

**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 PARASITOIDS OF  
THE PROCONIINE SHARPSHOOTERS IN THE NEOTROPICAL REGION**

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**Reporting Period:** The results reported here are from work conducted January 1, 2007 to September 30, 2007.

**ABSTRACT**

At least twenty species of the genus *Gonatocerus* Nees (Mymaridae) were reared and recognized in Argentina and Mexico from eggs of the proconiine sharpshooters (Hemiptera: Cicadellidae: Cicadellinae: Proconiini) in the course of the classical and neoclassical biological control projects against the glassy-winged sharpshooter, *Homalodisca vitripennis* (Germar) (GWSS), in California. During the reporting period, they were identified taxonomically and three of them were described as new species (two from Argentina and one from Mexico). Work is under way to prepare a pictorial, annotated key to more than 60 Neotropical species of the *ater* group of *Gonatocerus*. Results obtained during the last six months of the first year and the first three months of the second year of this two-year project 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). 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 (2006b).

**OBJECTIVES**

1. Identification of the numerous species of *Gonatocerus* reared by USDA researchers (G. Logarzo) 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 (mostly Year 1).
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 (Year 2).

**RESULTS**

Progress on Objective 1.

Types. All the available types of the *Gonatocerus* species (70 species), described from the Neotropical region, were located and examined, and digital photographs were taken from them and arranged in plates. All but one (lost) holotypes of the species described by A. A. Ogloblin from Ecuador were remounted into Canada balsam because the original mounting medium was so dark that the specimens were not visible.

Specimen preparation. Due to the enormous volume of the material of *Gonatocerus* from Argentina and Chile (more than 2,000 specimens have already been point-mounted in the course of this project), work on point-and slide-mounting of the specimens, which began in October 2006, will continue until June 2008.

Specimen identification. Morphologically, we recognized at least three more unidentified species among altogether at least 15 species of *Gonatocerus* reared in Argentina by G. Logarzo from eggs of the proconiine sharpshooters. *Gonatocerus* sp. #12, previously misidentified by A. A. Ogloblin as *G. nigriflagellum* (Girault), turned out to be a new species. *Gonatocerus* sp. #1 from Argentina and a similar, yet clearly different species, reared from eggs of *Homalodisca* sp. or *Oncometopia* sp. in Veracruz, Mexico, are also new, undescribed species. *Gonatocerus* sp. #6 from Argentina was described taxonomically in the course of this study (Triapitsyn et al. 2007). Also described was a new species of *Gonatocerus* from Sonora, Mexico, an egg parasitoid of *Homalodisca liturata* Ball (Triapitsyn & Bernal in review). The identities of other species were also figured out, particularly of seemingly the most promising neoclassical biological control agent, *G. tuberculifemur* (Ogloblin) [sp. #7] (Virla et al. 2005), which turned out to be a complex of at least two different species, one of which was described taxonomically as new (Triapitsyn et al. in review). Because *G. tuberculifemur* was originally described from a single, poorly preserved female specimen, G. Logarzo, S. Triapitsyn, and E. Virla made in February 2007 a collecting trip to its type locality in Pucará, at the shore of Lago Lácar in Neuquén Province, Argentina, where *G. tuberculifemur* was collected using sentinel eggs of *Tapajosa rubromarginata* (Signoret) on leaves of a citrus plant. The collected specimens were used to initiate a laboratory colony in Argentina (G. Logarzo) and also for molecular (J. de León) and morphological (S. Triapitsyn) analyses in the USA. The *G. tuberculifemur* complex also includes several morphological forms and molecular clades (de León et al. 2006a,b,c and de León et al. in press), such as *Gonatocerus* sp. #3 from Argentina, whose identity remains to be figured out. *Gonatocerus metanotalis* (Ogloblin) also turned out to be a complex of several molecular clades (de León et al. 2006d), which, however, were not found to differ morphologically. Altogether, more than 2,000 specimens of *Gonatocerus* from South America and Mexico were sorted to morphospecies, compared with the types of the described species, and identified, many as undescribed taxa. The newly collected specimens have been matched with the types of more than 30 described species of *Gonatocerus* from South America, and also more than 30 undescribed species have been recognized, many of which were reared from eggs of the proconiine sharpshooters and thus are of interest to this project as potential neoclassical biological control agents against the GWSS in California.

#### Progress on Objective 2.

Preparation of the illustrations. High quality digital photographs (arranged in plates, as in Figure. 1) were taken, using an Automontage system, of all the available types of the described *Gonatocerus* spp. from the Neotropical region and also of the new species that will be included in the key, such as an undescribed species from Tamaulipas, Mexico (Figure. 1). Additionally, scanning electron micrographs were taken from some of them to facilitate their recognition and to illustrate some key morphological features.

Preparation of the key. It is under way.

Publications and reports. The project has already resulted in 11 scientific papers and reports that either have been published or submitted for publication to the scientific journals.

### **CONCLUSIONS**

All but one (lost) type specimen of the Neotropical species of *Gonatocerus* were located and examined. High quality digital photographs were taken (and arranged in plates) from the females and, when available, males of all the species of *Gonatocerus* that will be included in the key, including at least ten new, undescribed species. Three of these have already been described. 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 completed, 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.

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#### FUNDING AGENCIES

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



**Figure 1.** *Gonatocerus* sp. (female) from Tamaulipas, Mexico. Top: antenna; center left: body (without head); center right: dorsellum and propodeum; bottom: wings.