

Tobias Gerhard Mueller

Community Ecologist, Data Scientist, Educator

tm524@cornell.edu | <https://orcid.org/0000-0002-6127-3091> | tobiasgmuller.com

Education

Ph.D. Entomology

Scheduled defense: March 2026

Cornell University — Ithaca, NY

Advised by Scott McArt and Bryan Danforth

B.S. Environmental Science and Management, *with honors*

2017

University of California, Davis — Davis, CA

Focus: Ecology, Biodiversity, and Conservation

Departmental Citation for Outstanding Undergraduate Accomplishments, 2017

Professional Appointments

Lab Manager & Staff Researcher

2019 - 2021

Vannette Lab, UC Davis Department of Entomology

- Managed an environmental microbiology lab: responsible for lab safety training, chemical inventory, purchasing orders, and maintenance of lab equipment
- Led experiments on community formation of flower nectar microbes, antimicrobial nectar proteins, and the impacts of nectar microbes on pollination
- Created a custom identification library using MALDI-TOF mass spectrometer for high throughput identification of unknown microbes to species

Campus Head Steward

2020 - 2021

UAW5810, Postdoc and Academic Researchers Union

- Elected as first UC Davis campus head steward representing approx. 12,000 postdocs and academic researchers
- Met with the majority of UC Davis researchers to explain their rights and help resolve problems

Field Technician

2019

Sacramento Yolo County Mosquito Vector Control District

- Implemented Integrated Pest Management (IPM) practices for scouting and treating mosquito source populations
- Provided public outreach to citizens about mosquito abatement practices
- Sampled mosquito populations to quantify the prevalence of west nile virus

Staff Researcher

2018 - 2019

Rosenheim Lab, UC Davis Department of Entomology

- Designed, led, and analyzed lab and field experiments to improve California citrus IPM guidelines

- Coordinated research between farmers and agricultural groups including managing a large database of confidential grower crop information and representing the lab at regular extension meetings and conferences

Undergraduate Research Assistant

2015 - 2017

Rosenheim Lab, UC Davis Department of Entomology

- Conducted multi-year field sampling in alfalfa and cotton across California including behavioral assays of beneficial insects
- Conducted independent research on insect viral-behavioral interactions and the related metabolomic impacts

Publications

Mueller, T., Buckner, M. (2025) UAV-based Remote Sensing of Bee Nesting Aggregations with Computer Vision for Object Detection. *BioRxiv*. doi: [10.1101/2025.06.16.659683](https://doi.org/10.1101/2025.06.16.659683), submitted.

Page, M., Davis, J., Glasser, S., Kusi, E., Lindsay, S., McCormick, E., **Mueller, T.**, Ng, WH., Pinilla-Gallego, M., Valdes, L., Van Wyk, J., Weiss, T., Irwin, R., Adler, L., McArt, S. (2025) Mechanisms and Consequences of Plant-Pollinator-Pathogen Interactions. *Annual Review of Ecology, Evolution, and Systematics*. doi: [10.1146/annurev-ecolsys-102723-042847](https://doi.org/10.1146/annurev-ecolsys-102723-042847)

Mueller, T., Baert, N., Muñiz, P., Sossa, D., Danforth, B., McArt, S. (2024) Pesticide risk during commercial apple pollination is greater for honeybees than other managed and wild bees. *Journal of Applied Ecology*. doi: [10.1111/1365-2664.14661](https://doi.org/10.1111/1365-2664.14661)

Francis, J., **Mueller, T.**, Vannette, R. (2023) Dispersal overwhelms variation in host quality in shaping deterministic nectar microbiome assembly. *New Phytologist*. doi: [10.1111/nph.19195](https://doi.org/10.1111/nph.19195)

Mueller, T., Francis, J., Vannette, R. (2023) Nectar compounds can impact the growth of microbes and shift community dynamics in floral nectar. *Environmental Microbiology Reports*. doi: [10.1111/1758-2229.13139](https://doi.org/10.1111/1758-2229.13139)

Kahl, H., **Mueller, T.**, Cass, B., Xi, X., Cluff, E., Rosenheim, J. (2022) Herbivory by European Earwigs (*Forficula auricularia*; Dermaptera: Forficulidae) on Commonly Cultivated California Citrus Species. *Journal of Economic Entomology*. doi: [10.1093/jee/toac030](https://doi.org/10.1093/jee/toac030)

Vannette, R., Hall, G., McMunn, M., **Mueller, T.**, Munkres, I., Perry, D. (2021) Culturable bacteria are more common than fungi in floral nectar and are more easily dispersed by thrips, a ubiquitous flower visitor, *FEMS Microbial Ecology*. doi: [10.1093/femsec/fiab150](https://doi.org/10.1093/femsec/fiab150)

Kahl, H., **Mueller, T.**, Cass, B., Xi, X., Cluff, E., Grafton-Cardwell, B., Rosenheim, J. (2021) Characterizing Herbivory by European earwigs (Dermaptera: Forficulidae) on Navel Orange Fruit. *Journal of Economic Entomology*. doi: [10.1093/jee/toab121](https://doi.org/10.1093/jee/toab121)

Cass, B., Kahl, H., **Mueller, T.**, Xi, X., Grafton-Cardwell, E., Rosenheim, J. (2020) Profile of fork-tailed bush katydid (*Scudderia furcata* Orthoptera: Tettigoniidae) feeding on fruit of clementine mandarins. *Journal of Economic Entomology*. doi: [10.1093/jee/toaa258](https://doi.org/10.1093/jee/toaa258)

Cass, B., Hack, L., **Mueller, T.**, Buckman, D., Grafton-Cardwell, E., Rosenheim, J. (2020) Arthropod infestation levels on mandarins in California. *Journal of Economic Entomology*, 113: 2335–2342. doi: [10.1093/jee/toaa141](https://doi.org/10.1093/jee/toaa141)

Mueller, T., Kahl, H., Cass, B., Grafton-Cardwell, E., Rosenheim, J. (2019) Differential impacts of citrus thrips, *Scirtothrips citri* (Thysanoptera: Thripidae), across sweet orange and mandarin species. *Journal of Economic Entomology*, 112: 2767–2773. doi: [10.1093/jee/toz178](https://doi.org/10.1093/jee/toz178)

Rosenheim, J., Booster, N., Culshaw-Maurer, M., **Mueller, T.**, Kuffel, R., Law, Y., Goodell, P., Pierce, T., Godfrey, L., Hunter, W., Sadeh, A. (2019) Disease, contagious cannibalism and associated population crash in an omnivorous bug, *Geocoris pallens*. *Oecologia*, 190: 69–83. doi: [10.1007/s00442-019-04407-y](https://doi.org/10.1007/s00442-019-04407-y)

Presentations

Mueller, T., Calixto, A. (2025) New York State Neonicotinoid Training. SAGES symposium. Geneva, NY. Poster.

Mueller, T., Danforth, B., McArt, S. (2023) Antimicrobial properties of glands in solitary ground nesting bees may control brood cell microbial community. Cornell Jugatae Entomology Research Symposium. Ithaca, NY. Oral Presentation.

Mueller, T., Danforth, B., McArt, S. (2022) Antimicrobial properties of glands in solitary ground nesting bees may control brood cell microbial community. Joint annual meeting, Entomological society of America. Vancouver, CA. Oral Presentation.

Mueller, T., Zhao, C., Sossa, D., Baert, N., McArt, S. (2022) Pesticide risk during apple pollination differs between honey bees and native wild bees. Cornell Jugatae Entomology Research Symposium. Virtual. Oral Presentation.

Mueller, T., Zhao, C., Sossa, D., Baert, N., McArt, S. (2022) Pesticide risk during apple pollination differs between honey bees and native wild bees. American Bee Research Conference. Virtual. Oral Presentation.

Mueller, T., Kahl, H., Cass, B., Rosenheim, J. (2018) Susceptibility to citrus thrips (*Scirtothrips citri*) across citrus species. Conference of the Association of Applied IPM Ecologists, Visalia, CA. Oral Presentation.

Rosenheim, J., Grafton-Cardwell, E., Cass, B., Kahl, H., **Mueller, T.** (2018) Improving pest management for California mandarins. California Citrus Conference, Visalia, CA. Poster.

Mueller, T., Rosenheim, J. (2017) Testing pathways of viral induced cannibalism in *Geocoris pallens*. UC Davis Undergraduate Research Conference, Davis, CA. Poster.

Fellowships and Grants

Atkinson Center for Sustainability Graduate Research Grant \$7,278	2024
Griswold Endowment Grant \$1,500	2023
Rawlins Award \$750, \$875	2023, 2025
Cornell Graduate School Conference Grant \$500, \$500	2023, 2025

NSF Graduate Research Fellowship \$159,000	2021
Cornell Entomology Fellowship \$15,000	2021
UC Davis Provost Undergraduate Research Fellowship \$980	2017
Tracy and Ruth Storer Zoological Scholarship \$500	2015

Outreach and Extension

New York State Neonicotinoid Training 2024

Created and narrated the Introduction to Neonicotinoid Insecticides, a required training for all neonicotinoid pesticide applicators in New York State. Within 6 months it became the most watched extension training created by Cornell and is being adapted to use in other states across the nation.

Honeybee lab student engagement 2025

Led an educational field trip for an undergraduate residential group about beekeeping and honeybee research at the Cornell Dyce Lab for Honeybees.

Insectapalooza 2022-2025

Manned a table with live insects and interactive displays at the annual Cornell Insectapalooza, an entomology open house event with an annual attendance of over 3,000 individuals.

Cornell Jugatae Symposium Committee 2021-2024

Organized guest speakers, presentations, and catering for the Cornell Entomology research symposium with an annual attendance of ~70 individuals.

UC Davis Arboretum 2020

Created outreach materials to educate gardeners on plant-pollinators interactions and planting native pollinator gardens.

California Native Plant Society 2020

Produced educational pamphlets on native butterflies and urban insects of the Sacramento, CA region.

Citrus Extension Field Days 2018-2019

Led educational field days to teach local growers and stakeholder about citrus pests and current research.

Print Journalism

Interviewed and featured in:

- The Cortland Standard - "Bee-coming a citizen scientist"
- The Cortland Standard - "A 'wild' idea takes root"

Public Outreach Talks

- Caroline Elementary, Grade 2 — 30 attendees
- Dryden Elementary, Grade 5 — 25 attendees
- Museum of the Earth, Mixed age — 20 attendees
- Southworth Library, Adult — 30 attendees
- Dryden Elementary, Grade 5 — 40 attendees
- St. Mark's High School, Highschool — 30 attendees
- Ithaca Science Center, Mixed age — 25 attendees
- Kendal Retirement Home, Adult — 50 attendees

- Cortland, NY 4H class, Mixed school age — 20 attendees
- Southworth Library Earth Day, Mixed age — 110 attendees
- Caroline Elementary, Grade 2 — 36 attendees
- Ithaca Children's Garden, Elementary — 50 attendees

Teaching and Mentorship

Undergraduate Theses

2024- 2025

Independently mentored two undergraduate thesis projects. Advised project creation, funding acquisition and grant writing, data collection, and analyses.

Applied Statistics: Biological Experiments in Practice

2025

Teaching assistant for ENTOM 3030: Applied Statistics. Helped a range of students, freshman to graduate students, learn how to design ecological experiments and conduct statistical analyses.

Field Biology

2023, 2024

Taught the Entomology unit of NTRES 2100: Field Biology. Presented a 1-hour lecture and led 14 hours of hands-on outdoor labs to introduce pollinator networks and calculating species-area curves.

The Bee Course

2024

Teaching assistant for The Bee Course, a workshop to train interdisciplinary attendees in wild bee identification, systematics, and ecology at the Southwestern Research Station in Portal, AZ.

Journals Reviewed For

Journal of Applied Microbiology

Environmental Entomology

Science of the Total Environment

Phytoparasitica

New Phytologist

Certifications and trainings

New York State Certified Pesticide Instructor

2024

Part 107 FAA Licensed Drone Pilot

2023

Society of Environmental Toxicology and Chemistry Pesticide Risk Assessment for Pollinators

2021

UndocuAdvocate Program for Educators

2021