

The Glowworm



Every day is a journey, and the journey itself is home. - Matsuo Basho



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An Extension Newsletter of the Dept. of Biochemistry, Molecular Biology, Entomology, & Plant Pathology

BugFest 2015 at the MSU Crosby Arboretum: Getting Better All the Time

There is always something new at MSU's BugFest and this was a banner year! It was great having Mississippi Environmental Education Alliance members including Harold Anderson, and Jennifer Buchanan from the Grand Bay National Estuarine Research Reserve with us this year. Of course our Arthropod Adventures crew, graduate students, and bug campers Brady Dunaway, Matthew Thorn, and Breanna Lyle were outstanding as usual, making BugFest what it has become. In an attempt to relieve the intense collection pressure, we have added a number of new education stations around the lake and it seems to be working. Dr. Daniel Fleming ran the event; Matthew Thorn gave the introductions and instructions on collecting, and Brady Dunaway handled the aquatic insect station. Breanna, aka Spider Woman, wrangled spiders and pinned insects while Dr. John gave trail talks, cooked insects, and officiated the cricket spitting Contest. Paige Fleming jumped in and ran an art booth and the carnivorous plant station. Peggy Guyton's honey snacks, insect snacks, and butterfly release were popular. Everyone enjoyed seeing Mary and Terry Cordray, whom we knew from the Lynn Meadows Discovery Center in Gulfport, as they ran an art station. Dr. Jeff Harris was a hit with bees, arthropod antics, and the most currently available answers to bee questions. Kay Williams with the Mississippi Geographic Alliance was the resident monarch authority.

The beautiful banners hanging on the front of Pinecote Pavilion were designed by MSU art student Kimberlin Singletary.





Our Outreach Staff Attends Career Expo by Dr. John Guyton

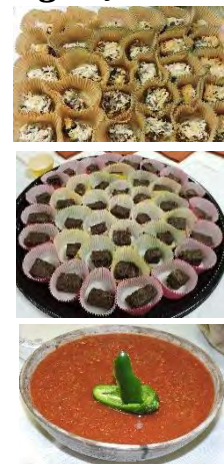
PT Barnum’s quote “Every day is opening day” came to mind as we headed to Tupelo for the



second day of Imagine the Possibilities, a career fair in Tupelo attended by over 3,000 eighth-graders and teachers. We discussed careers in entomology as we watched youth and adults face their greatest fear by holding a vinegaroon and/or a tarantula! Our golden knee tarantula was up for the challenge, walking miles each day and wolfing down a cricket each night.

18th International Insect Rearing Workshop Participants Eat Bugs by Dr. John and Peggy Guyton

As interest in rearing insects for human food grows among the participants at the MSU International Insect Rearing Workshop, we continue to feed them bugs. For the second year, we had a different insect snack for each break during the 5-day workshop. Peggy had the crickets delivered right before the workshop, producing the snacks just before they were served. The insect treats included banana cricket nut bread with MSU honey, peanut and pecan cricket brittle, cricket brownies, chocolate chirp cookies, magic cricket bars, insect energy bites, and the pièce de résistance, salsa with ground crickets.



WHAT'S NEW AT THE ZOO?

We Have Worms (Bagworms) by Dr. John Guyton

When bringing in foliage for the walking sticks in the zoo, we accidentally introduced a bagworm (*Lepidoptera, Thyridopteryx ephemeraeformis*). It was so entertaining, we intentionally introduced a couple more! We see a few bagworms every year on a buttonbush (*Cephalanthus occidentalis*) beside our driveway. I am more familiar with the sometimes called evergreen bagworm moth on arborvitae and eastern red cedar, but other host plants include elm, basswood, maple, oak, persimmon, pine, poplar, willow, and buttonbush.

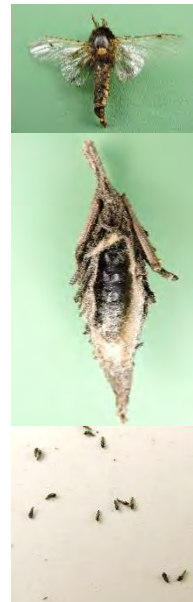
Between 300 and 1,000 bagworm eggs overwinter in the female’s spindle-shaped bag, hatch between May and June, and then take a silk line down to a leaf or the ground. From there they crawl back up the trunk to dine on the upper epidermis of leaves or buds. The larvae are extremely small and with a silk line they easily balloon, carried by the wind, to surrounding vegetation. In the

picture, they are enlarged to more than twice their emergence size. As they eat, they construct a bag that resembles a pinecone from silk, twigs, and leaves that blends in with the foliage. Their bags grow from around 1/8 inch to 2 1/2 inches.



The bagworms have made themselves at home, roaming around the cage, enjoying the water dish and ignoring the walking sticks. Note their circular pattern of silk on the screen top of the cage. Photos by J. Guyton

By mid-August, the mature larvae can poke their heads and legs out and move to a more desirable location. The larvae pupate in their camouflaged bags for 7 to 10 days, depending on temperature. The male's body is black



and furry with clear wings. When the male emerges in the fall he goes in search of a female that is producing attractive pheromones, using his feathery antennae. For him this is an urgent search because he has no functional mouthparts and only a limited amount of energy and time. After finding the female, he inserts his abdomen into the hole in the bottom of the bag to mate. The female has no need for wings, eyes, legs, antenna or mouthparts. She is soft, yellow-white, and virtually hairless in her silk-lined bag. After laying her eggs, she drops from the bag and dies. We most often see the males when we are blacklighting and usually one at a time.

Bagworms can defoliate trees and shrubs, though if caught early enough, they can be picked off by hand before the damage threatens the plant. As the summer progresses, Permethrin and Talstar treatments are not as effective because mature bagworms are more resistant.

BUG CLUB ACTIVITY

***Learn How to Care for Bess Beetles* by Dr. John Guyton**

Many insects are easy to care for and rear, and the bess beetle (*Odontotaenius disjunctus*) is one of those. When you consider that one out of every four animals in the world is a beetle, you will have a little better understanding of one of earth's most common inhabitants. Coleoptera, the beetle order, contains over 350,000 species. Comprising over 500 species, you would expect bess beetles to have a lot of names, and they do. In the U.S. alone, where only 4 species are found, their common names include: Betsy beetle, bessbug, patent leather beetle (from their shiny black color), and passalid beetle. The Entomological Society of America, which gives insects their common names, has formally named it the horned passalus.



Bess beetle in rotting wood. Photo by J. Guyton.

Bess beetles are important decomposers of wood in forests. Roll over a rotting log and there is a good chance you will find some entertaining black beetles. Cup two in your hand, hold them to your ear, and listen to them talking or squeaking. They have at least 14 different acoustical sounds that they use in communicating, making sounds, or stridulations, by rubbing the upper surface of their abdomen against their wings. The larvae also make sounds by rubbing the stridulatory peg on their third leg against the stridulatory file on their second leg.¹ Bess beetles are docile, but you will notice they have small but strong mandibles. If they should bite, and that is uncommon, it will be more surprising than painful. They use their mandibles to chew through decaying hardwood, dining while creating the galleries in which they live.

Bess beetles eat decayed wood that has been predigested by fungi and bacteria. Then they eat their frass (poop) for better digestion.² If you notice large, white larvae (grubs) or pupal cases that may remind you of mummies, you may want to leave them alone. The larvae take up to a year before entering the pupal stage. If you do take them home, they should be left undisturbed in one end of their cage. When you notice a reddish bess beetle roaming around the cage, one has just emerged from the pupal case and will soon turn black.

Bess beetles are easy to keep, but should be released after a couple weeks. You can keep them in a large critter keeper or a 10-gallon aquarium with a rotting oak log, preferably part of the one you found them under. An inch of soil from under the log is beneficial in the bottom of their cage.

The log should be misted every day, or leave a moist paper towel in the cage for a couple days. Adults live for about a year.



Bess beetle galleries excavated by adults for food and shelter.
Photo by J. Guyton.

¹Ward's Scientific https://www.wardsci.com/www.wardsci.com/images/Bess_Beetles.pdf

²Featured Creatures. University of Florida Entomology and Nematology.

http://entnemdept.ufl.edu/creatures/misc/beetles/horned_passalus.htm

Congratulations to State Fair 4-H Insect Collection Winners

Congratulations to State Fair 4-H Insect Collection winners Ainslee Davis of DeSoto County and Grant Houston of Tate County. We extend a sincere thank you to entomologist Jennifer Seltzer for judging this year's state fair entries. Jennifer was also at the fair building youths' awareness of invasive insect species, including red imported fire ants and the emerald ash borer.

Registration for MSU's 2016 Entomology Camps Is Now Open

Well, it is that time of the year! This is our 23rd camping season, featuring our 32nd and 33rd camps (including Bug & Plant and Beekeeping camps). We open registration before the Christmas holiday because we have had many parents and grandparents wanting to give their young entomologists a trip to camp.

Send your camper (or yourself) to MSU Bug & Plant Camp (June 12–16) or MSU Beekeeping Camp (June 5–9). We accept campers age 10 and up for these 5-day residential, intergenerational camps. CEUs are available for teachers. As a cost-saving measure, we are not doing online registration at this time. (See registration form next page)

We have been chasing bugs every summer for 23 years at what is now the oldest academic/residential bug camp in the world. We start early every day and collect late into the night. Campers learn to collect, trap, and pin insects, and enjoy presentations by leading researchers in the fields of forest, medical, forensic, and veterinary entomology. We also have sessions on aquatic entomology, insect physiology, beekeeping, arachnology, integrated pest management, insect and plant diseases, carnivorous plants, horticulture, entomophagy, and photography. Partnering with the Sam D. Hamilton Noxubee National Wildlife Refuge, we are allowed to collect on the refuge. As you can tell, we pack a lot into the week. Entomologists join campers at meals, sharing information from their areas that campers cannot wait to tell others! We also have an Arthropod Zoo in our lobby, where we meet and conduct some activities. Campers are encouraged to collect specimens for the zoo. Camp is intense, without official breaks, but the "bottomless fruit bowl for anytime snacks" is always available. We may even eat a few bugs, prepared by our excellent bug chefs!

Editor's Note: Details on Beekeeping Camp will be featured in the November-December *Gloworm*.

2016 Entomology Camp Registration

Biochemistry, Molecular Biology, Entomology, and Plant Pathology Department Extension



- Bug and Plant Camp, June 12–16, 2016 (check one)
 Beekeeping Camp, June 5–9, 2016

Camper (adult or youth) Information (please use a separate form for each camper)

Name _____ Age _____ Gender _____

Roommate Preference (not required) _____

Camper's cell phone (required if camper will be bringing a phone) _____

Have you attended an Entomology Camp at MSU? Bug and Plant Beekeeping No

T-shirt size (all sizes are adult) S M L XL XXL XXXL Other _____
(Circle one)

Hometown newspaper _____ School attended during 2014/15 _____

Grade Completed (before camp) _____

Teachers: Do you want continuing education units? Yes No

Adult Contact Information for Youth Campers

Name (Parent or guardian) _____

City _____ State _____ Home phone _____ Cell _____

Email address _____

Amount enclosed \$ _____ (Make checks payable to **MSU Bug and Plant Camp** or **MSU Beekeeping Camp**)

Payment Options

Down Payment	Full Payment
1 camper—\$225	1 camper— \$425
2 campers—\$450	2 campers— \$850

Mail registration forms for each camper and payment to Dr. John Guyton, Dept. of Biochemistry, Molecular Biology, Entomology, and Plant Pathology, P.O. Box 9775, Mississippi State, MS 39762-9775.

When we receive your registration, we will send you the medical and other required forms.

We are looking forward to seeing you at camp!

Questions? Contact Dr. John Guyton at 662-325-3482 or j.guyton@msstate.edu or Lois Connington at 662-325-0795 or lois.connington@msstate.edu.

Spitting Crickets and Serving Insect Treats: Not Your Average Tailgating Experience by Dr. John Guyton

Cricket spitting is popular in many entomology departments around the country and there is even a Guinness Book of World Records champion!¹ Tom Turpin, professor of entomology at Purdue University, is the father of cricket spitting. He drafted the rules in 1996 when he decided to add cricket spitting to their annual Bug Bowl that featured Roachill Downs cockroach racing as well as insect petting and eating and other spring events.² Needless to say, cricket spitting has been a very popular event with thousands participating (that is people, not crickets and roaches).



This event, sanctioned by the Guinness Book of World Records, has very simple rules so anyone can do it. The crickets have to be brown house crickets that weigh between 45 and 55 milligrams. The crickets must have been frozen and thawed for the contest. Cricket spitter Danny Capps of Madison, Wisconsin, spat a dead cricket from his mouth a distance of 9.17 m (30 ft., 1.2 in) to secure the Guinness World Record.

This year we decided it was time to quit yacking about hosting such an event, take the cricket in the mouth, and spit! While we don't have a bug bowl, we do have a few bowls of bugs! Here in the SEC we have our own variations, of course. We freeze our crickets, boil them, and refreeze them until game day. As Harold Anderson says, we want to make sure everything is "dade, dade, dade, dade (sic)" [dead, dead, dead, dead]. Instead of measuring distance, we are spitting for *accuracy and fun*. Oh, we don't have a problem with distance—we have a state champion cricket spitter from BugFest this year—but on game day it is all about accuracy.



This is not a team sport. It is an individual or family effort to feed our opposing team's mascot crickets. And either team's fans can participate.



Our rules include: spitting it down the mascot's throat (distance from the mascot does not matter); you may have as many tries as you like; if you accidentally eat your cricket, we will give you another. Everybody wins! For the University of Kentucky game, the prizes, always entomophagous treats, were Peggy's famous



We enjoyed having Christopher Perry, a freshman in our department, on hand to help show off our favorite arthropods.

fudge brownies with whole crickets and chocolate chirp cookies. Both hit the spot with the fans.



¹[http://www.guinnessworldrecords.com/world-records/cricket-spitting-\(indoors\)-greatest-distance/](http://www.guinnessworldrecords.com/world-records/cricket-spitting-(indoors)-greatest-distance/)
²<http://extension.entm.purdue.edu/bugbowl/>

Do Tarantulas Have Bad Hair Days? by Lois Connington

Although we are used to handling a number of critters in the Arthropod Zoo, this is a cautionary tale of what can happen when you least expect it. Our most docile tarantula is a Chaco golden knee (*Grammostola pulchripes*) that Dr. John received recently from a tarantula rescue service. So calm is she that several weeks ago she was held without incident by thousands of hands during a two-day career fair we attended. With such a stellar track record, the golden knee ("Goldie") was an obvious choice to take to the departmental tailgate party last weekend.

I was the first to remove her from her critter keeper, calmly allowing her to walk from hand to hand as I showed her to the children who were decorating pumpkins. Just as one child asked to hold her, the spider became agitated, running up my arm and toward my chest. Concentrating mainly on preventing the tarantula from diving onto the ground, I quickly scooped her up, telling the group that I had to put her back in her cage.

After that display, I happily handed Goldie off to Dr. John, first confirming with him that I had indeed brought the correct tarantula. Given the spider's restlessness, I was afraid that I had mistakenly brought the Costa Rican zebra (striped knee) tarantula that is famous for its skittishness and resides in a similar cage. Eventually Goldie was antsy even with Dr. John, her trusted handler, causing him to cage her for the remainder of the event.

Meanwhile, I spent the next several hours working the football crowd, serving as the vinegaroon's human treadmill while he walked miles across my hands. I did not realize until the next afternoon that Goldie had flicked unknown numbers of urticating (barbed, irritating) hairs into my hands and arms that likely were spread around in part by the constantly moving vinegaroon. The insane burning/itching 24 hours after contact, accompanied by numerous small bubbles on my arms and large, hot, swollen patches on my palm, were my first indication of the attack. In my ignorance, I had failed to try to remove the tarantula hairs before rubbing and ultimately scratching many of them deep into my skin.

My discomfort grew, turning me into a whiny and unhappy zookeeper by the time I returned to work on Monday. Always the scientist, Dr. John encouraged me to analyze my agony (and of course write about it), recording the symptoms and tracking the relief, if any, provided by numerous treatments recommended on the internet or tried out of sheer desperation. Applying macerated English plantain (*Plantago lanceolata*) leaves to the affected areas partially drew out the hairs, but I do not recommend pulling them out with forceps. Soaking in an Epsom salt bath softened the swollen areas on my palm, but set the open sores I had scratched on my arms on fire. Loratadine, an antihistamine (10 mg), provided relief from the itching and may have reduced the swelling on my palm. Washing the affected skin with Tecnu Extreme Poison Ivy Scrub curbed the itching for about



an hour at a time and was easy to repeat as needed. Burt's Bee's Res-Q Ointment did not really stop the itching, but TriDerma Eczema Fast Healing Face and Body Lotion (medical strength, no cortisone) seemed to help, as did calamine lotion. Chigger-X and Benedryl cream provided no long-lasting relief. By the time I applied sticky tape on my skin to remove the hairs, it was too late.

At Day 7, I can report that of the original affected areas, only my palm still itches. The large red lump is now two smaller, bumpy, hardened lumps. Of particular interest is the fact that although I can feel burning pain on the patches on my palm when I rub or scratch them, I cannot detect cold against that skin.

What turned Goldie from a gentle giant into a bundle of nerves? We can only speculate that the combination of sunshine, wind, and smoke from the nearby grill may have sent her into defensive mode. Or perhaps the paint on one of the children's hands set her off.

Whatever it was, NEVER assume that your trusted pet tarantula won't have "bad hair days." At the first indication of unease, put the spider up for the day, for everyone's sake.

Editor's note: Goldie was back to her old self for the Mississippi Science Teachers Association conference in late October and many teachers enjoyed holding her. The author, with some reserve, has resumed handling Goldie.

***Arthropod Adventures—Branding and Bundling Extension Entomology Outreach and Education Activities* by John Guyton and Lois Connington**

Arthropod Adventures, the comprehensive entomology education program of the MSU Extension Service in the Biochemistry, Molecular Biology, Entomology, and Plant Pathology Department, comprises a zoo, two educational summer camps, and additional outreach activities, including 4-H.

Most faculty, associates, and students in the entomology unit are actively involved in some aspect of educational outreach.

The Arthropod Zoo, located in the Clay Lyle lobby, has become an exciting destination for visitors to campus and a central element in Arthropod Adventures' programs. Many entomological concepts can be taught from the live and static exhibits in the lobby or from educational materials presented on the large screen TV. A collection of native Mississippi carnivorous plants is also on display, supplementing the pollinator gardens. In season, students in the department take arthropods to the weekly farmers market as a public education program. The zoo is open during normal business hours and tours are conducted by reservation.

Our intergenerational entomology summer camps include a new beekeeping camp that readies participants to purchase and maintain a colony and the world's oldest residential entomology camp. As the MSU Bug and Plant Camp enters its 23rd year, it continues to attract participants from across the country and outside the U.S. and is credited with providing a foundation for a growing number of entomologists. When campers enroll as students at MSU, they are actively engaged in Arthropod Adventures' outreach programs and undergraduate research in the department.

The Arthropod Adventures team coordinates most entomology outreach events, including the annual 2-day BugFest at the MSU Crosby Arboretum, which draws approximately one-quarter of the arboretum's annual visitors. The team also manages 4-H entomology events, including Project Achievement Days and State Congress competitions. Further, our newsletter *The Gloworm* provides hands-on activities for youth.



Visit *The Gloworm* archives at <http://msucare.com/newsletters/pests/gloworm/index.html>.



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