

**ANNUAL REPORT OF CONTRIBUTING PROJECT TO COOPERATIVE REGIONAL
PROJECT W-1185
Biological Control in Pest Management Systems of Plants**

January 1, 2006 to December 31, 2006

1. Project: Regional W-1185: Biological Control in Pest Management Systems of Plants.

2. Cooperating Agencies and Principal Leaders:

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Cooperators:

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- Thomas Marler, Western Pacific Tropical Research Center, University of Guam, Mangilao, Guam
- Aubrey Moore, Pacific Tropical Research Center, University of Guam, Mangilao, Guam
- Laurel D. Hansen, Department of Biology, Spokane Falls Community College, Spokane, WA

3. Progress of Work and Principal Accomplishments:

Goal A: Import and Establish Effective Natural Enemies.

Objective 5. Release, establish and redistribute natural enemies

The Asian cycad scale, *A. yasumatsui*, believed to have arrived on Guam on *Cycas revoluta* (king sego palm) nursery stock in 2003, has rapidly spread throughout populations of introduced *C. revoluta* and indigenous *Cycas micronesica* (fadang). Heavily infested trees of both species are less abundant than observed in previous years, and the coccinellid, *Rhyzobius lophanthae*, which was introduced from Maui, Hawaii, appears to be distributed throughout much of the cycad growing area. We estimate that about 30% of *C. micronesica* have been killed by the scale and *C. micronesica* has been placed on the IUCN Red List of Threatened Species.

Goal B: Conserve Natural Enemies to Increase Biological Control of Target Pests.

Objective 8. Identify and assess factors potentially disruptive to biological control.

R. Miller conducted a survey of invasive ants on the islands of Guam, Saipan, Rota in the Mariana Islands. This activity was part of USDA-APHIS-CAPS projects on the surveillance of *Wasmannia auropunctata* and *Solenopsis invicta* on Guam and other Mariana Islands. Analysis of morphometric and DNA (microsatellite flanking region analysis and barcoding data from the COx1 locus) data continued on the TSTAR-sponsored project "Genetic, morphological and ecological variation in *Aphis gossypii*." Morphometric and DNA data was also generated for the banana aphid, *Pentalonia nigronervosa*, and suggested that this aphid may consist of two separate species, with the species commonly found on banana being the principle vector of banana bunch top virus (BBTV).

4. Usefulness of Findings

a. About 20 quarantine personnel on Guam, the CNMI, the Republic of Palau, the Republic of the Marshall Islands, and the Federated States of Micronesia were trained in aphid and aphid natural enemy collection and identification techniques as part of an annual PPQ workshop hosted by the University of Guam and sponsored jointly by the Secretariat of the Pacific Commission and USDA-APHIS.

b. Surveys leading to the identification of the various strains/species comprising the *Aphis gossypii* and *Pentalonia nigronervosa* complex, along with the identification of associated natural enemies, will allow correct matching of natural enemies to the host pest in various regions of the Pacific.

c. Asian cycad scale appears to be under control in many of the cycad growing areas of Guam, although tree mortality has been high.

5. Publications Issued and Manuscripts Approved

Moore A. 2006. Oleander Hawk Moth, *Daphnis nerii* (Lepidoptera: Sphingidae). University of Guam Cooperative Extension Service.

Moore A. 2006. Cycad Blue Butterfly, *Chilades pandava* (Lepidoptera: Lycaenidae). University of Guam Cooperative Extension Service.

Moore, A., I. Iriarte & R. Quitugua 2004. Asian Cycad Scale, *Aulacaspis yasumatsui* (Homoptera: Diaspididae). University of Guam Cooperative Extension Service.

Moore, A., T. Marler, R. H. Miller, and R. Muniappan. 2005. Biological control of cycad aulacaspis scale on Guam. *The Cycad Newsletter* 28 (5):6–8.

Pike, K.S., R.G. Foottit, R. H. Miller, O. Idechiil and D. W. Allison. 2005. *Uroleucon formosanum* (Takahashi) and *Uroleucon sonchellum* (Monell) (Hemiptera, Aphididae): Morphological Comparison and Diagnosis. *Proc. Hawaiian Entomol. Soc.* 37: 49-64.

Williams, D. J., P. J. Gullan, K. Englberger, and A. Moore. 2006. Report on the scale insect *Icerya imperatae* Rao (Hemiptera: Coccoidea: Margarodidae) seriously infesting the grasses of Palau. *Micronesica* 38 (2):267—272.

Other publications

Idechiil, O., R. H. Miller, K.S. Pike and L.D. Hansen. Aphids (Hemiptera: Aphididae), ants (Hymenoptera: Formicidae) and associated flora of Palau with comparisons to other Pacific Islands. *Micronesica* (submitted).

Websites

Western Micronesia Invasive Species Committee Wiki. This website was set up to facilitate sharing information on invasive species throughout Western Micronesia.

<http://gisac.guam.net>

Checklist of Micronesian Insects. Links to a BioLink database to generate comprehensive checklists for specified insect taxa. Island distribution data is included.

<http://202.131.176.14:8080/MAD/CheckList2.htm>