

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Entomology Stridulations

A Newsletter of The Ohio State University Department of Entomology

Autumn 2020

Department Announcements

From the Chair, Dr. Jamie Strange



To say that autumn 2020 was an unusual semester would be an understatement, yet we have made it halfway through the academic calendar. We are still mostly working from home, but our labs and classrooms still remain active. The department started the fall semester with most of our classes online, but a few still had in-person lectures and labs. It is amazing to me, but our faculty managed to keep teaching in person as long as Ohio State allowed it, right up to Thanksgiving break. The effort to continue offering our courses both online and in person will continue this spring, and our faculty and graduate associates continue to work hard to modify courses so that we can deliver content safely and effectively. Our Seminar Series will remain online for the spring semester. Please be sure to check our [website](#) for our speaker lineup.

While research and extension have required extra effort this year, the department has remained productive, evidenced by the selected publications and events highlighted in this edition of our departmental newsletter. Our faculty, staff, and students have modified their work to deliver valuable outreach and extension to our stakeholders.

It wasn't without some bumps along the way, but we managed to move our Wooster-based operations from Thorne Hall and Annex into the new Wooster Science Building in December. This was a herculean effort led by Andy Michel and Jim Hacker. The official ribbon cutting occurred on January 14, even though we continue to move items from Thorne Hall and unpack the labs and offices. Once we can meet safely, we will hold an open house so everyone can come see our new home, which includes modern open labs and office space, a cafe, and the United Titanium Bug Zoo (more below) located in the lobby. Watch the [ribbon-cutting ceremony](#).

Sadly, I need to note the passing of two former faculty members this fall. Dr. Bob Treece, a faculty member from 1958 to 1991 passed away in November. In December, Dr. Harry Niemczyk, who was on faculty from 1964 to 1992, passed away. Finally, we lost a former graduate student, Alejandro Chiriboga, in December. Dr. Chiriboga worked with Dan Herms until 2014.

As we start 2021, we are hopeful that we can return to a more normal way of operating in the coming months. We will be interviewing candidates for a new specialty crop entomologist position in March and hope to welcome a new faculty member this year. Our graduate student recruitment will be virtual this spring, but as always, we have a strong slate of applicants. We continue to look for ways to grow and improve in the current, challenging environment, and we wish you all a fruitful 2021.

Featured Labs



Dr. Reed Johnson is an associate professor in the Department of Entomology. Johnson's research supports the health of honey bees in the face of the many challenges these pollinators face. His work explores the toxicity of pesticides and pesticide mixtures used in modern agriculture, including those used in almond orchards during bloom, and pesticides used in corn and soybeans. Development of new controls for Varroa mites, a devastating parasite of honey bees, is an area of ongoing research. The availability of flowers in modern environments is also a challenge for honey bees, and his lab has been using DNA sequencing to identify the plants that are most beneficial for bees through analysis of pollen in honey and hive products. This work has identified soybean nectar as a potentially important source of food

for bees, and his lab is collaborating with soybean researchers to explore ways to maximize benefits for both beekeepers and soybean growers. He is based at CFAES Wooster, but members of his lab also work at the Rothenbuhler Honey Bee Research Laboratory at CFAES' Waterman Agricultural and Natural Resources Laboratory on Ohio State's Columbus campus. He teaches a course on the biology and husbandry of honey bees and co-teaches a course on pesticide science.



Dr. Megan Meuti is an assistant professor in the Department of Entomology, and a Buckeye through and through, graduated in 2008 from Ohio State with her bachelor's degrees in entomology and microbiology, and she completed her PhD in Dr. David Denlinger's Insect Physiology Lab at Ohio State in 2014. After teaching at Kenyon College for one year as a visiting professor, Meuti joined the Department of Entomology faculty in August 2016. Megan's lab studies the northern house mosquito, *Culex pipiens*. Females of this species transmit West Nile virus and survive the winter by entering a hibernation-like state called diapause. Meuti and her students seek to determine how mosquitoes can anticipate winter's arrival, when mosquitoes enter and terminate diapause in the field, and how human-

mediated changes in the environment such as light pollution and increased temperatures in cities are affecting seasonal responses and disease transmission. The ultimate goal of this work is to effectively deploy existing control measures and develop new tools to manage these deadly pests. Currently, Meuti advises four graduate students and eight undergraduate student researchers. In addition to her research, Meuti teaches the department's graduate-level insect physiology lecture and lab courses, and two online general education courses for undergraduates.

Outreach

Highlights From Summer and Autumn 2020

Support the Bug Zoo's big move to the new science building!



\$50,000

200%

Raised toward our \$25,000 Goal
165 Donors



PROJECT HAS ENDED

Project ended on September 30, at 11:59 PM EDT

> Project Owners



Jeni Filbrun

[United Titanium Bug Zoo](#)

Ohio State Professor Emeritus Lowell (Skip) Nault and local company, United Titanium, Inc., were instrumental in doubling our original fundraising goal with donation-match challenges. Thank you to the many who contributed!

While cabinetry and finishing of the new Bug Zoo space is wrapping up at the newly established “heart” of CFAES Wooster, Department of Entomology Program Coordinator Jeni Filbrun has been maintaining arthropod colonies and collections amid the monumental Thorne Hall packing and moving efforts. Filbrun is also designing and creating dozens of enclosures for the United Titanium Bug Zoo’s inhabitants. The full arthropod collection will be moved into the new space after all appropriate USDA inspections and APHIS permits are in place, perhaps by April 2021.

Jeni Ruisch

[Columbus Bug Zoo](#)

Although summer 2020 threw Jeni Ruisch many curveballs, she successfully adapted outreach events to digital audiences and connected with 1,000-plus kids through dozens of events designed to bring science—and critters—to people via their screens. Ruisch offered weekly, family-focused bug box presentations via Zoom. These presentations attracted a highly varied attendance, with some familiar faces present each week. Summer camp collecting trips and bug box events moved online, resulting in digital presentations that engaged campers in new ways. COSI’s “Big Science” event was originally planned as a huge in-person event in downtown Columbus; however, it successfully shifted to a well-attended, multiday online event, with Ruisch connecting to about 650 homes during her session.

Ruisch plans to continue to provide Columbus Bug Zoo’s digital outreach to schools and at home groups, focusing on ways to get kids more engaged while interacting with screens, as she prepares for in-person outreach to make its comeback.

Denise Ellsworth, Pollinator Education

beelab.osu.edu/

The online course Eastern Bees 101 was developed and beta-tested in 2020. It features readings and videos by author and content expert Olivia Carril. Fifty-eight participants attended this introductory course, which focuses on bee biology and identification. The course content is being modified for a wider audience in 2021.

In October, the One Week (Virtual) Insect University attracted participants for daily webinars with pollinator experts, including Jamie Strange, Heather Holm, Olivia Carril, Jennifer Thieme, and Doug Tallamy. An average of 380 attendees took part in these educational sessions each day.

The Ohio Bee Survey is a statewide community science survey to find and identify bee species in Ohio. Bee collectors from across the state (154 total) were recruited and trained in 2020 to conduct a weekly bee survey from May through October. Thousands of bee specimens were collected and submitted for identification. This survey is coordinated by MaLisa Spring through Dr. Karen Goodell's lab at Ohio State at Newark, in partnership with the Department of Entomology. As an offshoot of this effort, [Bees of Ohio: A Field Guide](#) was produced.

The Ohio pollinators online course (not for credit) continued in summer of 2020 with two pollinator study groups: Nature's Best Hope and Observing Nature. These groups featured webinars and Zoom discussions with authors and content experts Doug Tallamy and Jack Muir Laws. A total of 100 participants took part in these monthlong study groups.

The Living Landscape Speaker Series will be offered in January and February 2021 in partnership with Chadwick Arboretum & Learning Gardens on Ohio State's Columbus campus. This ecologically focused webinar series features speakers Doug Tallamy, Marne Titchenell, Debra Knapke, and Rick Darke. Enrollment for each webinar is well over 1,000 participants.

Additional virtual programs are planned to celebrate the spring equinox and Earth Day.

Featured Bug Zoo Arthropods

Columbus Bug Zoo

Sonoran Desert centipede *Scolopendra polymorpha*

These little predators are fast and venomous, and known for their pinch! They are also known for being protective and attentive mothers when raising a brood of pedlings. The mother will curl up around the eggs and turn them every day, grooming them. This keeps them safe from predators, as well as contaminants like mold. Once they hatch, the babies will stay with their mom for a week or so before dispersing and going off into the desert on their own.



United Titanium Bug Zoo

Freshwater Shrimp *Neocaridina davidi*

This scavenger feeds on algae and microorganisms in the aquatic, cold mountain streams of China and Taiwan. They live one to two years and can range in color from cherry red to orange, blue, gray, and even translucent. Females are larger and more colorful! "Berried" females carry eggs under their tail for protection and fan the eggs to provide them with oxygen.



Publications

Autumn 2020, Selected From Around 20 Publications

Esquivel C.J., Martinez E.J., Baxter R., Trabanino R., **Ranger C.M.**, **Michel A.**, and **Cañas L.A.** 2020. Thiamethoxam differentially impacts survival of the generalist predators, *Orius insidiosus* and *Hippodamia convergens*, when exposed via the food chain. *Journal of Insect Science*. 20:13.

Gardiner, M.M., **K.I. Perry**, **C.B. Riley**, **K.J. Turo**, **Y. Delgado de la flor**, and **F.S. Sivakoff**. (in press). Community science data suggests that urbanization and forest habitat loss threaten aphidophagous native lady beetles. *Ecology and Evolution*.

Hegarty S.D., Sutton J.M., Pimsler M.L., Fierst J.L., **Strange J.P.**, and Lozier J.D. 2020. De Novo genome assemblies for three North American bumble bee species: *Bombus bifarius*, *Bombus vancouverensis*, and *Bombus vosnesenskii*. G3: Genes Genomes Genetics.

Hoy, C. and B. Snyder. 2020. Food and nutritional security: still the grand challenge for land-grant universities. In (S.M. Gavazzi and D.J. Staley, eds.) *Fulfilling the 21st Century Land-Grant Mission*. The Ohio State University Press. Pp. 103-112.

Kalsi, M., Walter, A., Lee, B., DeLaat, A., Trigueros, R.R., Happel, K., Sepesy, R., Nguyen, B., Manwill, P.K., Rakotondraibe, L.H., and **Piermarini, P.M.** 2020. Stop the crop: Insights into the insecticidal mode of action of cinnamodial against mosquitoes. *Pesticide Biochemistry and Physiology*, 104743.

Lin, C.H., D.B. Sponsler, R.T. Richardson, H.D. Watters, D.A. Glinski, W.M. Henderson, J.M. Minucci, E.H. Lee, S.T. Purucker, and **R.M. Johnson**. 2020. Honey bees and neonicotinoid-treated corn seed: contamination, exposure, and effects. *Environ. Toxicol. Chem.*

McMinn-Sauder, H., R. Richardson, **T. Eaton**, M. Smith, and **R. Johnson**. 2020. Flowers in conservation reserve program (CRP) pollinator plantings and the upper Midwest agricultural landscape supporting honey bees. *Insects*. 11.

Meuti, M.E. and Harrell R. 2020. Preparing and injecting embryos of *Culex* mosquitoes to generate null mutations using CRISPR/Cas9. *Journal of Visualized Experiments*. doi: 10.3791/61651.

Parker, D.M., **K.J. Turo**, Y.A. Delgado de la flor, and **M.M. Gardiner**. 2020. Landscape context influences the abundance and richness of native lady beetles occupying urban vacant land. *Urban Ecosystems*. Online awaiting issue, doi: 10.1007/s11252-020-01000-7.

Perry, K.I., N.C. Hoekstra, S.W. Culman, and **M.M. Gardiner**. 2020. Vacant lot soil degradation and mowing frequency shape communities of belowground invertebrates and urban spontaneous vegetation. *Urban Ecosystems*. doi: 10.1007/s11252-020-01069-0.

Potts, Leslie J., J.D. Gantz, Yuta Kawarasaki, **Benjamin N. Philip**, David J. Gonthier, Audrey D. Law, Luke Moe, et al. 2020. Environmental factors influencing fine-scale distribution of Antarctica's only endemic insect. *Oecologia* 194 (4): 529–39. doi:10.1007/s00442-020-04714-9.

Yates-Stewart A.D., **Pekarcik A.**, **Michel A.**, and Blakeslee J.J. Jasmonic acid-isoleucine (JA-Ile) is involved in the host-plant resistance mechanism against the soybean aphid (Hemiptera: Aphididae). *Journal of Economic Entomology*. 113:2972-2978.

Extension Materials

Philip, B. [Bed Bugs](#). 2020. Ohioline, OSU Extension.

Philip, B. *Junior Bed Bug Detective* video. [youtube.com/watch?v=SIXwYa8DsMk](https://www.youtube.com/watch?v=SIXwYa8DsMk).

Courses

Autumn 2020 Highlights

E. Klinger:

ENR 5350.01: Taxonomy and Behavior of Aquatic Invertebrates, lecture and lab; 29 students; 3 cr.

ENTMLGY 4601: General Insect Pest Management; 13 students; 2 cr.

M. Meuti:

ENTMLGY 1350: The Biology of Hope and Belief, online; 56 students; 3 cr.

ENTMLGY 2101: Pests, Plagues, Pollinators and Poisons: Insects in Human Affairs; 59 students; 3 cr.

B. Philip:

ENTMLGY 1111: Biology of Insects, Animals, and Fungi-Affecting Buildings; 73 students; 4 cr.

P. Piermarini:

ENTMLGY 4607: Veterinary Entomology, online; 55 students SU20 and 245 students AU20; 2 cr.

J. Raczkowski:

ENTMLGY 2400H: Evaluating Evidence in Biology and Medicine; 21 students; 3 cr.

ENTMLGY 1100: Exploring Entomology/Plant Health/Sustainable Plant Sciences and Professional Golf Management; 14 students; 0.5 cr.

ENTMLGY 3330: Social Insects; 4 students; 3 cr.

ENTMLGY 4000 (31202): General Entomology Lecture; 9 students in person and 59 students online; 3 cr.

ENTMLGY 4001: General Entomology Laboratory; 11 students.

ENTMLGY 4600: Introduction to Insect Science; 105 students first session and 81 students second session; 1 cr.

C. Welty:

ENTMLGY 7300: Plant Health Management Seminar; 5 students; 1 cr.

ENTMLGY 5800: Pesticide Science; 20 students; 3 cr.

Featured Educator



Dr. Ellen Klinger joined the department in January 2020 as an assistant professor focused on instruction. Before joining Ohio State, she was employed as a research entomologist for the USDA in Logan, Utah. She has 18 years of expertise in insect pathology with applications in IPM and pollinator health. She is excited to transition into a more teaching-centric role at Ohio State. Some of the classes she has taught in the past year have been nonmajors entomology, integrated pest management, aquatic entomology, and the capstone course in which entomology majors solidify their academic careers and prepare for their next professional steps. She is working on developing an experimental design class targeted to our graduate students, as well as an insect pathology class accessible to our undergraduates. In her free time she enjoys running and playing hockey.

The in-person collecting trips to Chadwick Lake for Klinger's Taxonomy and Behavior of Aquatic Invertebrates course were a highlight of the autumn semester. The students were 100% respectful of the COVID-19 requirements, and many were simply enthused to be able to participate in this in-person class. While transitioning to a teaching career has been challenging during these uncertain times, Klinger values the overwhelming excitement of her students and loves introducing students to the world of entomology.

Highlighted Awards and Features

Faculty Honors

Entomological Society of America Fellow
Carol Anelli

Staff Honors

2020 CFAES Staff Above & Beyond Awards:

Special Recognition Award

Jim Hacker

Key Values Award

Erin Parker

CFAES Time and Change Features

Sarah Scott, PhD Graduate Student

[Healthy Food, Land, and People Depend on Supported Research: Sarah Scott's Bumble Bee Research Provides It. Will You Support It?](#)

Dec. 17, 2020.

YouTube video featuring Scott's research:

[Time and Change: What's Best for Bees?](#)

Feb. 1, 2021.

Wooster Science Building

[Cutting-Edge in Wooster: At the CFAES Wooster Campus Science Building, People Will Gather in New Research Labs, Classrooms, a Cafe, a Bug Zoo, and More!](#)

Nov. 17, 2020.

CFAES Graduate Student SEEDS Grants

Dom Magistrado, Doctoral

Caitlin Peffers, Masters

Dylan Ricke, Masters

Grace Sward, Doctoral

Travel Awards

D. DeLong Award, spring

Katie Turo

D. DeLong Award, fall

Tae Lee

Ray Travel Award

Dylan Ricke

Society of Environmental Toxicology and Chemistry, North America Student Travel Award

Emily Walker

ESA Student Awards

Best Overall Debate Team:

Adrian Pekarcik and Dylan Ricke, Topic 1

President's Prize for Student Competition:

Tae Lee, 2nd place, Oral Presentation, Graduate MUVE

Valerie Anderson (Canas Lab), 1st Place Oral Competition, Undergraduate PIE

Matthew Lorentz (Tilmon Lab), 2nd Place Poster, Undergraduate PIE

Graduate Student Defenses

Autumn 2020

- **Jane Karetny, MS.** "Planning towards sustainable food systems: an assessment of U.S. municipal food system plans." *Advisor: Hoy.*
- **Taylor deGier, MS.** "Cucumber beetle management in dahlias." *Advisor: Welty.*
- **Jessica Burns, MS.** "How pesticide applicator training is perceived." *Advisor: M. Rose.*
- **Esther Kibbe, MS.** "Spotted-wing drosophila in blueberry." *Advisor: Welty.*
- **Michael Goard, MS.** "Monitoring apple pests." *Advisor: Welty.*

Spring 2021

- **Caitlin Peffers, MS.** "Characterizing the photoperiodic response and circadian clock in the Northern house mosquito, *Culex pipiens*." *Advisor: Meuti.*
- **Katie Turo, PhD.** *Advisor: Gardiner.*
- **Denisha Parker, PhD.** *Advisor: Gardiner.*

Student Groups

EGSA



Entomology Graduate Student Association
EGSA now has an official logo! Congratulations to Kendall King for creating the initial winning design, and a big thanks to Ohio State branding for finalizing our design.
EGSA will host Dr. Chris DiFonzo, field crop entomologist from Michigan State University, on Thursday, Feb. 18, for the 2021 DeLong Seminar. Additionally, EGSA will host a special seminar on April 28 for Dr. Jennifer Jandt from the University of Otago in New Zealand, who could not make the original DeLong Seminar date.

Social committee representatives Caitlin Peffers and Dylan Ricke have and continue to host monthly virtual game nights. Members have enjoyed games including "Among Us," "Spyfall," and "Codenames."

In the absence of the "Insect Night Walk" and "A Bug's World," EGSA is planning, developing, and producing virtual outreach content this semester!

Congratulations

Congratulations to our graduate student award winners, listed above in the Highlighted Awards and Features section!

Congratulations to our monthly photo contest winners so far this academic year! All winners receive \$20, and their photo will be featured for the upcoming EGSA calendar.

- October (Autumn Insects): Caitlin Peffers
- November (Study Specimens): Grace Sward
- December (Preserved Insects): Hannah McKenzie
- January (Immature Insects): TBD

Chrysalis

Entomology Undergraduate Student Association

Due to social distancing requirements, the Chrysalis group held virtual meetings during the autumn semester:

- On Sept. 14, undergraduate members were given a presentation on how to raise various insect species in captivity and were able to speak about their own experiences raising insects as pets.
- On Oct. 26, undergraduate members learned about collecting insect specimens and how to properly pin them for a collection. Members were able to share their own personal collections.



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