

Oviposition preferences of the blue-green sharpshooter and its first reported egg-parasitoids on Southern California wild grape

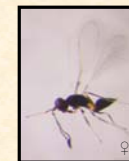
Elizabeth A. Boyd, Mark S. Hoddle, and Serguei V. Triapitsyn
Department of Entomology, University of California, Riverside

Abstract

A survey was conducted in late summer 2003 to determine the oviposition preferences of female *Graphocephala atropunctata* (Signoret) (Hemiptera: Cicadellidae) on Southern California wild grape, *Vitis californica* Benth (Vitaceae). Female blue-green sharpshooters (BGSS) oviposited into the new growth, primarily the succulent tendrils and stems. The under sides of small leaves and petioles were also used for oviposition, but to a lesser extent. Mature stems, large and medium sized leaves and petioles were not utilized for oviposition. Two parasitoids, *Gonatocerus latipennis* Girault and a *Polynema* sp. (Hymenoptera: Mymaridae) were reared from BGSS eggs. Literature reviews revealed a deficiency of known natural enemies for *Graphocephala atropunctata*. A sentinel plant study was conducted to further confirm the parasitization of BGSS eggs by these parasitoids. Collectively the *Polynema* sp. and *Gonatocerus latipennis* constitute the first documented parasitic natural enemies of the BGSS.



G. latipennis



Polynema sp.



Emergence hole in stem

Introduction and Objectives

The blue-green sharpshooter has been a threat to California grape growers for nearly a century due to its excellent transmission efficiency of the bacterium that causes Pierce's Disease. While much research has been devoted to the epidemiologically related issues concerning this insect, little has been done to examine some of the most fundamental life history traits of this native pest, specifically oviposition preference. Additionally, there are no recorded natural enemies of this native leafhopper. Ultimately, we would like to investigate the possible non-target effects of the exotic glassy-winged sharpshooter (GWSS) egg-parasitoids on this and other native sharpshooters in California, as well as classify their associated native parasitoid fauna. To pursue this type of study, one needs to know the oviposition preferences of these leafhoppers. The pilot studies below are an attempt to determine the oviposition preferences of the blue-green sharpshooter and document any of its associated parasitoids.

Materials and Methods

Oviposition Survey



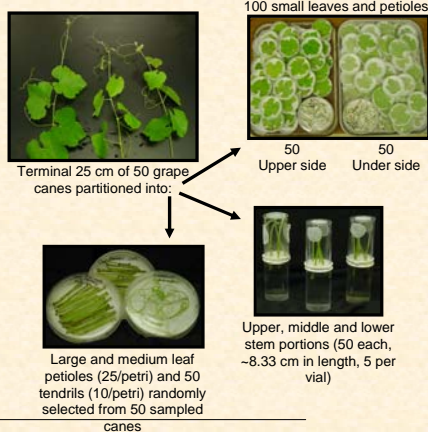
100 large leaves
(50 upper side, 50 under side)



100 medium leaves
(50 upper side, 50 under side)



Ten entire grape canes were sampled at a later date to account for any possible oviposition substrate not sampled in the previous survey. These canes were cut into thirds (apical, middle and basal, and caged), then placed into 10 cm of water in a Mason jar which left approximately 25 cm of cane exposed for emergence of nymphs and parasitoids.



Sentinel Plant Study



To confirm the host association of the emerged parasitoids with the BGSS, 3 basil, a mum and 2 wild grape were exposed to BG lab colonies for 3 days to allow for oviposition. These plants were then taken to the oviposition survey site and left for 3 additional days to allow for parasitization of the BG eggs and were caged separately in the lab. Plants were observed daily for any emerging insects.

Discussion

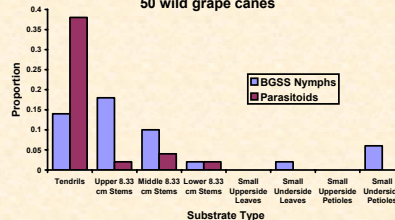
After nearly a century of attempting to control the blue-green sharpshooter, while lacking a clear understanding of vital life history traits, we now know BGSS oviposition preference. This preference is for new growth, consisting primarily of succulent stems and tendrils that occur along the entire length of the grape cane. Additionally we have confirmed two new natural enemy host associations for the BGSS. While these studies were conducted on wild grape, the information acquired may have implications in developing a more complete IPM program involving this native pest species. Overall, the new knowledge of BGSS oviposition preference provides essential information for conducting future non-target effect studies involving the exotic GWSS egg-parasitoids.

Results

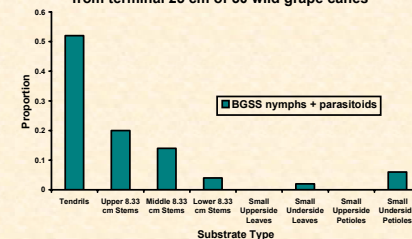
Oviposition Survey

No BGSS emergence was observed from large or medium leaves and petioles.

BGSS nymph and parasitoid emergence per substrate type sampled from terminal 25 cm of 50 wild grape canes

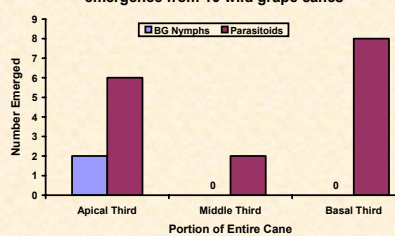


BGSS oviposition per substrate type sampled from terminal 25 cm of 50 wild grape canes

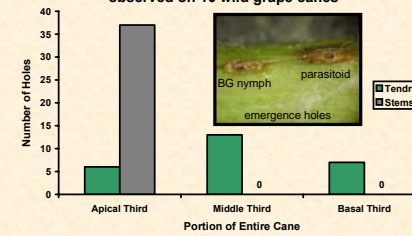


"Parasitoids" in the above graphs represent the combined emergence of *G. latipennis* and *Polynema* sp.

Blue-green nymph and *Polynema* sp. emergence from 10 wild grape canes

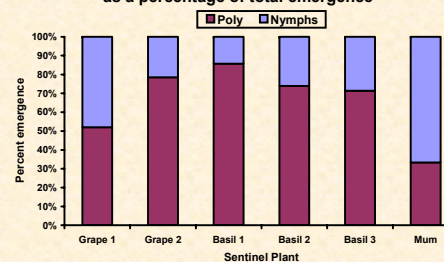


Total number of recent emergence holes observed on 10 wild grape canes



Sentinel Plant Study

BGSS nymph and *Polynema* sp. represented as a percentage of total emergence



Polynema sp.



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Contact Information

Elizabeth can be reached by phone or email: (909) 787-4360, eboyd@gocougs.wsu.edu