

# Seasonal Life History and Suitability of Horticultural Plants as Nectar Sources for *Larra bicolor*, a Parasitoid of Mole Crickets in the Northern Gulf Coast

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## Objectives:

1. Determine the seasonal life history of *Larra bicolor* in the northern Gulf Coast.
2. Determine the suitability of flowering plants as nectar sources for *Larra bicolor*.
3. Determine if incorporating wildflowers on golf courses will facilitate the establishment of *Larra* wasps on that site.

**Start Date:** 2006

**Project Duration:** three years

**Total Funding:** \$29,232

Recently, *Larra bicolor*, an introduced ectoparasitoid of mole crickets, was discovered in coastal Mississippi creating an opportunity for golf course superintendents outside of Florida to take utilize this biological control agent. It is necessary to determine the seasonal flight period in the extended range of this wasp. We are monitoring wasp activity monthly on local golf courses where *Larra bicolor* is known to occur on the Mississippi Gulf Coast. Alternatively, flowering plantings of ornamentals and *Spermacoce verticillata* on the grounds of the Coastal Research and Extension Center are monitored concurrently for wasps.

Previous research from Florida indicates that flowering plants are important to the establishment of *Larra* on new sites. Unfortunately, the primary nectar resource for this wasp is *Spermacoce verticillata*, a tropical weed naturalized in Florida. The first objective is to identify horticultural plants hardy to the Northern Gulf region that can serve as surrogate nectar sources. Using laboratory and field experiments and observations, plants will be selected and screened for suitability for *L. bicolor*.



Adult *Larra bicolor* at the entrance to a mole cricket burrow

The second objective determines if, by adding these nectar sources to a golf course, populations of *L. bicolor* can become established. Plantings of suitable host plants will be established on golf courses in 2007 on the Mississippi Gulf Coast and monitored for visitation by *L. bicolor*. Published studies attribute a 75% generational mortality of *Scapteriscus* mole crickets on sites where *L. bicolor* has been sampled. The results of this project will provide superintendents in the Northern Gulf region ideas on how to manipulate this natural enemy to prevent or reduce turf damage from mole crickets.

In spring 2006, a technician was assigned to survey local sites where *L. bicolor* was previously collected. *Larra bicolor* was first observed at the end of May 2006. Since June, we have monthly observations on the flight period. In July and August, we deployed several types of traps (pitfall, passive sticky, and a low-profile Malaise trap) to investigate alternative ways to monitor the flight period. None of these traps successfully collected *L. bicolor*. Therefore, direct observations of wasps foraging on flowers or on turf searching for prey are still the only way to monitor the flight period.

Also this summer, we began collecting wasps to test designs for a laboratory assay to screen potential nectar sources. A bioassay design was finalized but has not yet been tested. Using a laboratory no-choice test, we will evaluate wasp longevity in the presence or absence of flowering ornamental plants. Through monitoring plantings of flowering herbaceous plants at the Coastal REC and serendipity, we have observed several bouts of wasps on *Pentas lanceolata*. This plant is in the same family as *S. verticillata* (Rubiaceae) and is commonly used in ornamental plantings in the southern U.S.

Depending on availability of



Adult *Larra bicolor* feeding on the flowers of *Pentas lanceolata*

wasps this fall and spring 2007, we plan to conduct the laboratory assays needed to guide selection of flowering ornamentals. We will attempt to have a common garden of ornamentals established during peak flight (July-September) next year. Field plots will be established on local golf courses currently used in the study.

These plantings will serve as research sites where we can evaluate the incidence of parasitism in the presence of flowering plants during the flight period. Parasitism will also be evaluated with laboratory assays using the bioassay design previously described.

## Summary Points

- Monthly monitoring of the flight period of *L. bicolor* is ongoing and will continue through the fall. The 2006 flight began in late May and wasps were still active in late October.
- The ornamental *Pentas lanceolata* was found to be a host for *L. bicolor*. This species and other ornamentals will be evaluated in laboratory longevity studies to select plant species for field plot experiments on local golf courses.
- Several unsuccessful attempts were made to trap *L. bicolor*. Monitoring activity on flowers or while foraging in the turf is still the most reliable means to gauge the flight period.