

**IDENTIFYING THE SPECIES OF MYMARIDAE REARED IN ARGENTINA AND MEXICO
FOR POTENTIAL INTRODUCTION TO CALIFORNIA AGAINST THE GLASSY-WINGED SHARPSHOOTER
AND PREPARING AND SUBMITTING FOR PUBLICATION A PICTORIAL ANNOTATED KEY
TO THE *ATER*-GROUP SPECIES OF *GONATOCERUS*, EGG PARASITOID OF THE
PROCONIINE SHARPSHOOTERS IN THE NEOTROPICAL REGION**

Principal Investigator:

Serguei V. Triapitsyn
Department of Entomology
University of California
Riverside, CA, 92521, USA
serguei.triapitsyn@ucr.edu

Cooperators:

Guillermo A. Logarzo
USDA, ARS South Amer.
Biological Control Laboratory
Hurlingham, Buenos Aires, Argentina
glogarzo@speedy.com.ar

John T. Huber
Canadian Forest Service
Canadian Natl. Collection of Insects
Ottawa, Ontario, K1A 0C6, Canada
HUBERJH@AGR.GC.CA

Jesse H. de León
USDA, ARS
Beneficial Insects Research Unit
Weslaco, TX, 78596, USA
Jesus.DeLeon@ARS.USDA.GOV

Eduardo G. Virila
CONICET-PROIMI
Avenida Belgrano y Pasaje Caseros
San Miguel de Tucumán, Argentina
evirila@hotmail.com

Daniel A. Aquino
Museo de La Plata
Paseo del Bosque s/n, La Plata
Buenos Aires, 1900, Argentina
daquino@fcnym.unlp.edu.ar

Reporting Period: The results reported here are from work conducted January 1, 2008 to October 10, 2008.

ABSTRACT

The already described Neotropical species of the speciose fairyfly genus *Gonatocerus* Nees (Hymenoptera: Mymaridae) are reviewed and re-diagnosed in the forthcoming publication, which is near completion (Triapitsyn et al. in preparation). 82 valid species are recognized including 10 newly described ones, and an illustrated identification key (based on females) to 77 species is provided (the remaining five species are known from the male sex only). The known distribution ranges and host associations of the included species are indicated, with emphasis on the egg parasitoids of the proconiine sharpshooters (Hemiptera: Cicadellidae: Cicadellinae: Proconiini), all of which belong to the *ater* species group (the *ater* and *morilli* subgroups) of *Gonatocerus*. Results obtained during the last year of this three-year project (a one-year no-cost extension was granted by the funding agency) are being reported.

INTRODUCTION

In the New World, eggs of the proconiine sharpshooters, which are known vectors of *Xylella fastidiosa*, are parasitized by various Mymaridae; their natural biological control is mainly due to the beneficial activity of the numerous species of *Gonatocerus*. A key to the Nearctic mymarid egg parasitoids of the proconiine sharpshooters was published recently (Triapitsyn 2006a). A rationale and a more detailed introduction for this project, which will result in publication of an illustrated, annotated key to the Neotropical species of *Gonatocerus*, were given by Triapitsyn (Triapitsyn 2006b).

OBJECTIVES

1. Identification of the numerous species of *Gonatocerus* reared by USDA researchers (G. A. Logarzo) and others in Argentina, Chile, and Peru, colonies of some of which were established in the quarantine facilities in California and Texas, and also of several species reared in Mexico from eggs of *Homalodisca* and other proconiine sharpshooters.
2. Preparation and submission for publication of a pictorial, annotated key to the *ater* species group of *Gonatocerus*, egg parasitoids of proconiine sharpshooters in the Neotropical region, with emphasis on the species targeted for introduction into California (Years 2 and 3).

RESULTS AND DISCUSSION

Progress on Objective 1.

Specimen preparation. Due to the enormous volume of the material of *Gonatocerus* from Argentina and Chile (more than 5,000 specimens have already been point-mounted in the course of this project), work on point-and slide-mounting of the specimens and their curation, which began in October 2006, will continue until July 2009.

Specimen identification. Sorting of the new material has continued. We described two new species of *Gonatocerus* reared in Argentina from eggs of *Tapajosa rubromarginata* (Signoret) (Triapitsyn et al. 2007, 2008) and also a new species of *Gonatocerus* from Sonora, Mexico, an egg parasitoid of *Homalodisca liturata* Ball (Triapitsyn & Bernal 2008). Many other

species of *Gonatocerus* egg parasitoids of Proconiini were identified using both morphological and molecular methods (de León et al. 2008; Virla et al. 2008).

Progress on Objective 2.

Preparation of the illustrations. High quality digital photographs were taken, using an Automontage system, of all the available types and many non-type specimens of the described *Gonatocerus* spp. from the Neotropical region and also of the new species that are included in the key. All the illustrations have been arranged into plates (more than 100).

Preparation of the key. All keys have been completed and all the already described Neotropical species of *Gonatocerus* have been re-described; descriptions of the 10 new species are under way.

Publications and reports. The project has already resulted in at least 12 scientific papers and reports that either have been published or submitted for publication to the scientific journals (in press). We expect that a review of the described species of *Gonatocerus* in the Neotropical region will be completed in early 2009, and then it will be submitted to Zootaxa (Triapitsyn et al. in preparation); it currently has more than 200 manuscript pages.

CONCLUSIONS

A review of the described species of *Gonatocerus* in the Neotropical region is near completion; it also includes descriptions of 10 new species. Additionally, two new species of *Gonatocerus* egg parasitoids of Proconiini were described during the reporting period. Results of this project will be of significant benefit to biological control (especially to the CDFA/PD Biological Control Program) specialists, ecologists, and other researchers that manage the Pierce's disease threat posed by GWSS. When published, this key will make possible identifications of the mymarid egg parasitoids of the proconiine sharpshooters in America south of the USA, differentiation of native vs. introduced species of *Gonatocerus*, and also will provide information on the candidate species of Mymaridae for introduction as part of biological control programs, facilitate surveys for assessing levels of egg parasitism of the proconiine sharpshooters, and indicate all known host associations of the mymarid species important for classical and neoclassical biological control of GWSS and other Proconiini.

REFERENCES CITED

- de León, J. H., Logarzo, G. A. & Triapitsyn, S. V. 2008. Molecular characterization of *Gonatocerus tuberculifemur* (Ogloblin) (Hymenoptera: Mymaridae), a prospective *Homalodisca vitripennis* (Germer) (Hemiptera: Cicadellidae) biological control candidate agent from South America: divergent clades. *Bulletin of Entomological Research* 98 (1): 97-108.
- Triapitsyn S. V. 2006a. A key to the Mymaridae (Hymenoptera) egg parasitoids of proconiine sharpshooters (Hemiptera: Cicadellidae) in the Nearctic region, with description of two new species of *Gonatocerus*. *Zootaxa* 1203: 1-38.
- Triapitsyn, S. V. 2006b. Identify the species of Mymaridae reared in Argentina and Mexico for potential introduction to California against the glassy-winged sharpshooter and prepare and submit for publication a pictorial, annotated key to the *ater*-group species of *Gonatocerus* - egg parasitoids of the proconiine sharpshooters (Hemiptera: Cicadellidae: Proconiini) in the Neotropical region. In: *Proceedings of the 2006 Pierce's Disease Research Symposium*, pp. 111-113.
- Triapitsyn, S. V. & J. S. Bernal. 2008. Egg parasitoids of Proconiini (Hemiptera: Cicadellidae) in northwestern Mexico, with description of a new species of *Gonatocerus* (Hymenoptera: Mymaridae). *Journal of Insect Science*, in press.
- Triapitsyn, S. V., J. T. Huber, G. A. Logarzo, & D. A. Aquino. A review of the described species of *Gonatocerus* (Hymenoptera: Mymaridae) in the Neotropical region, with new additions. To be submitted to *Zootaxa* in early 2009, in preparation (more than 200 manuscript pages and more than 100 plates with illustrations).
- Triapitsyn, S. V., G. A. Logarzo, J. H. de León & E. G. Virla. 2008. A new *Gonatocerus* (Hymenoptera: Mymaridae) from Argentina, with taxonomic notes and molecular data on the *G. tuberculifemur* species complex. *Zootaxa*, in press.
- Triapitsyn, S. V., G. A. Logarzo, E. G. Virla & J. H. de León. 2007. A new species of *Gonatocerus* (Hymenoptera: Mymaridae) from Argentina, an egg parasitoid of *Tapajosa rubromarginata* (Hemiptera: Cicadellidae). *Zootaxa* 1619: 61-68.
- Virla, E. G., Logarzo, G. A., Paradell, S. L. & Triapitsyn, S. V. 2008. Bionomics of *Oncometopia tucumana* (Hemiptera: Cicadellidae), a sharpshooter from Argentina, with notes on its distribution, host plants, and egg parasitoids. *Florida Entomologist* 91 (1): 55-62.

FUNDING AGENCIES

Funding for this project was provided by the University of California's Pierce's Disease Grant Program.

ACKNOWLEDGMENTS

We thank Vladimir V. Berezovskiy and Jennifer Walker (University of California, Riverside) for technical assistance.

Section 2:

Vector

Management



