Stonefly by Bill Ravlin, MSU Entomology

FROM THE CHAIR

MAKING OUR MARK

My first fall in East Lansing has been full of change and new beginnings. As you'll read more about in this issue of Bugged, we welcomed the largest cohort of new Entomology undergraduate students to the department in recent memory and added a healthy group of new grad students. The growth of our student programs as well as the enthusiasm of Bug Club, our undergraduate student organization, are both strong signs that our department is making healthy strides. I want to particularly commend Dr. Amanda Lorenz, our undergraduate advisor, Bug House director, and Bug Club advisor, for creating an environment that is attracting and supporting outstanding students.

In addition to new students, members of our department are taking on new and exciting projects. These include work by Meghan Milbrath to build the capacity of veterinarians to contribute to honey bee health, new national nematology collaborations by Marisol Quintanilla to address critical pest management needs, Henry Chung has begun new NSF and NIH funded projects on reproductive biology and chemical ecology, and Will Wetzel has successfully begun work leading the Herbivore Variability NSF Research Coordination Network.

This fall, our department continued to make impacts through our participation at the Joint Annual Meeting of the Entomological Society of American and Entomological Society of Canada in Vancouver. Our students presented 17 presentations and posters, and other members of the department delivered an additional 16 presentations and posters. Three of our graduate students, Natalie Constancio, Nicole Wonderlin, and Jen Zavalnitskaya, and one undergraduate student, Taylor Hori, were selected among the top two presentations in their sessions. In addition, the debate team comprised of members from MSU, University of Florida, and Purdue University won their match and the overall debates.

Another way we are seeking to make our mark is through the development of a five-year branding and messaging plan. This has truly been the brainchild of Judi Smelser, Entomology Communications Manager (and Bugged editor). I am so excited for you to learn about the insects we are highlighting, the themes they represent, and how we will use this plan to share and amplify our good work—how *BUGS WORK!* to impact and improve our world. I also invite you to be a part of this plan. If you are interested in learning more about *Bugs Work!*, how you can share our message, or support our efforts, please do not hesitate to connect.

Hannah Burrack,
Chairperson

Meet the Entomology Research and Outreach Fellows

The Entomology Research and Outreach Fellowship (EROF) was started by a group of graduate students who were passionate about diversity, equity, and inclusion and increasing opportunities in STEM.

EROF allows undergraduate students with limited research opportunities to participate in world-class university research in the Department of Entomology. This program promotes diversity and inclusion within the department by providing students a summer-long immersive research experience and financial support.

By offering direct support to undergraduates who otherwise would not have financial means to explore a career in entomology, the department has the unique opportunity to engage and promote a diverse generation of scientists.

KARENINE ORNEVIL

Karenine earned her Associates in Science from Lansing Community College (LCC) and plans to transfer to Michigan State to pursue Chemical Engineering with a concentration in the environment. She found the EROF program through her environmental science class at LCC.

According to Karenine, "I was interested in the ability to explore the natural science world with a mentor who is well-experienced in the capacity, as well as laboratory and entomology experience!"

Karenine worked on a project that studied bacterial disease in honeybees. Her role included observing and critically analyzing hives, working in the lab to further prepare larval samples for continued research and sterilizing tools and necessary items for research and fieldwork use.

"My favorite part of the program was the ongoing learning I had the opportunity of doing daily." As Karenine explained, "I never knew if I was going to walk into a diseased or a healthy hive, and I enjoyed the anticipation and the diversity from hive to hive. I also enjoyed working with different faculty and seeing their individuality in beekeeping."

"The lessons I took away from this experience are acts of working both independently and as a team, working at a diligent pace, communication with team members and remembering to praise small wins along the way."

When asked what she would say to other considering the program Karenine said, "Team building, responsibility, communication, open-mindedness and active learning. I highly recommend this program to anyone who is searching for a fully engaged and committed opportunity!"

THANG SAWMTUNG

A biochemistry major in the MSU College of Natural Science, Thang found EROF through his chemistry professor. He said, “I was not familiar with Entomology, and it gave me a chance to explore different experiences in the science field.”

Thang worked on the Swallow-wort Biological Control project. This project combines lab, field, and greenhouse experiments to investigate the establishment and persistence of a small defoliating moth that feeds on invasive swallow-wort vines in Michigan as a form of biological control.

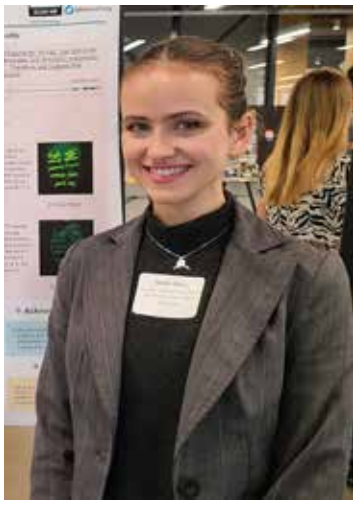
Thang’s role was the care and maintenance of the target weed, swallow-wort, and maintaining the moths, which included feeding adults, feeding larvae, bucketing larvae, pulling pupae, and cage maintenance.

“My biggest surprise from the program is the number of tasks I was able to do efficiently.” As Thang sees it, “My mentor told me not to be afraid of making mistakes and it has been the most helpful because I was able to do my tasks without stress and give me the confidence to take on new takes.

“Going forward, I am interested in going into the medical field and teamwork is essential for a job in that field, so these lessons will boost my confidence.”

When asked, Thang expressed enthusi
asm for the program, “The best way to grow as a person is to get out of your comfort zone and embrace it. The EROF program is perfect for students who are looking for a new experience and who are looking to improve themself as a person and professionally.”

NADIA SBISA



Nadia is a student at Kalamazoo Valley Community College earning her Associates degree in math. She plans to transfer to a 4-year institution and double major in Biochemistry and Piano Performance. She found the EROF program through her organic chemistry professor.

Nadia was attracted to the program for very a personal reason, “It was encouraging to discover a research program that prioritized community college students rather than stigmatizing them!”

Nadia worked on the study of the evolution of sexually dimorphic cuticular hydrocarbons (CHCs), a contact pheromone in Drosophila (fruit flies). In her role, she learned to perform the protocol for gene cloning.

“My experience has convinced me to pursue a research career!” Nadia went on to explain, “I had so much fun in the lab and getting to work with such smart and talented scientists was inspirational!”

“I was able to present the summer’s research at the Mid-Sure 2022 symposium and the opportunity to practice presenting a scientific poster was of great benefit!”

Nadia’s overall view of the program was positive. “I believe the research projects in the program are beneficial to a diverse selection of science majors and is a great way to improve the quality of your education as well! I am so grateful for everything the EROF program has done for me, I could not recommend it enough! “

CONGRATULATIONS!

2022 ESA STUDENT AWARD WINNERS

Undergraduate 10 Minute Presentation

Evolution & Genetics

Taylor Hori
second place

Graduate 10 minute presentation

Vectors of Plant Disease

Natalie Constancio
second place

Graduate 10 minute presentation

Pollinators

Jen Zavalnitskaya
first place

Graduate 10 minute presentation

Biodiversity, Ecology, & Pollinators

Nicole Wonderlin
second place

ESA PBT Frontiers in Insect Science

Graduate Student Travel Award

Susu Cong

Debate Team

First in Match & First Overall

Members included
Natalie Constancio &
Kayleigh Hauri

As of Fall 2022, the Entomology Undergraduate Cohort has reached parity with our Graduate Cohort.

- **45 Graduates**
- **41 Undergraduates**

- 9 new majors

- 4 new minors

The Department of Entomology is proud to announce a new initiative launching this year. The campaign is called “Bugs Work!”

Insects work every day to create the biological foundation for ecosystems. In the same way, our donors provide the basis of support that allows our entomological work to continue. Ultimately the work of our department faculty, staff and students brings a greater understanding of those insects and how they interact with the world. Together, this defines what we call “Bugs Work!”

Every year for the next 5 years, we will feature an insect and corresponding theme:

Honey Bee - Teamwork and Collaboration
Sesia Spartani - Embracing Diversity
Emerald Ash Borer - Tackling Difficult Challenges
The Giant Mayfly - Conservation
Spotted-wing Drosophila - Engaging Stakeholders

To start, we will recognize our donors generous support by sending them a specialized coin with that year’s featured insect on one side and the Bugs Work! logo on the other side. Donors who contribute five consecutive years will receive a shadow box to display all five coins.

In addition to the donor incentives, we are also using the annual insect art and themes in our student recruitment efforts. Each year, the cohort of incoming students will be identified by that year’s chosen bug. For example, the cohort chosen in 2023 will be known as “Team Honeybee”. As they move through the recruiting process, we will provide collateral materials to reinforce the theme and build community.

Going forward you will also see the insect art and themes used for departmental team building efforts, and to create affinity for the department in our outward facing communications.

Honeybee
"Teamwork and Cooperation"

Sesia Spartani
"Embracing Diversity"

Emerald Ash Borer
"Tackling Hard Challenges"

Mayfly
"Conservation"

Spotted Wing Drosophila
"Engaging Stakeholders"

Distinguished Alumnus John Wallace Returns for Seminar Series

2021 Distinguished Alumnus recipient John Wallace, Ph.D. came to East Lansing this fall to present the Distinguished Alumnus Seminar titled *"There and Back Again: From Graduate Student to Professor – An Entomologist's Tale."*

Dr. Wallace chronicled his journey from MSU entomology graduate student to full professor at Millersville University. The talk highlighted the important people, projects and adventures that characterize a wonderful career and payed homage to the Department of Entomology where it all started.

Along the way, Wallace maintained close connections with his MSU colleagues like Eric Benbow and his major professor, Emeritus University Distinguished professor and former Entomology Chair Rich Merritt. In the end, Wallace said it was his connections that made the biggest difference in his success. "The quality of the people I met here. And just the friendliness, the openness, the willingness to help."

Wallace's advice to graduate students is to step outside of their comfort zones. "Explore different opportunities such as assisting with hosting conferences, networking at meetings and maintain those connections after completing your studies. One never knows from where the next collaboration may come."

Ayers Obituary

George Scott Ayers II, PhD, passed away peacefully on Friday, January 6, 2023.

He was an MSU graduate with a PhD in Entomology. George served on the MSU Department of Entomology faculty until he retired. He dedicated his career to understanding, protecting and teaching about insects and in particular, honey bees. He also traveled around the United States studying and photographing bee forage and was regularly published in the American Bee Journal.

He is survived by his loving wife of 57 years, Alessandra Ayers, son George Ayers III (Teresa), daughter Rebecca Ayers (John Hansen), and grandchildren- J. Christopher, Alyssa, George IV, James, Jaclyn, and four great grandchildren.

A Nemotology Team Effort

After receiving her B.S. and M.S. in Entomology (Nematology) from MSU, Lesley Schumacher worked as a laboratory technician at the MSU College of Veterinary Medicine, MSU Development at the stadium and as an award winning student advisor for the MSU Department of Forestry.

Later, Lesley enrolled in a Ph.D. program in nematology at the University of Florida. Dr. Schumacher is currently a research nematologist with USDA/ARS. In December of 2022, Drs. Schumacher and Clemen De Oliveira became the most recent husband/wife nematology team.

Quintanilla Brings the Midwest perspective to PAPAS project

Marisol Quintanilla, PhD, Assistant Professor in the MSU Department of Entomology, is bringing a Midwest perspective to a nationwide problem. She is Co PI on the USDA-NIFA Specialty Crop Research Initiative (SCRI) project called Potatoes and Pests - Actionable Science Against Nematodes (PAPAS).

This four-year-long research project aims to provide growers with the best management practices for controlling infestations of both root knot and potato cyst nematodes in potato fields.

The project, spear-headed by Project Director Louise Marie Dandurand from the University of Idaho, encompasses four main objectives:

Objective 1: Improving Diagnostics and Implementing Predictive Modes for Decision Support

Objective 2: Mining Plant Defenses and Deployment of Novel Resistance

Objective 3: Planning for the Future Through Smart Nematicide Chemistries

Objective 4: Passing It Along – Engaging Our Stakeholders

Dandurand brought Quintanilla on board because of her applied approach to extension and her knowledge of nematode issues in the Midwest region.

In addition to the current nematode research in her lab, Quintanilla's experience on industry coalitions proved to be a key component in securing the grant. As a member of the Soybean Cyst Nematode Coalition, Quintanilla worked with MorganMyers, a food and agriculture marketing/ PR firm. Quintanilla suggested that PAPAS include the firm in their plans for extension.

As Quintanilla explained, "They created a good website and their social media got millions of clicks. They were really reaching out to a massive amount of growers. When USDA accepted our proposal, they said that that's one of the things that they really liked about the about the grant."

Leading the efforts for Objective Four:"Passing It Along- Engaging Stakeholders" with the help of her graduate student Luisa Parrado, Quintanilla will coordinate the Objective Four team efforts, ensure representation at PAPAS meetings and provide outreach to growers and other stakeholders.

Completion of the project will result in several tools for growers including development of resistant varieties, molecular diagnostic methods, novel nematocidal chemistries, and decision support systems.

The other PAPAS Co-Project Directors include Joe Kuhl and Philip Watson from the University of Idaho, Cynthia Gleason from Washington State University, and Inga Zasada from USDA-ARS Corvallis.

Marisol Quintanilla, PhD

Training & Tools for Vets

Meghan Milbrath, Ph.D. , of the Michigan State University (MSU) Department of Entomology, was awarded $250,000 through an Education Extension and Training grant as part of the U.S. Department of Agriculture National Institute of Food and Agriculture's Veterinary Service Grants Program for the project 'Taking the sting out of honey bee medicine: Training and tools for veterinarians to increase access to care for beekeepers.'

Working with the University of Florida and Texas A&M University, the multi-state project focuses on improving educational materials and training for veterinarians, veterinary technicians, and veterinary students in honey bee medicine and is part of a larger initiative to develop certifications in honey bee medicine. Also on the grant is Ana Heck, MSU Extension educator for apiculture, who will be leading hands-on training sessions, as well as assisting in the creation of an online course.

"Veterinary care is often essential to maintain commercial honey bee hives, but honey bee health has not traditionally been part of veterinary training," said Hannah Burrack, MSU Department of Entomology chair. "Dr. Milbrath is using her deep expertise in honey bee health to develop innovative programs to build the capacity of veterinarians to be proactive partners with beekeepers. This partnership is critical for continued pollination services and food security."

Vertinary Students studying Honey Bee Medicine

In 2017, changes in the federal code required that beekeepers receive an order from a veterinarian to access needed honey bee medications – treatments that used to be directly available from bee supply companies. According to Milbrath, "It was designed mainly for pork and poultry producers, but bees and aquaculture got caught up in it because they technically fit the definition. Bees are more like dairy cattle than any other animal, because you have herds and you move them around, and you feed them different diets when you need them to produce food for you."

"Real commercial beekeeping is migratory. For example, beekeepers who are based in Michigan bring their bees to California for almonds in February, then they go back down south to Georgia or Florida for citrus, then they bring them up to Michigan for blueberries, apples and cherries. And then they go to a honey production yard and make honey. So, they're constantly getting trucked around," Milbrath explained.

Honey bees, like other animals, can be affected by viral, fungal, and bacterial diseases, but finding good care can often be difficult, as honey bee medicine is not covered by most standard veterinary schools. Trained veterinarians are needed to provide access to needed antibiotics, but in time can also help to address other issues with the bee crises, including optimizing nutrition, and managing parasites.

MSU already leads the way in training future veterinarians in honey bee medicine. Since 2018, Milbrath has instructed a three-week rotation in honey bee health for veterinary students in the MSU College of Veterinary Medicine (CVM), and she is the faculty advisor to the CVM honey bee medicine student club. Milbrath sits on the education committee of the Honey Bee Veterinary Consortium, and MSU hosted its virtual and in-person conference of veterinarians in August 2022.

Bugged newsletter

NEWSLETTER PRODUCTION

Judi Melena Smelser, editor
smelserm@msu.edu

CONTACT MSU ENTOMOLOGY

www.ent.msu.edu
entnews@msu.edu
517-355-4663
Twitter or Instagram:
@MSUEntomology

Michigan State University
Natural Science Building
288 Farm Lane Room 243
East Lansing, MI 48824

SEASONAL GATHERING

END OF SEMESTER COOKIE EXCHANGE

As an exciting semester came to a close, the department took the opportunity to gather in the Gordon Guyer Conference Room to share the fruits of their labor.

This cookie swap brought out the bakers in faculty, staff and students. With cocoa in hand, conversation spurred a recap of the Fall semester. Participants left with some treats for the winter break and anticipation for the spring semester ahead.

Judi Smelser, MSU Entomology