

SCIENTIFIC NOTE

# First detection of the woolly alder sawfly, *Eriocampa ovata* (Hymenoptera: Tenthredinidae), in Manitoba, Canada, on novel host *Alnus hirsuta* ‘Harbin’ (Betulaceae)

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## Abstract

*Eriocampa ovata* (Linnaeus) (Hymenoptera: Tenthredinidae), commonly known as woolly alder sawfly, is an introduced species to North America. Its larvae have six or more prolegs, a brown spot on the head's vertex, and are woolly in appearance due to a wax secretion from epidermal glands. The author was contacted about six recently planted alder trees in Winnipeg and Victoria Beach, Manitoba, Canada. The trees were determined to be *Alnus hirsuta* ‘Harbin’ (Betulaceae) (Prairie Horizon<sup>TM</sup> Manchurian alder), a tree species that has recently gained popularity in Manitoban urban forestry. The defoliation was determined to be caused by larvae of *E. ovata*. This is the first published record of *E. ovata* in Manitoba and the first published record of *E. ovata* on *A. hirsuta*. This detection should inform pest inventories for *E. ovata* in Manitoba and provide the basis for a critical examination of biosecurity measures for *A. hirsuta*.

Native to Europe, *Eriocampa ovata* (Linnaeus, 1760) (Hymenoptera: Tenthredinidae) is a specialist phytophagous insect with a restricted distribution across temperate regions of its native range in Europe and its introduced range of North America (Smith 1979). In 1979, Smith reported *E. ovata* in Ontario, east of Sault Ste. Marie, to Québec, and in the Lower Mainland of British Columbia, Canada. The iNaturalist database includes recorded sightings across British Columbia and throughout eastern Canada but not in Manitoba or Saskatchewan, Canada (iNaturalist 2022). There is no published documentation of *E. ovata* in Manitoba nor in the Canadian Forest Service pest survey records. This short communication details a recent identification of *E. ovata* on six *Alnus hirsuta* ‘Harbin’ (Betulaceae) (Prairie Horizon<sup>TM</sup> Manchurian alder) in Manitoba.

In June 2023, three property owners in Winnipeg, Manitoba (49.895° N, 97.138° W; elevation: 239 m) and one in Victoria Beach, Manitoba (50.709° N, 96.540° W; elevation: 237 m) contacted the author concerning the defoliation of their *A. hirsuta* ‘Harbin’. The six alders were all young and less than 2 m tall. All six trees had originated from the same nursery source and had been planted by the property owners less than three weeks before the author's observation.

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**Figure 1.** Woolly alder sawfly larvae inactive on the undersurface of an *Alnus hirsuta* leaf. Image by author.

In concealing itself on the underside of the leaf and appearing like bird excrement (Fig. 1), the *E. ovata* larvae – the cause of the defoliation – had gone undetected by all four homeowners.

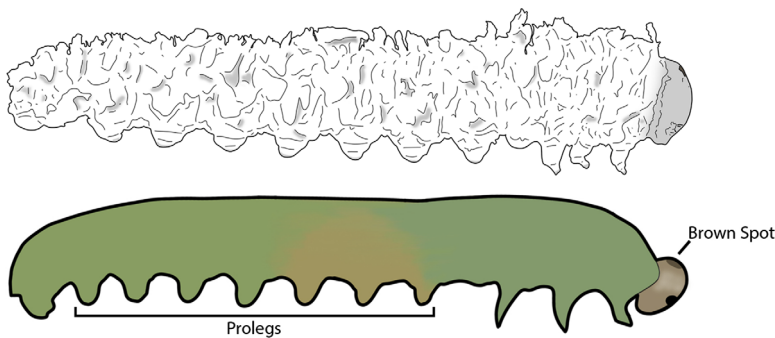
The *E. ovata* larvae's appearance as bird excrement is owing to its production of a waxy secretion from epidermal glands, producing a wool-like outer coating around the larvae (Percy *et al.* 1983) that protects them from predators (Eisner 1994). It is from this secretion that the insect's primary common name, woolly alder sawfly, is derived. Other defining characteristics of the larvae include seven prolegs and a dark brown spot on the head at the vertex that is not found on *E. juglandis*, the other North American *Eriocampa* species (Smith 1979). The larvae first feed on the upper surface of the leaf, then on the lower surface until fully matured (Bouchard 1960). At this point, the larvae descend to the ground to overwinter and pupate in cocoons in the leaf litter (Bouchard 1960). The emergent adult female *E. ovata* are approximately 6.8–7.2 mm in length and primarily black in colour, although the scutellum is red (Smith 1979). The red scutellum is the source of the insect's alternative common name, the red-backed sawfly. Adult females reproduce through parthenogenesis, ovipositing the eggs into the midrib of the leaf (Bouchard 1960). Male specimens have not been identified in North American populations (Smith 1979) and are considered rare in Europe (Benson 1952).

Because the Manitoban *E. ovata* were discovered as larvae, their identification was based on the wool-like coating, the dark brown spot, and the seven prolegs, per the identifying characteristics, taxonomic concepts, and taxonomic classification from Smith (1979). All the sampled sawfly larvae ( $n = 59$ ) had seven prolegs and brown spots on the vertex of their heads (Figs. 2, 3). Although the prolegs were identified with the wool still on the larvae, the brown spot became visible only after the larvae were submerged in a 70% ethanol bath. For those storing *E. ovata* in a local collection, it should be noted that it was necessary to replace the ethanol three times before the wool no longer clouded the liquid solution. Following confirmation by entomologist H. Goulet, with the National Identification Service at the Canadian National Collection of Insects, Arachnids and Nematodes (Ottawa, Ontario, Canada), voucher specimens were deposited at the University of Manitoba (Winnipeg, Manitoba, Canada; WRME0520556).

In addition to this newfound occurrence of *E. ovata* in Manitoba, the detection of *E. ovata* on *A. hirsuta* (Spach) Ruprecht (Manchurian alder) presents a new host species identification of *E. ovata*. Existing literature on *E. ovata* host species include *A. glutinosa* (Linnaeus) Gaertner (common alder; black alder), *A. incana* (Linnaeus) Moench (grey alder; speckled alder), and *A. rubra* Bongard (red alder; Benson 1952; Berland 1947; Markham and Chanway 1998; Smith 1979). In Europe, *E. ovata* has also been recorded on *Ulmus* spp. (elm) and *Corylus* spp. (hazel; Smith 1979). No published cases of *E. ovata* on *A. hirsuta* were found through searches of



**Figure 2.** Woolly alder sawfly with wool removed. Note the seven prolegs on the specimens. Image by author.



**Figure 3.** The woolly alder sawfly larvae, **A**, sketched with waxy wool-like secretions and **B**, cleaned of wax secretion. The identifying characteristics unique to woolly alder sawfly (seven prolegs and brown spot on the vertex of head) are more easily visible after cleaning the wool from the body. Image by author.

Google Scholar, EBSCO Host, ProQuest, PubMed, Scopus, and Web of Science. Additionally, although *A. hirsuta* is sometimes treated as a subspecies of *A. incana*, no record of *E. ovata* on *A. incana* subsp. *hirsuta* was found.

Despite the lack of prior records of *E. ovata* on *A. hirsuta*, *E. ovata* was observed to be a considerable defoliator of the six trees. Using the percent crown missing measure, as per Nowak (2020), two trees had moderate defoliation (26–50% defoliation), two had significant defoliation (51–75%), and two had severe defoliation (76–100%). The average larval population per tree was 56 larvae (standard deviation = 13.56). The most heavily infested tree had 73 larvae, and the least infested tree had 31 larvae. The extent of defoliation and the larval populations are concerning, especially since *A. hirsuta* is being used as a replacement tree for *Fraxinus* spp. (ash) and *Ulmus* spp. (elm) in the urban forests of the Canadian prairies (e.g., City of Winnipeg 2017). The severity of defoliation may be sufficient to cause tree mortality if infestation continues for multiple years (Borden and Dean 1971; Wittwer 2004) or when *E. ovata* predisposes the tree to cankers, such as *Cryptosporella suffusa* (Fries) L.C. Mejia and Castlebury (*Gnomoniaceae*) (Wittwer 2004).

Repeat defoliation could be propagated by the concealed nature of the larvae, making it challenging for homeowners to detect the larvae before defoliation reaches noticeable levels unless larvae are observed transiting along the stem (Fig. 4). Consequently, homeowner-initiated action or reporting of the species may be too delayed to effectively manage the larvae on the basis of individual trees. Local arborists and foresters should be made aware of the species' presence within Manitoba and on the host species *A. hirsuta* to assist in the sawfly's detection on urban tree populations. Concurrently, *E. ovata* should be included in pest inventories conducted by local nurseries and municipalities.



**Figure 4.** Woolly alder sawfly larvae transiting along the stem of an *Alnus hirsuta*. Image by author.

Pointing to a broader concern, the detection of nonnative species – in this case, *E. ovata* – on trees sourced from the same location indicate a biosecurity issue that should be addressed. Given the life cycle of *E. ovata*, the delay from the female ovipositing the eggs into the leaf, egg maturation and hatching, and larval maturation (Borden and Dean 1971; Mackay and Wellington 1977), it is most likely that the trees had eggs in the foliage before their sale to the four customers. If this is indeed the case, it would further justify the involvement of community organisations in biosecurity prevention by specifying to their stock providers that trees meet the Canadian Nursery Stock Standard (Canadian Nursery Landscape Association 2017) and biosecurity controls (Brasier 2008; Dunn *et al.* 2020; Marzano *et al.* 2021).

Genome sequencing of the *E. ovata* samples will be conducted to determine if they differ from existing genetic database records of *E. ovata* sufficiently to indicate a subspecies.

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**Data availability.** Interested parties can contact the author for access to data.

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