

## Data Sheets on Quarantine Pests

*Numonia pirivorella***IDENTITY**

**Name:** *Numonia pirivorella* (Matsumura)

**Synonyms:** *Acrobasis pirivorella* (Matsumura)  
*Eurhodope pirivorella* (Matsumura)  
*Nephopterix pirivorella* Matsumura  
*Numonia pirivora* (Gerasimov)  
*Rhodophaea pirivorella* (Matsumura)

**Taxonomic position:** Insecta: Lepidoptera: Pyralidae

**Common names:** Pear fruit moth, pear moth, pear pyralid (English; these names are translations of original Japanese and Russian names)

**Bayer computer code:** NEPOPI

**EPPQ A1 list:** No. 184

**EU Annex designation:** II/A1

**HOSTS**

Wild and cultivated forms of pears are the main host of *N. pirivorella*. Currently, there is no indication that the moth attacks other fruit trees and it is considered to be restricted to pears (Shutova, 1977).

**GEOGRAPHICAL DISTRIBUTION**

*N. pirivorella* is indigenous to the temperate zone of eastern Asia, where it is widely distributed.

**EPPQ region:** Russia (Far East).

**Asia:** China (northern), Korea Democratic People's Republic, Korea Republic, Japan (Shiraki, 1952), Taiwan, Russia (Far East; Primor'ye and Khabarovskii provinces, with Vladivostok as its southern limit and Khabarovsk as its probable northern limit, Shutova, 1977).

**EU:** Absent.

**BIOLOGY**

*N. pirivorella* overwinters as first-instar larvae (Gibanov & Sanin, 1971), but more commonly as second-instar larvae (Shutova, 1970; Gibanov & Sanin, 1971) in the flower buds of pears in a thin white cocoon. The buds die but do not fall. In spring the larvae move to fresh buds, feed in the developing buds, flowers and fruitlets, eating out the core of the latter. Larvae may move from fruit to fruit. A single larva can infest and destroy two to three buds, one to three primordial flowers and up to three fruits (Shutova, 1977).

Larvae spin a silk attachment to hold the fruit onto the tree and the presence of black shrivelled fruitlets persisting on the trees seems to be a feature of attack by this species. The larva makes a prominent hole in each fruit near the calyx end with an overhanging lip

of silk and excreta. The larvae pupate in the fruit, usually at the end of May and, in Russia, the first adults emerge by mid-July when the fruit is about the size of a hazel nut. However, most adults will emerge between late July and mid-August (Komarova, 1984).

The moths lay eggs (about 120 per female) both on the new flower buds and on the fruit. Presumably the larvae from the former hibernate, but larvae from eggs on fruit complete development there to produce adults in September. These adults then lay eggs on flower buds and the resulting larvae overwinter. In the cooler areas the first flight of adults may not appear until September and the second generation is small. As a preparation for the winter, first-generation adults bore into the bud and go into hibernation and those which do not succeed in doing so die (Shutova, 1970). For more information, see Muramatsu (1927), Krylova & Mevzos (1930).

## **DETECTION AND IDENTIFICATION**

### **Symptoms**

Fruits are normally retarded in growth and turn black with a shrivelled appearance. Furthermore, fruits remain on the tree even until the following year (Shutova, 1977). During summer conspicuous webbings on exit holes and masses of excreta on the exterior of the fruit may indicate an infestation by the parasite (Shutova, 1977).

### **Morphology**

#### **Eggs**

Length 1 mm, flat and elliptical, yellow when newly laid but darkening to a reddish tint before hatching.

#### **Larva**

Rose-pink in the first instar with a black head and a blackish-brown pronotum. Fully developed caterpillars are dark-green dorsally and pale-yellow ventrally with blackish-brown heads and pale-brown legs. They reach a length of 12 mm. Two setae are located on the prespiracule plate of the prothorax (Danilevskii, 1958; Shutova, 1977).

#### **Pupa**

Pupae are in general oval, 10-12 mm in length, with a compression towards one end. Their body colour is brown with darker spiracles. Pupae lie with their heads in the direction of the exit hole in the fruit and when the adult moth emerges the pupal case is left protruding from the fruit.

#### **Adult**

A greyish moth with a violet tinge. The wingspan reaches 14.5-21.5 mm. The forewings have two transverse stripes and between them a crescent-shaped dark apical spot; the hindwings are yellowish-grey. The head, thorax and dorsum are covered with ashen-violet-brown bands. For more information, see Matsumura (1900), Danilevskii (1958), Shutova (1977).

## **MEANS OF MOVEMENT AND DISPERSAL**

The potential for natural spread of *N. pirivorella* can be considered as relatively low. The main means of spread would be international trade of planting material and fruits infested with the pest (Shutova, 1977).

## PEST SIGNIFICANCE

### Economic impact

In the Far Eastern territories of Russia, *N. pirivorella* is rated as the most serious pest of cultivated pears, and damages up to 90% of pear crops (Shutova, 1970). It is also considered to be of economic importance in Japan (Siezo, 1968).

### Control

In Japan, *N. pirivorella* is controlled by applying fenitrothion, diazinon, cyanophos or methidathion shortly before flowering and two later applications between June and August depending on the developmental stages of the pest (Umeya, 1980). In Russia, the latest insecticidal application is recommended for mid-August (Komarova, 1984). Biological control has not been thoroughly researched, although *Meteorus colon* has been reported to parasitize *N. pirivorella* up to 57% (Komarova, 1984). In China, fruits are individually wrapped in paper to exclude the pest. However, in certain parts of the trees the fruits remain unwrapped and serve as bait-fruits which are destroyed after infestation (Shutova, 1977).

### Phytosanitary risk

*N. pirivorella* was recently added to the EPPO A1 list of quarantine pests, but is not listed as a quarantine pest by any other regional plant protection organization. In Russia, *N. pirivorella* is considered to be capable of survival wherever pears are grown (Shutova, 1977). Originally, EPPO recognized the risk for the EPPO region, but considered that the measures taken against *Carposina niponensis* (EPPO/CABI, 1996) adequately covered it. The addition to the EPPO list harmonizes it with EU Directive Annex II/A1.

## PHYTOSANITARY MEASURES

The specific quarantine requirements for *Carposina niponensis* (OEPP/EPPO, 1990), in relation to planting material and fruits of *Pyrus*, are sufficient to cover *N. pirivorella*.

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