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ENTOMOLOGY Stridulations

A Newsletter of The Ohio State University Department of Entomology
Spring - Summer 2020

DEPARTMENT ANNOUNCEMENTS



From the Chair, Dr. Jamie Strange

My first year at The Ohio State University is one I won't forget. I certainly never imagined spending half my second semester working from home. COVID-19 has changed the way we do

everything. Change is spreading in other ways as well, as we are seeing the emergence of a historic social and racial justice movement, one that will undoubtedly shape us as a department as we move forward. We are seeing budget reductions, changes in CFAES structure, movement of courses to on-line delivery, restrictions on our access to labs and field sites, cancellations of meetings and events to deliver work to our stakeholders, and many other disruptions. Yet our faculty, staff and students continue to rise to the challenges. You will note that we are still graduating students, still teaching our

COVID-19 Telework Productivity

All Entomology faculty, students and staff have been teleworking for all or most of their time since March 16th. Yet during this time, we have remained highly productive with:

- Over 5 papers and 11 grant proposals submitted
- 10 graduate student defenses and qualifying exams
- More than 8 classes taught, with all quickly switching to virtual instruction
- Over 10 student presentations submitted to virtual conferences and competitions (including the virtual ESA-NCB Student competitions, see our winners below)
- More than 20 virtual extension and outreach events
- Too many Zoom meetings to count!!!

We have been thankful that our college has allowed us to maintain all our insect colonies, as well as approved a fair number of research activities. We have deployed honeybee hives, planted fields, and started insect surveys while keeping our department personnel safe.

courses (this summer 209 undergraduates enrolled in four on-line courses), still publishing high quality research, still delivering valuable extension and outreach to our communities, and still growing our department for the future. These successes are only made possible because our people have chosen to make them happen, despite the headwinds.

We will welcome new classes of graduate and undergraduate students this autumn and we will launch new extension, teaching, and research projects. We hope to unveil the Columbus-based mobile bug zoo, and move the entire Wooster-based Entomology unit into a brand-new building.

The SARS-CoV-2 pandemic will change how we do things, it will not prevent us from doing the things necessary to accomplish our goals.

I hope you enjoy the newsletter and finding out the ways that Entomology has adapted to the COVID-19 crisis, and while I am proud of what we've accomplished, I am also excited for what lies ahead.

We are committed to OSU's COVID-19 prevention and management policy and will continue to do so as we begin to responsibly and safely open our labs later this summer as well as plan for teaching, extension and outreach activities in the autumn semester.

Wooster Entomology's New Home

Wooster based operations will move to the new 60,000 sq ft Science Building at the center of the Wooster Campus in Fall 2020, featuring a revamped Bug Zoo in the lobby! Live camera feed and construction time lapse: <https://facilities.cfaes.ohio-state.edu/livefeed>



FEATURED LABS



Dr. Mary M. Gardiner, Ph.D. 2008, Professor, serves as the Graduate Studies Chair for Entomology and the Environmental Sciences Graduate Program. Her

research program focuses on the ecological value of urban vacant land concentrated in Cleveland, OH, a city that has experienced significant economic and population decline. The Gardiner Lab studies how habitat design, landscape context, and a legacy of contamination influence the value of vacant land for the conservation of biodiversity and provision of ecosystem services. Collaborators include R. Johnson, Sivakoff, Phelan, and

Dr. Larry Phelan is a Professor in the Department and leads the Chemical Ecology and Metabolomics Lab. The first two research foci for the lab entails identifying and behaviorally

characterizing natural products that elicit behavioral response in insects. Phelan developed the first of its kind commercial ovipositional disruptant, used against the navel orangeworm in almonds, by employing soybean fatty acids to confuse the pest while protecting the beneficial arthropods. The second area of research focuses on understanding the role of soil organic matter and the rhizosphere community in mediating inclusive plant



Meuti Labs. Mary is a State Specialist in Extension working with home gardeners, Master Gardeners, Master Naturalists, and urban farmer stakeholders, identifying and attracting beneficial insects to promote conservation and ecosystem services. In 2015, she released *Good Garden Bugs: Everything You Need to Know about Beneficial Predatory Insects*, focused on biological control in home gardens. The Lab embraced community science research with their statewide program for youths, Dandelion Detectives, to measure the value of lawn weeds for insects.

health and defense against insects and disease. Most recently, the Phelan lab has joined efforts with the Mary Gardiner Lab to connect below-ground and above-ground processes in the urban landscape. The goal is to understand the impact of organic matter management and the soil community on heavy metals and industrial contaminants as well as measure their capacity to mediate other ecosystem services for the benefit of the urban landscape and community.

OUTREACH

Entomology's outreach plans creatively evolved to accommodate the COVID-19 cancellation of all OSU in-person activities on March 16.

Our outreach team, Denise Ellsworth, Jeni Ruisch, and Jeni Filbrun implemented successful dynamic and interactive online programs, while maintaining their high level of continuous care for our Columbus and Wooster Bug Zoos.

Ellsworth and Ruisch each swiftly modified in-person conferences, workshops, classroom visits, camp curriculums, on-going **pollinator program** activities, small-group sessions – everything- to provide online content delivery. Entomology's interactive engagement within our communities continue and thrive, as evidenced by the impressive number of attendees in these online programs.

Adapting to COVID-19 restrictions, Ellsworth and Entomology alumni, MaLisa Spring, coordinated and implemented The Ohio Bee Survey, a new community science project to create a detailed inventory of Ohio's wild bees.

Meanwhile, Filbrun is consumed with the creation, design, permitting and move logistics for our new Bug Zoo in Wooster, as well as the continuous care of **BugZooWoo's** large and diverse collection of live arthropods.

As for the Columbus BugZoo – Ruisch has it under constant supervision in her dining room, all 40 species!

Detailed updates and summaries of the incredible activities listed below are available on our website:

Ellsworth: Pollinator Education

- **[Ohio Pollinators On-Line Course](#)**
- **[ZoomBees Pollinator webinars](#)**
- **[The Ohio Bee Survey](#)**
- *A Bug's World re-cap*

Ruisch: **Columbus BugZoo & Outreach**

- *BugZoo's temporary new home*
- *Outreach by Zoom*

Filbrun: Wooster Bug Zoo transformation

Featured Bug Zoo Arthropods:

Columbus Bug Zoo, Ruisch
Emperor Scorpion, *Pandinus imperator*

In the Wild: These carnivorous arachnids live in rainforests and savannas of west Africa. They burrow under rocks and logs, often near termite mounds to prey on the occupants. Emperor scorpions are the largest scorpions in the world by average weight. They have very mild venom and pose no threat to humans.

In Human Care: Though capable of stinging and pinching, Emperor scorpions are among the most docile scorpions. Tropical heat and humidity, plenty of substrate to burrow in, protection from bright lights, and live prey, such as crickets, or mealworms, are required. Like all true scorpions, Emperors fluoresce under UV light, very interesting to observe!



BugZooWoo, Filbrun
Ferocious Waterbug, *Adebus ssp.*

Range: Southwestern US, Mexico

Habitat: Aquatic; slow-moving freshwater

Diet: Carnivorous; live insects, fish, crustaceans, amphibians

Lifespan: 1 year or longer

Ecological Role: Ambush predator

Fun Facts

- Stalk their prey and can catch an animal 50 times its size!
- Non-venomous bite is very painful
- Females lay eggs on male's wings to prevent mating with other females
- When in danger, will play dead and excrete a foul odor!
- Popular food in Asia!

PUBLICATIONS

Spring 2020, selected from ~20 published

Parker, D.M., K.J. Turo, Y.A. Delgado de la flor, and M.M. Gardiner. (in press) Landscape context influences the community assembly of native lady beetles occupying urban vacant land. *Urban Ecosystems*.

COURSES

Spring 2020 Highlights

M. Meuti:

ENTMLGY 1350: *The Biology of Hope and Belief* Online; 213 students; 3 cr

ENTMLGY 7890: *Special Topics in Entomology*, Mosquito Disease

Chang, V. and Meuti, M.E., 2020. Circadian transcription factors differentially regulate features of the adult overwintering diapause in the Northern house mosquito, *Culex pipiens*. *Insect Biochemistry and Molecular Biology*, p.103365.

Delgado de la flor, Y.A., K. Perry, K.J. Turo, D.M. Parker, T. Thompson, and M.M. Gardiner. (in press) Local and landscape-scale environmental filters drive the functional diversity and taxonomic composition of spiders across urban greenspaces. *Journal of Applied Ecology*.

Manwill, P.K., M. Kalsi, Wu S, E.J. Martinez Rodriguez, X. Cheng, P.M. Piermarini, H. L. Rakotondraibe. 2020. Semi-synthetic cinnamodial analogues: Structural insights into the insecticidal and antifeedant activities of drimane sesquiterpenes against the mosquito *Aedes aegypti*. *PLoS Negl Trop Dis* 14: e0008073.

Dieterich Mabin M.E., C. Welty and M.M. Gardiner. 2020. Predator richness predicts pest suppression within organic and conventional summer squash (*Cucurbita pepo* L. Cucurbitales: Cucurbitaceae). *Agriculture, Ecosystems and Environment* 287: 106689.

Yates-Stewart A.D., J. Daron, S. Wijeratne, S. Shahid, H. A. Edgington, R. K. Slotkin, A. Michel. 2020. Soybean aphids adapted to host-plant resistance by down regulating putative effectors and up regulating transposable elements. *Insect Biochemistry and Molecular Biology*. 121:103363.

Riley, C.B. and M.M. Gardiner. 2020. Examining the relationship and distributional equity of urban tree canopy cover and ecosystem services across United States cities. *PLoS ONE* 15: e0230398.

Perry, K., N. Hoekstra, Y.A. Delgado de la flor, and M.M. Gardiner. (in press) Disentangling landscape and local drivers of ground-dwelling beetle community assembly in an urban ecosystem. *Ecological Applications*.

Sivakoff, F.S., S.P. Prajzner, and M.M. Gardiner. (in press) Urban heavy metal contamination limits bumble bee colony growth. *Journal of Applied Ecology*.

Gardiner, M.M., Delgado de la flor, Y.A., Parker, D.M., and J.D. Harwood. (in press) Rich and abundant spider communities result from enhanced dietary niche breadth and reduced overlap in urban greenspaces. *Ecological Applications*.

Vectors w/ Short & Piermarini, 5 graduate students; 1-3 cr.

P. Piermarini:

ENTMLGY 4607: *Veterinary Entomology Online*; 363 students-record enrollment; 2 cr. Offered for SU2020 as 8-week course for 1st time.

Developed 3 **online Veterinary Entomology certificate courses** for Continuing Education

C. Anelli:

ENTMLGY 7910: *Nature and Practice of Science*; 10 stu.; 2 cr.

J. Raczkowski:

ENTMLGY 2400H: *Evaluating Evidence*; 25 students; 3 cr.

ENTMLGY 4000 Online: *General Entomology*; 50 students; 3 cr.

ENTMLGY 4191: *Entomology Internship*; 2 students; 1 cr.

ENTMLGY 4440: *Honors Social Insects*; 16 students; 3 cr.

ENTMLGY 4600: *Introduction to Insect Science*; 1 cr. 1st Session: 249 stu.; 2nd Session: 132 stu.

E. Klinger:

Entomology 1101: *Insect Biology*; 41 students; 4 cr.

Entomology 5604: *Capstone Course: Problem-Based Studies in Plant Health*; 4 students; 2 cr. Co-taught w/ Lewandowski, CFAES Plant Pathology

FEATURED EDUCATOR



Dr. Joe Raczkowski joined the Department of Entomology in 2009 as a Lecturer and was promoted to Assistant Professor Professional Practice in September 2016.

He is the instructor of record for 10 separate entomology courses and has taught over 5000 students in his time with the department. His courses include Introductory Insect Field Biology at Stone Laboratory, Introduction to Insect Science (online), General Entomology (online and in-person), Social Insects (Honors and non-Honors), and Evaluating Evidence (Honors).

Joe serves as the department's Academic Advisor, Internship Coordinator, Advisor to the undergraduate entomology club (Chrysalis), Linnaean Games Team Coach (academic competition) and represents Entomology on CFAES Undergrad. Academic Affairs & Coordinating Advisor committees.

Under Raczkowski's guidance 6 Undergraduate Entomology Majors and 8 Minors graduated this spring.

Bachelor Degrees: Adebimpe Abimbola Adelaja, Jack Hudak, Hannah McKenzie (Autumn 2020 Entomology Master's Student!), Michael Rogers, Matthew Volkman, and Caleb Whitney

HIGHLIGHTED AWARDS

FACULTY HONORS

2020 Excellence in Undergraduate Research Mentoring Award
Megan Meuti

GRADUATE STUDENT AWARDS

Susan W. Fisher Teaching Award, Ento Dept
Denisha Parker

David J. Horn Service Award, Ento Dept
Katie Turo

Lowell R. Nault Research Award, Ento Dept
Yvan Delgado de la Flor

James E. Tew Extension Award, Ento Dept
Sarah Scott & Adrian Pekarcik

USDA-NIFA Predoctoral Fellowship
Adrian Pekarcik

OARDC SEEDS Research Grant Award
Dominique Magistrado

CFAES POSTER COMPETITION AWARDS

2nd Place: Denisha Parker
3rd Place: Sarah Scott, Harper McMinn-Sauder, Erick Martinez Rodriguez

NCB-ESA Student Awards

1st Place: Alex Tyrpak
2nd Place: Lydia Fyie
3rd Place: Caitlin Peffers

UNDERGRADUATE STUDENT AWARDS

2020 CFAES Distinguished Senior Award
Hannah McKenzie

Denman Undergraduate Research Forum Award

Derek Huck

Dean's List

Austin Gruber
Hannah McKenzie
Danny Phillips

GRADUATE STUDENT DEFENSES

Spring 2020

- **Edna Alfaro Inocente, MS**, “Insecticidal and antifeedant activities of Malagasy medicinal plant (*Cinnamosma* sp.) extracts and drimane-type sesquiterpenes against *Aedes aegypti* mosquitoes”. *Advisor: Piermarini*
- **Yvan Delgado de la flor, PhD**, “Spider and Beetle Communities across Urban Greenspaces in Cleveland, Ohio: Distributions, Patterns, and Processes”. *Advisor: Gardiner*
- **Denis Nyamu, MS**, “Management of *Tuta absoluta* in Kenya”. *Advisor: Cañas*
- Master's of Plant Health Management (MPHM) graduate student defenses: **Patrick Hoehn, Peter Aldag, Grant Collier**

Summer 2020

- **Alex Tyrpak, MS**, "How ant communities are shaped by vacant land management strategies, landscape context, and a legacy of industrialization". *Advisor: Gardiner*
- **Kendall King, MS** defense upcoming SU20. *Advisor: N. Johnson*

STUDENT GROUPS

EGSA

Entomology Graduate Student Association

EGSA hosted its first "Bugs n' Brews" event in collaboration with Seventh Son Brewing on February 23. This family friendly event attracted over 300 attendees.

EGSA contributed to a variety of outreach and extension activities in early spring, including A Bug's World in Wooster, March 3-4 and COSI's Science Fest webinar series on May 5, with a seminar titled "Axolotles in Action!".

Congratulations to our Department Graduate Student award winners and to those who won and awards for presentation competitions! Also, congratulations to Adrian Pekarcik for receiving the USDA AFRI predoctoral fellowship!

CHRYSALIS

Entomology Undergraduate Student Association

The Chrysalis group had two events this semester before social distancing was implemented.

On January 27 George Keeney gave the group a tour of the on-campus insectary in Columbus, where they handled many live arthropods and learned about arthropod rearing.

On February 10, Abigail Ratcliff from the Ohio Department of Agriculture gave an informational presentation as a guest lecturer on important forest pests and how they are being managed here in Ohio.





THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

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