DAMIE PAK

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Education

2015 - 2020 **PhD in Biology**, *The Pennsylvania State University*, University Park.
Advisor: Ottar Bjørnstad
Thesis: Biological Timing across Multiple Ecological Scales and Systems

2011—2014 **BSc in Ecology and Evolutionary Biology**, *University of Michigan*, Ann Arbor.

Positions

2024—Now **Postdoctoral fellow (Tad Dallas Lab)**, *Arnold School of Public Health, University of South Carolina*.

2021—2024 **Postdoctoral associate (Megan Greischar Lab)**, *Department of Ecology and Evolutionary Biology, Cornell University*.

2021—2021 **Postdoctoral associate (Katriona Shea Lab)**, *Department of Biology, The Pennsylvania State University*.

2011—2015 **Research assistant (John Vandermeer Lab)**, *Department of Ecology and Evolutionary Biology, University of Michigan*.

Publication

Published

2024 **Damie Pak**, Tsukushi Kamiya, and Megan A Greischar. Proliferation in malaria parasites: how resource limitation can prevent evolution of greater virulence. *Evolution*, 2024.

2023 **Damie Pak**, Varun Swamy, Patricia Alvarez-Loayza, Fernando Cornejo-Valverde, Simon A. Queenborough, Margaret R. Metz, John Terborgh, Renato Valencia, Joseph S. Wright, Nancy C. Garwood, and Jesse L. Lasky. **Multiscale phenological niches of seed fall in diverse Amazonian plant communities**. *Ecology*, Volume 104(5), 2023.

2022 **Damie Pak**, Spencer Carran, David Biddinger, Bill Nelson, and Ottar N. Bjørnstad. **Incorporating diapause to predict the interannual dynamics of an important agricultural pest**. *Population Ecology*, Volume 64, 267–279, 2022.

2022 Barbara Joncour, William A. Nelson, **Damie Pak**, and Ottar N. Bjørnstad. **An integrated experimental and mathematical approach to inferring the role of food exploitation and interference interactions in shaping life history**. *Functional Ecology*, Volume 36, 1098–1112, 2022.

2020 Theresa W Ong, Kevin Li, Azucena Lucatero, **Damie Pak**, L'Oreal Hawkes, MaryCarol Hunter, and John Vandermeer. **Taylor Made Landscapes: Using Taylor's Law to Scale Between Metapopulations and Source-Sinks in Urban Garden Space**. *Frontiers in Sustainable Food Systems*, Volume 4, 46, 2020.

2019 **Damie Pak**, Steven B. Jacobs, and Joyce M. Sakamoto. **A 117-year retrospective analysis of Pennsylvania tick community dynamics**. *Parasites & vectors*, Volume 12, 1–13, 2019.

2019 **Damie Pak**, David Biddinger, and Ottar N. Bjørnstad. **Local and regional climate variables driving spring phenology of tortricid pests: a 36 year study**. *Ecological Entomology*, Volume 44(3), 367–379, 2019.

2019 Mario Novelo, Matthew D Hall, **Damie Pak**, Paul R Young, Edward C Holmes, and Elizabeth A McGraw. **Intra-host growth kinetics of dengue virus in the mosquito Aedes aegypti**. *PLoS pathogens*, Volume 15(12), 2019.

2019 William Nelson, Barbara Joncour, **Damie Pak**, and Ottar Bjørnstad. **Asymmetric interactions and their consequences for vital rates and dynamics: the smaller tea tortrix as a model system**. *Ecology*, Volume 100, 2019.

2019 Aaron L Iverson, David J Gonthier, **Damie Pak**, Katherine K Ennis, Robyn J Burnham, Ivette Perfecto, Mariangie Ramos Rodriguez, and John H Vandermeer. *A multifunctional approach for achieving simultaneous biodiversity conservation and farmer livelihood in coffee agroecosystems*. ***Biological conservation***, Volume 238, 108179. Elsevier, 2019.

2018 Daniel S Karp, Rebecca Chaplin-Kramer, Timothy D Meehan, Emily A Martin, Fabrice DeClerck, Heather Grab, Claudio Gratton, Lauren Hunt, Ashley E Larsen, Alejandra Martínez-Salinas, and others including **Damie Pak**. **Crop pests and predators exhibit inconsistent responses to surrounding landscape composition**. *Proceedings of the National Academy of Sciences*, Volume 115, 2018.

2015 **Damie Pak**, Aaron L Iverson, Katherine K Ennis, David J Gonthier, and John H Vandermeer. **Parasitoid wasps benefit from shade tree size and landscape complexity in Mexican coffee agroecosystems**. *Agriculture, Ecosystems & Environment*, Volume 206, 21–32, 2015.

Submitted

Submitted **Damie Pak**, Emily Howerton, William Probert, Micheal Runge, Ruiyun Li, Rebecca Borchering, Cecile Viboud, Ottar Bjørnstad, and Katriona Shea, **The value of information in age-prioritization of COVID-19 vaccination**.

In-review Kayla Zhang**, Damie Pak,** and Megan Greischar, **Using models to identify the causes of pre-symptomatic transmission from human infection data** (In revision for PNAS).

Fellowships & Awards

2018 *Life Science Symposium 2nd Prize for Poster Presentation*

2016, 2017 *Penn State Biology Travel Award*

2016 ***National Graduate Research Fellowship ($102,000)***

2015 *Penn State Biology's Braddock Supplement ($10,000)*

2015 *Verne M. Willaman Distinguished Graduate Fellowship ($34,000)*

2014 *EEB Travel, Research, and Internship Grant ($1,000)*

Talks

Invited Talks

2024 **Proliferation in malaria parasites: how resource limitation can prevent evolution of greater virulence.** Damie Pak, Tsukushi Kamiya, and Megan Greischar, *Society of Mathematical Biology,* (Seoul, South Korea).

2024 **Disease across scale and system**, *Damie Pak*, *University of South Carolina, (Columbia, SC)*.

2023 **Proliferation in malaria parasites: how resource limitation can prevent evolution of greater virulence**, *Damie Pak*, *University of South Carolina, (Columbia, SC)*.

2023 **Resource availability constrains the proliferation rate of malaria parasites**, *Damie Pak, Tsukushi Kamiya,and Megan Greischar*, *Society of Mathematical Biology, (Columbus,OH)*.

2020 **Climate and the spring phenology of tortricid moths from 1981 to 2016: Local temperatures and the North Atlantic Oscillation**, *Damie Pak, David Biddinger, Ottar Bjørnstad*, *Entomology Society of America (Virtual)*.

Contributed talks

2023 **Resource availability constrains the proliferation rate of malaria parasites**, *Damie Pak, Tsukushi Kamiya,and Megan Greischar*, *Ecological Society of America (Portland, OR)*.

2018 **Historical biodiversity of tick communities in Pennsylvania (1900-2017)**, *Damie Pak, Steven Jacobs, and Joyce Sakamoto*, *Entomology Society of America (Vancouver, Canada - Presented by JS)*.

2018 **Can we predict the range of a prospective biological control agent of weeds in a novel environment using demographic modelling?**, *Benno Augustinus, Damie Pak, Yan Sun, Sandra Citterio, Rodolfo Gentili, Ottar Bjørnstad, Heinz Müller- Schärer, and Urs Schaffner.*, *Entomology Society of America (Vancouver, Canada - Presented by BA)*.

2018 **The role of diapause in the developmental synchrony of an agricultural pest: a case study with the tortricid pest Cydia pomonella**, *Damie Pak, David Biddinger, Ottar Bjørnstad*, *Ecological Society of America (New Orleans, LA*).

2018 **Climate and the spring phenology of tortricid moths from 1981 to 2016: Local temperatures and the North Atlantic Oscillation. role of diapause in the developmental synchrony of an agricultural pest: a case study with the tortricid pest Cydia pomonella**, *Damie Pak, David Biddinger, Ottar Bjørnstad*, *Ecological Society of America (New Orleans, LA)*.

2015 **Species-specific generation cycles of tortrix moths and their effects on community dynamics**, *Damie Pak, David J. Biddinger, Ottar Bjørnstad*, *Ecological Society of America (Fort Lauderdale, FL)* .

2014 **Does diversity matter? Farm- and landscape-level vegetation diversity and structure effects on biocontrol**, *Aaron Iverson, Damie Pak, David J. Gonthier Katherine K. Ennis, John H. Vandermeer, Ivette Perfecto, and Robyn Burnham*, *Ecological Society of America (Sacramento, CA)* .

2014 **Ecosystem services in Mexican Coffee Farms: Role of biodiversity and vegetation structure**, *Aaron Iverson, Damie Pak, David J. Gonthier Katherine K. Ennis, John H. Vandermeer, Ivette Perfecto, and Robyn Burnham*, *Calvin College (Sacramento, CA)* .

2013 **Habitat and landscape heterogeneity positively influence biological control and natural enemy community composition in coffee agroecosystems.**, *Aaron Iverson, Damie Pak, David J. Gonthier Katherine K. Ennis, John H. Vandermeer, Ivette Perfecto, and Robyn Burnham.*, *Ecological Society of America (Minneapolis, MN)*.

Posters

2023 **Resource availability constrains the proliferation rate of malaria parasites.**, *Damie Pak, Tsukushi Kamiya, and Megan Greischar*, *EEID (University Park, PA)* .

2022 **How do within-host processes explain burst size in Plasmodium species?**, *Damie Pak, Tsukushi Kamiya, and Megan Greischar*, *Intercampus Cornell (New York City, NY) Symposium and EEID (Atlanta, GA)* .

2022 **Quantifying malaria transmission potential within the mosquito**, *Martina Morelli, Damie Pak, Courtney Murdock, and Megan Greischar*, *Intercampus Cornell (New York City, NY)*.

2022 **Evaluating the practical identifiability of a malaria model to assess conversion to transmissible stages**, *Anthony Raymond Krueger, Damie Pak, Megan Greischar, and Lauren M Childs*, *Biology and Medicine Through Mathematics Conference (Richmond, VA)*.

2021 **What causes pre-symptomatic transmission?**, *Kayla Zhang, Damie Pak, and Megan Greischar*, *Cornell EEB December Symposium (Ithaca, NY)*.

2018 **The role of diapause in the developmental synchrony of an agricultural pest: a case study with the tortricid pest Cydia pomonella**, *Damie Pak, David J. Biddinger, and Ottar Bjørnstad*, *Life Science Symposium (University Park, PA)*.

2018 **Dynamics of Pennsylvania tick communities over a century**, *Damie Pak, Steven B. Jacobs, and Joyce Sakamoto.*, *Graduate Exhibition at The Pennsylvania State University (University Park, PA)*.

2017 **Climate and the spring phenology of tortricid moths from 1981 to 2016: Local temperatures and the North Atlantic Oscillation**, *Damie Pak, David J. Biddinger, and Ottar Bjørnstad*, *Life Science Symposium (University Park, PA)*.

2017 **Tea Tortrix: Population dynamics of tortrix moth in Pennsylvania fruit orchards**, *Damie Pak, David J. Biddinger, and Ottar Bjørnstad*, *Life Science Symposium (University Park, PA)*.

2014 **The effect of local practices and landscape composition affect local parasitoid populations.**, *Damie Pak, Aaron Iverson, Katherine K. Ennis, David J. Gonthier, John Vandermeer, and Ivette Perfecto*, *Ecological Society of America (Sacramento, CA)*.

2014 **Ecosystem service optimization in coffee agroecosystems**, *Aaron Iverson, Damie Pak, David J. Gonthier Katherine K. Ennis, Kaleigh Fisher, John Vandermeer, Robyn Burnham, and Ivette Perfecto*, *10th Early Career Scientists Symposium (Ann Arbor, MI)*.

2014 **Flying pests and natural enemy dispersal in an urban system**, *Theresa Wei Ying Ong, L'Oreal Hawkes, Damie Pak, Azucena Lucatero, and John Vandermeer*, *10th EarlyCareer Scientists Symposium (Ann Arbor, MI)*.

2014 **Coupled Socio-ecology dynamics of urban garden**, *Lesli Huey, Ivette Perfecto, John Vandermeer, Carolina Simao, Theresa Ong, Paul Glaum, Danielle Rivera, Allison Sponseller, Naim Edwards, Chatura Vaidya, Kelly Mcgrall, L'Oreal Hawkes, Hillary Hunt, Natalie Imerzian, Azucena Lucatero, Brandon Bonariuk, Sonali Devaratan, Damie Pak*, *Cubed Symposium (Ann Arbor, MI)*.

Service

Mentorship

2021-2023 Kayla Zhang (undergraduate, Cornell University).

Workshop

2022 Led a workshop **Intro to ggplot2** (Cornell University).

2021 Led a workshop **Intro to ggplot2** (The Pennsylvania State University).

2020 Created a new graduate student group **Data Viz for the Life Sciences** (The Pennsylvania State University).

2019 Led a workshop **Intro to ggplot2** (The Pennsylvania State University)).

2017—2018 Organized workshops on professional development for the Center of Infectious Disease Dynamics (The Pennsylvania State University) .

Positions

2023 **Co-representative** for the postdoctoral employees in Cornell EEB.

2020 **Treasurer** of the Center for Infectious Disease Graduate Student (The Pennsylvania State University).

2017—2018 **Vice-President** of the Center for Infectious Disease Graduate Student (The Pennsylvania State University).

Reviewed for

PNAS.

American Naturalist.

Scientific Reports.

PLoS Computational Biology.

Arthropod-Plant Interaction.

Membership

Ecological Society Of America.

Society of Mathematical Biology.

OSTEM.

Teaching

2024 Guest lecturer for **Infectious disease modeling** at University of South Carolina.

2021—2022 Guest discussion for **EEB Core Course** at Cornell University.

2022 Guest lectured for **Applied Biostatistics** at The Pennsylvania State.

2022 Guest lectured for **Ecology of Infectious Disease** at Cornell University.

2021 Guest lectured for **Wildlife Disease Ecology Undergraduate Seminar** at Macalester University.

2019 Guest lectured for **Ecological and Environmental Problem Solving** at The Pennsylvania State University.

2019 Guest lectured for **Introduction to Biology** at The Pennsylvania State University.

2017—2018 Teaching assistant for **Introduction to Biology** at The Pennsylvania State University.

2017 Pedagogy training **Supervised Experience in College Teaching** at The Pennsylvania State University.

2016 Pedagogy training **Experiential Teaching in Biology** at Pennsylvania State University.

Outreach

2020 **Coding for Her** Assisted in a workshop to teach graduate students and faculty to code in R .

2016-2019 **Great Insect Fair** Volunteered at an event designed to showcase entomology to the public.

2018 **Community Education Extended Learning Outreach** Volunteered to prep materials for a NSF-funded outreach event at Ferguson Township Elementary School.

2016-2017 **PJAS State Competition** Served as a judge for students (K-12) presenting their independent research.

2017 **Ask a Scientist Booth Climate March** Engaged with the public about the role of climate change on insects.

2016 **EYH STEM Career Day** Volunteered at a STEM-outreach for young girls interested in the STEM fields.

2016 **EYH STEM Career Day** Volunteered at a STEM-outreach for young girls interested in the STEM fields.

2016 **Integrated Pest Management Elementary School Visit** Visited an elementary school in the State College Area to talk to young children about IPM.

2015 **Haunted U** Halloween-themed scientific activities directed towards K-5th grade students.