Relevant Qs How often do SBs rise to damaging levels?
Q. Any egs of Pentatomids being effectively controlled Biologically
Q - who did the parasites

Biological Control

# IDENTIFICATION OF PARASITOIDS OF THE CONSPERSE STINK BUG IN NORTH-CENTRAL WASHINGTON, AND ATTRACTION TO HOST-PRODUCED AGGREGATION PHEROMONE

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## INTRODUCTION

Management of the consperse stink bug, *Euschistus conspersus*, an emerging pest in many Washington orchards, has primarily been attempted using broadcast applications of insecticide to border vegetation and/or the orchard itself. A lack of information about the life history and habits of this pest, including its natural enemies, mean that there are no management alternatives for growers. Research was undertaken in 2000 to quantify the impact of natural enemies upon populations of the consperse stink bug in typical orchard situations. This information is useful in targeting sprays to maximize impact upon the target pest, while minimizing destruction of beneficial parasitoids and predator populations. We also examined the response of the 2 major groups of parasitoids (tachinids and scelionids) to stink bug pheromone lures in the field to determine whether this was used as a host-finding kairomone by these insects, as has been reported by other researchers for other stink bug/parasitoid systems in other parts of the world.

## METHODS AND MATERIALS

Identification/abundance of parasites - adults: Adult bugs were collected from a variety of orchards in early spring, immediately after overwintering. Bugs were held in isolation and supplied with food. Bugs were monitored daily for emergence of parasitoids. Emerged parasites (maggots) were allowed to pupate in soil and preserved and identified upon emergence. Parasitism rates were recorded as well.

Identification/abundance of parasites – eggs: Consperse stink bug eggs were collected daily from colony at WSU-TFREC. Fresh eggs were cut out from the mullein leaves upon which they were laid in colony and the entire section of leaf glued to paper tabs to preserve any volatile or tactile cues used by the parasites. Tabs were stapled to the undersides of mullein leaves on orchard borders. Eggs were collected every 7 days and replaced. Collected eggs were evaluated in lab for parasitism and predation. Parasites were reared in lab, preserved and identified. This procedure was continued for approximately 7 weeks to coincide with the duration of the stink bug mating and oviposition in central Washington.

Attraction to host-produced volatile – tachinids: Bucket traps were baited with the stink bug primary sex pheromone component methyl 2,4-decadienoate and placed in a variety of orchard borders and paired with unbaited control traps. Trap locations were randomized, and lures rotated throughout the experiment. Traps were checked weekly for the presence of tachinid parasites. Parasites were preserved and identified.

Attraction to host-produced volatile – egg parasites: Similar to the protocols outlined above, with egg masses placed on mullein plants either baited with pheromone or unbaited control plants.

RESULTS AND DISCUSSION

Identification/abundance of parasites-adults: Parasitism rates were very low (<2%) in all areas surveyed (approx. 500 adult bugs). Two tachinid parasites were identified: *Gymnoclytia occidentalis* and *Gymnosoma filiola*.

Identification/abundance of parasites-eggs: Parasitism rates peaked near 10%, with predation forming the major source of mortality for stink bug egg masses in the field (Fig. 1). Predators noted at egg masses included ants, earwigs, and other hemipterans including adult *E. conspersus* cannibalizing eggs. Two scelionid wasp parasites were identified from parasitized egg masses: *Trissolcus utahensis* and *Telenomus podisi*, with the former representing over 95% of the parasites identified. It is likely that these parasitism rates (tachinids and scelionids) increase greatly in areas not impacted heavily with pesticide, and this will be investigated in 2001.

Attraction to host-produced volatiles-tachinids: Tachinids of both species were highly attracted to stink bug aggregation pheromone component baited bucket traps (Fig.2), and appear to use this compound as a host-finding kairomone.

Attraction to host-produced volatiles-egg parasites: There were no statistical differences between baited and unbaited sentinel egg mass parasitism. It appears that the parasitoids we collected do not use this particular compound as a host-finding kairomone.

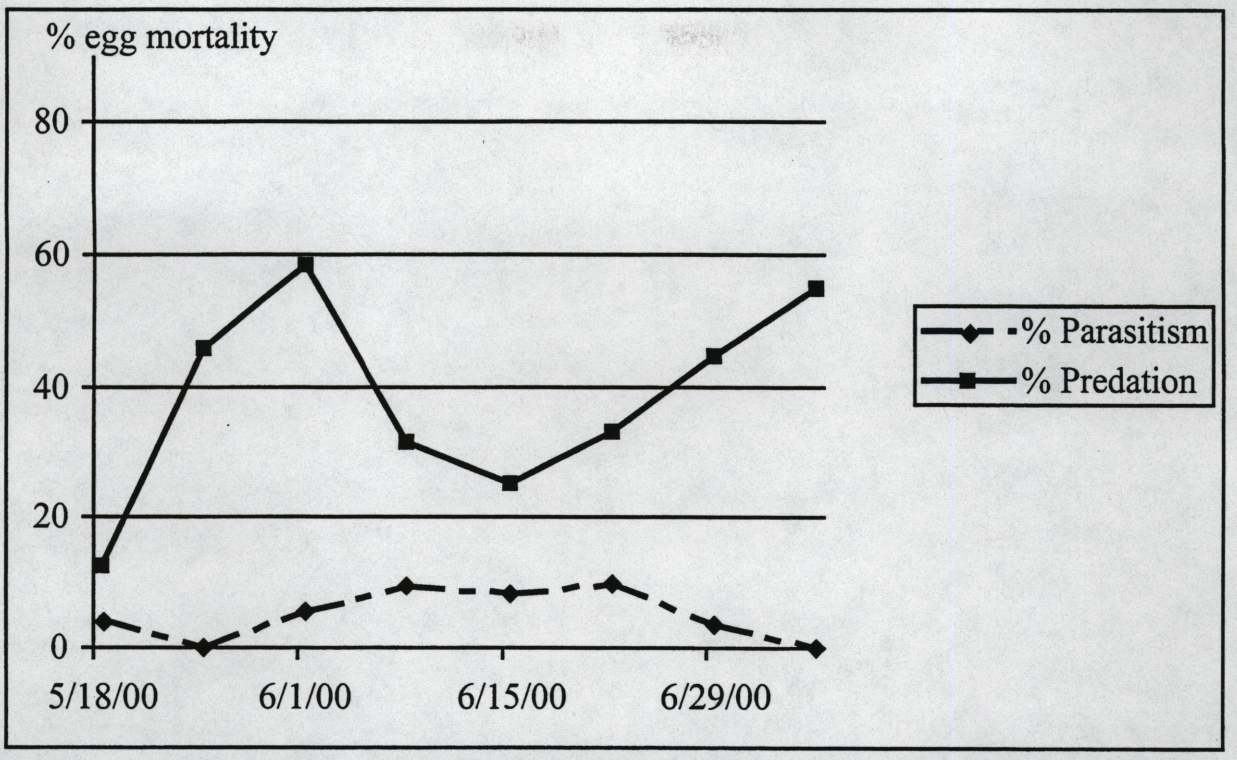


Figure 1. Parasitism and predation rates upon sentinel egg masses of *E. conspersus* placed on mullein along orchard borders (n=80)

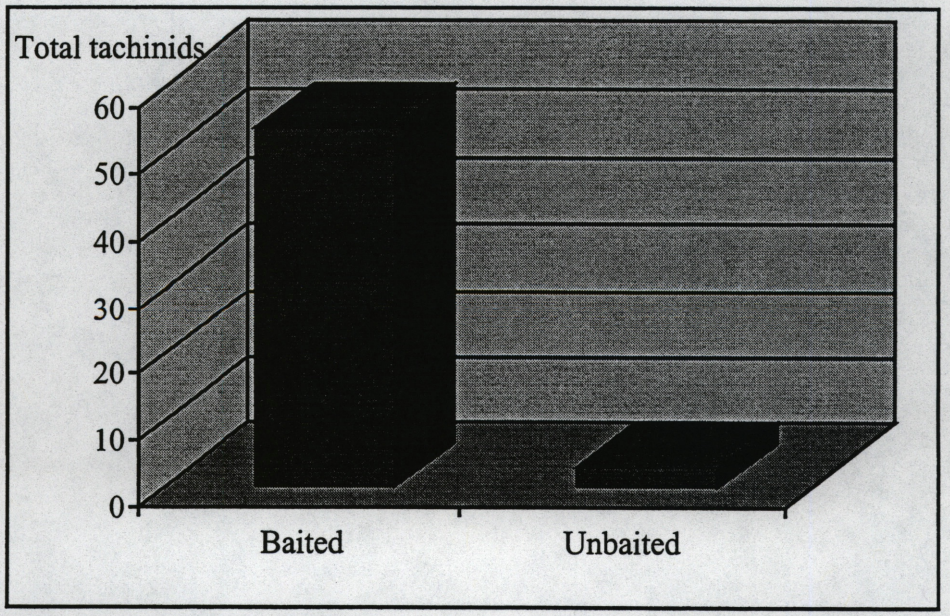


Figure 2. Capture of adult tachinid parasites of E. conspersus in bucket traps baited with the primary pheromone component methyl 2,4-decadienoate, compared with unbaited traps. (n=70)