

## Mexican Bromeliad Weevil Report

October – December 2011

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The colony of *Lixadmontia franki* appears to be recovering after low production periods during June to October. This is likely due, in large part, to the influx of wild genes from flies collected in Honduras during October and November (see below). Environmental conditions are optimal for fly reproduction and development, and no mechanical malfunctions have caused problems. In October, 15 pupae were produced, 27 pupae in November, and 74 pupae in December. The trimestral total harvest was 116 pupae.

Ron Cave, Teresa Cooper, Howard Frank, and Dennis Giardina were in Honduras October 11-18 with the primary purpose of collecting larvae of *Metamasius quadrilineatus* in order to obtain wild flies for invigorating the gene pool in our laboratory colony. We collected 90 weevil larvae during five trips to the dense bromeliad population on Cerro Uyuca. From these larvae, we obtained 53 pupae of *L. franki*, and from these pupae emerged 42 adults. We received 406 additional larvae from Marlon Godoy, who collected at La Montañita before our arrival and during our stay. From these larvae, 93 pupae of *L. franki* were produced, and from these pupae emerged 70 adults. All adults were placed in cages for mating, and females that survived were placed in the parasitization cage for exposure to weevil larvae in pineapple tops.

Marlon Godoy collected another 106 weevil larvae in late November and delivered them to Rosa Ortega at Zamorano. Rosa sent these larvae to us by courier and they were received on December 9. From these larvae, 9 fly pupae were obtained, and from these pupae emerged 8 adults (1 pupa remains). This material was also introduced into our laboratory colony.

Research has focused on 1) testing new diets for rearing the weevil – so far, the most promising diet is an agar-pineapple fruit gel; and 2) testing a new method for exposing weevil larvae to the flies. The old method placed egg-laying females on pineapple tops in a cage. The females were allowed to deposit eggs for two weeks, then the females were removed and the tops developed for two more weeks before being exposed to the flies. The new method collects eggs from females kept in vials, developing the eggs to larval hatch, and then slipping the newly hatched larvae into pineapple tops, which develop for two more weeks before being exposed to the flies. The new method is statistically similar to the old method in percent parasitism, and the new method allows for greater control over weevil numbers, density, and age that are placed in the cage than the old method.

### Publications:

Cooper, T. M., J. H. Frank, R. D. Cave, M. S. Burton<sup>†</sup>, J. S. Dawson, and B. W. Smith. 2011. Release and monitoring of a potential biological control agent, *Lixadmontia franki* (Diptera: Tachinidae), to control an invasive bromeliad-eating weevil, *Metamasius callizona* (Coleoptera: Curculionidae), in Florida. *Biological Control* 59(3): 319-325.

Cooper, T. M., J. H. Frank, R. D. Cave, M. S. Burton<sup>†</sup>, J. S. Dawson, B. W. Smith. Response of a specialist herbivore, *Metamasius callizona*, to host plant density and patch size. *Biological Invasions* (submitted November 2011).

Frank, J.H., Giardina, D.J., Andrus, T.A. 2011. Exploration in Guatemala and Belize for more parasitoids to use against *Metamasius callizona* in Florida. *Journal of the Bromeliad Society* 61: 112-115.

### Presentations:

Frank JH. Hunting bromeliad-eating weevils in Belize. Florida West Coast Bromeliad Society, Clearwater, Florida. 4 October.

Cave, R. D. Control biológico. Universidad Nacional Autónoma de Honduras in Tegucigalpa, Honduras. 13 October.

Cooper, T. M. Un picudo, una mosca, y las bromelias de Florida: un proyecto de control biológico. Universidad Nacional Autónoma de Honduras in Tegucigalpa, Honduras. 13 October.

Cave, R. D. Control biológico. Zamorano, Honduras. 13 October.

- Cooper, T. M. Un picudo, una mosca, y las bromelias de Florida: un proyecto de control biológico. Zamorano, Honduras. 13 October.
- Cave, R. D., and B. C. Ratcliffe. The Dynastinae (Coleoptera: Scarabaeidae) of Peru. Annual meeting of the Entomological Society of America. Reno, NV. 15 November. [poster]
- Cooper, T. M. Effect of Temperature on Survival, Development, and Oviposition Behavior of *Metamasius callizona* (Coleoptera: Curculionidae). Annual Meeting of the Entomological Society of America. Reno, NV. 15 November.
- Cooper, T. M. Loss of bromeliad-contained waters in the Enchanted Forest Sanctuary (Florida, USA) due to an Invasive bromeliad-eating weevil and the impact on forest ecosystems. Biolief 2011, Mar del Plata, Argentina. 22 November.