The gloworm

Mississippi State University Extension Service

4 October 2004 Volume XII No. 10

Show season and fall contests are in full swing; it's great to see many new faces participating in entomology projects. The Mid-South Fair, a regional 4-H event, had 35 insect collections on display in 2004. These collections quite often reflect the dedication to excellence 4-H young people feel about their projects and truly show that 4-H is helping to make the `Best Better!' The fun is quite often derived in the chase and capture, but the dedication to excellence comes with pinning, identification and display.

The Linnaean Championship Games were also conducted on September 25. Both the Junior and Senior contests were hotly contested. Tate county Mississippi won the Senior event, edging Pope and Searcy county, Arkansas for the title. Junior competition was really intense with six teams vying for the honors. Arkansas' Howard, Pope and Pike counties came well prepared as did the Mississippi teams from Copiah, Desoto and Marshall county. Desoto (MS) won the Junior event with a come from behind victory over Pike (AR), 2nd place team, and Marshall (MS) took third. Competition was stiff and spirits are high for this event. We've added **The Practical Entomologist** by Rick Imes (ISBN 0-671-74695-2), as a new reference source for questions for 2005. We solicit questions from this source to be added to our current body of new questions for the 2005 contest season. Send your contributions before March 1, 2005, by email (Word attachment) to

Linnaean Gamemaster mikew@ext.msstate.edu .

The 2005 Linnaean Study Guide will again be distributed on March 15, 2005. All 2005 contest questions will be derived from that document.

4-H Day at the Mississippi fair will also feature some fun activities. Volunteer 4-Hers and I will be showing off butterflies and giving out free live critters. Plan to join us for the activities on October 16.

Camp dates have been selected and we have a south location for the 2005 camp. Dr. John Guyton and Mr. Mike Howell visited the King's Arrow Ranch, near Lumberton, MS, and signed us up to `chase bugs' in that location from July 17 through 21, 2005. You can see more information on King's Arrow ranch at www.kingsarrow.org, so make plans now, this one will be FUN! We'll have the first camp location nailed down in the next few days and will get word out, quickly. First camp is scheduled for June 19 through 23. We will begin accepting applications for camp in January.

Another activity which is coming up which has a January deadline is the Bee Essay Contest. We've had a little trouble getting the full rules posted on the WEB site, so I am including the complete contest

announcement and rules in this ***Gloworm.*** Now is the time to write your essay. It is perfectly okay for you to write it and have your English teacher look at it to help to get it correct.

This year at camp Dr. David Held helped to conduct a scientific experiment using some of the insects campers collected. Our feature for this ***Gloworm*** is that set of observations.

Io moth research project from Entomology camp

Even the casual observers can't help but notice the tremendous diversity in size, shape, and color among insects. Diversity among a set of characteristics such as these is more appropriately called variation. For some, the beauty conveyed by this variation is the handiwork of a creative God. In Entomology, we can utilize this variation for identification of insect groups, and to better understand the life histories and behaviors of insects.

In July, I had the privilege of working a bright group of kids at the Entomology camp [Personal note: Thanks to all of the campers and staff for welcoming me]. As collections became filled with insects I noticed that several Io moths (*Automeris io*) were collected. As a camp project, I asked the campers to record the variation in wingspan among the collected Io moths. The campers were asked to measure the wingspan of the Io moths from wingtip to wingtip and to record those measurements in the lab. The table lists the data they collected and the collector's name.

Data from 13 specimens were recorded. As a final activity, I asked campers to gather around the data and we calculated the range of results and the average (mean) wingspan. We concluded that nine moths had below average wingspans (less than 71.3 mm or 2.8 inches). The moth with the largest wingspan (93 mm or 3.7 inches) accounted for about 10% of the total recorded wingspans of all collected moths!

Wingspan of Io moths (*Automeris io*) collected from 18–22 July 2004, Tombigbee State Park

Collector	**Wingspan (mm)**	**Collector**	**Wingspan (mm)**
Taylor Pang	69	Abra Floyd	93
Joshua Southworth	67	McKinnon Herring	65
Zach Michiels	76	Ryan Hollis	86
Hannah Moss	70	Sergio Vaughn	64
Olivia Moss	79	Summer Shaw	65
Mike Williams	63	**Total**	927 mm

Claire Welch	60	**Range**	60–93
Matt Cagle	70	**Average (mean)**	71.3 mm

Why was there so much variation in wingspan among a single species of moths? The campers accurately pointed out that adult size was dependent on the size of the larvae when they pupated. All moths have complete metamorphosis and will have a pupal stage before becoming adults. The conditions under which the larvae developed then likely had a direct influence on the size of the adults. The campers mentioned temperature and rainfall as factors in larval growth. Since these larvae are plant feeders, the plants they feed on may also determine the size. For example, leaves from a 'good' nutritious host may make bigger larvae, bigger pupae, and bigger moths, whereas leaves from a 'poor' less nutritious plant may produce smaller larvae, smaller pupae, and smaller adults.

As we discussed the results, we also determined that human error in spreading the wings, and measuring the wingspan could also create variation. In our experiment, the campers suggested that these errors could have been minimized if one person would collect all the data, or if all the wings were adequately spread. Human error in experiments reduces the ability to draw strong conclusions from the results. For example, in our experiment we cannot adequately say how much of the variation we observed was true biological variation and how much was human error. Keep this tip in mind as you begin developing methods for science fair projects or other research projects.

Thanks again to all the campers that participated in this research project. **Dr. David Held**

IO Moths

Identification: Upperside: Male forewings are bright yellow-orange to orange-brown with faint brown bands and eyespots, but occasionally males from the spring brood will be mostly brown. Female forewings are brown or brownish purple to red and the bands and eyespots may or may not be apparent. Hindwings of both sexes are yellow to brownish orange with yellow or orange margins. Each hindwing has a large black and blue eyespot with a white dash in the middle.

Life history: Adults emerge during late morning or early afternoon, and mating takes place in the late evening. Females lay clumps of eggs on leaves or stems of the host plants. Young caterpillars feed together as a group and move in long "trains" while older caterpillars feed alone. Papery cocoons are spun in litter under the host plant or in crevices.

Io moth

Flight: One brood in the north from May-June, two to three broods in the south from February-September, several broods throughout the year in the Florida Keys.

Caterpillar hosts: A variety of plants including hackberry (Celtis), willow (Salix), mesquite (Prosopis), redbud (Cercis), currant (Ribes), blackberry (Rubus), and pear (Pyrus).

Adult food: Adults do not feed. **Information on the Io Moth and pictures were taken from the Moths of North America USGS Web site: http://www.npwrc.usgs.gov/resource/distr/lepid/moths/**

Happy Buggin'

Michael R. Williams, PhD
Extension Entomologist