

FRUIT TREE LEAFROLLERS (LEPIDOPTERA) AND PARASITES (HYMENOPTERA) INTRODUCED IN THE VANCOUVER DISTRICT, BRITISH COLUMBIA

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ABSTRACT

Introduced European species comprised 5 of the 6 most common and 8 of the 11 total species of leafrollers found on apple and pear in the Vancouver district in 1977. Parasitism was low. Two of the leafroller parasites, *Apanteles ater* (Ratz.) and *A. longicauda* (Wesm.), and a graciariid parasite, *Achrysocharoides zwölferi* (Delucchi), are European species new to North America.

LEAFROLLERS

One, *Choristoneura rosaceana* (Harr.), of the six most common species of leafrollers found on apple and pear in the Vancouver district in 1977 is native to North America. The other five were introduced to North America from Europe. They are: *Croesia holmiana* (L.), found in North America for the first time in this survey and recorded elsewhere (Doganlar and Beirne, in preparation); and *Hedia nubiferana* (Haw.), *Spilonota ocellana* (Den. and Schiff.), *Pandemis cerasana* Hbn., and *Archips rosanus* (L.), all already known to inhabit the district.

Other species of leafrollers found on apple and pear were: *Acleris comariana* (Zell.), previously recorded only as a strawberry pest in B.C. *Archips podana* (Scop.), and *Acleris variegana* (Schiff.), all introduced species; *Pandemis canadana* Kft., a native species; and *Acleris robinsoniana* (Forbes), whose status as a Holarctic or Nearctic species appears to be obscure. These species were found in only small numbers.

Eight of the 11 species of leafrollers mentioned above are non-natives that were introduced accidentally into North America, 5 of them apparently first into southwestern British Columbia or the Pacific Northwest. Only one of the introduced species, *A. rosanus*, has so far spread into the Okanagan Valley, where it was first found in 1971 as an apple pest in 1972. Others of the introduced species may become important pests when they colonize the Okanagan Valley or the fruit growing regions of the interior of Washington and Oregon, as their distributions abroad indicate that they could survive the climate there, at least in irrigated situations.

PARASITES

Two of the three species of hymenopterous parasites that were reared from two or more of the six most common species of leafrollers (none was reared from the other five) are apparently accidentally-introduced European

species. They are: *Apanteles ater* (Ratz.), reared from *P. cerasana*, *A. rosanus*, *C. rosaceana*, and *H. nubiferana* and not recorded previously from North America; and *Apanteles longicauda* (Wesm.), reared from *H. nubiferana* and *C. rosaceana* and also not recorded previously from North America.

Ascogaster quadridentata Wesm., reared from *S. ocellana*, was deliberately introduced from England into the Lower Fraser Valley in the 1940's as a biological control agent of the pea moth, *Laspeyresia nigricana* (Steph.), itself an accidentally introduced species. The morphologically identical form known as *A. carposapsae* Vier was introduced into B.C. from Ontario in the 1930's as a biological control agent of the codling moth, *L. pomonella* (L.), and became established. It is not yet known which of these forms is the parasite of *S. ocellana*.

Spilonota ocellana was also parasitized by *Agathis dimidiator* (Nees), a European species probably accidentally introduced into Eastern North America and apparently not recorded previously from the West.

The European eulophid *Achrysocharoides zwölferi* (Delucchi) was reared from the graciariid *Phyllonorycter blancardella* Forb. during this survey. It also has not been recorded previously from North America. At Burnaby, British Columbia it has three generations a year, overwinters as a pupa inside the larval web of its host, and was reared from nearly 10 percent of the host larvae collected.

Other parasites reared from the leafrollers were: *Meteorus argyotaeniae* Joh., from *H. nubiferana*, *C. rosaceana*, and *S. ocellana*; *Enytus* sp. (or spp.), from *C. holmiana* and *H. nubiferana*; *Tranosema* sp. (or spp.), from *C. rosaceana* and *C. holmiana*; and *Macrocentrus iridescens* French, *Scambus* (S.) *decorus* Walley, *Ischnus inquisitorius atriceps* (Cress.), *Apanteles* sp., and *Miscogaster* sp., from *C. rosaceana*.

The native species of leafroller, *C. rosaceana*, had 9 species of parasites and a total parasitism of under 10 percent. The five introduced

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of the six most common species had one to four species each. Total parasitism averaged 5 percent and ranged from less than 1 percent in *C. holmiana* to about 8 percent in *H. nubiferana*.

None of the parasites identified in this survey was the same as any of those identified from a survey of parasites of apple leafrollers on various foodplants in the Okanagan Valley, B.C., in 1972 (Mayer and Bierne, 1974. *J. ent. Soc. B.C.* 71: 22-25).

"While this paper was in press *Phyllonorycter blaucardella* Forb. was found to be a different and undescribed species."

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AN ERRONEOUS REFERENCE TO *AËDES AEGYPTI* (L.) IN BRITISH COLUMBIA

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There is an unfortunate error in the standard monograph "*Aedes aegypti* (L.) the yellow fever mosquito" by Sir. S. Rickard Christophers (1960).

In dealing with the northern limits of its distribution, Christophers states: "There is, however, a record (Good, 1945) stating that *A. aegypti* used to occur in British Columbia, but has not been recorded for thirty years". This record is included in his Figure 1, a map showing the world distribution of the species and in his Table 1, the recorded northern limits of its distribution. However, British Columbia is not mentioned in Good's paper, which is a list of mosquitoes of the District of Columbia.

The list does include *A. aegypti*, collected by J. Carrol on August 3rd 1901.

The present northern limit of *A. aegypti* on the west coast is Baja California although interceptions are occasionally made by quarantine officials in the state of California (Bohart and Washino 1978).

Summer temperatures in both North and South America (July & January respectively) are lower on the west coast than at corresponding latitudes on the east coast. Ignoring the erroneous British Columbia record, the present distribution of *A. aegypti* in the Americas corresponds closely with the 21 C summer isotherm.

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