FALL 2025

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Department of Entomology Newsletter

Department of Entomology
MICHIGAN STATE UNIVERSITY

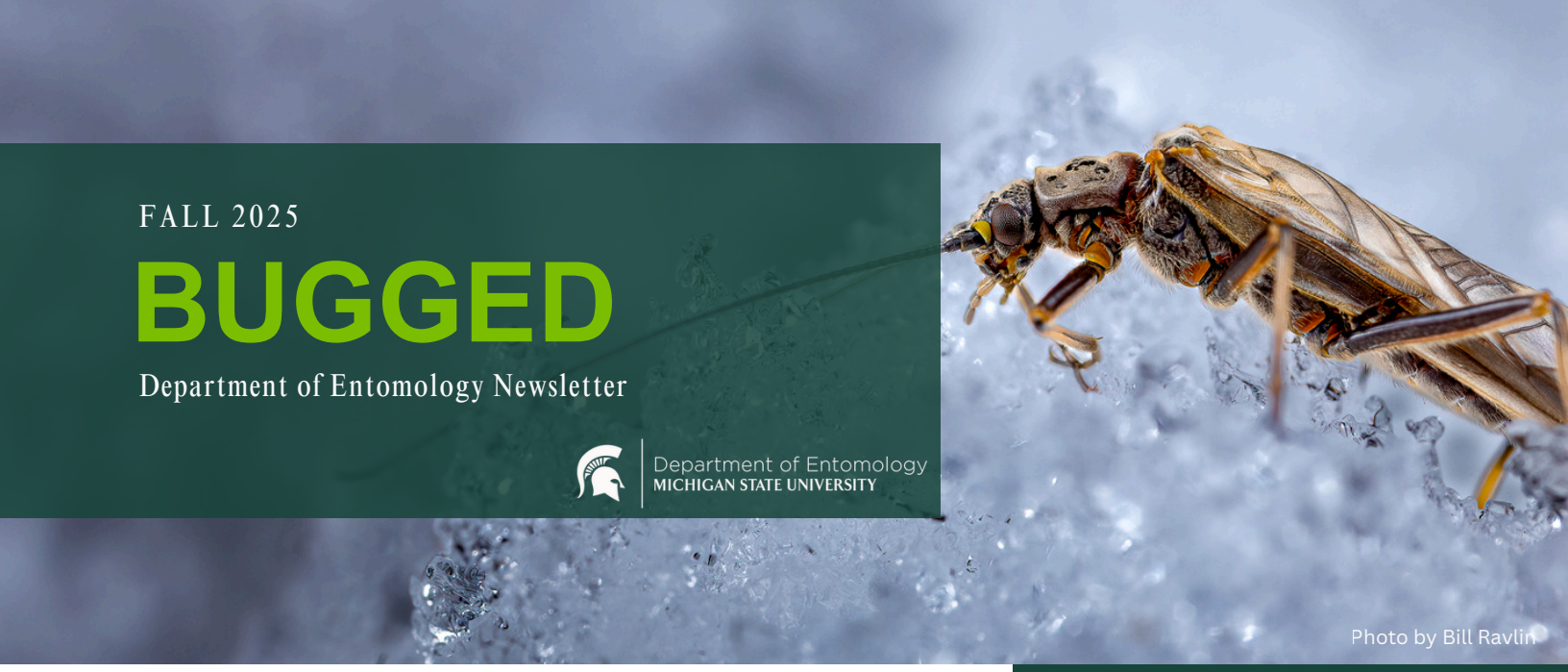


Photo by Bill Ravlin

From the Chair

BY HANNAH BURRACK

It has been an eventful fall at MSU Entomology! This fall, we launched the brand-new Tatter Family Entomology Graduate Fellowship and accepted applications for our first fellow who we look forward to welcoming next fall. We also welcomed new faculty members and affiliates including Dr. Anders Huseth, Dr. Jeff Barrick (joint appointment with Microbiology, Genetics, and Immunology), and Dr. Gwen Pearson, new adjunct faculty member and science communicator extraordinaire!

MSU Entomology at ESA: MSU Entomology Department members were highly engaged at this year's Entomological Society of America annual meeting held in Portland, OR last month. Department students, faculty, and staff organized 5 workshops or symposia, presented 26 talks, and displayed 9 posters. Two of these student talks were award winners--read more about Chris Brown and Jenna Bryne's award winning presentations in this issue. MSU Entomology alumnus, Jordy Hernadez, was also recognized by the Systematics, Evolution & Biodiversity (SysEB) Section with the Patch Memorial Research Award which recognizes an outstanding masters thesis and honor Dr. Edith M. Patch, the first female president of ESA.

International engagements: In this issue, we highlight international connections led by MSU Entomology faculty. Dr. Eric Benbow is building connections to leverage insects as a powerful tool to strengthen global food security. This summer, that meant organizing the first global symposium on insects for food, feed, and food security along with Dr. Deborah Ruth Amulen of Makerere University, a former MSU visiting scholar and Excellence in Insect Science Symposium panelist.

This issue:

People Spotlight
PAGE 11

Student Features
PAGE 14

Another exciting international engagement was undertaken by Dr. Anthony Cognato, director of the A.J. Cook Arthropod Research Collection, and Dr. Sarah Smith, collection curator, who traveled to Thailand to transport more than 12,000 bark beetle specimens to add to the collection. This gift was provided by Roger Beaver, bark beetle expert and friend of the collection.

Expanding Bug House programming: Through a successful MSU CrowdPower campaign and particularly generous support from the Great Lakes Entomological Society, we will be expanding free MSU Bug House programming to Saturdays! Starting in January, join us on the third Saturday of each month from 10am to 1pm. Six-Legged Saturday events will include a kid-friendly story time, themed craft activities, and, as always, live insect encounters.

Connect with us! MSU Entomology has recently expanded our social media presence, so be sure to connect with us on your favorite platform whether that's Bluesky (@msu-entomology.bsky.social), Facebook, LinkedIn, or Instagram (@msuentomology). This fall also marks the return of new episodes of Bug Talk (bugtalk.buzzsprout.com), the MSU Entomology podcast which began in 2020. Check out new episodes featuring Dr. Andrea Glassmire and Dr. Eric Benbow as well as the archive featuring faculty, students, staff, alumni, and friends.

I wish all MSU Entomology members a peaceful close to the semester and look forward to next year!

Hannah J. Burrack
Chairperson

Photo by Bill Ravlin

2025 ESA Winners

Christopher Brown earned first place in the Graduate Student 10-Minute Presentation category. His talk highlighted his experience designing K-12 curricular resources as both a former middle school science teacher and a researcher on the MothEd project. Brown shared strategies for scientists developing educational materials, emphasizing the importance of high-quality resources paired with clear lesson plans, understanding the barriers teachers face, designing materials that help address those challenges and valuing teacher feedback even when it differs from research priorities.

Jenna Byrne received second place in the Graduate Student Poster Competition in the P-IE, Forestry and Agroecosystems section. Byrne is a graduate student in the Department of Entomology studying ambrosia beetles and the factors that influence orchard infestation patterns.

Jordy Hernandez received the SysEB Patch Memorial Research Award. The award recognizes outstanding master's research in arthropod morphology, systematics, taxonomy, or evolution. Jordy completed his M.S. in Entomology at MSU under Professor Anthony Cognato, where his thesis work earned this national recognition. He's now a research technologist at the University of Kansas, continuing to contribute to exciting systematics and biodiversity projects.

MSU student's vacation leads to novel insect discovery

BY JUSTIN WHITMORE

Michigan State University Doctoral student Junkai Wang always knew he wanted to work with insects.

"I've always liked bugs," said the first-year PhD student. "I've liked bugs since before I can remember. So, if people ask me why I like bugs, I have no good answer for it. As far back as I can go in my memory, I've liked bugs."

As a sophomore in high school at Cranbrook, located in Bloomfield Hills, Michigan, Wang decided he wanted to pursue his interest in insects as a career.

“I emailed a bunch of professors that I didn't know, saying, ‘Hey, if anybody would like some free work from a high schooler with no experience on any type of research, I would love to learn.”

Michigan State University Entomology professor Anthony Cognato provided the opportunity, and Wang spent three summers working in the Cognato Lab on species detection and eradication projects.

As an undergraduate student at The University of Michigan, Wang continued his collaboration and contributions to the Cognato Lab. When he graduated from Michigan with degrees in Ecology and Evolutionary Biology and Art and Design, he knew he wanted to pursue an Entomology doctoral degree in East Lansing.

Over the past 20 years, Dr. Anthony Cognato has developed an international research program in insect systematics and collection stewardship. His program supports the education and research goals of graduate and undergraduate students and advances in the study of bark beetle. As director, he has been pivotal in the revitalization of the A.J. Cook Arthropod Research Collection.

One aspect of their work that Cognato and Wang particularly enjoy is species identification and discovery.

“I spend a lot of my free time looking for bugs,” Wang said.

Recently, the two teamed up to discover, identify and describe a novel cockroach species. The discovery started with Wang going to Florida on vacation and doing what he loves.

Junkai Wang

“(Co-author) Alan Jeon and I were planning a trip to Florida just to try to catch random bugs, and we were looking at the App iNaturalist on our phones to see what was in the area to catch. There was this random, unidentified cockroach reported from a neighborhood, So, Alan and I said, ‘hey, that's something interesting, we should go catch one to keep as a pet.”

When they learned more about the mystery roach, they started to realize they had discovered something unique.

Cognato, who identified his first new species in 1998, coordinated with collectors and researchers around the world to examine populations of the cockroach in Florida with related and similar species. Researchers found populations of the same cockroach in Austria and Malaysia.

Anthony Cognato

To identify this new species, researchers looked at the morphology, physical characteristics, and DNA of the collected specimens and compared them to other known Nocticola species. The collected specimens showed significant divergence in the COI gene, a segment of mitochondrial DNA often used in species identification.

“Most of the time you don’t know a new species until you get them under a microscope or look at their DNA, so after we get the insects into the lab is when it gets real exciting,” Cognato said.

Researchers found that the DNA of the Florida and exotic pet specimens found in Malaysia was identical to one another but differed slightly from the Austrian specimens. The team concluded that the three specimens formed a monophyletic group, meaning they all evolved from one common ancestor.

It was determined that Wang had come across an undescribed species of Nocticolid cockroach, which the MSU researchers have named *Nocticola vagus*. The genus is mostly found in Africa and Asia, and this was the first discovery of this genus and species in the Western Hemisphere. The study was recently published in Zootaxa by Wang, Jeon and Cognato.

One of the defining traits of this new species is that it is parthenogenetic, meaning females can reproduce without fertilization from males. This is the first recorded instance of this trait in Nocticolidae. Researchers believe the species likely spread through the soil of potted plants, and that asexual reproduction enabled it to establish a population far from its native range.

Preserved specimens from each source of the new species are now housed in the A.J. Cook Arthropod Research Collection (ARC) at MSU, contributing to the growing knowledge about the diversity of Nocticolidae. The holotype, the designated single specimen that represents a new species, provides a critical reference point for future studies and is included among these specimens.

“This research highlights the contributions that graduate students can make towards biodiversity knowledge and the role of the ARC in the preservation of scientifically important specimens like this holotype,” Cognato said.

The ARC hosts about 1.5 million preserved arthropod specimens from around the world, representing approximately 35,000 species. It has served as an invaluable scientific resource for 158 years, helping researchers identify new species, uncover nformation about evolutionary relationships and even support species conservation efforts.

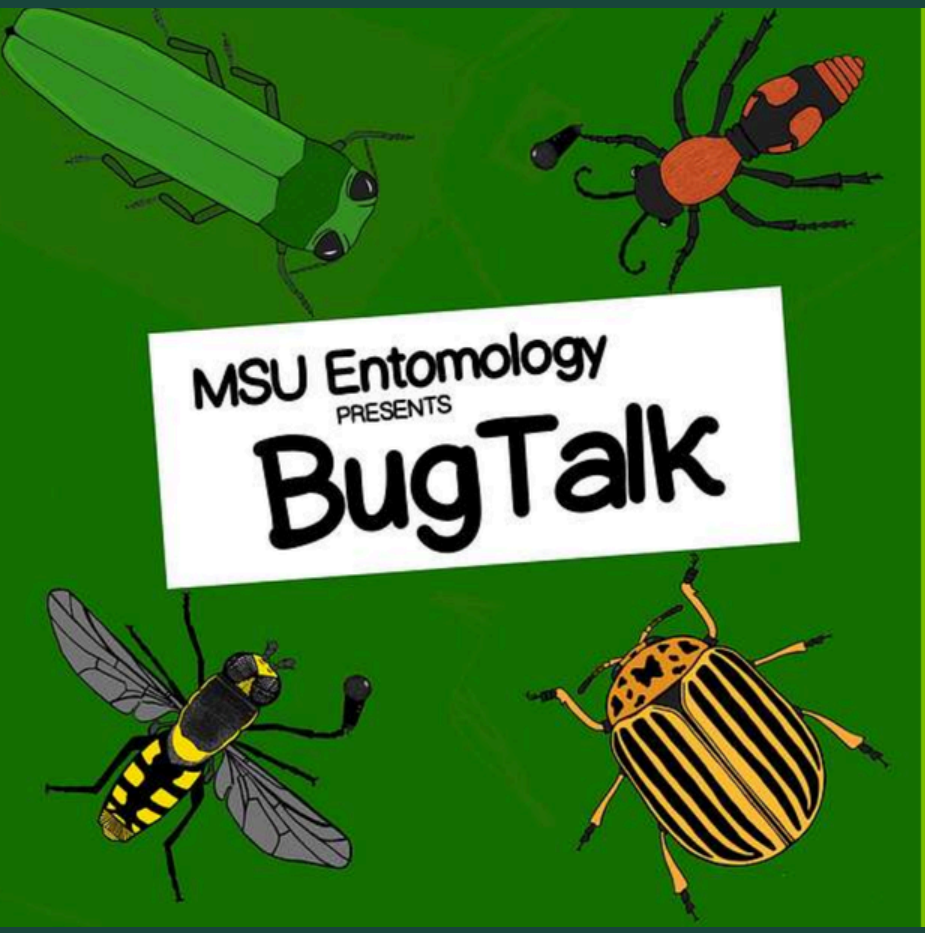
“Our specimens are like books in the library,” Cognato said. “We've have specimens, mostly butterflies and moths, in a public database that are accessed very frequently. Our data has been cited in publications hundreds of times, and we lend out specimens to researchers around the world to study and compare with local specimens to help re-describe or identify a species.”

Modern technology has allowed researchers at the ARC to expand their search for undiscovered species into the digital world, Cognato said. Using DNA sequencing technology, researchers can search the databases of arthropod collections around the world to compare different samples to determine genetic matches or unique species characteristics.

“We have a technique that can sequence old degraded DNA. We’ve been successful in sequencing genes of more than 100 species, some specimens up to 100 years old,” Cognato said. “So now we explore collections just like we explore the woods. For example, an expedition from the Netherlands in the 1990s to Vietnam produced a large collection of specimens that can now be examined for new species. Discovery of new species gives you that Christmas morning feeling in this research.”

The *Nocticola vagus* cockroach marked Wang’s second species discovery in his short research career, which he plans to continue upon finishing his Ph.D. at MSU. His long-term goal is to bridge the gap that exists between scientific research and hobby collectors and use networks to identify species and encourage a new generation of bug enthusiasts.

“I hope to bring the scientific community closer to the amateur community and the insect hobby community, in general,” Wang said. “The insect hobby community in the U.S. and around the world brings in a lot of undescribed, unique species to the scientific community, and if we can work more closely, I think we can a raise more interest and more funding for the scientific community and raise a new generation of promising young researchers that want to go into the field.”



Meet the people behind the science!

Hear how MSU entomologists are exploring insects, ecosystems and everything in between.

Scan to listen!

Bug Talk is Back!

Bug Talk, the podcast from MSU's Department of Entomology, is back! Hosted by multiple co-hosts, the show takes you beyond the lab to meet the people behind the science. Hear conversations with entomologists and other scientists about their lives, inspirations, and interests outside of work. Episodes are available wherever you listen to podcasts.

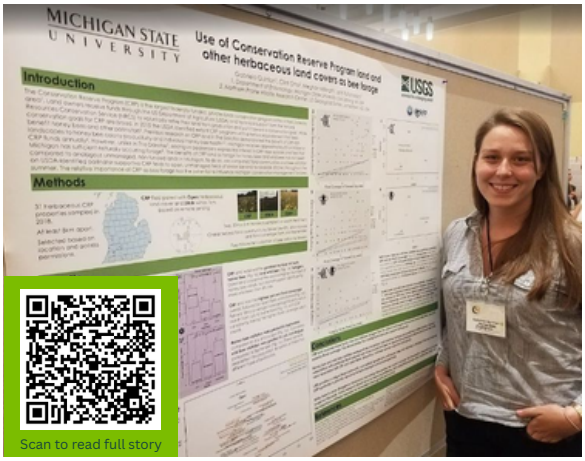
Recent episodes feature:

- **Dr. Andrea Glassmire** – Explore plant-insect-soil interactions and learn how plant trait diversity shapes pest management and biological invasions.
- **Dr. Eric Benbow** – Discover the fascinating roles insects play in decomposition, disease spread and even as food and livestock feed in Africa.

News

Spartan scientists contribute to global examination of pollinator habitat

Michigan State University Distinguished Professor Rufus Isaacs and Entomology alumna Gabriela Quinlan (Ph.D. ’20), now an Assistant Professor at the University of North Carolina-Greensboro, collaborated with researchers from 19 countries to develop a framework for informing conservation policies to increase the quantity and enhance the quality of pollinator habitat in agricultural landscapes.



What were MSU Entomologists up to this Summer?

Fall semester is wrapping up, and our entomologists are settling back into campus after a busy season of teaching, fieldwork, research and international travel. From Michigan to Thailand, their work continues to span the globe, uncovering new species and advancing our understanding of how insects shape ecosystems, agriculture and everyday life.

MSU transforms property to support pollinators

Michigan State University is converting 30 acres of campus land into pollinator-friendly habitat, replacing mowed turf with native-plant gardens, meadows and clover fields. Led by MSU’s Entomology Department and Infrastructure Planning and Facilities, the project has already transformed 22 acres, reducing mowing from 26 times a year to just once while enhancing ecological support for pollinators and cutting maintenance demands. With positive campus feedback, MSU plans to seed additional meadow areas and expand clover plantings near solar lots.

MSU faculty, students participate in global symposium on food security in Africa

In June, MSU Entomologist Dr. Eric Benbow co-organized the inaugural Global Symposium on Insects for Food, Feed & Food Security in Africa in Kampala, Uganda, alongside former MSU Entomology visiting scholar Dr. Deborah Ruth Amulen. The event brought together more than 100 international experts to explore the role of insects in sustainable agriculture, food security and economic development. MSU Entomology was also represented by Ph.D. student Kelly Waters and M.S. student Kat Yoskowitz, who attended the symposium.

New pollination management resource for urban growers in the Great Lakes region

Scan to read full story

MSU Entomology's Bee Urban Growers (BUG) Project helped develop a new guide, Native Bee Habitat Management on Urban Farms in the Great Lakes Region, to help urban growers boost pollination with native plants. It profiles 40 plants and 17 bee genera, covering habitat, pollination and conservation information. A Spanish version is also available.

MSU Entomology Welcomes Largest Freshman Cohort in Department History

This fall marks a milestone for MSU Entomology, which welcomed its largest incoming class ever. Fifteen new majors and twelve minors joined Team Emerald Ash Borer, bringing the department to 48 undergraduate majors. Enrollment has nearly doubled over the past three years, reflecting growing interest in entomology and the department's expanding academic opportunities.

Welcome to MSU Entomology!

Gwen Pearson
Adjunct Assistant Professor

Gwen Pearson joins the Department of Entomology as an adjunct assistant professor, bringing decades of experience in entomology, science writing, and outreach. Her projects like The Lesson Hive, which curates K–12 entomology lessons, and the Insect Festival Working Group, which develops best practices for insect-focused festivals nationwide, aims to make science more accessible and help foster curiosity about insects. Pearson's career has spanned research, higher education and science communication, with writing credits ranging from WIRED to The Guardian. Check out Pearson's Q&A on our website!

Jeff Barrick
Hannah Distinguished Professor

Dr. Jeff Barrick returns to MSU as a Hannah Distinguished Professor with joint appointments in Entomology and Microbiology, Genetics, & Immunology. A leader in microbial evolution and synthetic biology, Barrick oversees the Long-Term Evolution Experiment and studies honeybee gut microbiomes, using engineered symbionts to protect pollinators. He brings a passion for mentorship and interdisciplinary research, bridging molecular biology, ecology and biotechnology to address real-world challenges. Learn more about Barrick and his return to MSU on our website.

Fellowship Focus: Entomology fellowship leads Amelia McGinnis to graduate school at CANR

BY JUSTIN WHITMORE

Amelia McGinnis was introduced to entomology through the MSU Entomology Research and Outreach Fellowship (EROF) and was drawn to its many wide-ranging, interdisciplinary applications. An undergraduate student at Lansing Community College (LCC), she was one of three students selected in 2023 as part of the EROF program.

An experiential summer program supported by private funding from the Tatter family, the EROF is open to undergraduate students from any college or university. Working alongside world-class researchers at MSU, the EROF offers hands-on research and community outreach experiences to students who might not otherwise have access to such opportunities.

McGinnis worked with Professor and Department of Entomology Chair Hannah Burrack as well as graduate student DeShae Dillard during her time as a fellow. At the conclusion of her fellowship, McGinnis transferred to MSU to pursue a bachelor's degree in plant biology and continued her work with Burrack and Dillard.

Driven to continue her studies after graduation, McGinnis began developing research questions she hoped to explore further in graduate school. She applied to the Entomology Department and was admitted in the fall of 2025.

Department Chair Dr. Hannah Burrack emphasized the importance of fellowship support in cultivating the next generation of scientific leaders, like McGinnis. “Fellowships like EROF are essential to unlocking opportunities for talented students who may not otherwise have access to entomology training and opportunities,” said Burrack. “They not only provide financial support, but also mentorship and hands-on experience that can propel a student’s academic and career trajectory.”

Amelia McGinnis

McGinnis credits the EROF program for igniting her interest in graduate-level research and deepening her commitment to the field. “My experience as a fellow was my introduction to both research and MSU. It shaped my interest in entomology and ultimately led to my decision to enter graduate school.”

Her current doctoral research focuses on plant-insect interactions, with an emphasis on comparing bee and fly pollination across Michigan prairies using a quality-versus-quantity pollination framework. “Insects play many important roles in our world,” said McGinnis, “through studying entomology, you gain a unique way to explore many different disciplines of science, including ecology, conservation, taxonomy, pathology, pest management and sociology.”

Since being admitted to the Department of Entomology’s graduate program, McGinnis has been awarded the Academic Achievement Graduate Award (AAGA) from the College of Agriculture and Natural Resources (CANR) to support her first year of studies as well as a Engagement Fellowship from the Ecology, Evolution, and Behavior (EEB) Program. “The fellowships I have received have allowed me to continue my education and have given me the chance to explore the scientific questions I am interested in asking,” said McGinnis. “I am extremely grateful for the resources and support these opportunities have provided me.”

McGinnis hopes to find a career that will allow her to continue pursuing her research ambitions following the completion of her Ph.D. She encourages students to actively connect with faculty and current graduate students in their department in order to find mentors and partners. “Entomology is a field that bridges many different areas of science,” she said, “so it’s important to seek out who is asking the types of questions you’re interested in exploring.”

Feature Undergraduate Student

Sabrina Bak

Hometown: Novi, MI
Major or Minor: Major
Expected Graduation: Fall 2027

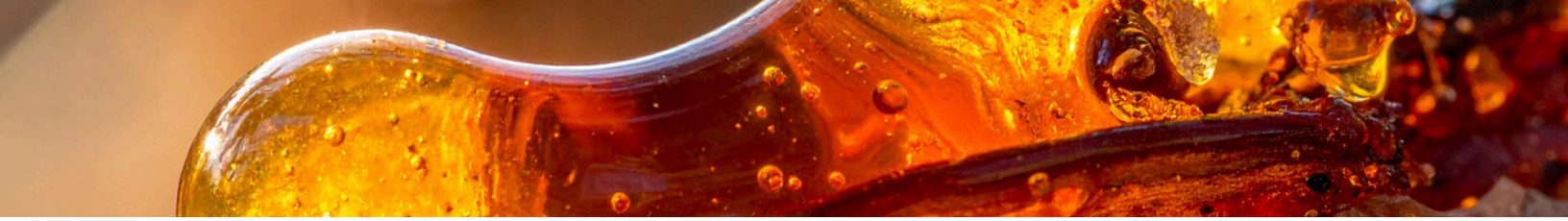
What inspired you to choose entomology as your area of study?
I have been fascinated by insects since a very young age, and my love for them has only continued to grow throughout my life. Because of this passion, I have known that I wanted to go into entomology for longer than I can remember.

What's been your favorite class or lab experience so far, and why did it stand out to you?
My favorite class so far has been ENT 404, or Fundamentals of Entomology. The experience of collecting and pinning my own collection of insect specimens has been a fascinating process that allowed me to learn hands-on.

How has studying at MSU shaped or changed your interest in insects or the natural sciences?
If anything, studying at MSU has only increased my fascination for the natural world and how everything works and interacts together, from insects to plants to humans. I am now more attentive to small details than ever, as even the smallest organism can affect the entire ecosystem.

Is there a particular insect or topic in entomology that fascinates you, and what drew you to it?
Wasps are some of my favorite insects! In my opinion, they are some of the coolest but most misunderstood insects out there. From the striking intelligence of social wasps to the incredibly specialized lifestyles of solitary wasps, the hymenopteran world offers a lot of incredible things to learn about.

What are your career goals, and how do you hope to apply what you're learning here?
I hope to ultimately work in conservation. Insects are in global decline, a fact that is largely hidden and dismissed by most of the world, and I hope to help these vital creatures make a comeback. What I am learning here at MSU can help me in this goal by teaching me ways that I can help, such as identifying invasive species or specific food sources for threatened species.



Kelly Waters

Hometown: Neshanic Station, NJ
Previous education: Loyola University Maryland (B.S.)
Advisor: Eric Benbow

What sparked your initial interest in entomology, and how has it evolved over time?
My first introduction to entomology was during a forensic entomology class at Loyola University Maryland during my undergraduate degree. I then had the opportunity to join Dr. David Rivers' forensic entomology lab and work on a project characterizing beetle stains that resulted from contact with blood. This work led me here to continue researching decomposition.

Could you tell us a bit about your current research? What are you focusing on, and what impact do you hope it will have?
My research focuses on decomposition ecology and insect-microbe interactions, focusing on microbe change in beetles and soil throughout the decomposition process.

What has been your favorite course or project so far, and what makes it stand out?
The most impactful project that I have had the opportunity to join was team Limelight Rainforest in the XPRIZE Rainforest competition. XPRIZE Rainforest was an international, $10 million competition that began with 33 qualifying teams in 2021. The goal of the competition was to develop autonomous biodiversity monitoring methods to support local conservation and economies. During the final competition, our team traveled to Amazonas, Brazil to remotely monitor and sample 100 hectares in 24 hours, and processed all samples, analyzed data, and generated a final report within the following 48 hours. In all, we produced over 2 million sequences with 1,582 taxa detections, 250 of which were unique species, and led to us winning first place!

What's your favorite part about being at MSU?
My favorite part of MSU are the natural areas and how pretty campus is, especially in the summer and in the snow!

What has been a particularly memorable or meaningful experience for you during your time in graduate school?
In June, I had the opportunity to attend the Global Symposium on Insects for Food, Feed & Food Security in Africa where I learned about the newest developments in black soldier fly (BSF) farming, and the use of other insects as food and feed in Africa. So much work is being done to further BSF, and other insects, farming to contribute not only food and feed, but fertilizer, waste management, and building economies. My favorite part of the conference was visiting the BSF farms in Uganda led by Dr. Deborah Amulen and her group and learning about their ongoing collaborations within Uganda and neighboring nations.

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Embracing Diversity

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Donate To MSU Entomology

Just as insects create the biological foundation for ecosystems, you provide the basis of support that allows our entomological work to continue. Your support provides access for students to hands on learning, advanced training, and travel to network and share their results. It empowers faculty to conduct innovative and impactful research, your support allows us to share the wonders of insects with children of all ages. To show our appreciation for your generous support this year, we will send you the second in our series of commemorative coins featuring Sesia spartani, which represents our theme for this year Embracing Diversity. Each year, when you submit your tax deductible donation to MSU Entomology, we will send you the next coin in the series. Collect all five by committing your support over five years, and we will send you a shadow box to display your collection. Entomology is a gateway to a more inclusive community. Not only does your gift support the department, but you are changing lives in the process. Become a part of Bugs Work! Donate today.