

Insect Rearing and Laboratory Assays with Caterpillar Pests

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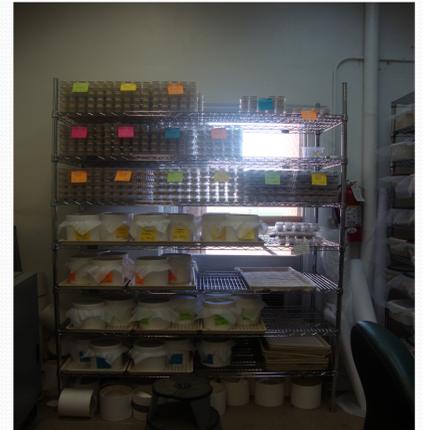
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Introduction

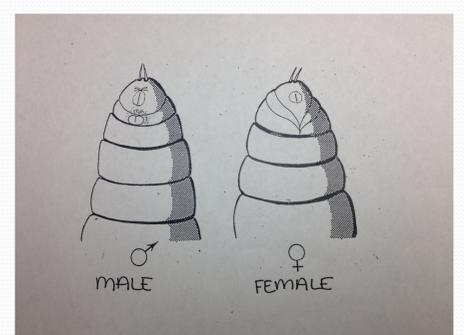
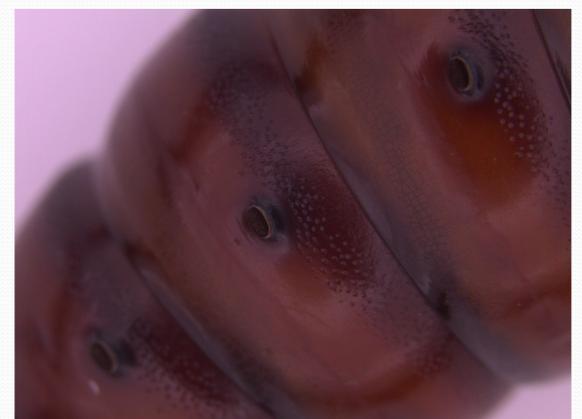
Some of the major caterpillar pests in the Southern U.S. include: the corn earworm, *Helicoverpa zea*, tobacco budworm, *Heliothis virescens* and the soybean looper, *Chrysodeixis includens*. All of these insects can be pests of cotton and soybean, while the corn earworm is the only one of the three that is usually found on corn. The ability to rear these insects is important for conducting research about their biology and susceptibilities to various insecticides. Some insect colonies are maintained year round for scientists to run various tests and have access to insects during the winter months. Currently, I am involved with rearing colonies of the corn earworm (or bollworm) and soybean looper in lab 332 of the Southern Insect Management Research Unit.

Materials and Methods

Every Monday, Wednesday, and Friday we feed moths of these colonies with 20 percent sugar water, and we also change their egg sheets with cheese cloth. The egg sheets are then placed in Ziploc bags in an incubator to induce hatching at 29.9 degrees Celsius. Once the eggs have hatched, the larvae are placed on a powdered artificial diet, a specifically formulated substance which is mixed with water and a small amount of propionic and phosphoric acid. After mixing in the blender, diet is transferred into individual cups. Larvae are placed on the diet after it cools with a soft paint brush and cups are capped. The larvae remain on this diet as they progress through each instar stage until they become pupae. This process takes about two weeks. The pupae are then transferred to buckets where they emerge as moths. Once they reach adulthood they begin to reproduce. The cycle is then repeated and the generations continue.



One of the tests I helped with this summer was to examine the proportion of tobacco budworm and bollworm larvae on wild host plants in the MS Delta, and examine the sensitivity of different spring populations of bollworms to the insecticide, lambda cyhalothrin. A major host plant of bollworms and tobacco budworms during the spring is crimson clover. Larvae were collected with a sweep net from crimson clover at various locations in Mississippi and a location in Arkansas and Louisiana, placed on artificial diet and brought back to the lab. Bollworm and tobacco budworm larvae are almost identical and very hard to distinguish from one another. We reared the larvae to the pupal stage and identified them to species based on the characteristics of the pupae (Neunzig 1960). Characteristics include spiracle size, as well as the sex of the pupae. Spiracles are used for breathing, and bollworm pupae have larger spiracle openings compared to the tobacco budworm. 25 male and female pupae were placed within a bucket from a location. Once moths emerged and laid eggs, larvae from these eggs were placed on artificial diet and reared to 3-4th instar. These larvae were treated topically with different rates of technical grade lambda cyhalothrin (a pyrethroid) insecticide diluted in acetone with a Hamilton syringe.



Results

Survival of bollworms were dependent on the weight of the larvae when treated. Bollworms collected from Jonesville, LA were more tolerant to lambda-cyhalothrin than colonies collected from Leland, Natchez, Vicksburg, MS and Warren, AR. This information is used to examine susceptibilities of bollworm to pyrethroid insecticides from different areas of the MS Delta and can be used to track potential changes later in the growing season.

References

Neunzig, H. H. 1960. The pupae of *Heliothis zea* and *Heliothis virescens* (Lepidoptera: Noctuidae). Ann. Entomol. Soc. Am. 53: 551-552.

Acknowledgments:

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