

# Tobias Gerhard Mueller

NSF Graduate Fellow Cornell ◆ Atkinson Research Fellow

McArt Lab ◆ Danforth Lab

Department of Entomology, Cornell University, Ithaca, NY

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## Education

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### Ph. D. | Entomology

2021 - present

Advised by Scott McArt and Bryan Danforth  
Cornell University — Ithaca, NY

### B. Sc. with honors | Environmental Science and Management

2014 - 2017

Focus on Ecology, Biodiversity, and Conservation  
University of California, Davis — Davis, CA

## Professional Appointments

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### Campus Head Steward

Feb 2020 - June 2021

UAW5810, Postdoc and Academic Researchers Union

- Elected as first ever UC Davis campus head steward
- Seated on the union leadership body representing approx. 12,000 postdocs and academic researchers
- Personally met with the majority of academic researchers hired at UC Davis to explain their rights and deal with problem resolution

### Lab Manager | Staff Researcher

Oct 2019 - June 2021

Vannette Lab, UC Davis Department of Entomology

- Oversaw and managed research lab of approx. 10 people
- Conducted experiments on flower nectar microbes looking at community formation, antimicrobial nectar proteins, and the impacts of nectar microbes on pollination
- Constructed a MALDI-TOF custom identification library to allow for high throughput identification of unknown microbes to species in minutes

### Field Technician

Jun 2019 - Oct 2019

Sacramento Yolo County Mosquito Vector Control District

- Scouted and treated mosquito source populations to stop the spread of west nile virus
- Provided public outreach to citizens about mosquito abatement practices
- Sampled and collected mosquito populations to quantify the prevalence of west nile virus
- Implemented Integrated Pest Management (IPM) treatment practices to stop mosquito pesticide resistance

### Staff Researcher

Feb 2018 - June 2019

Rosenheim Lab, UC Davis Department of Entomology

- Designed and ran experiments both in the lab and field which led to the rewriting of California citrus IPM guidelines
- Oversaw and managed a large database of confidential grower crop information
- Served as a liaison for farmers and agricultural groups by disseminating information and coordinating research
- Attended and presented regularly at citrus extension meetings and conferences
- Analyzed experimental data on pest impacts across citrus species

## Rosenheim Lab, UC Davis Department of Entomology

- Conducted multi-year field sampling in alfalfa and cotton across California
- Performed behavioral assays of beneficial insects
- Received university funding to develop and pursue independent research on insect viral-behavioral interactions and their related metabolomic impacts

**Publications, peer reviewed**

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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)

**Academic presentations**

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**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. Talk

**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. Talk

**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. Talk

**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. Talk

**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. Talk

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 awards**

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Atkinson Graduate Research Grant	2024
Griswold Endowment Grant	2023
Rawlins Travel Grant	2023
NSF Graduate Research Fellowship	2021
Cornell Entomology Fellowship	2021
UC Davis Provost Undergraduate Research Fellowship	2017
Tracy and Ruth Storer Zoological Scholarship	2015
Departmental Citation for Outstanding Undergraduate Accomplishments	2017
UC Davis Research Scholarship Program in Insect Biology	2015

## **Teaching**

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### **Field Biology**

Taught the entomology unit of NTRES2100 (field biology), consisting of 1 hour lecture and 14 hours of hands-on outdoor labs. Students conducted experiments to create pollinator networks as well as calculate species area curves.

## **Outreach and Extension**

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### **Insectapalooza**

Took part in the annual Cornell entomology open house day, interacting with 100s of individuals each year. The event in total has an annual attendance of over 3,000 individuals.

### **Cornell Jugatae Symposium Committee**

Organized the annual Cornell entomology research symposium with an annual attendance of ~70 individuals from 2021-2024

## **UC Davis Arboretum**

Created outreach materials to educate gardeners on how plants are used by pollinators and which native plants should be bought when establishing a pollinator garden.

## **California Native Plant Society**

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

## **Citrus Extension Field Days**

Helped lead field extension days, bringing local growers and stakeholder to field sites to learn 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 — 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 — 25 attendees
- Kendal retirement home, Adult — 50 attendees
- Cortland, NY 4H class, Mixed school age — 20 attendees
- Southworth library earth day, Mixed — 110 attendees
- Caroline Elementary, Grade 2 — 36 attendees
- Ithaca Children's Garden, Elementary — 50 attendees

## **Professional Memberships** \_\_\_\_\_

Entomological Society of America

California Lichen Society

## **Journals Reviewed For** \_\_\_\_\_

Journal of Applied Microbiology

Environmental Entomology

Science of the Total Environment

Phytoparasitica

## **Special trainings attended** \_\_\_\_\_

SETAC Pesticide Risk Assessment for Pollinators

2021

