

The Great Lakes Entomologist

Volume 17
Number 2 - Summer 1984 *Number 2 - Summer*
1984

Article 9

June 1984

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Recommended Citation

Kniest, F. M. and Hoffman, J. R. 1984. "Brown-Tail Moth, *Euproctis Chrysorrhoea*, an Indigenous Pest of Parks and Public in the Benelux Countries (Lepidoptera: Lymantriidae)," *The Great Lakes Entomologist*, vol 17 (2)

Available at: <https://scholar.valpo.edu/tgle/vol17/iss2/9>

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**BROWN-TAIL MOTH, *EUPROCTIS CHRYSORRHOEA*, AN
INDIGENOUS PEST OF PARKS AND PUBLIC IN
THE BENELUX COUNTRIES (LEPIDOPTERA: LYMANTRIIDAE)**

F. M. Kniest¹ and J. R. Hoffman²

ABSTRACT

Euproctis chrysorrhoea is a pest of park and shade trees and of the public in the Benelux countries as well as in the northeastern United States and Canada. In the Benelux countries the brown-tail moth is present every year in the dune regions, where it mainly feeds on *Hippophae rhamnoides*. Hairs from the larvae are irritating to the human skin producing a papular urticaria. An outbreak of the caterpillars produced widespread discomfort at a beach in the Netherlands in 1982 following defoliation of food plants and migration of the larvae seeking food, with resulting human contact, as well as wind dispersal of the hairs.

The brown-tail moth, *Euproctis chrysorrhoea* (L.) (Lepidoptera: Lymantriidae), is a defoliator of park and shade trees, and also a pest of the public because of the irritating properties of its hairs. The species is a pest in great areas of Europe and Asia, and a minor pest in the northeastern United States and Canada where it was accidentally introduced about 1897. It exists in scattered coastal areas in Massachusetts, New Hampshire, and Maine (Metcalf et al. 1951). Its range formerly also included Connecticut, Vermont, and New York.

Every year the brown-tail moth is present in the dune regions of The Netherlands and in the West-Frisian Islands. The lower reaches of the rivers Rhine, Meuse, and Waal are the natural northern limits of distribution. Approximately once every decade a major infestation occurs which may extend as far north as Utrecht. The observations of *Euproctis* species in the northern provinces come from incidental reports of adults.

In the Benelux countries, brown-tail moths are present from June until September. From 200 to 400 eggs are laid on the under surface of leaves just after mating. Egg masses are wrapped in a protective cover of brown hair dislodged from the anal tuft of the female, and hatch in about 1 month. The caterpillars spend the rest of the season feeding and spinning silken tents called winter nests in which they hibernate.

The caterpillars in a winter nest may number up to 500. In April or May, depending on the weather, the young larvae will come out of their shelter and start feeding again. At this point the larvae will be small, only 6–12 mm, but after a few weeks they may have tripled their length. A few weeks later they will pupate and in about 10 days a new generation of adult moths will appear.

The larvae of the brown-tail moth are polyphagous although in 40% of all infestation reports received in the Benelux countries they fed on *Quercus* spp. (oak), in 25% on *Hippophae rhamnoides* (buckthorn), and in 20% on *Crataegus* spp. (hawthorn). During major outbreaks they will feed on a great variety of plants. These caterpillars can defoliate an enormous number of trees.

There are three ways of controlling this defoliator: by hand, by pesticide, and by biological agents. The presence of winter nests facilitates control of an infestation, as

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cutting out one winter nest in January destroys up to 500 larvae. Effective pesticides which can be used for eradication are carbaryl (Sevin) or diflubenzuron (Dimilin). They should be used in the period from the end of July until the beginning of August, when the caterpillars are still young and sensitive to pesticides. Also a biological agent, *Bacillus thuringiensis*, may be used for controlling the larvae in the spring as well as in the fall. The results vary widely so that we are sometimes forced to also use a pesticide. In most cases an early reporting of the caterpillars or the winter nests will be the first step to a "proper control."

An example of an outbreak was the one in 1982 in Oostvoorne, a small city in the western part of The Netherlands, where we discovered thousands of caterpillars on buckthorn. Because most of the shrubs were eaten bare the larvae were crawling on the sand looking for new food sources. Tourists sunbathing on the beach came in contact with the travelling caterpillars. After a few hours children as well as adults complained of itchy, painful skin.

The disagreeable symptoms caused by this species are called "caterpillar dermatitis," a form of papular urticaria. Symptoms range from mild erythema to epidermal necrosis and varying degrees of pruritis (rash). Also lesions of the eyes involving conjunctivitis, keratitis, and iritis resulting from direct contact with the caterpillars, have been described. Mostly we find red, itchy skin with many small urticaria.

Infection may occur under several conditions: after direct contact with larvae or winter nests, for example by foresters who are removing winter nests or children playing in the shrubs, by wind, or by infected clothing, mainly by tourists sitting or cycling near the beach or under infested trees. The capacity to produce skin lesions is due to the presence of small barbed hairs, the so-called nettle hairs. These setae are very small hollow tubes, 100–150 μm in length, filled with venomous fluid. On contact these nettle hairs enter the skin and inject the venom like a syringe. The venom consists of a mixture of histamine, trypsin, phospholipase, and several other enzymes. In most cases a skin reaction follows. Laboratory experiments pointed out that epicutaneous application of minute amounts of netting hairs produces skin lesions within 48 h in 70% of all cases (de Jong 1977).

During outbreaks about 30% of all people in that area would exhibit papular urticaria. A remarkable fact is that even after several decades these nettle hairs can cause a skin reaction, which was demonstrated by Oudemans (1901) with an 18-year-old preserved caterpillar.

ACKNOWLEDGMENTS

We thank Dr. J. E. M. H. van Bronswijk, Laboratory of Minibiology, Department of Dermatology, State University Utrecht, The Netherlands, for her aid and assistance.

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