Elm Sawfly

John D. Stein[1]

The elm sawfly (*Cimbex americana* Leach) sporadically causes serious defoliation of elms and willows, particularly in urban areas. Where adults are numerous, they can kill treetops by girdling small twigs.

This native sawfly is found from Newfoundland to Florida, westward to Texas, and northward to British Columbia, the Yukon and Alaska (fig. 1).[2] Outbreaks have been recorded from forested areas in several Eastern States, as well as Colorado, Ontario, and Quebec. Heavy defoliation in urban areas or windbreaks has been recorded along the East Coast north to Quebec and Ontario, west into Saskatchewan, and south through the Dakotas into Nebraska and Kansas.

Hosts

Species of elm and willow are the principal hosts of the elm sawfly. However, insect survey records in the United States and Canada indicate that the larvae will also feed on alder, apple, basswood, birch, boxelder, ironwood, linden, maple, plum, and poplar.

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[2] The author is indebted to Dr. R. M. Prentice, Program Coordinator, Forest Insect and Disease Survey, Canadian Forestry Service, for data concerning elm sawfly distribution in Canada.

Damage

Both the adults and the larvae injure trees. The adults cut transverse gashes in the bark of small limbs and branches with powerful mandibles to feed on the sap.

Elm sawfly larvae may extensively defoliate elm and willow. While feeding, larvae expel large frass pellets (droppings) on the ground. An accumulation of frass pellets under the crown of a tree is an indicator of sawfly larvae.

The elm sawfly characteristically maintains high populations for several successive years before its numbers begin to decline. With repeated defoliation the trees become more susceptible to stress from other factors. This is especially true for trees in the Great Plains.

Several years of defoliation may kill the entire tree and ruin the esthetic qualities of landscape and ornamental plantings. In specialty plantings such as windbreaks, dead trees leave gaps within the row. Wind funnels through these gaps, and the increased velocity desiccates adjacent crops or causes soil erosion.

Description

Elm sawfly adults are 1 inch long with a 1¾-inch wing span (fig. 2). The adults have transparent, smoke-gray wings. Both the male and female have a black head with prominent knobbed antennae and a black thorax.

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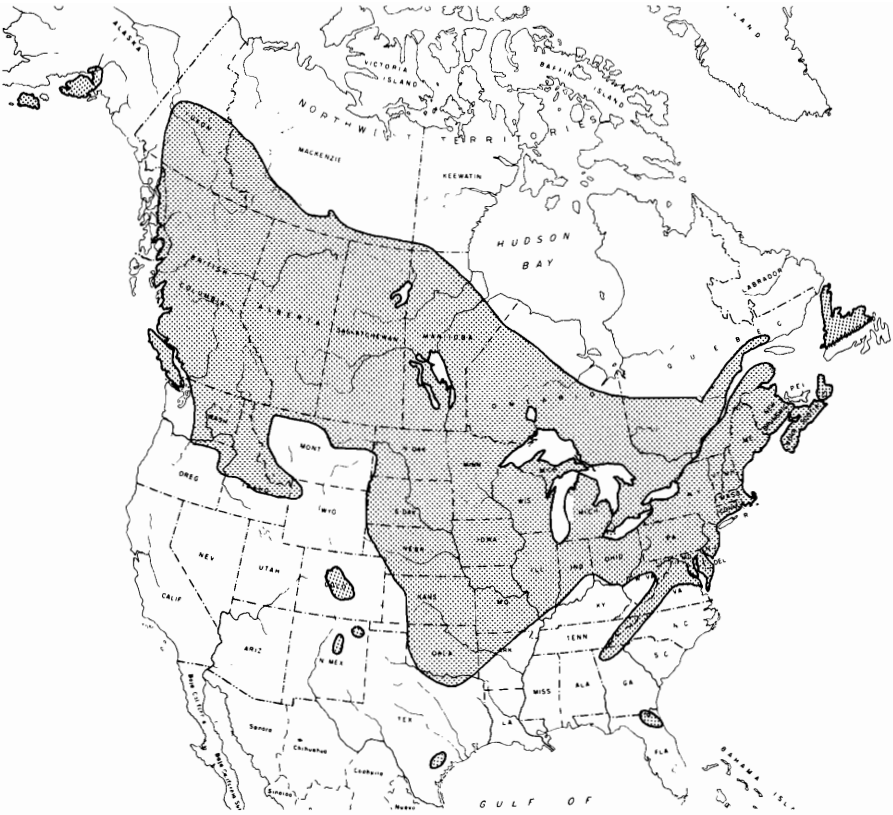

Figure 1.—Distribution of the elm sawfly in North America.

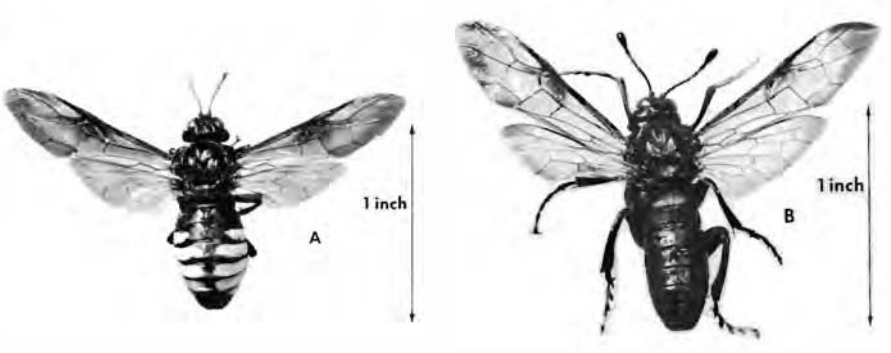

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Figure 2.—Adult elm sawfly: *A*, Female with typical lateral markings on abdomen; *B*, Male with solid-colored abdomen.

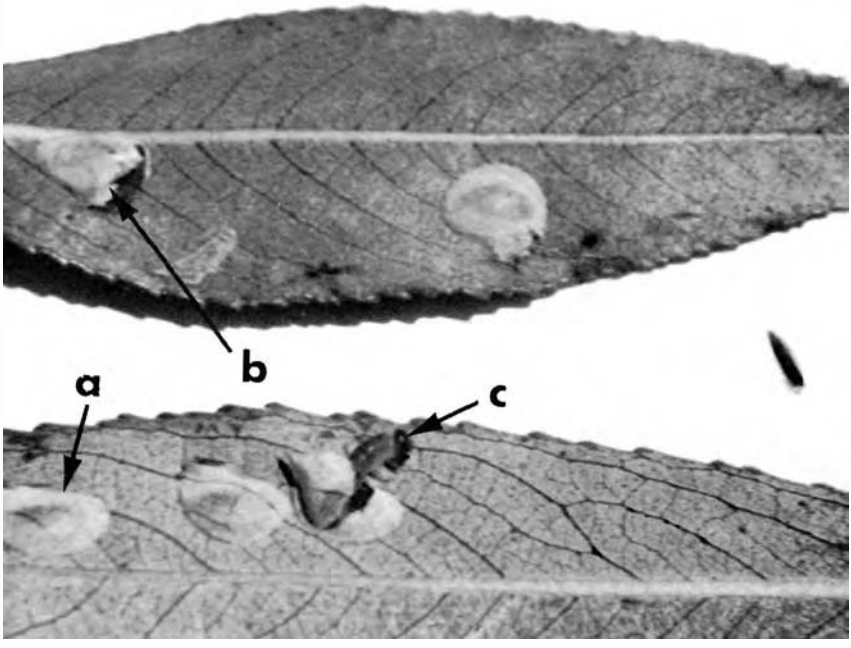

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Figure 3.—Egg pouches on underside of willow leaf: *a*, Unhatched egg; *b*, Hatched egg, *c*, Larva emerging from egg.

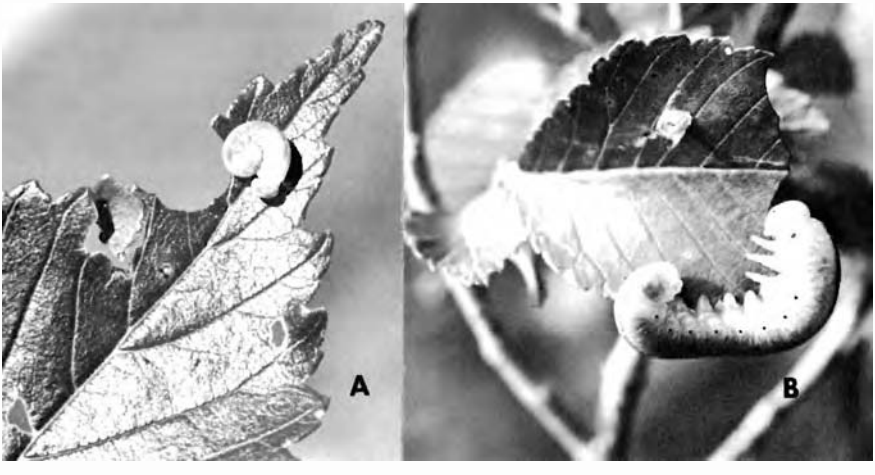

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Figure 4.—Elm sawfly larvae: *A*, First instar larva in the coiled resting position after feeding on the leaf; *B*, Third instar larva feeding on Siberian elm.

Their legs vary in color from shades of orange to black. The abdomen of males varies in color from reddish brown to black, while the female's abdomen is black with lateral yellow spots on most tergites.

The average egg is 1/8 inch long, 1/16 inch wide, and tapered toward each end. Eggs are a translucent green when first deposited in the leaf, but turn white with age. Eggs are found in pouchlike slits on the underside of leaves (fig. 3).

The head and body of young sawfly larvae are slate gray on top and light gray on the bottom half. As the larvae mature, their skin becomes wartlike or pebbly in texture and yellowish green in color with a black dorsal stripe down the back. At the end of approximately 10 weeks, the larvae are fully grown and measure about 2-¼ inches in length (fig. 4).

The large, capsule-shaped cocoons average 1-¼ inch in length and ½ inch in width (fig. 5). The tough, papery cocoons are constructed from finely spun silk. Fresh cocoons are light gold in color, but turn dark brown with age.

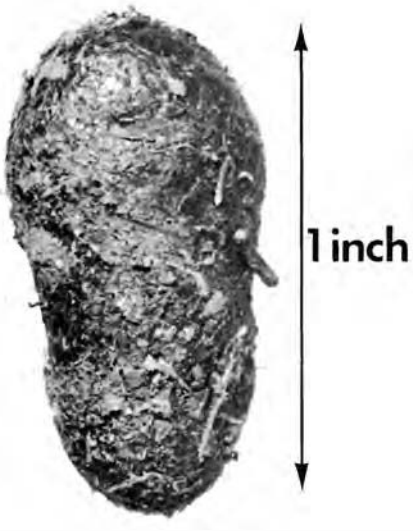

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Figure 5.—Elm sawfly cocoon

Life History

The elm sawfly has one generation each year (fig. 6). Adults first appear in early May throughout the southern portion of their range, late May to June in the northern United States, and mid-June in northern Canada and Alaska. Emergence continues for approximately 30 days. Adults mate on the foliage or on the ground under the tree. After mating, the female deposits her eggs in pocketlike slits cut on the undersurface of leaves (see fig. 3). Each female can lay 50 to 130 eggs. As many as 12 eggs may be deposited on one leaf. Larvae emerge within 7 to 10 days after the eggs were laid (see fig. 3c).

The larvae feed upon leaves from June to October, depending upon location. Young larvae gouge out small areas along the leaf margin (see fig. 4*A*). As the larvae mature, they consume the entire leaf (see fig. 4*B*).

Fully grown larvae begin dropping from the trees in late August to search for pupation sites in the debris around the base of the tree. After the larvae have located suitable pupation sites, they spin their cocoons and overwinter as prepupae (fig. 7). Pupation takes place the following spring, and adults emerge after approximately 2 weeks.

Not all the prepupae pupate and become adults the first spring. A portion remain prepupae through the second winter and emerge as adults the next spring. Thus, individuals from two successive generations emerge during the same season.

Natural Enemies

Several species of parasites and

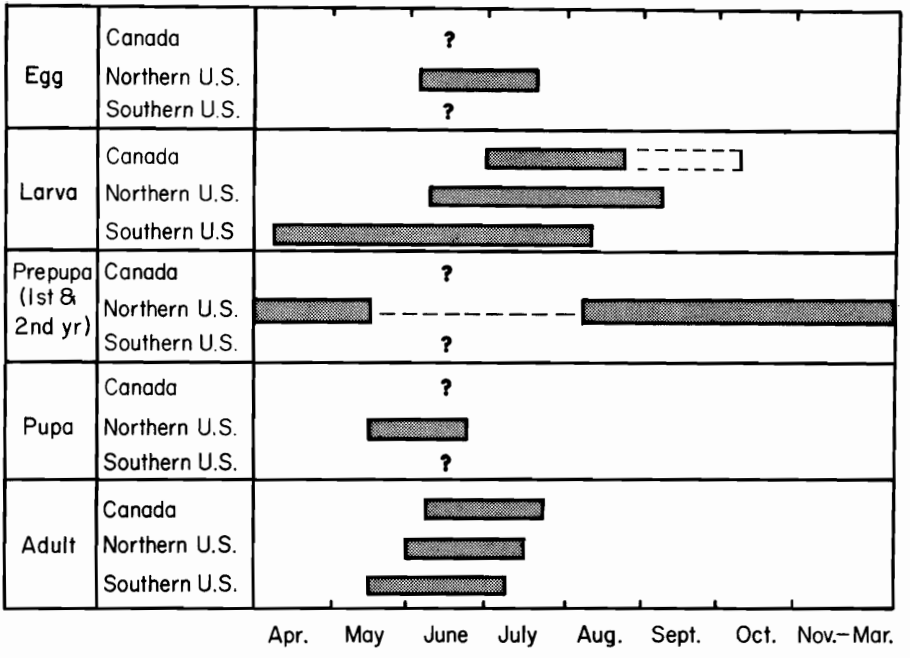

Figure 6.—Life cycle of the elm sawfly in North America.

predators help to regulate elm sawfly numbers. Eggs of the elm sawfly are parasitized by *Trichogramma minutum* Riley. Up to 82 percent mortality of larvae has been attributed to a large ichneumon parasite, *Opheltes glaucopterus flavipennis* (Provancher) in some instances.

Several other species of wasps and flies have been reared as parasites: *Agrothereutes cimbcivorus* (Cushman), *Campoplex* sp., *Boettcheria cimbicis* (Townsend), *Aplomya epicydes* (Walker), *Diplonevra funebris* (Meigen), *Megaselia minuta* (Aldrich), and *Megaselia setacea* (Aldrich).

Small mammals such as the shorttailed shrew (*Blarina brevicauda*), the masked shrew (*Sorex cinereus*), the white-footed mouse (*Peromyscus leucopus*), and the deer mouse (*Peromyscus maniculatus*) prey on the larvae and cocoons.

The incidence of disease has been slight. Only the pathogens *Bacillus cereus* and *Fusarium* sp. have been identified from larvae.

Direct Control

When only a few larvae are found on trees, they can be dislodged by vigorous shaking. When larvae are abundant, other methods of control may be required. However, no chemicals are currently registered for control of this insect. Persons encountering high populations of larvae should consult their county extension agent, state agricultural experiment station, or state or Federal forest office to obtain current information concerning direct control.

References

Orcutt, L. H., and J. M. Aldrich.
1892. Parasites of the large willow sawfly. S. D. Agric. Coll. and Exp. Stn. Bull. 30, p. 5-8.

Raizenne, Henri.
1957. Forest sawflies of southern

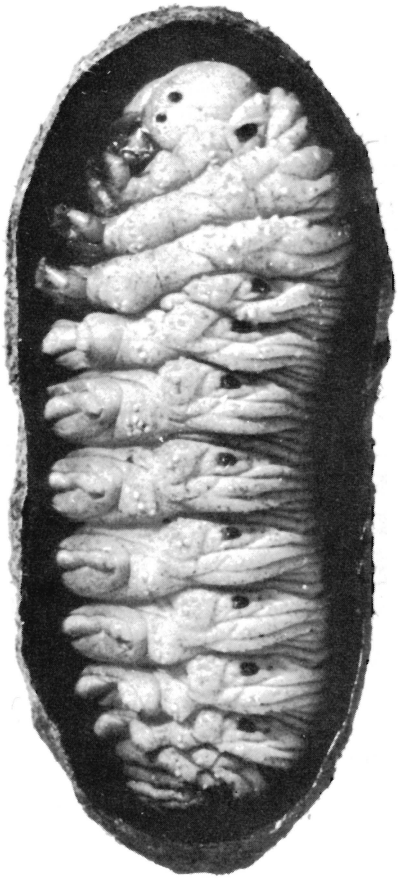

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Figure 7.—Elm sawfly prepupa.

Ontario and their parasites.
Can. Dep. Agric. Publ. 1009, 45 p.

Severin, Henry H. P., and Harry C. M. Severin.
1908. Habits of the American sawfly, *Cimbex americana* Leach, with observations on its egg parasite, *Trichogramma pretiosa* Riley Wis. Acad. Sci., Arts and Lett., Trans., p. 61-76.

Stein, John D.
1966. Bionomics of the American elm sawfly *Cimbex americana* Leach. Master's Thesis, N. D. State Univ. Fargo, 66 p.

Wong, H. R.
1954. Common sawflies feeding on white birch in the forested areas of Manitoba and Saskatchewan. Can. Entomol. 86: 154-157.

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