Walkingstick

Louis F. Wilson [1]

The walkingstick, *Diapheromera femorata* (Say), is a defoliator of deciduous trees in North America. Because of its shape, this insect is also commonly called the stickbug, specter, stick insect, prairie alligator, devil's horse, witch's horse, devil's darning needle, thick-thighed walkingstick, or northern walkingstick, depending on locality.

The walkingstick occurs predominantly in the eastern half of the United States and adjacent Canada. It has been recorded in nearly all States east of the Great Plains and in parts of western Texas, New Mexico, and Arizona, as well as Manitoba and Ontario in Canada. Severe outbreaks rarely occur below a line drawn from southern Nebraska to Delaware, except in the Ouachita Mountains in Arkansas.

Hosts and Injury

The young nymphs feed on low-growing plants, such as beaked hazel, rose, juneberry, sweetfern, blueberry, and strawberry. The preferred hosts of the older nymphs and adults are various species of black oak, basswood, and wild cherry (fig. 1). Less preferred hosts, such as quaking aspen, paper birch, hickory, locust, apple, and chestnut, are fed upon if they are in stands with the preferred hosts. Occasional feeding has been recorded on ashes, bigtooth aspen, wild grape, and some dogwoods.

Most species of maple and boxelder are avoided. Conifers are rarely attacked, but there is one record of walkingstick defoliation of pitch pine. At times the selective feeding habits of the older nymphs and adults are beneficial: they may result in releasing white oaks or conifers that are more desirable than black oak.

The entire leaf blade, except the basal parts of the stout veins, is consumed. During heavy outbreaks many large stands are completely denuded. Trees may be defoliated twice in the same season in some outbreaks. Three or

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Figure 1.—Adult female walkingstick on partially consumed leaf (about natural size).

four heavy infestations are usually sufficient to kill some branches.

Because the walkingstick does not fly, infestations are often localized and spread only a few hundred yards during the season. A stream or road separating parts of a stand often retards the spread of the insect. One side of such barriers can have completely denuded trees while the other might have little or no injury.

Description

The seedlike, oval egg (fig. 2) is about 2.2 mm. long, 1.5 mm. wide, and 1.0 mm. deep. It is very hard and shiny black or brown with a broad white or olive-colored band on one edge. One end has an indistinct brown cap by which the nymph emerges.

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Figure 2.—Walkingstick egg (about 10 times natural size).

The newly hatched nymph looks like a miniature reproduction of the adult. It is a delicate pale green color and measures about 5/16 inch long.

The adult is 2½ to 3½ inches long, the female (fig. 1) usually being larger and thicker than the male (fig. 3). Both sexes are slender and wingless, with long, thin legs and antennae. Some adults are all brown or green, while others are mottled or multicolored with dark or light shades of grays, greens, reds, and browns. Their shape and coloration, plus their habit of remaining motionless for long periods, make them closely resemble the twigs of their hosts.

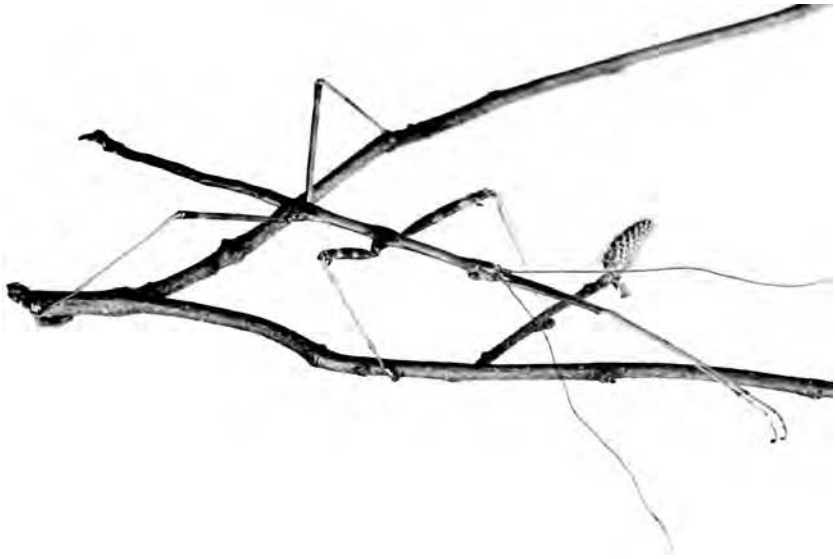

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Figure 3.—Adult male walkingstick on twig. Notice the outstretched position of the forelegs and antennae, which enhances its twiglike appearance (about natural size).

Life History and Habits

In the northern part of the walkingstick's range, the nymphs hatch from eggs in May or early June. They are limp and soft at first but soon harden. They move onto and feed upon the preferred shrubs on the forest floor until about midsummer. Then most of them feed in the trees. When alarmed, young nymphs either drop to the ground or make jerky, back-and-forth movements. Older ones react by freezing in position, remaining still for long periods. They characteristically stand motionless with their front legs outstretched alongside the antennae, so that they look even more like twigs (fig. 1 and 3).

Adulthood is reached in late July or early August, and mating occurs about a week later. Egg laying continues until October or the arrival of cold weather. Each female may lay up to 150 eggs at an average rate of 3 per day. The eggs are dropped from wherever the insect happens to be on the tree. When numerous insects are present, the eggs falling through the foliage onto the ground sound like the patter of rain. Over 100 eggs per square foot of ground have been recorded in severe infestations in some localities.

The eggs overwinter in the leaf litter, and most remain unhatched throughout the following summer and winter. Nymphs emerge the next spring. As the cycle in the north is 2 years long, even-year and odd-year broods have developed. In some localities both broods

are nearly equal in numbers, but in others they are unequal. For instance, in Minnesota even years are "off years" while in Wisconsin and Michigan odd years are "off years."

In the southern part of the range, most of the eggs hatch the year after they are laid. Emergence may occur as early as the first part of June, depending upon locality. Nymphs that emerge late in the season succumb to cold weather before reaching maturity or before laying their entire egg supply.

Natural Control

Much mortality occurs during the hatching period if the local weather conditions are dry. The nymphs need moisture to release themselves effectively from the eggshells.

The parasitic wasp *Mesitiopterus kahlii* Ashmead has been recovered from the eggs of the walkingstick, but never in sufficient numbers to be considered an important means of control. Two parasitic flies, *Biomya genalis* Coq. and *Phasmophaga antennalis* Towns., destroy the nymphs. *Phasmophaga* is unusual in that it lays its eggs on the foliage instead of on the insect host. The walkingstick becomes parasitized by swallowing the eggs while feeding.

Crows, robins, and other birds have been seen to concentrate in heavily infested areas to feed upon the insects and probably have effectively controlled it, at least in localized areas.

Chemical Control

As this publication goes to press, there are no chemical insecticides registered for use in controlling the walkingstick. Ask your State agricultural experiment station or your county agricultural agent or other local source of information whether any recommendations have been developed for chemical control of this insect.

References

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