

Biological Control

Biological Control of the Cherry Bark Tortrix, 1997: Survey for Natural Enemies

T.A. Murray and L.K. Tanigoshi

Washington State University Department of Entomology, Vancouver, WA

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Egg Parasitoid Survey

Freshly cut, small logs were exposed to mated adult CBT females in a sealed cage. Females were allowed to oviposit onto the logs for seven days. These logs were placed in the field for an additional seven days. Logs were hung parallel to tree trunks using two screw hooks. After field exposures, the logs were sealed in cardboard cylinders with a glass vial attached on one end to collect any emerging parasitoids. After two weeks, the logs were visually inspected for egg hatch or parasitization.

Sleeve Cage Survey

Fifteen sleeve cages were designed for determining areas of parasitoid activity. Cages were placed into the field at different time intervals. Trees were thoroughly hand cleaned of other observable organisms (e.g., mostly spiders and egg masses). The sleeves were sealed for a duration of at least one and a half months to allow any parasitoids to emerge and die. After the duration, the sleeves were cut open along the seam to survey the contents. A white plastic tarp was placed below the sleeves to catch anything falling out during the opening of the sleeve. All specimens collected were mounted and labeled. A good diversity of parasitoids was collected using this method. This survey gave an indication of areas where we can expect parasitoid activity. Most activity was found in areas of unmaintained habitats. Few parasitoids were collected from landscaped trees.

Parasitism Rate

Two hundred individual cages, designed to cover and trap emerging moths and parasitoids, were placed in the field throughout the summer months. This cage fit over an area to include the larval frass tube and any other organisms were removed prior to containment. Cages remained in the field for at least 45 days. Upon removal, the contents of the cages were collected and recorded. Percent of cage effectiveness was calculated based on whether anything was contained in the cage. Percent parasitism was determined by the number of cages containing parasitoids divided by the number of cages containing either parasitoids or CBT adults (from the previous percent calculated). Specimens were collected from 86.5% of the traps, so this trapping method was quite successful. Lack of specimens was due to inadequate sealing of the cage allowing escape of its contents, mortality other than successful parasitization of CBT larvae, or prior emergence of CBT adults. Parasitism in the field was 1.7%; three traps yielded parasitoids.

Destructive Tree Sampling for Parasitoids

Trees were removed bimonthly throughout the season and sectioned into logs. Trees removed were mainly of naturalized sweet cherry (*P. avium*) and wild cherry (*P. emarginata*).

Logs were placed into 50 gallon plastic containers. Three wide-mouthed jars were placed on the container lid to collect any emerging insects. Containers were checked daily for contents. Any specimens collected were prepared for authoritative identification. This sampling method provided the most diversity and abundance of parasitoids.

Parasitoids were collected from 6 different sites. Parasitoids were trapped and sampled on 5 different host plants: *Prunus avium*, *P. serrulata*, *P. emarginata*, *P. lusitanica* and *Malus*. spp. One site in Blaine proved to consistently produce multiple species of parasitoids. Tentatively, we have recovered one species each from the Trichogrammatidae, Scelionidae, Ichneumonidae, Braconidae, Eupelmidae and Eurytomidae. Specimens have been sent off to specialists for species identifications.

It is clear that currently no natural enemy endemic to the Pacific Northwest is offering any significant control of CBT populations. However, there does appear to be a rich parasitoid complex already attacking CBT and could have potential if enhanced. These preliminary studies are the starting point to understanding the current nature of CBT in North America and the potential impacts of any native or endemic parasitoids. Ultimately, it is recognized that the importation of new parasitoids, native to the homeland of the cherry bark tortrix, are the most rational and economic approach to bring CBT into balance if natural control cannot be achieved endemically in the Pacific Northwest.