



The glowworm

Mississippi State
UNIVERSITY
Extension
SERVICE

12 March 2007

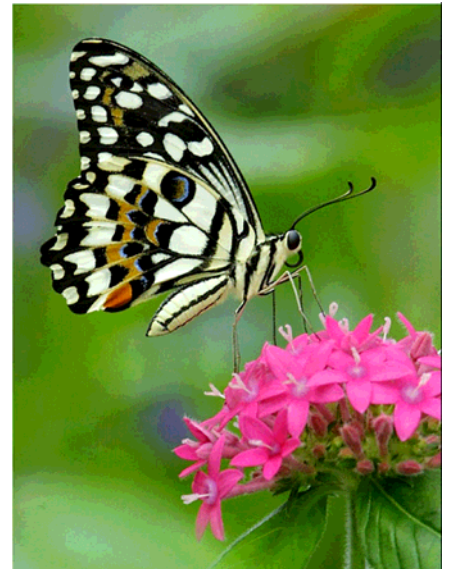
Volume XV No. 2

This month we start the *Gloworm* with an exciting article from a camper. This is a great story about the find of a lifetime. Congratulations on your find and thanks for sharing Nicholas!

You don't have to be a professional scientist to make a contribution to entomology. Last February, my family was on vacation in southwest Puerto Rico, near the Guanica Dry Forest Reserve. Before I left on vacation, I studied the butterflies that lived there so I would know what to look for and where. After a morning of collecting, I was resting on the balcony when I saw an unusual butterfly fluttering around a bush in the garden below. Before I could get a closer look, it flew off. This happens frequently – I spot an unusual butterfly, but it flies off before I can get a good look.

It was obviously a swallowtail and it was clearly black and white. I did not remember that there were any swallowtails that looked like this in Puerto Rico. There are several swallowtails that live on neighboring islands, Cuba, Hispanola, Jamaica, that look somewhat similar. I wondered if it could have been one of those, straying from one of these islands. But it was gone and it didn't really matter.

The next day, I saw another butterfly like this, again lingering around the same lime bush. This time I was ready. I ran down the stairs, climbed the fence to the garden below and caught it. Looking at it in my hand, I knew that it was an Asian swallowtail that I had seen in a book on world butterflies. This was definitely not a local species.



I had noticed that it was ovipositing on the bush, which meant that there was a reproducing population there, whether it was a single stray butterfly or part of a larger population.

When I returned home, I did some research and identified it as an Asian lime swallowtail (*Papilio demoleus*). I also found that it had been collected in the neighboring island of

Hispanola the previous year, the first record of this butterfly in the Western Hemisphere. I contacted the person who identified the Hispanola butterflies, and sent him a digital shot of my specimen. He confirmed that it was indeed a lime swallowtail.

Since this was a first record for Puerto Rico, I decide to submit my finding as a note to a scientific journal. The reviewers found the finding significant and suggested that I expand it into a full article showing that the butterfly was expanding it's range and how this pest could affect the citrus industry Caribbean. The article was published in December in volume 84 of the *Florida Entomologist*, a journal read in Latin America and the Caribbean. You can see a copy of the article on line at <http://www.fcla.edu/FlaEnt/fe89p485.pdf> . The USDA used the locality data from my draft to collect additional specimens of adults, eggs and larvae, confirming that a population had become established.

I am 15 and have been going to MSU Entomology Camp since 2001. The knowledge and support from bug camp and from what I learned on my own had me ready to make the step from being a kid interested in butterflies to making a scientific contribution to entomology

Nicholas Homziak

More good news about Bug Campers!!!

Max Miller, a regular participant at MSU Entomology Camp since 2001, competed in the Acadiana regional Science Olympiad entomology competition in Louisiana. He placed 2nd, and will move on to the state competition in April. Max also placed first in the Rocks and Minerals competition. We might add, Max's mother, Dr. Renee Clary, is also a Bug Camp staffer and her area of expertise is geology! (Congratulations Max!)

How Insects Become Pests: Cultivation: Monoculture and Bad culture

This is part two of my three part series on how insects become pests. Last month I discussed accidental introductions of insects into new areas. This month features two insects, potato beetles and wood boring insects, as evidence that monoculture and bad culture of plants can lead to trouble.

First, the Colorado potato beetle (pictured here) is native to North America, so how can it be a pest? Well, it was not really a pest until farmers started planting potatoes in large acreage. This beetle naturally fed on weeds in the same plant family as potato (Solanaceae). But when a good host plant is concentrated into one area, it was like Barnhill's for this specialist herbivore! This is a beautiful beetle



to have in your collection. Another group of pests, I will collectively call the wood boring insects serve an important ecological function. Pine beetles, ambrosia beetles, clearwing moth borers in the forest help to recycle nutrients from dead or dying

trees by hastening the death of these trees. It is the 'calling' of these insects to attack plants under stress or that are dying. Now take that ecological role and place it into downtown Jackson or Gulfport in the 'urban forest'. Street trees perhaps suffering from heat stress, drought, air pollution or physical damage become weak. These trees, as part of their nature, produce chemical signals when under stress or stress limits the trees ability to fight back due to a lack of water or available nutrition. Either way, opportunistic wood boring insects can detect these chemical signals. It is as if the tree actually invites them in. The borers find the tree and attack it, sometimes in large numbers. So, a few interesting observations or questions (potential science fair experiments) come to mind from this: First, can potato beetles find potato plants well in a weedy garden versus a 'clean' garden? Second, can the chemical signals produced by the plants and exploited by wood boring insects be used by us to know when are trees are not healthy? Even if we don't know the signal used, it is best to keep plants healthy and undamaged to prevent possible attack by borers. One way to start would be to mulch the area around the base of trees so that you don't mow too close and damage the trees. I once heard a military officer say that lawnmowers kill more trees on military bases than insects or diseases-and he is probably right!

Chemical Warfare and Natural Alliances, Nature Invented them First!

Willow trees (*Salix*) have lived in wet environments, where insects abound, for millions of years. In order to do this they had to develop powerful chemical defenses to protect them from insects. When insects take a bite of willow they ingest a bitter toxic chemical, called salicin, which prevents the muscles in their stomach and legs from tightening properly. Some insects, however, not only survive the willow's defensive chemicals but break them down into a nutritious sugar and salicylic acid that they store in scuba-like tanks inside their backs. When these willow leaf eating beetles are attacked by ladybird beetles, or others predators, they simply turn their backs, open the nozzles on their scuba tanks and spray them with salicylic acid interfering with the functioning of their muscles!

The adage "one man's meat is another man's poison," dating to 1576, has an interesting application of scale here. Salicylic acid is a precursor to aspirin and humans' use of this insecticide is ancient. Hippocrates (born 460 B.C.), the father of medicine, in his record of pain relievers popular during his time, mentioned the powdered bark and leaves from the willow tree. In humans, who are much larger than insects, it also relaxes muscles. It also, in its purest form, causes some stomach problems, just as in insects!

Willows are also the host plant of the viceroy butterfly (*Limenitis*) and there in lies another story involving the willow. Viceroy caterpillars are also able to dine on willow leaves without any ill effects and actually accumulate salicylic acid in their bodies for

use as a chemical deterrent. The young caterpillars do not have enough salicylic acid to deter predators, however they have developed a second strategy - the disgusting disguise of appearing as bird droppings on leaves! As an adult the viceroy, as is commonly known, mimics the monarch where monarchs occur. In areas where the queen (*Danaus*) is more common viceroys mimic the queen. The queen and monarch both accumulate toxic glycoside, from their host plants. Since all three have similar coloration and appearances, and contain toxic chemicals, they collectively constitute a natural alliance deterring birds and discourage predators from attacking them or their allies!

Advice to bird brains: if it eats toxic plants like a viceroy, looks like a monarch and flies like a queen it must not be happenstance and none are tasty!

Fun fact - some naturalists still chew on willow twigs for minor pain relief, but watch out for something that looks like a bird dropping!

Entomology Camp Plans

It is looking like we will have really exciting camps this summer. The first camp is for everyone; youth and adults including teachers, 4-H agents, etc. The second is for adults and older youth. We will offer CEU's for teachers at both and are working on securing college credit (graduate and/or undergraduate) for the second camp. Both will be at Plymouth Bluff, just west of Columbus, to take advantage of Dr. Marty Harvill's new sampling boat to increase our collection and study of aquatic insects. We are increasing our study of forest insects. After Katrina, insects have been a larger problem in Mississippi. Although we are not in south Mississippi this summer, we do have funding to improve our forest entomology component. Expect forest insect hikes similar to the plant-insect interaction hikes that were so popular last year. We will continue the plant-insect hikes that Drs. Joy Anderson, Lelia Kelly and David Held made so popular.

We are working on some new activities for this summer. You already know we are increasing our aquatics and forest bugs components. Dr. Held has indicated his continuing interest in having live insects to observe, so you can expect more cages. We are going to try to train wasps to seek scent targets. We will learn to tie flies, for fishing, that resemble the insects and macroinvertebrates fish are dining on. Dr. Tim Menzel (University of Mississippi) hope to do acoustic night hikes to record the sounds of insects. We are working to improve our GIS/GPS component and receiving assistance from Dr. Bronson Strickland that should improve our map making.

Since Plymouth Bluff is so close to MSU, Dr. Mike will likely paint trees to bait moths before camp. For the adult camp we will be doing all of the above plus dissecting insects, experimenting with insecticides, collecting with a wider variety of traps, studying caterpillars' circulatory systems and insects defensive chemicals.

Of course we are interested in your ideas. Reading Eisner's *For Love of Insects* this

past year gave us a lot of ideas - what have you been reading or wondering about insects? Drop us an email with your ideas and we will see if we can work it into an activity for Bug Camp.

Wildlife and Fisheries Camp

FYI - There is a new camp you may be interested in, Wildlife and Fisheries Camp. Like Entomology Camp it will be intergenerational, so parents are welcome to attend. My instructions were to create a wildlife and fisheries camp that was as good as bug camp. Now, that won't be easy since bug camp has evolved over the years as we have dropped marginal activities, kept the most exciting and tried out a few new ones each year. Since camp activities will be on campus and at the Noxubee National Wildlife Refuge, we will be doing a lot of traveling so it will be more expensive-maybe around \$250.

Two camps are planned and both will be residential camps on and near campus. Everything else is tentative. It looks like June 3 - 7 and July 8 - 12 will be the best dates. Camp will start at 1:00 Sunday afternoon and camp will officially end at 11:00 Thursday morning. This year we will be limiting each camp to 25 youth with no limit on parents. We are also looking for a few 4-H agents who want to get involved on an ongoing basis. The Noxubee National Wildlife Refuge is already an exciting partner and we will be spending some time on the refuge learning from their staff.

An intensive camp is being planned. In addition to hook and bullet programs we will be investigating wildlife ecology, natural resources and management. Each day will start early with a bird ID walk and activities will continue into the night. There will be several options to accommodate campers with different backgrounds and needs. For example, we will offer hunter and boating safety for those who need it and alternative activities for the others. On our first afternoon we will experiment with different methods of fishing, learn about fish ecology and even tie a few flies. Archery and an introduction to bow fishing, tracking, orienteering with compasses and GPS receivers are planned. A trip to our wildlife pens and instruction on sketching animals will be used as an introduction to maintaining journals. Experts will provide many short wildlife briefings and show-and-tells throughout the camp. Evenings will be used to introduce campers to nocturnal animals and sounds, the stars, insects that are attracted to lights and on the final night a talent show. Other exciting opportunities being planned include tracking with telemetry equipment, mist netting, tomahawk throwing, blow guns, storytelling, weather forecasting for outdoor enthusiasts, small mammal trapping, forest bugs, skulls and bones and the opportunity to shoot a few different guns. And, we are still trying to fit all the things we want to do into the schedule!

For more information, contact Dr. John Guyton jguyton@cfr.msstate.edu; 662-325-3482 or Jonathan Peeples jpeeples@ext.msstate.edu; 662-325-0221

Behavior briefs

Several species use tools: a wasp (*Ammophila*) taps down the soil surrounding its burrow by holding a small rock in its mandibles. Adult weaver ants, that cannot produce silk, build nest by holding silk secreting larvae with their mandibles as they sew leaves together. Another ant (*Conomyrma*) from Arizona throws rocks at its prey. Actually, they drop rocks down other ants burrows to prevent their competing with them for food.

Attention Bug Camp GISers

The 2007 ESRI Education User Conference (EdUC) in San Diego will be June 16 - 19. This conference coincides with the ESRI International User Conference (UC). If you want to attend, we have a complimentary registration for a team of one adult and one 4-Her. You would be responsible for room, meals and transportation. From what we have heard this is a huge exciting event. New products, books, teaching materials, computer labs to try things out in, the opportunity to meet with experts, troubleshoot issues with experts and meet with educators and ESRI experts. If you are interested let us know.

ATTENTION: YOUNG PEOPLE –TEACHERS – PARENTS ALL WHO ARE INTERESTED IN ENTOMOLOGY!!!!

THE MISSISSIPPI STATE ENTOMOLOGY DEPARTMENT PRESENTS ENTOMOLOGY
CAMP:

Camp #1: June 17–21 – Plymouth Bluff Environmental Camp, Columbus

This camp is for **adults and youth** (over age 10) who want to learn about insects from experts. The camp will be taught by professors from the Entomology Department at Mississippi State, and will be educational and fun!!!!

- Learn how to collect, identify, and preserve insects!
- Learn about unique critters you've never seen, yet they live all around you!
- Make an insect collection with help from the experts!

4-H rules and guidelines apply.

Camp #2: July 15–19 –Plymouth Bluff Environmental Camp, Columbus

This camp is for **adults** (teachers, college students, youth leaders) that are looking for a unique learning experience. The camp will be also be taught by professors from the Entomology Department at Mississippi State, but will be available for college credit at Mississippi State University or CEU credits for teachers! This camp will include:

- Lecture and field collecting components that cover ecology, behavior, and taxonomy of insects
- Field identification and use of keys for family level identification of pinned specimens
- Field collecting methods

**Mississippi State University
4-H Entomology Camp Registration Form**

I will be attending CAMP Session #_____. Indicate 1 or 2, please!

Indicate t-shirt size: Small _____ Medium _____ Large _____ XL _____ Other _____
All shirt sizes are measured in adult sizes, the vendor does not handle children's sizes

Name: _____

Address: _____

City: _____

State: _____ Zip: _____ County: _____

Age: _____ Gender: _____

Telephone _____ email _____

I am interested in: CEUs or credit hours.

For adults attending Camp #2, please check the appropriate box above if you need CEU credits or wish to take the course for credit.

Please submit a **separate copy of this form for each camper** - be sure to indicate the session the camper will be attending.

Certification of health is required - so camp physicals are in order
Mail individual applications along with **\$60.00 deposit** to reserve your place to:

**Entomology Camp
MSU Entomology Department
Box 9775
Mississippi State, MS 39762**

Charges include room/board, t-shirt and miscellaneous supplies. Pins and insect boxes can be made available for an additional cost. Deposit is not refundable after May 1, 2007 for camp #1 and June 15, 2007 for camp #2, deposit is applied to camp costs.

**Enroll now for either camp!! Out of state campers are welcome!!!!!!
Enrollment is limited and will be on a first come basis.**

Entomology\4-H Calendar

May

May 1-Deadline for register for the June
Entomology Camp

June

June 3-7 Wildlife and Fisheries Camp #1

June 12-Project Achievement Days, SE District

June 13-Project Achievement Days, SW District

June 14-Project Achievement Days, NW District

June 15-Project Achievement Days, NE District

June 15-Deadline to register for the July
Entomology Camp #2

June 17-21 First Entomology Camp

July

July 8-12 Wildlife and Fisheries Camp #2

July 15-19 Second Entomology Camp