Data Sheets on Quarantine Pests

Malacosoma disstria

IDENTITY

Name: *Malacosoma disstria* Hübner
Taxonomic position: Insecta: Lepidoptera: Lasiocampidae
Common names: Forest tent caterpillar (English)
Livrée des forêts (French)
Bayer computer code: MALADI
EPPO A1 list: No. 213

HOSTS

Malacosoma disstria occurs in the south of the USA, where the gums *Liquidambar styraciflua*, *Nyssa aquatica*, *N. sylvatica* and various oak species (*Quercus macrocarpa*, *Q. nigra*, *Q. phellos*) are the principal hosts. In Canada and the north of the USA, *Acer saccharum*, *Betula papyrifera* and *Populus tremuloides* are preferred hosts. Many other deciduous trees may be defoliated by *M. disstria* including, apart from those already mentioned, members of the genera *Abies*, *Alnus*, *Amelanchier*, *Cornus*, *Corylus*, *Crataegus*, *Cydonia*, *Fraxinus*, *Larix*, *Malus*, *Ostrya*, *Picea*, *Pinus*, *Populus*, *Prunus*, *Pseudotsuga*, *Pyrus*, *Rosa*, *Salix*, *Sorbus*, *Tilia*, *Ulmus*.

GEOGRAPHICAL DISTRIBUTION

Common and widespread in the USA and southern Canada.
EPPO region: Absent.
North America: Canada (Alberta, British Columbia, Nova Scotia, Ontario, Quebec), USA (Alabama, California, Colorado, Florida, Georgia, Kentucky, Louisiana, Michigan, Pennsylvania, South Carolina, Texas, Virginia, West Virginia, Wyoming).
EU: Absent.

BIOLOGY

There is one generation per year. The egg clusters are deposited around small branches and are covered with 'spumaline' as a protection against low temperatures and desiccation. Egg clusters may contain up to 350 eggs. The embryonic development is very rapid, but the larvae do not hatch before early spring. The young larvae are gregarious, following each other with the aid of a trail pheromone (Fitzgerald & Webster, 1993) and feed on opening buds. Unlike related species, they do not build a typical tent but spin a nest against the tree trunk, in which they rest after feeding. However, during their daily feeding trips, they produce webs which may cover the trees totally. Full-grown caterpillars change to a solitary way of living. They pupate in cocoons between webbed leaves or in bark crevices, and rarely on other substrates like buildings. The adults appear after about two weeks. A simulation model of the population dynamics of *M. disstria* has been developed by

Rejmanek *et al.* (1987). General accounts of the species are given by Prentice (1962) and Johnson & Lyon (1988).

DETECTION AND IDENTIFICATION

Symptoms

M. disstria is a leaf feeder, but young larvae mainly feed on new growth. The bark of infested trees may be covered with silken webs with many caterpillars underneath. The larvae feed through the entire tree, leaving webs wherever they go. During severe outbreaks the trees may become completely defoliated and totally covered with webs.

Morphology

Eggs

The eggs are deposited in large oval clusters, up to 19 mm, around or along small branches or other parts of plants. The egg clusters are covered with a dark-brown layer of 'spumaline', by which they get a varnished appearance.

Larva

The larvae are bluish to brown with a white keyhole-shaped dorsal spot on each segment, which may consist of a larger anterior and a smaller posterior spot (Dixon & Folk, 1991). The spots are interrupted and flanked by thin orange lines and on each side there are two small lateral yellow lines below the stigmata. The body is covered with a dense pubescence without any distinct pattern. Full-grown larvae are about 4 cm long.

Pupa

The pupae are enclosed in white to yellowish-white cocoons.

Adult

Light-brown moths with a wingspan of 25-37 mm and two distinct dark-brown bands on the forewing.

MEANS OF MOVEMENT AND DISPERSAL

Locally, dispersal takes place by moth flight and wandering larvae. In international trade, the eggs, young larvae or pupae may be carried by host plants, or on bark. Dormant plant material will mainly carry the very distinctive egg clusters.

PEST SIGNIFICANCE

Economic impact

M. disstria is a major defoliator of deciduous trees in North American forests. Severe infestations, covering thousands of square kilometres and lasting for several years, have been recorded. Attacked trees mostly survive complete defoliation, but growth reduction may be considerable. Most outbreaks will last 3 to 4 years. In Minnesota (USA), the total growth reduction in aspen (*Populus tremuloides*) for 3-year outbreaks averages about 58% (Anon., 1985). In the south of the USA, heavy defoliation has resulted in a substantial mortality of bottom-land gums. In sugar maple orchards (*Acer saccharum*), defoliation has caused serious tree injury and reduction in the quality and quantity of the product (Gross, 1991). Infestation of deciduous shade trees may also cause considerable annoyance in parks and recreation areas.

Control

Eggs, larvae and pupae of *M. disstria* are known to be parasitized by Hymenoptera and Diptera (Knight *et al.*, 1991), and tachinid flies especially have been found to be very effective. Predators and a polyhedrosis virus may also reduce populations of *M. disstria* significantly. Effective control can be achieved with large-scale applications of chemicals

(Schultz, 1989), *Bacillus thuringiensis* (Bernier *et al.*, 1990), and a polyhedrosis virus (Keddie & Erlandson, 1995). The integrated approach to control the pest has been outlined by Goyer (1991). There are resistant clones of *Populus* (Robison & Raffa, 1994). Also, *B. thuringiensis* endotoxin has been genetically engineered into a *Populus* clone, showing good resistance to *M. disstria* (Robison *et al.*, 1994).

Phytosanitary risk

M. disstria has recently been added to the A1 quarantine list of EPPO. Many host trees of *M. disstria* are grown in Europe. So, if it were introduced into the EPPO region, *M. disstria* could certainly establish in European forests. Although infested trees normally recover, growth loss may be substantial. Moreover, if local natural enemies are not able to control the pest, major outbreaks could lead to unacceptable damage in orchards, deciduous forest and shade trees.

PHYTOSANITARY MEASURES

In countries where *M. disstria* occurs, nursery inspections should be carried out during the growing season prior to dispatch. The consignment should come from a place of production that has been found free from *M. disstria* during the last growing season (OEPP/EPPO, 1990).

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