate matter exposure with sleep disorder indices in adults and mediating effect of body fat. *Atmospheric Pollution Research* 14 (10), 101886. Link
 4. Lin, Y.-H.[†], Chen, Y.-Y.[†], Rubenstein, D. R., **Liu, M.**, Liu, M., Shen, S.-F.* (2023). Environmental quality mediates the ecological dominance of cooperatively breeding birds. *Ecology Letters* (14226). Link
 5. **Liu, M.***, West, S. A., Wild, G. (2022). The evolution of manipulative cheating. *eLife* 11 (80611). Link
 6. Cooper, G. A.*, **Liu, M.**, Peña, J., West, S. A. (2022). The evolution of mechanisms to divide labour in microorganisms. *Nature Communications* 13 (195). Link
 7. Cooper, G. A.*, Frost, H., **Liu, M.**, West, S. A. (2021). The evolution of division of labour in structured and unstructured groups. *eLife* 10 (71968). Link
 8. **Liu, M.***, West, S. A., Cooper, G. A. (2021). Relatedness and the evolution of mechanisms to divide labour in microorganisms. *Ecology and Evolution* 11(21): 14475-14489. Link
 9. **Liu, M.**, Rubenstein, D. R., Cheong, S.-A., Shen, S.-F.* (2021). Antagonistic effects of long- and short-term environmental variation on species coexistence. *Proceedings of the Royal Society B: Biological Sciences* 288 (1958), 20211491. Link
 10. Tibbetts, E. A.*, **Liu, M.**, Laub, E. C., Shen, S.-F. (2020). Complex signals alter recognition accuracy and conspecific acceptance thresholds. *Philosophical Transactions of the Royal Society B: Biological Sciences* 375(1802), 20200482. Link
 11. **Liu, M.**, Rubenstein, D. R., Liu, W.-C., Shen, S.-F.* (2019). A continuum of biological adaptations to environmental fluctuation. *Proceedings of the Royal Society B: Biological Sciences* 286(1912), 20191623. Link
 12. **Liu, M.**, Rubenstein, D. R., Cheong, S.-A., Shen, S.-F.* (2018). Multitasking and the evolution of optimal clutch size in fluctuating environments. *Ecology and Evolution* 8(17), 8803-8817. Link
- **Liu, M.***, Bell-Roberts, L., Botero, C., Cornwallis, C. K., West, S. A. (2024). Capturing the influence of climatic variation and predictability on trait evolution. Under review in *Proc Soc B*.
 - Thomas, J. L.*, Wilson, D. J., **Liu, M.**, Bray, J. E., Griffin, A. S., Ghoul, M. (2024). The evolution & ecology of bacteriocin-mediated competition in natural populations of *Staphylococcus aureus*. In preparation for *ISME*.
 - **Liu, M.[†]**, Wu, S.[†], Hung, T.-M.[†], Colwell, R. K., ..., Chen, I.-C.*, Shen, S.-F.* (2024). Benign environment promote thermal trait diversity. In preparation for *Nat Ecol Evol*.

*: Correspondence, [†]: Co-first authorship

Experience

University of Oxford

POSTDOCTORAL RESEARCHER

• Bridge the gap between ecological theories and microbial communities experiments in Prof Kevin Foster's group

Oxford, United Kingdom

Oct. 2023 -

University of Oxford

DEMONSTRATOR AND TUTOR

• Teach in scientific writing course, mini-projects, math catch-up, biology labs, journal clubs, and problem-solving sessions
• Mentor or support PhD and master projects

Oxford, United Kingdom

Oct. 2019 -

Academica Sinica

RESEARCH ASSISTANT

- Continue the research projects from master program

Kenting National Park

SUBSTITUTION MILITARY OFFICER

- Compulsory service for the country

Part-time jobs

PRIVATE TUTOR

- Teach science, biology, and chemistry with Taiwanese or AP materials

Taipei, Taiwan
Apr. 2019 - Aug. 2019

Kenting, Taiwan
Apr. 2018 - Apr. 2019

Taipei, Taiwan
2012 - 18

Awards & Achievements

SHORTLISTED IN SCHMIDT SCIENCE FELLOWS (1/8 CANDIDATES NOMINATED BY OXFORD)

Jul. 2023

BEST SLIDE AWARD FROM EUROPEAN MEETING OF PHD STUDENT IN EVOLUTIONARY BIOLOGY (EMPSEB 28)

Jun. 2023

TRAVEL AWARD FROM INTERNAL SOCIETY OF BEHAVIOURAL ECOLOGY (ISBE 2022)

Aug. 2022

PRESIDENTIAL AWARDS FROM NATIONAL TAIWAN UNIVERSITY

2011 & 2012

SCHOLARSHIPS

OXFORD-TAIWAN AND OXFORD-NATURALMOTION GRADUATE SCHOLARSHIPS

2019 - 23

UNDERGRADUATE RESEARCH SCHOLARSHIP FROM MINISTRY OF SCIENCE AND TECHNOLOGY OF TAIWAN

2014 - 15

SERVICE

REVIEWER FOR PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B: BIOLOGICAL SCIENCES

2022

PRESIDENT OF OXFORD UNIVERSITY TAIWANESE STUDENT SOCIETY

2020 - 21

TREASURER OF OXFORD UNIVERSITY PHOTOGRAPHY SOCIETY

2020 - 22

Skills

PROGRAMMING AND THEORETICAL BIOLOGY

- Construct individual-based simulations for eco-evolutionary theories with genetic algorithm or Gillespie algorithm (C and Python)
- Derive analytical and numerical solutions for game theoretical models or differential equation systems (Mathematica and Python)
- Set up and manage Linux-based server (shell script)

BIOLOGICAL STATISTICS

- Time series analysis with autocorrelation or spectrum (R and Python)
- Comparative analysis with frequentist or Bayesian inference tools (phytools, phylolm, and MCMCglmm in R)

COMMUNICATION

- Project visualisation and management (R Markdown and Jupyter Notebook)
- Digital illustration and image processing (Adobe Illustrator, Photoshop, and Lightroom)

Presentations

SELECTED CONTRIBUTED TALKS

- European meeting for PhD students in evolutionary biology (EMPSEB 28, 2023); Millport, United Kingdom
- International Society of Behavioral Ecology (ISBE, 2016 and 2022); Exeter, United Kingdom and Stockholm, Sweden

SELECTED CONTRIBUTED POSTERS

- Understanding and predicting microbial evolutionary dynamics (2022); Manchester, United Kingdom
- Annual meeting of Microbiology Society (2021); Online
- Festival of ecology by British ecological society (2020); Online

SELECTED INVITED TALKS

- Monthly Webinar of Taiwanese Entomologists in the World (2021); Online
- Symposium of adapting to new challenges: evolution in humans, animals, and plants (2019); Taipei, Taiwan