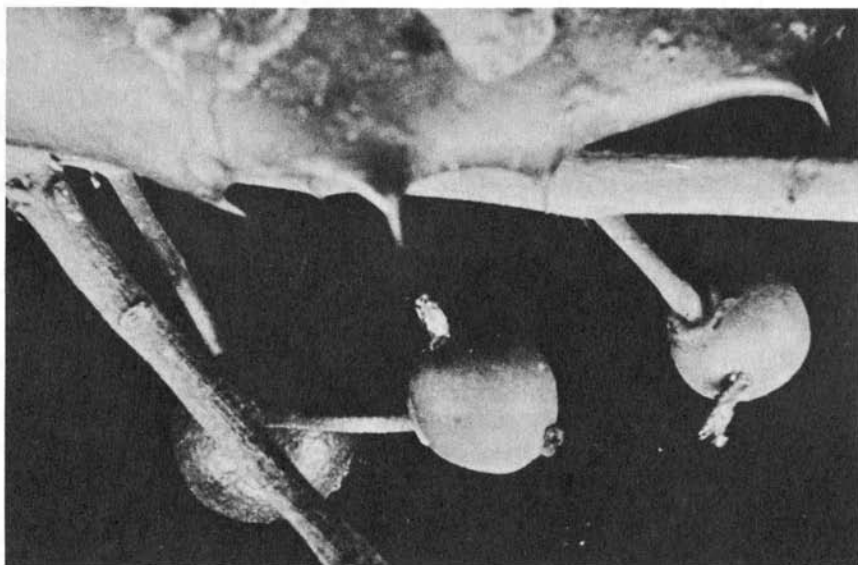


The Holly Berry Midge

JOHN C. SCHREAD



Holly berries showing pupal cases of the midge.

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The holly midge, *Asphondylia ilicicola* Foote, attacks holly berries but does not injure the trees. Homeowners often plant holly trees essentially for the pleasing appearance of green leaves interspersed with red fruit. While green foliage is usually prevalent throughout the year, the red berries are only expected to persist from late summer until early spring. When the green fruit fails to turn red because of the holly berry maggot, the esthetic value of the plant is lost, and thus it sometimes becomes necessary to control the midge with insecticides.

The holly berry midge was first observed in Connecticut in late May 1957, on a large estate in Middletown. Innumerable green (about 98%) holly berries housing larvae had persisted through the winter of 1956 and 1957 on 15- to 22-foot American holly trees (*Ilex opaca* Aiton). Since then the midge has spread to holly trees growing in several places in the central and southern portions of the state. Apparently *A. ilicicola* was unknowingly introduced into the estate in Middletown in holly berries adhering to small trees bought at a nursery near Trenton, New Jersey, in 1951.

This midge has been reported by the Holly Society of America to be on the increase in West Virginia, Virginia, Maryland, Delaware, District of Columbia, and southern New Jersey (Cannon 1971). Until now nothing has been published concerning the presence of the holly berry maggot in Connecticut. This publication reports on the biology of the holly berry midge in Connecticut and methods of suppressing it by chemical means. Birds and a single species of Hymenoptera larval parasite are indicated as natural control agents (Highland 1964, Cannon 1971).

Biology

There is one generation per year, with the insects overwintering in the larval or maggot stage. The adult is small, $2\frac{3}{32}$ inches long, weak, and a poor flier. Initial emergence takes place during the latter part of May and early part of June. In 1958, the first adult appeared on June 4, and on May 25 in 1960. Eggs are deposited in a small fruit while the petals are still on the flowers (Highland 1964). Feeding is continued to the inside of the seeds (4 seeds per holly berry). Maggots range in number per berry from 1 to 3, averaging 1.5. They are light lemon-yellow in color and measure from $\frac{3}{4}$ to $\frac{1}{5}$ mm in length by late autumn.

By this time dissection of a hundred green holly berries indicated 78 berries contained 1, 19 contained 2, and 3 contained 3 maggots each. Rarely did a single maggot devour more than one seed. The maggot remains in the berry over the winter, and in early May of the following year enters the prepupal condition. Chestnut colored pupae were first observed on May 12. On emergence the adult leaves the pupal case protruding from the exit hole in the side of the holly berry (cover picture).

The insect can cause distortion and stunting of holly berries. In addition, seed development may be completely inhibited; however, in trees with very light infestation one or two seeds may mature. In the latter instance a small area of a berry may assume a pale red bloom related to the interior portion of the berry where the seeds have not been destroyed by a maggot.

Mortality of overwintering larvae may be quite high in berries above the snow line. This is shown in data collected during the winter of 1960-61 (Table 1).

Table 1. Mortality of larvae in berries above and below the snowline during the winter of 1960-61

Site berries collected	No. of larvae examined	No. of larvae dead	% larval mortality
Above snowline all winter	100	85	85
Below snowline until after March 16	105	15	14

Chemical Control

Foliar sprays

Foliar sprays were applied on June 1, 1959 using 25E Diazinon®, 20E lindane, 48E ethion, and 25E Thiodan® at the rate of 16 oz of formulation in 100 gallons of water (1 teaspoon per gallon). NNO wetting agent was added to each spray at the rate of about $\frac{1}{8}$ teaspoon in 100 gallons of water. There were 43, 10- to 15-foot holly trees in the test. A 3-gallon wheelbarrow mist blower was used to apply the treatments. The presence of larvae in berries was determined by dissection.

Data were obtained on December 2, 1959 by taking a random sample of 500 berries from treated and untreated trees. With the exception of the lindane-sprayed trees where a few maggot infested berries were found, complete control of the pest was obtained with the remaining insecticides. There were 161 maggot infested berries in a random sample of 500 berries taken from untreated trees.

Soil treatments

On May 15, 1958, Thimet 2% granules were applied evenly on the surface of the soil under holly trees from their base to the periphery of the branches. They were raked in but not watered down. Four trees (averaging 2 inches in diameter, measured 24 inches from the ground)

were used for each treatment. The granules were applied at the rate of 8.5, 6, and 2.5 lbs. of formulation per tree. On December 2, random examinations of 500 holly berries per rate of treatment indicated 100% red berries on the trees treated with 8.5 lbs., 91% on those treated with 6 lbs., and 67.8% on the ones treated with 2.5 lbs. Thimet. Approximately $\frac{2}{3}$ or 63.6% of the berries on untreated trees were red or uninfested with larvae.

Registration

Thiodan, lindane, and Diazinon are registered for use on shade trees, shrubs and ornamentals.

Thimet and ethion are not registered for use on holly.

References

- Cannon, Norman H. 1971. Holly berry midge can be controlled. *American Nurseryman*, 133(8): 13.
- Highland, Henry A. 1964. Life history of *Asphondylia ilicicola* (Diptera: Cecidomyiidae) a pest of American holly. *J. Econ. Entomol.* 57(1): 81-83.

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