

Data Sheets on Forest Pests

## *Cecidomyia pumila*

### IDENTITY

<b>Name:</b>	<i>Cecidomyia pumila</i> Mamaev
<b>Synonyms:</b>	none
<b>Taxonomic position:</b>	Insecta: Diptera: Cecidomyiidae
<b>Common name:</b>	Dwarf pine cone midge; Лиственничная чехлоноска даурская (Russian).
<b>Bayer computer code:</b>	CECIPU

### HOSTS

*C. pumila* attacks cones of *Pinus pumila* (Khomentovsky and Efremova, 1991; Battisti et al., 1998). It may also infest *Pinus sibirica* on which closely resembling but yet unidentified larvae having been recently observed in cones (Battisti et al., 1998).

### GEOGRAPHICAL DISTRIBUTION

**EPPO region:** Russia (North Far East)

**Asia:** Russia (North Far East), China (Heilongjiang) (Khomentovsky and Efremova, 1991; Battisti et al., 1998; Roques, unpublished observations).

**EU:** Absent.

### BIOLOGY

There is one generation per year. The adult midges fly from early to late June in Kamchatka. Once mated, the females oviposit in the recently pollinated conelets of dwarf pines. They lay 1 to 5 eggs per cone. The eggs are mostly laid in the middle part of the cones (50%) but may also occur at apex (30%) or base (20%). By mid-June, it is possible to observe very small larvae between conelet scales but no damage is visible at this time. Then, the larvae bore a gallery into a cone scale causing the appearance of resin droplets on scale surface. Each larva feeds in a pitch-filled cavity within the scale which is progressively transformed into a gall during the development of the midge larva. As a result, the galled scale will not grow during the cone growth period occurring during the 2<sup>nd</sup>-year of cone development and the mature cone will be characteristically deformed (Fig. 1). Fully developed larvae exit the cones and usually drop to the ground during August. Then, they build an oval, white cocoon long of 2.5-3.0 mm where they hibernate and pupate next spring (Khomentovsky and Efremova, 1991). A few cocoons may remain attached to the cones or to the needles.

## DETECTION AND IDENTIFICATION

### Symptoms

Damage is only noticeable on 2<sup>nd</sup> –year cones. The cones issued from conelets attacked by *C. pumila* during the 1<sup>st</sup> year of development are deformed, assymetrical, and significantly smaller than the sound ones (Fig. 1).



Fig. 1. Cone of *Pinus pumila* attacked by *Cecidomyia pumila* (Roques, unpublished)

### Morphology

#### Eggs

No description available.

#### Larva

The larvae are spindle-shaped and lack of sternal spatula on the anterior-ventral part of the body. They closely resemble those of *C. bisetosa* which attack pine conelets in North America (Hedlin *et al.*, 1980). There are 3 larval instars. The neonate larva is quite transparent. Then, the 2<sup>nd</sup> and 3<sup>rd</sup> instars progressively turn to orange-rose or orange-red. The mature larva is 3.0 – 4.5 mm long and 1.0-1.5 mm broad.

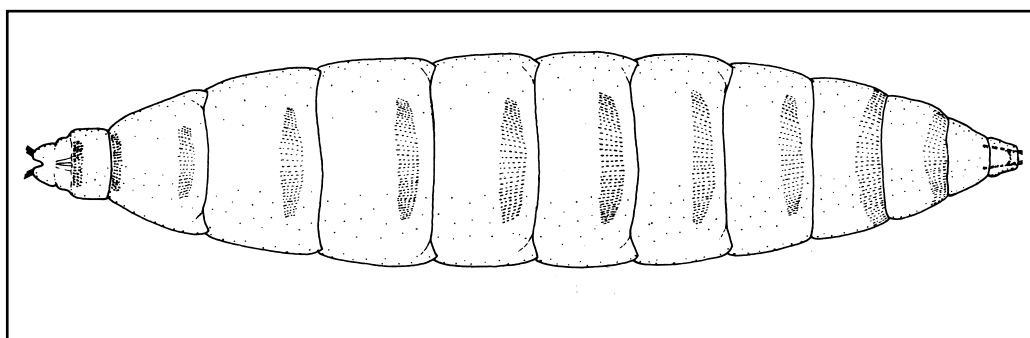


Fig. 2. Larva of *Cecidomyia bisetosa* (from Hedlin *et al.*, 1980, modified)

#### Pupa

The pupa is free in a white cocoon, 2.5- 3 mm long. The pupal stage lasts 4-5 days under laboratory conditions.

#### Adult

The adult of *C. pumila* is a fragile, minute midge with translucent wings and thin, elongate antennae and legs. Its wingspan is 6.0 mm with comparatively longer legs (5.0 mm). The length of the body is 2.0 – 3.0 mm in males, 3.0- 5.0 mm in females.

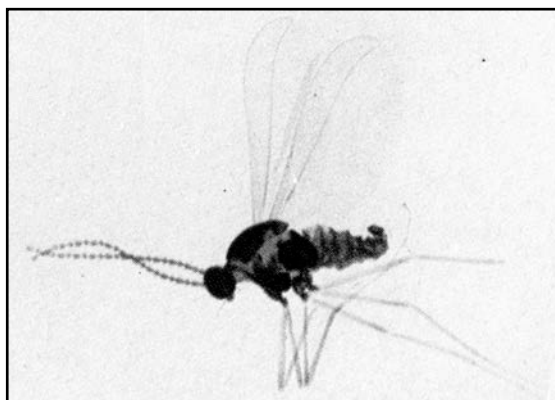


Fig. 3. Adult of *Cecidomyia pumila* (Roques, unpublished)

## MEANS OF MOVEMENT AND DISPERSAL

Adults of *C. pumila* are poor flyers but may be dispersed by wind over long distances. Midge cocoons accidentally attached to cones can be transported with cones collected for seed trade when appropriate cleaning measures are not taken.

## PEST SIGNIFICANCE

### Economic Impact

A permanent heavy infestation of dwarf pine conelets by *C. pumila* was recorded all over Kamchatka from seashore to 1000 m elevation. The percentage of attacked conelets ranged from 50 up to 100% of the cone crop during the 80s (Khomentovsky and Efremova, 1991) but more recent surveys supplied lower attack values for Central Kamchatka (20- 25%; Battisti et al., 1998). An infested conelet results in a deformed mature cone where the seeds attached to the scales galled by midge larvae are not viable. An indirect impact on the neighbouring seeds is also likely. Thus, a larva can decrease the final seed yield of a cone by at least 20-30%. Midge attack also seems to favour further colonization of 2<sup>nd</sup>- year cones by geometrids, *Eupithecia* spp. (Khomentovsky and Efremova, 1991).

### Environmental Impact

*C. pumila* is severely reducing the potential of natural regeneration of *Pinus pumila*.

### Control

No control methods have been tested yet and no natural enemies are known.

### Phytosanitary risk

Because of the strong phylogenetic relatedness of stone pines, *C. pumila* is probably capable of shifting to Swiss stone pine, *Pinus cembra*, as well as to Siberian pine, *Pinus sibirica*, if not yet done. EPPO countries where the Swiss stone pine grows naturally, especially in the Alps and the Carpathians, are at risk for that midge.

## PHYTOSANITARY MEASURES

To prevent introduction of *C. pumila* to other countries, the effective measure would be to prohibit import of cones of dwarf pines and inspect seed lots for checking the presence of white midge cocoons.

**BIBLIOGRAPHY**

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- Khomentosvky P.A., Efremova L.S. (1991). Seed production and cone feeding of *Pinus pumila* on the Kamchatka peninsula: Aspects of coexistence. In Baranchikov Y., Mattson W.J., Hain F.P., Payne T.L. (Eds.): IUFRO International Conference, "Forest insect guilds: Patterns of interaction with host trees", Abakan, Sibérie (URSS), 13-19/8/1989. USDA, Radnor. pp. 316-320.
- Hedlin A. F., Yates H.O. III, Cibrian-Tovar D., Ebel B.H., Koerber T. W., Merkel E.P. (1980). Cone and seed insects of North American conifers. Ottawa: Environment Canada/Canadian Forestry Service, Washington D.C.: US Forest Service, México: Secretaría de Agricultura y Recursos Hidráulicos, 122 pp.