



The glowworm

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Featured Insect: Katydid

Summer is winding down and the katydids are singing or I should say, “the seniors are serenading the senioritas.” During the day these nocturnal revelers use their camouflage to blend into the foliage and rest up for another night on the countryside!

There is some good physics in the katydids’ musical instrument. They produce sound by stridulation or raking a file on the base of their left forewing with a scraper on right forewing. The file is a modified vein with file-like teeth. As the insect closes its wings the scraper is raked over the file. The frequency of their sound increases as the scraper more rapidly rakes the file. When necessary, they can increase the volume by slightly raising their forewings, forming a small cavity in which the sound resonates and is amplified. Our hearing is not sensitive enough to hear their entire melody because their ultrasonic range extends above the 20 kHz upper limit of our hearing! They apparently achieve these high frequencies by straining the scraper against the file in such a fashion that when it breaks loose and glides down the file it is under greater pressure and moving significantly faster.

Katydid’s auditory organs are located on their front legs just below their knees. This likely enables them to better discern where the male of their desire is hidden in the foliage. Incidentally, grasshoppers’ auditory organs are on their abdomen and crickets like the katydids use their front legs. Crickets and katydids also have extra long antenna, used for smell and touch, and some katydids’ antenna are longer than their bodies. These antenna are essential to this nocturnal insect. If a gum leaf katydid’s antennae is broken it will regrow to its normal length after its next molting.

Katydid get their name from their song.

The old story goes like this: A woman named Katy fell in love with a handsome man who scorned her and instead married someone else. After the honeymoon, the couple were found dead in bed. The bugs began debating whether Katy could have done it or not. So if you listen carefully you can hear them debating, "Katy Did, Katy Didn't."

After mating, the female uses her long, scythe-shaped ovipositor to make a slit in vegetation or soil for her eggs. The male's external equipment is called a "clasper" because it actually holds the female's abdomen in position during copulation. After winter the eggs hatch revealing nymphal katydids that resemble the adults but without wings.

In some cultures katydids are kept as pets.

There are over 4,000 species of katydids and they not only feed on the leaves, stems, flowers and fruits of many grasses, weeds, shrubs and trees, they become an important part of the food chain making energy from the sun through plants, available to birds and many other animals. Some tree katydids eat mosses and lichens. And, some species are omnivores and will supplement their diet with snails, caterpillars, frog eggs and even other katydids!

The katydid is a weather forecaster. According to wise observers it is three months until the first frost when they start singing and during the late summer when they begin calling during the day from the deep shade you can expect frost in six weeks. After the first hard frost they are silent.

Katydid, like their cricket cousins, may be able to give you an approximation of the temperature. Try count the number of calls per minute and add 161 to it and divide by 3 to get the temperature.

Fun Facts

- Some katydids eat their shed skin after molting to prevent predator from finding them.
- Katydid undergo simple or incomplete metamorphosis and the nymph typically goes through five molts.
- Katydid can bite and may if handled roughly.
- There are so many species of Katydid and crickets that the easiest way to differentiate them today is their sonograms, or sound. These can be recorded and compared to sonograms on the internet to determine their identity.

The Pink Katydid

You are looking at an oblong-winged katydid (*Amblycorypha oblongifolia*) that was collected by Dawn Edwards in Pass Christian, Mississippi on August 3, 2008.

The unusual pink pigment in this katydid is an insect erythrochromism; being genetic in origin it is not influenced by diet, sex or environment. Katydid color is apparent from the time they emerge from the egg, is constant throughout its life and passed on to their offspring. This one is a female as can be discerned by the wide scythe-shaped ovipositor.

Fall is for Collecting and Buggy Night Outs are Scheduled for the Crosby Arboretum and the Noxubee National Wildlife Refuge

Fall is an outstanding time to collect and we plan to be on site mid-afternoon to set up sheets in a couple different locations. Those who arrive early can use our aerial nets and do a little collecting. We ***will not be providing kill jars*** but have included the directions on how to make them in this issue. We will have a few on hand for you to use but bring a box you can carry your insects home in. If you have to do an insect collection at school this year this would be a good time to get started. Lately we have been seeing around 6 or 7 orders on our sheets. Rain cancels!

Meet Dr. John and Peggy Guyton and Michelle Gaona at the **Noxubee National Wildlife Refuge** on the **Evening of September 20** for a little night collecting.

If you are on the south end of the state the **MSU Crosby Arboretum** will also be hosting a Buggy Night Out on **September 20**. Senior curator Pat Dracket and her son Peter were at bug camp this year and long term bug campers D.J., Marella and Belle Failla will be assisting.

Collecting Insects

You will need two different jars for killing insects for your collection.

An **alcohol vial** or jar is useful for collecting: Coleoptera (beetles), Collembola (springtails), Ephemeroptera (mayflies), Hemiptera (bugs), Isoptera (termites), Plecoptera (stoneflies), Psocoptera (booklice), Siphonaptera (fleas), Thysanoptera (thrips) and Thysanura (silverfish). A half pint jar makes a good alcohol jar. Fill it about 1/3 with 70% isopropyl alcohol available at any department store or pharmacy. To remove the insects you collect strain the alcohol into a coffee cup through a small fish net from an aquarium shop or gently remove them with forceps. Pour the alcohol back into your jar because it can be reused for months!

An ethyl acetate **kill jar** is preferred for collecting: Blattaria (roaches), Coleoptera (beetles), Dermaptera (earwigs), Diptera (flies), Hemiptera (bugs), Homoptera (aphids, scale insects and whiteflies), Hymenoptera (bees, wasps, ants), Lepidoptera (moths and butterflies), Mantodea (mantids), Mecoptera (scorpionflies), Neuroptera (lacewings, antlions), Odonata (dragonflies), Orthoptera (crickets, grasshoppers), Phasmida (walkingsticks) and Trichoptera (caddisflies).

Yes, there is a degree of overlap. In general you want to use the jar likely to best preserve the specimen. Never put butterflies and moths in alcohol since it will damage their scales. Do not leave any plant material in the alcohol jar since alcohol will extract the chlorophyll and that may in-turn alter the color of other specimens. Ethyl acetate may be the best choice for colorful insects.

The kill jar is made from a pint jar, preferable a wide mouth one. Pour about an inch of sawdust in the jar and gently pack with a stick. Then add about 3/4 to 1 inch of Plaster of Paris. Allow this to harden and season for about 3 days. Then add a couple mm of ethyl acetate (non-acetone fingernail polish remover) and allow to soak into the Plaster of Paris. Finally add a piece of

paper towel to prevent insects from damaging each other before they die.

Important note: for **Lepidoptera** - fold the wings upward and firmly pinch the upper thorax between your thumb and forefinger before placing them in the kill jar. This will paralyze the wings and enable you to have a more beautiful specimen. **NEVER place beetles in a jar with butterflies or moths.** It's quicker and easier to kill beetles in the alcohol vial. Just drop them in.

Mississippi Entomological Association Education Roundtable

Teachers and educators, Drs. Mike Williams and John Guyton will host the MEA Entomological Education Round Table Tuesday October 28, 2008. Come and join us and learn some fun ways to use insects in your lessons.



Announcing the 4-H Art Exhibition and Photo Salon

October 26 – November 30, 2008

All Entries must be received by October 24, 2008

Rules for Exhibition Photos:

All photo exhibit entries must be submitted by October 24, 2008 to 4-H Entomology Art Exhibition, Clay Lyle Building, Box 9775, Miss State, MS 39762. Photos may be digital or traditional.

Combined Rules (digital and traditional)

The 4-H member must photograph all entries submitted. The 4-H member does not have to be enrolled in the photography or the entomology project areas.

- No more than 5 entries per individual should be submitted. All entries must have an entomological theme.

Traditional 35 mm Camera –

- For traditional film camera: Mount the regular size print (3" x 5" or 4" x 6") on 8 x 10 inch white poster board
- Do not mat or cover the front of the poster board or picture in any way.
- On the back of the poster board include title of print, photographer's name, address (including city, state and zip code), 4-H age and your county name.

Digital Camera –

- You must submit an 8" x 10" (photographic) print in a clear 8" x 10" or 8.5" x 11" page protector. In order to show the most detail in your final print take your final edited image file to a film processor (such as Wal-Mart or Walgreens) to be printed, rather than printing the photo with an ink-jet printer.
- On the back of the 8" x 10" prints, using a sticker or peel-off label, print or type: the title of print, photographer's name, address (including city, state and zip code), 4-H age. Please print the county name under the address. Do not write this information directly on the back of the prints as it will ruin the 8" x 10" prints.

Photographs will be returned to exhibitors when the public exhibition closes in December.

Rules for Art submissions:

All art should have an entomological theme but may take any form desired by artist.

- Paintings and drawings should be mounted on mat board for display.
- Each piece of art should be identified by a 'title' and the artist's name, address, including county, and age. Sculptures or other objects should have a tag attached with the above information.
- Submissions should be designed for display.

Art will be returned to exhibitors when the public exhibition closes in December.

Rules for Prose and Poetry Submissions:

All Prose or Poetry should have an entomological theme but may take any form desired by artist.

- Prose or poetry should be typewritten, double spaced, in at least a size 12 font.
- The submission should be included in a clear plastic folder and should have the title and author's name on the front.
- All submissions should have the author's name, address, and age.

All submissions will be exhibited at the Mississippi Entomological Association meeting October 26 -28, 2008 and then in the foyer of Clay Lyle Entomology for the month of November.

Selected submissions will be reprinted in the *Gloworm* newsletter and possibly other locations. **The submissions will not be returned.**

Adults are invited to submit entries to the 4-H Entomological Art Exhibition and Salon. Please indicate 'Adult' in the age slot!

Please send or bring submissions to: 4-H Art Exhibition and Photo Salon, Clay Lyle Entomology Building, Box 9775, Mississippi State, MS 39762

Bee Essay Contest

TOPIC for 2009: ***The Dance Language of Bees***

Mississippi State Deadline: January 15, 2009

Honey bees possess the ability to communicate the distance and direction of resources to their nest-mates. They employ a symbolic dance language. A trained observer can watch their dances and predict where they are foraging. The use of symbolic language by an insect has made them one of the most studied animals. This year's essay contest invites participants to learn about the honey bee's dance language, how it was discovered, how it works and how it provides colonies the ability to find and exploit floral resources.

Sources Karl Von Frisch was awarded the Nobel Prize in 1973 for his work with insect communication. His classic text is *The Dance Language and Orientation of bees*, (1967) Harvard University Press. There are dissenters to Von Frisch's findings. See: *Anatomy of a Controversy: They Question of a 'Language' Among Bees*, (1990) Columbia University Press. The results of scout bees leading nest-mates back to a new food source can be demonstrated easily by a beekeeper. There are links to additional beekeeping websites at the Foundation's website (<http://www.honeybeepreservation.org>) where the winning essays

from previous years may also be found.

The scope of the research is an essential judging criterion, accounting for 40% of your score. The number of sources consulted, the authority of the sources, and the variety of the sources are all evaluated.

Personal interviews with beekeepers and others familiar with bees and beekeeping activities are valued sources of information and should be documented. Sources that are not cited in the endnotes should be listed in a "Resources" or "Bibliography" list.

Note that honey bee is properly spelled as two words, even though many otherwise authoritative references spell it as one word.

RULES:

1. Contest is open to active 4-H Club members only. 4-H'ers who have previously placed first, second, or third at the national level are not eligible; other state winners are eligible to re-enter.

2. Requirements (failure to meet any one disqualifies)

Preparation for Judging: Typewritten, double-spaced, on one side of the paper following standard manuscript format.

Length: 750 to 1000 words long.

Write on the designated subject only.

All factual statements must be referenced with bibliographical style endnotes.

A brief biographical sketch of the essayist, including date of birth, gender, complete mailing address, county and telephone number, must accompany the essay.

The word limit does not include the references, endnotes or the essayist's biographical sketch.

3. Essays will be judged on

(a) scope of research - 40%;

(d) conciseness - 10%; and

(b) accuracy - 30%;

(e) logical development of the topic - 10%.

(c) creativity - 10%;

4. Essayists should forward essays to the Dr. Clarence Collison, Entomology and Plant Pathology Department, Box 9775, Mississippi State, MS, 39762-9775 postmarked no later than 15 January 2009. State judging will be completed and the winning state essay will be mailed to the ABF office before March 1, 2009. No essay received after January 15 will be considered.

5. We encourage ALL 4-H'ers to submit an essay! Only one state essay will go to the national contest. The Mississippi Beekeeper's Essay Committee will judge the state entries and all decisions are final. The state winners will be announced the first week in March 2009.

6. Final judging and selection of the National Winner will be made by the Foundation's Essay Committee, whose decision is final. The National Winner will be announced by May 1, 2009.

7. All entries become the property of the Beekeeping Federation, Inc. and may be published or used as it sees fit. No essay will be returned.

8. Deadline for entry in the MISSISSIPPI CONTEST is January 15, 2009.