Gypsy moth: possible threat to California trees

Carlton S. Koehler ▪ W. Douglas Hamilton

An infestation of the gypsy moth, *Lymantria dispar* (L.), was discovered in San Jose in October 1976, only a year after positive identification of Dutch elm disease in California. In all respects, the gypsy moth is an even greater threat than Dutch elm disease to California's landscape trees.

San Jose infestation

Routine insect surveys by the California Department of Food and Agriculture, in collaboration with the Santa Clara County Department of Agriculture, disclosed a single male gypsy moth in 1975. Insect trapping operations during 1976 were therefore intensified in the general area of the 1975 catch. As a result of additional male moth captures in the summer of 1976 and door-to-door surveys within the suspect area, over 400 egg masses and the remains of other life stages were found in seven adjacent residential properties. This discovery proved beyond doubt that the gypsy moth was established and was reproducing in Santa Clara County.

Gypsy moth in Northeast

This insect, a native of temperate Europe, Asia, and North Africa, was deliberately introduced into Massachusetts a century ago by an individual seeking a silk moth that would survive in the Northeast. Part of the colony escaped from holding cages, which eventually led to the defoliation of millions of acres of forested and residential properties in the northeastern states. In addition to scattered, isolated infestations, such as that in California, the insect now ranges over all or parts of 11 states from Maine to Delaware, westward to Pennsylvania and New York, and southern Ontario and Quebec provinces in Canada—an area of over 200,000 square miles.

Damage

The gypsy moth causes damage only in its larval stage, defoliating host trees during the spring and early summer. Under extreme conditions, defoliation leads to death of trees and to changes in stand composition of forests.

This insect has a broad host range; its favored eastern foliages are apple, alder, aspen, beech, certain birches, hawthorn, oak, and willow. Older caterpillars continue to develop successfully on some cedars, pines, and spruce. Hosts not favored include ash, fir, black walnut, red cedar, dogwood, holly, locust, and sycamore.

No one can be certain which California host plants would be preferred over others, if the gypsy moth became a general problem here. In the East, oaks are fed upon and defoliated more severely than any other species, so our extensive forests and plantings of both deciduous and live oaks may be prime targets of this insect. At the San Jose infestation site, evidence was found that larvae had been feeding on apricot, apple, and plum.

Prospects for management

More money has been invested in gypsy moth control over the past century than on any other forest or shade-tree insect in the United States. Efforts made years ago to eradicate this pest from North America have all failed. Prospects are brighter for the program now anticipated to eradicate the California infestation, which is limited and is far from the infested northeastern states. Should this program fail, it will be necessary to develop a management strategy to minimize the economic and environmental impacts of the insect. Such a strategy would probably include the following:

Biological control efforts, primarily involving imported natural enemies, have been in progress for many years. Indeed, by 1934 over 40 species of parasites and predators had been introduced into the eastern U.S. infestation. Those that have become established are now an important

Agricultural Experiment Station
University of California
Berkeley, California 94720

Director

PUBLICATION
Penalty for Private Use $300

POSTAGE PAID
U.S. DEPARTMENT OF
AGRICULTURE
AGR 101

THIRD CLASS
BULK RATE

Gypsy moth. . .

element in gypsy moth mortality.

An insect growth regulator—Dimilin —has shown great promise in large-scale tests in the East. Unlike conventional insecticides, Dimilin prevents the caterpillar exoskeleton from developing normally when the immature insect molts from one larval instar to the next, and the insect dies as a result.

Trials are continuing on the use of a synthesized sex attractant, or pheromone, identical to that produced by the female moth, to prevent the two sexes from assembling and mating successfully. Beyond its potential as a direct management tool, this pheromone—known as disparlure—will continue to be deployed in survey traps to discover new infestations of the gypsy moth and to monitor spread from existing infestations.

Finally, insecticides chosen for their selective properties against the target gypsy moth larvae will probably form an important part of the strategy package. Of particular promise is a nucleopolyhedrosis virus similar to one just registered for use against the Douglas-fir tussock moth. An application for full registration of the gypsy moth virus was submitted to the Environmental Protection Agency in November 1976.

Carlton S. Koehler is Urban Pest Management Specialist, University of California, Berkeley, and W. Douglas Hamilton is Horticulture Advisor, Alameda, Santa Clara, and Contra Costa counties. *The use of photos provided by Cornell University is gratefully acknowledged.*

Larva of the gypsy moth.

Adult female (left) and male (right) gypsy moth.

Eastern hardwood forest partially defoliated by gypsy moth larvae.