CLASSICAL BIOLOGICAL CONTROL OF THE GLASSY-WINGED SHARPSHOOTER

Project Leader:
Walker A. Jones
USDA-ARS
Beneficial Insects Research Unit
Subtropical Agricultural Research Center
Weslaco, TX 78596

Cooperators:
Guillermo Logarza
USDA-ARS
Hurlingham, Argentina

Serguei Triapitsyn
University of California
Riverside, CA

Lloyd Wendel
USDA-APHIS
Mission, TX

Stuart McKamey
USDA-ARS
Washington, DC

INTRODUCTION

The leafhopper tribe Proconiini composes the "sharpshooters". There are 54 described genera and hundreds of species within this specific taxonomic group (Young, 1968). All are confined to the New World. The genus *Homalodisca* is found from the United States to Brazil and Argentina. Outside California, the glassy-winged sharpshooter (GWSS), *Homalodisca coagulata*, is known to occur from the southeastern and south central United States into northeastern Mexico. The exact limits of its range are known primarily through label data in insect collections.

A collaborative program to collect natural enemies from its area of origin in the United States and Mexico has been underway since at least 1999, initiated by the California Department of Food and Agriculture, and in cooperation with the University of California, Riverside, USDA-APHIS, and USDA-ARS and Mexico. These efforts have led to the successful collection and release in California of a number of native parasitoids of the GWSS. In south Texas, GWSS is rare. A survey of local egg parasitoids during the past two years has demonstrated that the eggs are heavily attacked by *Gonatocerus triguttatus* throughout the sharpshooter's breeding season and appears most responsible for the low population levels of GWSS in the area. This parasitoid was only recently identified from GWSS (Triapitsyn and Phillips, 2000). No nymphal parasitoids were detected.

It is not known if parasitoids from other sharpshooter genera and species will attack GWSS eggs. However, many genera within the Proconiini are very closely related to *Homalodisca* and possess similar habits. *Homalodisca* is among at least 10 leafhopper species that transmit citrus variegated chlorosis in South America. It is felt that parasitoids of eggs, and possibly other stages of sharpshooters from similar climate and habitat types from South America, may possess the ability to also attack GWSS because (1) they can be collected from areas that allow them to be pre-adapted to California climate conditions, and (2) they may be able to search for and successfully attack GWSS eggs in micro-habitats such as citrus. Thus, contacts were made and a plan was formulated to explore for and collect sharpshooter parasitoids from South America and import them into quarantine for identification and evaluation for their potential against GWSS. Additionally, a project was initiated to conduct a survey of insect collections to determine the historical range of the GWSS.

OBJECTIVES

The program will encompass the total array of activities available for classical biological control from:
1. Climate matching.
2. Taxonomic review.
3. Foreign exploration.
4. Quarantine evaluation.
5. Release and post-release evaluation.
6. It is also proposed to support collections in South America, provide technical support for insect and host plant colonization, quarantine evaluation of parasitoids, and in release and evaluation in California.

RESULTS AND CONCLUSIONS

During 2000-2001, the initial survey year, parasitoids would be collected for identification only, with shipments of live material beginning during the 2001-2002 season. Parallel with initial sampling, climate matching will be conducted to identify areas in South America that match subclimate types where grapes are grown in California.

In cooperation with USDA-APHIS, Mission Plant Protection Center, Mission, TX, a collaborative project was developed with the USDA-ARS South American Biological Control Laboratory (SABCL), Hurlingham, Argentina, to collect natural enemies for identification and importation for evaluation in US quarantine. More recently, a cooperative agreement was developed with Dr. Mark Hoddle, University of California, Riverside, to share responsibility for receipt, identification, evaluation and possible non-target effects of imported material. The USDA-ARS Systematic Entomology Laboratory would collect label data from GWSS in museum collections to provide information for an accurate distribution map of GWSS.

The survey of data label information from insect collection is still underway. A survey of egg parasitoids of the sharpshooter *Tapajosa rubromarginata* (Signoret) in northern Argentina was conducted. This genus is most closely related to *Oncometopia*. *T. rubromarginata* possesses a wide host range including citrus. Adults were caged over small potted citrus plants and transported to several sites, including citrus. From about 220 specimens shipped in alcohol to Dr. Serguei Triapitsyn, about 10 were species of *Gonatocerus*, all belonging to the subgroup that attack GWSS in the United States. The most common species closely resembles *G. triguttatus*. Among the trichogrammatids were species in the genera *Oligosita* and *Zagella*.

The examination of Klammadiagrams and a review of the CLIMEX program (Sutherst et al. 1999) resulted in the identification of areas in the country of Chile that possess identical subclimate types as those where grapes are grown in California. Also, areas in northern Argentina matched much of the climate of the southeastern United States where GWSS is considered to be indigenous.

Permits to import live parasitoids into quarantine facilities in California (Riverside) and Texas (Mission) have been submitted to USDA-APHIS-PPQ. Exploration for egg and nymphal parasitoids in Argentina and Chile by USDA-ARS personnel located in Argentina was initiated again in September, 2001 with the goal of shipping live parasitoids for evaluation pending receipt of permits.

REFERENCES

Heinrich W. and H. Lieth, H. 1967. Gustav Fischer Verlag Lena.

Sutherst, R. V., G. F. Maywald, T. Yonow and P. M. Stevens. 1999. CLIMEX. CSIRO. Ver. 1.1. (CD-ROM).

Triapitsyn, S. V. and P. A. Phillips. 2000. Fla. Entomol. 83: 200-203.

Young, D. A. 1968. Smithsonian Institute, U.S.N.M., Bull. 261: 287 pp.