FIRST RECORD OF *GONATOCERUS TRIGUTTATUS* (HYMENOPTERA: MYMARIDAE) FROM EGGS OF *HOMALODISCA COAGULATA* (HOMOPTERA: CICADELLIDAE) WITH NOTES ON THE DISTRIBUTION OF THE HOST

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The glassy-winged sharpshooter, *Homalodisca coagulata* (Say), is primarily a southeastern US species, but due to an apparent accidental introduction it has recently become a problem pest of crops and ornamentals in southern California (Blua et al. 1999); its spread into central and northern California is quite likely. Triapitsyn et al. (1998) reported results of the 1997 survey of *H. coagulata* egg parasitoids in Florida and Louisiana, where it is native, and also in southern California. In Monticello, Florida, its main egg parasitoids were the mymarid wasp *Gonatocerus ashmeadi* Girault throughout the season, and the trichogrammatid wasp *Zagella* sp. during July and August. This trichogrammatid was later found (S. V. Triapitsyn, unpublished data, and J. D. Pinto, personal communication) to be different from the closely related species *Zagella floridae* Viggiani, described from a female and a male collected from jasmine in Fort Lauderdale, Florida (Viggiani 1985), thus representing a new, undescribed species.

Despite the fact that parasitization of *H. coagulata* eggs by *G. ashmeadi* may at times reach 80% in Florida and Louisiana, and up to 100% in California (Phillips 1998, Triapitsyn et al. 1998), it has become clear that the large numbers of *H. coagulata* in southern California are due in part to poor natural control of the first, early spring, generation of the sharpshooter.

In an effort to find a more effective natural enemy of the spring brood, we visited Texas (Weslaco), and the state of Tamaulipas, Mexico, in late April 1999. Both states have never been surveyed for *H. coagulata* natural enemies, yet this leafhopper is known to occur there (Young 1958, Turner & Pollard 1959). Young (1958, 1968) reported this species from Mexico, without providing further details about its distribution. We examined a specimen of this species from Llera de Canales, which is in the tropical part of Tamaulipas. It is the most southern record of *H. coagulata* known in North America, based on the published locality data and according to our assessment of *H. coagulata* distribution (Fig. 1). This leafhopper is abundant from eastern Texas to southern Georgia and northern Florida, but its populations in central Texas (west of Brown and Kerr Counties) and in central Florida decrease considerably (Turner & Pollard 1959). It appears to be rare also in northeastern Mexico, according to our own observations and the study of the leafhopper collection of the Universidad Autónoma de Tamaulipas in Ciudad Victoria.

Homalodisca insolita (Walker) and several *Oncometopia* species are the prevalent sharpshooters in southern Florida, Mexico, and central America (Young 1968), although *H. insolita* not long ago invaded the traditional areas of *H. coagulata* distribution (Turner & Pollard 1959). The sharpshooters *Oncometopia clarior* (Walker) and *O.* sp. near *nigricans* (Walker) occur on citrus in both Nuevo León and Tamaulipas, Mexico (see "Material Examined"). In Weslaco, Texas, we could not find any *H. coagulata* on citrus, but we saw last year's egg masses, characteristic of this sharpshooter, with parasitoid exit holes on leaves of a mescal bean tree, *Sophora secundiflora* (Ortega) de Candolle.

Fig. 1. *Homalodisca coagulata* distribution map in North America.

In parks and citrus groves of central Tamaulipas, we were not able to find any adult or nymph stages of *H. coagulata* despite the fact that we saw many last year's egg masses characteristic of the glassy-winged sharpshooter, all of them with evidence of parasitization. Only on one occasion did we collect *H. coagulata* adults and nymphs and also found its parasitized eggs both on citrus and peach, grown in the shade of larger trees in a private garden near Valle Hermoso, in Río Bravo del Norte Valley (northern Tamaulipas).

In the laboratory of the Universidad Autónoma de Tamaulipas, the mymarid wasps *Gonatocerus triguttatus* Girault (taxonomic determination by S. V. Triapitsyn) emerged from *H. coagulata* egg masses collected in Valle Hermoso, thus providing us with the first known host record for *G. triguttatus*. Interestingly, the type series of this species was reared from an egg-mass of a leafhopper on orange in Trinidad (Girault 1916). *Gonatocerus triguttatus* was redescribed and illustrated by Huber (1988), who also indicated its distribution in Texas (Cameron, Hidalgo, and Val Verde Counties) and its presence in several states in Mexico, without, however, giving details of the Mexican material; these are provided below under "Material Examined". This species is probably widely distributed throughout Central America and parts of South America (first author has seen unidentified specimens from Brazil, Costa Rica, Guatemala, Guyana, and Mexico that may be conspecific with *G. triguttatus*).

We would expect that *G. triguttatus* would also attack other sharpshooter species in the genera *Homalodisca* and *Oncometopia*. Our observations in the citrus groves in Tamaulipas indicate that the early spring populations of the sharpshooters *H. coagulata*, *O. clarior*, and *O.* sp. near *nigricans* are under good natural control by egg parasitoids.

We believe that, subject to obtaining proper permits, prompt introduction of *G. triguttatus* into southern California from southeastern Texas or northeastern Mexico is warranted. Finding live *G. triguttatus* beyond *H. coagulata's* range would be very difficult because its host associations there are unknown. Other obvious candidates

for importation into California are *Gonatocerus fasciatus* Girault from Louisiana and *Zagella* sp. from Florida (Triapitsyn et al. 1998). If established, these species may enhance the overall natural control of *H. coagulata* in southern California.

Material Examined. *Gonatocerus triguttatus*: MEXICO: Baja California Sur: Las Barracas (ca. 30 km E. of Santiago), 18-IV-1984, P. DeBach, 11 females; 10 km N. of La Paz, 28-X-1983, J. D. Pinto, 2 females. Nuevo León: El Carmen, 10-VII-1983, A. González H., 2 females; Hacienda El Canada, 12-VII-1983, A. González H., G. Gordh, M. A. Rodríguez P., 2 females; Linares, 23-X-1961, H. Suarez, 1 female (on citrus); San Juan, 14-VII-1983, A. González H., F. Reyes V., 2 females [CNCI, Canadian National Collection of Insects, and UCRC, University of California at Riverside, det. J. Huber]. Tamaulipas, nr. Valle Hermoso, 22-IV-1999, S. Triapitsyn & P. Phillips: 6 females (ex. *H. coagulata* eggs on peach); 18 females, 3 males (ex. *H. coagulata* eggs on citrus). *Homalodisca coagulata*: MEXICO, Tamaulipas: Llera de Canales, 20-VIII-1994, D. Covarrubias, 1 female (on lemon); nr. Valle Hermoso, 22-IV-1999, S. Triapitsyn & P. Phillips, 1 female, 2 males. *Oncometopia clarior*: MEXICO, Tamaulipas: Ciudad Victoria, 28-VI-1997, Hernandez & Villegas, 1 female; Llera de Canales, 21-VI-1997, Mtz., Monrreal & Teran, 1 male (on orange). *Oncometopia* sp. nr. *nigricans*: MEXICO: Nuevo León, Montemorelos, 24-IV-1999, S. Triapitsyn & P. Phillips, 1 male (on citrus). Tamaulipas, nr. Santander Jiménez, 22-IV-1999, S. Triapitsyn & P. Phillips, 1 male (on *Hibiscus* sp.) [unless stated otherwise, all above specimens, including vouchers, deposited in the collection of Universidad Autónoma de Tamaulipas, Ciudad Victoria, Mexico].

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Summary

A survey of egg parasitoids of the glassy-winged sharpshooter, *Homalodisca coagulata* (Say), was conducted in Tamaulipas, Mexico and Texas, USA in April 1999. The mymarid *Gonatocerus triguttatus* Girault was reared from egg masses of this leafhopper on citrus and peach in northern Tamaulipas. This discovery is the first known host record of *G. triguttatus*; its other, probable, host associations are indicated. This wasp, whose geographical distribution also includes the eastern Rio Grande basin in Texas and the states of Baja California Sur and Nuevo León, Mexico, is identified as a potential biological control agent for introduction into California against *H. coagulata*.

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