

Stone Fruits—Biology

Another Exotic Ermine Moth, the Cherry Ermine Moth, *Yponomeuta padellus*, Discovered in the Pacific Northwest

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Keywords: apple ermine moth, cherry ermine moth, cherry, plum, almond, peach

In 1992 Forestry Canada Columbia reported that apple ermine moth, *Yponomeuta malinellus* (AEM), was found on a new host, hawthorn (*Crataegus*), in British Columbia. Hawthorn is not known to be a host of *malinellus* in its native range. Agriculture Canada investigated the situation and subsequently identified the specimens as cherry ermine moth (*Y. padellus*) (CEM). Hawthorn is a known host of CEM in Eurasia. In the spring of 1993 ermine moth larvae were found in B.C. on hawthorn (*C. laevigata* and *C. monogyna*), cherry plum (*Prunus cerasifera*), mountain ash (*Sorbus aucuparia* and *S. sitchensis*), and serviceberry (*Amelanchier alnifolia*). Associations with these hosts, which are among those known for CEM in Eurasia, further confirmed the identification. The infested area includes part of Vancouver Island and sites on the mainland within a few miles of the U.S. border near Blaine, Washington.

Biology. In addition to the hosts listed above, plum (*Prunus domestica*), sweet cherry (*Prunus avium*), almond (*Prunus communis*), peach (*Prunus persica*) and blackthorn (*Prunus spinosa*) are the hosts of CEM in Eurasia. CEM behavior is similar to that of AEM. Like AEM it overwinters as first instar larvae under hibernacula, emerging in the spring to feed on foliage. Larvae form a communal web and periodically move as a group to a new cluster of leaves. Observations in B.C. indicate that CEM larval development may be earlier than AEM. Adult flight may begin and end earlier. While AEM has been trapped into September, suspected CEM catches in WSDA traps in 1993 (see below) stopped in mid-August.

Taxonomy. Separation of the ermine moth species is difficult because there are no reliable distinguishing morphological features for larvae or adults. However, in Eurasia significant differences are reported in appearance of cocoons and webs surrounding clusters of pupae. The CEM cocoons and webs are described as loose, while cocoons of AEM are opaque and cluster webs are dense. In British Columbia CEM pupae were easily visible within the cocoon, while AEM pupae are enclosed in a dense cocoon. In Eurasia species can be separated by host association (Herrebut et al., 1976). Also, the species is considered to be reproductively isolated according to mating studies conducted in Europe. In mating pheromone response studies CEM males did not respond to AEM females. In hybridization studies by Hendrikse (1986) offspring of CEM x AEM did not reach adulthood. According to Hendrikse there is no evidence for hybridization under natural conditions.

Potential impact. In the literature from Eurasia CEM is described variously as an "economic," "major," and "very harmful" pest. One paper reported complete defoliation of cherry trees. There is no information in the literature that would exclude its potential range from wherever hosts are available in North America.

As with AEM, there is a potential for economic impact on the fruit tree nursery industry. Washington nurseries export large volumes of *prunus*. Quarantine restrictions similar to those for AEM could be enacted by other states or countries requiring regulatory treatments for *prunus* stock. Regulatory procedures would have to be developed for this pest. Since the hosts list includes hawthorn and mountain ash, which are popular ornamentals as well as fruit bearing *prunus* species, significant defoliation in residential and park trees could lead to increased pesticide use.

1993 Survey. After learning in June of 1993 about the B.C. detections, WSDA fielded a trap survey in cooperation with USDA/APHIS in three northwestern Washington counties closest to B.C. (San Juan, Skagit and Whatcom). In July and August wing traps baited with CEM pheromone supplied by the USDA Otis Methods Development lab were distributed from Blaine south to Mt. Vernon and on Orcas and San Juan Islands. Traps were placed in host trees of cherry ermine moth including native and ornamental hawthorn, domestic and wild cherry, cherry plum, plum, mountain ash, and serviceberry. Most traps were placed in hawthorns since they appear to be the most favored host in British Columbia. Trap placement started on July 7 with all traps up in San Juan and Whatcom counties by July 28. Traps were inspected about every two weeks. The survey was extended to Skagit County on August 11 after numerous detections in Whatcom county.

Results. Suspected cherry ermine moths were detected in numerous widely scattered sites in San Juan and Whatcom counties (Table 1). Percentage of positive sites was 81 and 57 in San Juan and Whatcom counties, respectively. None were detected in Skagit County. However, this could be a function of a low level of trapping and placement late (August 11) in the flight season. The last moths were caught sometime in the July 29 to August 18 period in Whatcom County. Ermine moths were caught in all host species that were trapped.

Identification/confirmation. These specimens have not been confirmed as an introduction of cherry ermine moth by USDA. USDA was supposed to provide the identification support by developing the genetic methodology, but this plan lost out to higher priorities. Also, no positive host association has been made in Washington.

Since high populations of AEM are common in the survey area, it was difficult to avoid placing traps near apple trees infested with AEM. Although the literature says that the pheromones in the *Yponomeuta* group are species specific, there is an unknown potential for random catches of AEM in the CEM traps.

Table 1. 1993 Cherry ermine moth trap distribution and results.

County	Number of sites	Number of positive sites	Number of moths
San Juan	110	90	408
Skagit	27	0	0
Whatcom	106	60	167