FIRST RECORD OF AN EGG PARASITOID FOR THE NORTH AMERICAN PROCONIINE SHARPSHOOTER *PARAULACIZES IRRORATA* (HEMIPTERA: CICADELLIDAE), WITH NOTES ON REARING TECHNIQUES

CHRISTOPHER TIPPING[1], SERGUEI V. TRIAPITSYN[2] AND RUSSELL F. MIZELL III[3]
[1]Delaware Valley College, Department of Biology, Doylestown, PA 18901

[2]University of California, Department of Entomology, Riverside, CA 92521

[3]University of Florida, Department of Entomology and Nematology, Quincy, FL 32351

Interest in the natural enemies of proconiine sharpshooters (Hemiptera: Cicadellidae: Cicadellinae: Proconiini) has increased since the accidental introduction and subsequent establishment of the glassy-winged sharpshooter, *Homalodisca coagulata* (Say), in California, Tahiti, Hawaii, and most recently Arizona. Previous surveys of egg parasitoids of proconiine sharpshooters from Florida indicated several species in the families Mymaridae (primarily *Gonatocerus* spp.) and Trichogrammatidae (Hymenoptera) (Triapitsyn et al. 1998; Triapitsyn & Hoddle 2001; Triapitsyn et al. 2002; Triapitsyn 2003; Tipping et al. 2005). However, no egg parasitoids have been reported to attack the eggs of the common proconiine sharpshooter *Paraulacizes irrorata* (Fabricius). This species has a distribution that includes central, northeastern and southeastern USA as well as northern Mexico (Young 1968).

The eggs of *P. irrorata* are deposited in masses into woody twigs and stems as well as the hardened petioles of a great variety of plant species. This method of oviposition results in great difficulty for researchers to find and identify egg masses in the field. Additionally, this species does not apply brochosomes to the site of oviposition. Other North American proconiine sharpshooter species, particularly those in the genera *Homalodisca* Stål and *Oncometopia* Stål, often powder oviposition sites with highly visible brochosomes.

Rearing *P. irrorata*

The first author of this communication initiated a colony of *P. irrorata* from females collected from crape myrtle, *Lagerstroemia indica* L. during the spring of 2004 at the University of Florida's North Florida Research and Education Center (NFREC) in Quincy, Florida. Individuals were kept in 1-m^2 wooden framed, screen-covered cages that were maintained in greenhouses. Greenhouse temperatures ranged between 25-32°C with indoor lighting to maintain a 16:8 light/dark photoperiod. Cages were provisioned with a combination of cotton (*Gossypium hirsutum* (L.), glabrous soybean (*Glycine max* (L.) 'D90-9216'), and basil (*Ocimum basilicum* L. 'Lemon'). The cotton and soybean plants were maintained in the cages after they had formed secondary growth on the stems and/or petioles, regardless of vigor, to provide oviposition sites for gravid *P. irrorata* females. The basil plants were replaced as they began to decline in vigor which occurred after flowering because nymphs and adults of *P. irrorata* would congregate on the younger basil plants. All plants used in the colony cages were potted in a 3:1:1 pine bark: sphagnum moss: sand mixture before placement into colony cages. The soil medium for all plants was watered to saturation twice daily. Declining plants often had newly deposited egg masses. The plant parts holding these eggs were trimmed to fit into Petri dishes (10 cm) filled with water agar and held until eclosion as described by Tipping et al. (2004).

Acquisition of Parasitoids

Thirty female *P. irrorata* were collected from several colony cages and placed into a separate cage that was provisioned with cotton plants that had secondary growth. After 48h, the plants were removed from the colony cage and placed in the field along a forest edge at NFREC for 5 d. Plants were then brought into the lab and covered with a clear plastic tube cage (15.2 cm by 45.7 cm) until parasitoids or leafhopper neonates were observed. Egg masses on stems and petioles were parasitized.

Several *P. irrorata* egg masses (<24 h old) were placed in agar-filled Petri dishes as described earlier and maintained at 25°C. Newly emerged parasitoids from the previous study were also placed in the dishes for 24 h and then removed. Twelve d later, adult parasitoids were observed in the dishes. Several parasitoids emerged from each egg of *P. irrorata*, exiting through two emergence holes in each end of the host egg. The parasitoids were preserved in 70% ethanol and sent to the second author for identification; they were then determined as *Gonatocerus fasciatus* Girault.

Gonatocerus fasciatus

This species was previously known only as an egg parasitoid of *H. coagulata* and *O. orbona* in the USA (Triapitsyn et al. 2003). Its distribution

includes Florida, Georgia, Illinois, Louisiana, Missouri, Tennessee, Texas, and Virginia (Triapitsyn et al. 2003), all within the range of *P. irrorata*. Recent biological observations on *G. fasciatus* revealed that it is a gregarious species (Triapitsyn et al. 2003). Following its introduction from Louisiana during 2002 (Triapitsyn et al. 2003), *G. fasciatus* has been mass-reared and released in California (CDFA 2005).

Material Examined

Gonatocerus fasciatus: USA, Florida, Gadsden Co., Quincy, 13-VI-2005, C. Tipping, numerous females and males (emerged from an egg mass of *P. irrorata* deposited on a soybean stem). All voucher material for this record (including two specimens of the host leafhopper) was deposited at UCRC (Entomology Research Museum, University of California, Riverside).

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Summary

The mymarid wasp, *Gonatocerus fasciatus* Girault, was reared from egg masses of the proconiine sharpshooter *Paraulacizes irrorata* (Fabricius) maintained in culture at the University of Florida North Florida Research and Education Center in Quincy, Florida. This discovery is the first known host record of an egg parasitoid for *P. irrorata* and also for the genus *Paraulacizes* Young, members of which lay eggs in plant stems and twigs rather than in leaves.

References Cited

CDFA. 2005. GWSS biological control spring report, 2005. California Department of Food and Agriculture, Pierce's Disease Control Program. Available online at: http://www.cdfa.ca.gov/phpps/pdcp/BioCtrlRep/gwBioIndex.htm.

Tipping, C., R. F.Mizell III, and P. C. Andersen. 2004. Dispersal adaptations of immature stages of three species of leafhopper (Hemiptera: Auchenorrhyncha: Cicadellidae). Florida Entomol. 87: 372-379.

Tipping, C., S. V. Triapitsyn, and R. F. Mizell III. 2005. A new host record for the egg parasitoid *Paracentrobia americana* (Girault) (Hymenoptera: Trichogrammatidae) of the proconiine sharpshooter *Homalodisca insolita* (Walker) (Hemiptera: Clypeorryncha: Cicadellidae). Florida Entomol. 88 (2): 217-218.

Triapitsyn, S. V. 2003. Taxonomic notes on the genera and species of Trichogrammatidae (Hymenoptera)—egg parasitoids of the proconiine sharpshooters (Hemiptera: Clypeorrhyncha: Cicadellidae: Proconiini) in southeastern USA. Trans. American Entomol. Soc. 129(2): 245-265.

Triapitsyn, S. V., and M. S. Hoddle. 2001. Search for and collect egg parasitoids of glassy-winged sharpshooter in southeastern USA and northeastern Mexico, pp. 133-134, *In* M. A. Tariq, S. Oswalt & T. Esser [compillers], Proceedings of the Pierce's Disease Research Symposium, December 5-7, 2001, Coronado Island Marriott Resort, San Diego, California. Organized by California Department of Food and Agriculture, Copeland Printing, Sacramento, CA. 141 pp.

Triapitsyn, S. V., M. S. Hoddle, and D. J. W. Morgan. 2002. A new distribution and host record for *Gonatocerus triguttatus* in Florida, with notes on *Acmopolynema sema* (Hymenoptera: Mymaridae). Florida Entomol. 85 (4): 654-655.

Triapitsyn, S. V., R. F. Mizell III, J. L. Bossart, and C. E. Carlton. 1998. Egg parasitoids of *Homalodisca coagulata* (Homoptera: Cicadellidae). Florida Entomol. 81 (2): 241-243.

Triapitsyn, S. V., D. J. W. Morgan, M. S. Hoddle, and V. V. Berezovskiy. 2003. Observations on the biology of *Gonatocerus fasciatus* Girault (Hymenoptera: Mymaridae), egg parasitoid of *Homalodisca coagulata* (Say) and *Oncometopia orbona* (Fabricius) (Hemiptera: Clypeorrhyncha: Cicadellidae). Pan-Pacific Entomologist 79 (1): 75-76.

Young, D. A. 1968. Taxonomic study of the Cicadellinae (Homoptera, Cicadellidae). Part 1. Proconiini. United States Nat. Mus. Tech. Bull. 261: 1-287.