

SYUAN-JYUN SUN, PhD

ADDRESS Department of Ecology and Evolutionary Biology, University of Michigan-Ann Arbor
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NATIONALITY Taiwanese

My research focuses on the ecology and evolution of species interaction, particularly parasitism and mutualism. The main goal is to explore how biodiversity persists under human pressure - how environmental changes impact species interactions, structure communities, and ultimately alter their ecosystem functions.

EMPLOYMENT

- 2021-present **University of Michigan - Ann Arbor**
Postdoctoral Research Fellow in Ecology and Evolutionary Biology
Local adaptation in host-parasite interactions in *Daphnia* and their fungal parasites (Grant to Dr. Meghan Duffy)
- 2020-2021 **National Taiwan University**
Postdoctoral Research Fellow/Co-PI in Institute of Ecology and Evolutionary Biology
Herbivore adaptation to environmental changes: a transgenerational study of aphids and their endosymbiotic bacteria under lady beetle and warming pressure (Recruitment of Visiting Science and Technology Personnel with Subsidies from Ministry of Science and Technology Project to Dr. Chuan-Kai Ho)
Postdoctoral Research Fellow in Institute of Ecology and Evolutionary Biology
Investigating how multiple climatic stressors impacts trophic interactions and ecosystem functions (Sustained Progress and Rise of Universities in Taiwan Project to Dr. Chuan-Kai Ho)
- 2019-2020 **University of Cambridge**
Postdoctoral Research Assistant in Department of Zoology
Investigating how genetic variation is linked to epigenetic processes using burying beetles as a model system (Royal Society Grant to Dr. Rahia Mashoodh)
- 2014-2015 **Taiwan Taipei District Court**
Justice administration substitute services
Alternative military service

EDUCATION

- 2015-2019 **University of Cambridge - PhD in Zoology**
Supervisor: Prof. Rebecca Kilner
Title: On the ecological transitions between parasitism and mutualism
Examiners: Prof. Greg Hurst (University of Liverpool) and Dr Edgar Turner (University of Cambridge)
Advisors: Prof. Nick Davies FRS and Dr Claire Spottiswoode

Focused on how environmental factors determined variation in interspecific interaction outcomes from mutualism to parasitism, using burying beetles and their phoretic mites as a model system.

- 2012-2014 **National Taiwan University** - MSc in Entomology
Supervisor: Prof. Ping-Shih Yang and Dr Sheng-Feng Shen
Title: Climate-mediated cooperation promotes niche expansion
Finished 1st in class of 11; GPA 4.24/4.30
Conducted field experiments on a large altitudinal scale with social group manipulation and experimental warming. This work has been done in collaboration with Dr Sheng-Feng Shen at Biodiversity Research Centre, Taiwan.
- 2008-2012 **National Taiwan University** - BSc in Plant Pathology and Microbiology
Minor in Entomology
Finished 3rd in class of 40; GPA 3.90/4.30

PUBLICATIONS

2020

8. **S.J. Sun*** and R.M. Kilner. 2020. Temperature stress induces mites to help their carrion beetle hosts by eliminating rival blowflies. *eLife*. 9:e55649 doi: [10.7554/eLife.55649](https://doi.org/10.7554/eLife.55649) IF: 8.14, 5/93 (Biology)
7. H.Y. Tsai, D.R. Rubenstein, B.F. Chen, M. Liu, S.F. Chan, D.P. Chen, **S.J. Sun**, T.N. Yuan, S.F. Shen*. 2020. Antagonistic effects of intraspecific cooperation and interspecific competition on thermal performance. *eLife*. 9:e57022 doi: [10.7554/eLife.57022](https://doi.org/10.7554/eLife.57022) IF: 8.14, 5/93 (Biology)
 - selected by Science Daily
 - featured on featured on EurekAlert
 - highlighted on *Nature Climate Change*
6. **S.J. Sun***, A.M. Catherall, S.C.M. Pascoal, B.J.M. Jarrett, S.E. Miller, M.J. Sheehan, and R.M. Kilner. 2020. Rapid local adaptation facilitated by phenotypic plasticity. *Evolution Letters*. 4:4. doi: <https://doi.org/10.1002/evl3.176> IF: 5.21, 10/50 (Evolutionary Biology)
 - featured on Cambridge Zoology website
5. M. Liu[†], S.F. Chan[†], D.R. Rubenstein, **S.J. Sun**, B.F. Chen, S.F. Shen*. 2020. Ecological transitions in grouping benefits explain the paradox of environmental quality and sociality. *The American Naturalist*. doi: 10.1086/708185 IF: 3.93, 34/168 (Ecology)
4. B.F. Chen, M. Liu, D.R. Rubenstein, **S.J. Sun**, J.N. Liu, Y.H. Lin, S.F. Shen*. 2020. A chemically triggered transition from conflict to cooperation in burying beetles. *Ecology Letters*. 23:3. doi: <https://doi.org/10.1111/ele.13445> IF: 9.49, 6/168 (Ecology)
3. **S.J. Sun**. 2020. On the ecological transitions between parasitism and mutualism (Doctoral thesis). <https://doi.org/10.17863/CAM.45796>

2019

2. **S.J. Sun***, N.P.C. Horrocks, and R.M. Kilner. 2019. Conflict within species determines the value of a mutualism between species. *Evolution Letters* 3:2. <https://doi.org/10.1002/evl3.109> IF: 4.60, 10/50 (Evolutionary Biology)
 - featured on *Science* editor's choice
 - featured on Cambridge University and Department of Zoology website
 - featured on *Evolution Letters* editor's blog
 - featured on featured on EurekAlert

2014

1. **S.J. Sun**, D.R. Rubenstein, B.F. Chen, S.F. Chan, J.N. Liu, M. Liu, W. Hwang, P.S. Yang, and S.F. Shen*. 2014. Climate-mediated cooperation promotes niche expansion in burying beetles. *eLife* 3: e02440. <https://doi.org/10.7554/eLife.02440.001> IF: 9.33, 3/85 (Biology)

- Master's thesis
- featured on *eLife* homepage

Preprint

S.J. Sun* and R.M. Kilner. Cryptic host specialization within *Poecilochirus carabi* mites explains population differences in the extent of co-adaptation with their burying beetle *Nicrophorus vespilloides* hosts. Preprint on *bioRxiv*. doi: <https://doi.org/10.1101/641936>

In preparation

S.J. Sun, X.Y. Lee, Y.J. Wang, W.P. Chuang, S.Y. Hwang, C.K. Ho*. Warming, elevated CO₂ and trophic interactions interactively affect crop performance and pest control in a soybean-aphid-ladybeetle system.

S.J. Sun, F. Pamatat, R.M. Kilner, and N.P.C. Horrocks*. Within-species interactions affect the evolutionary interests of co-evolving species.

S.J. Sun*, S. Chen, W. Federle, and R.M. Kilner. Biomechanics mediates spatial niche partitioning between phoretic mites on burying beetles.

S.J. Sun* and R.M. Kilner. Host synchronous hatching as an anti-parasite defence strategy.

†*equal contributions; *corresponding author*

AWARDS AND HONOURS

2020	Invited for interview, Presidential Postdoctoral Fellowship, Nanyang Technological University, Singapore
2020	Shortlisted for Research Fellowship Competition, St John's College, University of Cambridge, UK
2019	Shortlisted for Science Research Fellowship, Girton College, University of Cambridge, UK
2019	Outstanding Academic Achievement, Queens' College, University of Cambridge, UK
2018	Best Poster, Taiwan Scientific Symposium, University of Cambridge
2018	Best Student Talk (Pechakucha), Department of Zoology Seminar Day
2017	Best Student Talk, Taiwan Scientific Symposium, University of Oxford
2016	Selected for exhibition 150th Anniversary Zoology Department Photo Competition
2016	Best Student Talk, The Association for the Study of Animal Behaviour Easter Conference, Aberystwyth University, UK
2016	The Rosemary Grant Award, The Society for the Study of Evolution, awarded \$1,750 to support high impact research
2014	The Award of Academic Research Thesis in Master, College of Bioresources and Agriculture, National Taiwan University
2011	Outstanding College Youth, National Taiwan University
2011	College Student Research Training Program Fellowship, National Science Council, Taiwan

2008-2009 Presidential Awards, National Taiwan University

PRESENTATIONS

Invited Job Talks

- MAR 2021 *The impact of climate change in fragmented landscapes*
Professorship at Institute of Ecology, Peking University, China
- MAR 2021 *Linking biodiversity and ecosystem functioning: the impact of climate change in fragmented landscapes*
Professorship at the International Degree Program in Climate Change and Sustainable Development, National Taiwan University, Taiwan
- NOV 2020 *Species interaction, biodiversity and ecosystem function in a changing world*
Professorship at the Institute of Ecology and Evolutionary Biology, National Taiwan University, Taiwan
- NOV 2020 *Species interaction, biodiversity and ecosystem function in a changing world*
Professorship at the Department of Life Sciences, National Cheng Kung University, Taiwan

Invited Seminars

- OCT 2020 *Ecological transitions of symbiosis in a changing world*
Department of Entomology, National Taiwan University, Taiwan
- MAY 2020 *Friend and foe: the ecological drivers of the parasitism-mutualism continuum*
Institute of Ecology and Evolutionary Biology, National Taiwan University, Taiwan
- SEP 2019 *On the ecological transitions between parasitism and mutualism*
Biodiversity Research Center, Academia Sinica, Taiwan

Conferences

- JUL 2019 *Biomechanics mediates spatial niche partitioning between phoretic mites on the burying beetle host microhabitat*
Society for Experimental Biology Annual Meeting in Seville, Spain
- JUN 2019 *Conflict within species determines the value of a mutualism between species*
Cambridge Scholar Symposium (Cambridge Taiwanese Society and Cambridge University Hong Kong Postgraduate Scholars Association) at the University of Cambridge, UK
- AUG 2018 *Hot under the collar: a thermal by-product mutualism between burying beetles and their phoretic mites*
The International Society for Behavioural Ecology Conference at the University of Minnesota, USA
- OCT 2017 *The "mity" civil war: interspecific competition between phoretic mites and its fitness consequences on their burying beetle hosts*
MCR-SCR Talks at Queens' College, University of Cambridge, UK
- MAR 2016 *Variation in the extent of local adaptation between burying beetles and their phoretic mites*

The Association for the Study of Animal Behaviour Easter Conference, Aberystwyth University, UK

MAR 2014 *Climate-mediated cooperation promotes niche expansion*

International Union for the Study of Social Insects International Congress, Cairns Convention Centre, Queensland, Australia

GRANTS AND SCHOLARSHIPS

2019 Travel Grant Award, Queens' College, University of Cambridge - £350

2018 Research Studentship Award, Cambridge Philosophical Society - £1,500

2018 Travel Grant Award, Cambridge Philosophical Society - £300

2018 Travel Grant Award, Queens' College, University of Cambridge - £350

2018 Conference Fund, The Cambridge Commonwealth Trust - £500

2018 Conference Fund, Department of Zoology, University of Cambridge - £250

2018 Travel Award, The International Society for Behavioural Ecology - \$1,100

2018 The Hitchcock Fund, Department of Zoology, University of Cambridge - £500

2016 Conference Grant, The Association for the Study of Animal Behaviour - £193

2015-2019 Taiwan Cambridge Scholarship, full scholarship - £117,307

MENTORING AND TEACHING

In total, I have supervised three master's students and one PhD student.

2020-2021 Tutored Master's student projects, National Taiwan University
Support the student design experiment, collect and analyse data

2018 Tutored Zoology MSc project, University of Cambridge
Support the student design experiment, collect and analyse data, and write the report

2017 Tutored Zoology undergraduate project, University of Cambridge
Support the student design experiment, collect and analyse data

2014 Teaching assistant of The Ecology of Aquatic Insects, National Taiwan University

2014 Teaching assistant of Practical Entomology, National Taiwan University

2013 Teaching assistant of Insect Conservation, National Taiwan University

2013 Teaching assistant of Insects and the Life of Mankind, National Taiwan University

2012-2013 Teaching assistant of Introduction to Forest Biodiversity, National Taiwan University
Helped with teaching logistics, field trips, and group discussions

PROFESSIONAL EXPERIENCE

OCT 2020 Invited as a host and selection panel for Behaviour, Physiology and Organismal Biology in the 41th Annual Meeting of Taiwan Entomological Society.

JUL 2019 Completed "Biological interactions, from genes to ecosystems" summer school in integrative biology and ecology. Held near Toulouse (France) for a total of 48 hours of seminars and workshops by the TULIP LabEx training program. Twenty-two out

of 500 graduate students and post-doctoral researchers worldwide were selected by the pedagogical committee. Subsistence costs were fully covered.

OCT 2017 Completed “Structural equation modeling for ecologists and evolutionary biologists” held by PR Statistics at Margam Discovery Centre, Port Talbot, UK

OTHER EXPERIENCE

2015-2019 First team, awarded Half Blue, Cambridge University Badminton Club
2015-2019 Queens’ College Cambridge Badminton Club
2016-2017 Vice president, Cambridge Taiwanese Society

ADDITIONAL INFORMATION

MEMBERSHIP Society for Experimental Biology, Cambridge Philosophical Society, Society for the Study of Evolution, and The Association for the Study of Animal Behaviour

OUTREACH Research sharing in Guangfu Senior High School
Research sharing on *Us and STEMM*, CAM FM 97.2
Organised BioSalon monthly meeting in Cambridge Taiwanese Society

REVIEW Reviewed for Review College of British Ecological Society, *Journal of Applied Ecology*, *PeerJ*

LANGUAGES

Mandarin Native language
English Reading and writing: advanced; conversing: fluent. IELTS score: 7.5/9.0

REFEREES

Prof. Rebecca Kilner FRS, Department of Zoology, University of Cambridge,
rmk1002@cam.ac.uk, 01223 (3)31766

Prof. Nick Davies FRS, Department of Zoology, University of Cambridge,
nbd1000@cam.ac.uk, 01223 (3)34405

Dr. Nicholas Horrocks, Cambridge Institute of Therapeutic Immunology & Infectious Disease,
Department of Medicine, University of Cambridge,
nh415@cam.ac.uk