Defoliation of haskap shoots by the honeysuckle moth in Southcentral Alaska

by Alexandria Wenninger[32]

The honeysuckle moth (*Ypsolopha dentella* (Fabricius, 1775)) has been identified as a defoliator of developing shoots on haskap (aka 'honeyberry' or 'blue honeysuckle', *Lonicera caerulea* Linnaeus) in Southcentral Alaska. Haskap is a cold-hardy ornamental shrub that is grown for its edible berries in Alaska, however little information is available regarding insect pests of haskap in North America. Several instances of shoot defoliation on haskaps and ornamental honeysuckles were reported from Anchorage and the Matanuska-Susitna Valley in late May and early June of 2022 leading to an investigation into the identity and life history of this non-native defoliator (Figure 1).

Figure 1: Left and Middle: Late instar larvae blending in with stems on ornamental Tatarian honeysuckle. Photographed 8 June 2022 in Anchorage, AK by A. Wenninger. Right: Late instar larva on a haskap shoot, note the two-toned color pattern of the reddish stripe up the green haskap stem. Photographed 14 June 2022 by A. Wenninger.

Honeysuckle Moth Life History

Honeysuckle moth caterpillars were found feeding on host plants late May through mid-June in both Anchorage and the Matanuska-Susitna Valley. Early instar caterpillars feed within developing leaf shoots, producing silk which keeps the developing leaves loosely clasped together into a retreat, protecting the feeding caterpillars (Figure 2). The early instar caterpillars are pale yellowish in color with green longitudinal stripes down the dorsum and many long, dark setae speckling their abdomens. Later instar caterpillars develop a wide, reddish stripe down the dorsum, which appears to mimic the two-toned coloration of haskap and ornamental honeysuckle stems (Figure 1). The caterpillars display notable quick and erratic "wiggling" movements when disturbed, and upon reaching the edge of the leaf may leap from the host plant by a silken thread affixed to their retreat in a process other authors have named "bungee-jumping" (Eisner et al. 2005); soon after making the leap they return to the retreat by pulling themselves up by their mouthparts, folding the silken thread as they go. Pupation occurs within a spindle-shaped

[32]University of Alaska Fairbanks Cooperative Extension Service Integrated Pest Management Program, akwenninger@alaska.edu

silken covering on or near the host plant. Adults at rest are ~12 mm long and appear reddish brown laterally with a pale dorsal band that makes a ventral turn posteriorly; when viewed laterally the posterior end appears upturned ("apically falcate") and the face features a brush of setae projected forward (Figure 3). Adults have been observed in Anchorage from early July through August (University of Alaska Museum records accessed 6 June 2022 via Arctos and iNaturalist records accessed 15 July 2022). Information about the overwintering of this species is scarce, but it is thought that eggs are laid on the host plant in late summer and the species overwinters as an egg (Wall 2005, Montgomeryshire Moth Group 2009).

Figure 2: Early instar larvae feeding within a silk-tied haskap shoot; the outer leaves have been removed to reveal the larvae within. Photographed 23 May 2022 by A. Wenninger.

Figure 3: Adult honeysuckle moth. Reared from a caterpillar, photographed 23 June 2022 by A. Wenninger.

Hosts

The honeysuckle moth is known to feed on members of the honeysuckle genus (*Lonicera* spp.). This defoliator is of particular interest due to its impact on haskap (*Lonicera caerulea*), a cold-hardy ornamental shrub grown in Alaska for its early-ripening edible berries. Wild-types of *L. caerulea* are circumpolar in distribution, native to forests of Asia, Europe, and North America[33], however, Alaska is not within the native range of this species. The University of Saskatchewan (Saskatchewan, Canada) began a haskap breeding

[33]The taxonomic status of *L. caerulea* is still under debate. Some taxonomists have proposed splitting the North American species apart from *L. caerulea* and into two distinct species—*L. villosa* in central/eastern North America and *L. cauriana* in western North America (Fernald 1925). However, genetic and morphological study is yet to produce a widely-accepted global taxonomy (Peterson et al. 2018, Hayes and Peterson 2020)

program in 2000, creating cultivars of haskap with improved taste and berry size, and is now home to a diverse collection of haskap cultivars including 35 Russian cultivars, over 70 Japanese types, and wild collections from Canada, in addition to thousands of seedlings planted from controlled crosses among their collection (Bors 2008). Despite the extensive study of haskap through the University of Saskatchewan Fruit Program and production of haskap by the Haskap Canada Association, this plant is largely considered to have few pests in Canada, with reported pests including birds and powdery mildew without mention of defoliating caterpillars (Bors 2008, Haskap Canada Association 2018). Ferris (2017) mentions leafrollers with a vigorous wiggle found in production haskaps in Yukon, Canada, however, no identification or photo is given to determine whether this may be the honeysuckle moth. Honeysuckle moth larvae were also collected from ornamental Tatarian honeysuckles (*Lonicera tatarica* Linnaeus) in Anchorage in 2022.

Alaska does have a native honeysuckle, the twin honeysuckle (*Lonicera involucrata* (Richardson) Banks ex Spreng.), which could potentially serve as host to the honeysuckle moth if the moth were to spread outside Southcentral Alaska. This native honeysuckle occurs in parts of Southeast Alaska but is not naturally occurring in Anchorage nor the Matanuska-Susitna Valley where the honeysuckle moth has been found (Bressette 2017).

Records & Distribution

The early records of the honeysuckle moth indicate this species was introduced to North America from Europe in the early 1900s. The earliest records I can find of this species in North America are reported by William T. M. Forbes under the name *Cerostoma xylostella*[34] Linnaeus (subgenus *Harpipteryx*) which he calls the "honeysuckle leaf-roller"; his reports include adults collected by Frank Haimbach in July 1910 flying near honeysuckle in Massachusetts (Forbes 1923, Johnson 1927) and adults collected in 1924 by Forbes himself in Ithaca, New York, from a trap light (Forbes 1924). Forbes (1924) refers to this species as a minor pest from Europe. Charles W. Johnson (1927) was interested in the dispersal of this newly introduced species; he reports this species under the name *Harpipteryx xylostella* L. as identified by lepidopterist August Busck and finds additional records of this species from 1919 in both Rhode Island and New Hampshire. Busck describes the honeysuckle moth as "a European species introduced within recent years" (Johnson 1927). Busck had previously published descriptions and keys to the North American *Cerostoma*-group yponomeutids in 1903, in which *H. xylostella* is mentioned as a European member of the genus but was not known to occur in North America at that time (Busck 1903). Additional names synonymous with this species include *Alucita dentella* Fabricius, *Tinea harpella* Dennis & Schiffermuller, and *Cerostoma affinitella* Staudinger.

There are two records of the honeysuckle moth in the University of Alaska Museum of the North Arctos database prior to 2022: an adult observed 10 July 1989 (UAMObs:Ento:97862) and an observation of unspecified life stage from 20 July 1992 (UAMObs:Ento:35257), both from Anchorage and both listing "*Lonicera* sp." as the habitat.

In 2022, caterpillars of the honeysuckle moth were reported late May through mid-June in Southcentral Alaska. The majority of reports indicated haskap (*L. caerulea*) as host; less commonly host was indicated to be ornamental Tatarian honeysuckle (*L. tatarica*). Joey Slowik (University of Alaska Fairbanks, Cooperative Extension Service, Integrated Pest Management Technician) and I verified six reports of the honeysuckle moth in Anchorage and three reports in the Matanuska-Susitna Valley (all near Palmer, AK) (Figure 4).

[34] A note of caution when searching the earlier literature, there is a bit of taxonomic confusion involving the name *Cerostoma xylostella* (L.) as this name is also considered a synonym of the diamondback moth, *Plutella xylostella* (L.) (Alford 1971, Lim 1982). The host plants help to clarify which species a reference pertains to, as *P. xylostella* larvae feed on plants in the family Brassicaceae whereas Forbes' "honeysuckle leaf-roller" caterpillars were collected from *Lonicera* (Family Caprifoliaceae) (Forbes 1923). Forbes published several articles using the name *Cerostoma xylostella* to refer to the honeysuckle moth, however know that he uses the name *Plutella maculipennis* Curtis when referring to the diamondback moth (Forbes 1923). An interesting tidbit about the name is that in 1858, Van Voorst (1858) published a species list of British moths in which he includes name derivations for each species. He attributes the name *Cerostoma xylostella* to refer to the honeysuckle moth, interpreting "*xylostella*" to mean "feeds on honeysuckle" derived from the plant *Lonicera xylosteum*. It is thought that Linnaeus himself got the two species confused at some point in their descriptions (Harcourt 1963) but due to naming priority "*xylostella*" is currently considered to be the valid species name for the diamondback moth (Lim 1982).

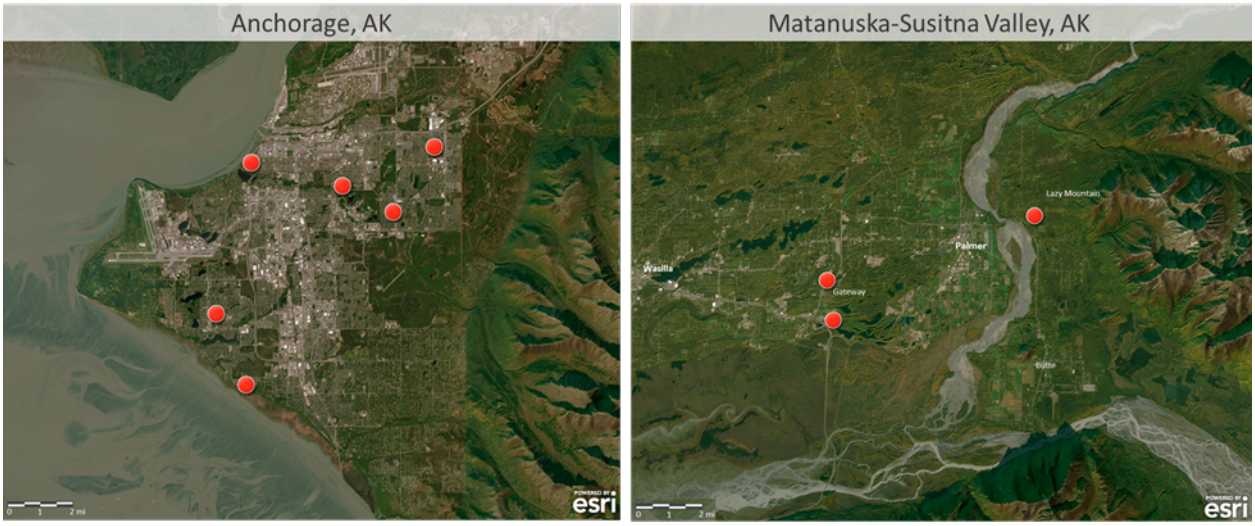

Figure 4: Locations of verified honeysuckle moth reports received in 2022 from Anchorage, AK (left) and Matanuska-Susitna Valley, AK (right). Maps generated using ArcGIS Online, basemap 'Imagery' by Earthstar Geographics.

Rearing Methods

I use the general methods outlined by Eiseman (2016) for rearing caterpillars. For this species I used 5 dram plastic vials with 1 sheet of toilet paper crumpled and pressed into the bottom of the vial and moistened with a couple drops of water (Figure 5). Each larva is placed singly in a prepared vial with a sprig of host material. Once the host material is exhausted, or once frass begins to accumulate, I move the larva to fresh host material in a clean, newly prepared vial to prevent mold. Once the larva pupates I move the pupa to clean vial with moistened toilet paper only, no host material. (To prevent data loss through the vial changing process I find it easiest to put the collection data on the lid, keeping the same lid with the specimen through each vial change.) Vials are kept at ambient room temperature, about 70 °F. I wild-collected several late-instar caterpillars on 8 June 2022 and reared them in this manner, the adults of which emerged 20–28 June 2022.

Figure 5: Container setup used for rearing the honeysuckle moth. The vial on the left contains a pupa, the middle and right vials each contain a single larva with a sprig of host material (*Lonicera tatarica*). Photographed 9 June 2022 by A. Wenninger.

Reporting

Based on the timing we have seen in 2022, host plants should be monitored from late May through mid-June for feeding activity by caterpillars of the honeysuckle moth. Observations of the honeysuckle moth can be submitted via the UAF CES monitoring portal at https://alaskapestreporter.org.

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