EPPO Datasheet: *Byakushincecis eppoi*

Last updated: 2024-06-12

IDENTITY

Preferred name: *Byakushincecis eppoi*
Authority: (Inouye)
Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta: Diptera: Cecidomyiidae
Other scientific names: *Aschistonyx eppoi* Inouye, *Janetiella eppoi* Inouye
Common names: Japanese gall midge, juniper gall midge
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EU Categorization: A1 Quarantine pest (Annex II A)
EPPO Code: ASCXEP

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Notes on taxonomy and nomenclature

Based on the revision of archival specimens and newly collected samples in the type locality in Japan (Honshu), a new genus *Byakushincecis* has been established. *Aschistonyx eppoi* Inouye has been reassigned to this new genus as it did not match the morphological characteristics of the genus *Aschistonyx*, under which it was originally described (Yukawa *et al.*, 2024). Presently, *Aschistonyx* is a monotypic genus accommodating only one species *Aschistonyx carpinicolus* Rübsaamen, 1917 (Yukawa *et al.*, 2024). *Byakushincecis eppoi* differs from *A. carpinicolus* in certain morphological characteristics. *B. eppoi* has different antennae (in males, middle circumfilum not shorter than the two others) and middle leg structures (lobe of spines is little longer than claw on the final leg segment), a narrower ventral plate, a shorter ovipositor and cerci compared to *A. carpinicolus*. Detailed species diagnosis is provided in Yukawa *et al.* (2024). In Japan, intraspecific genetic diversity of *Byakushincecis eppoi* in DNA barcoding fragments is less than 0.5% based on the analysis of five specimens from *Juniperus chinensis* var. *globosa* and *J. chinensis* var. *sargentii* (Yukawa *et al.*, 2024).

The species name '*eppoi*' seems to be derived from the first name of Mr Eppo Inouye, who observed some life history aspects and collected many specimens of the gall midge in Toyohira, Sapporo, Hokkaido (Japan), which were used for the species description (Inouye, 1964).

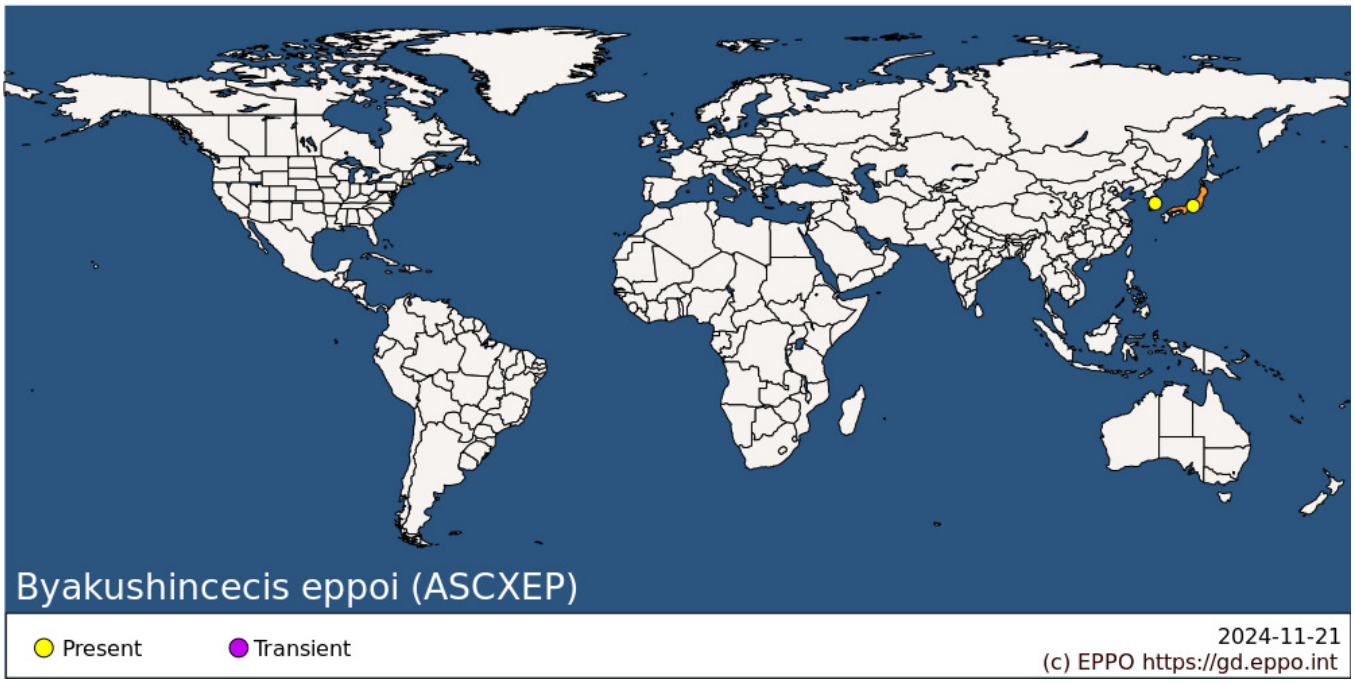
HOSTS

The Chinese juniper *Juniperus chinensis* and its varieties are the only known hosts (Inouye, 1964; Yukawa, 1976; Paik *et al.*, 2004; Yukawa *et al.*, 2021, 2024). In the EPPO region, *J. chinensis* is mainly planted as an ornamental tree in gardens and used indoors as a bonsai tree, and there is no available data on the susceptibility of European species of junipers (EFSA, 2018).

Host list: *Juniperus chinensis var. chinensis*, *Juniperus chinensis var. sargentii*, *Juniperus chinensis*

GEOGRAPHICAL DISTRIBUTION

Byakushincecis eppoi occurs in Japan (Honshu – Okayama and Saitama Prefectures) and the Republic of Korea (Yukawa *et al.*, 2021, 2024); and is not present in Europe (Bell *et al.*, 2013; Björklund & Boberg, 2021).



Asia: Japan (Honshu), Korea, Republic

BIOLOGY

Byakushincecis eppoi is a univoltine species. In Japan, the adults emerge from the ground at the end of May – beginning of June and lay eggs on the apical buds of juniper (Yukawa *et al.*, 2024). The larvae develop within the buds and induce small quadrangular pyramid-like galls (Inouye, 1964;). They stay in the galls until the following April or beginning of May (Inouye, 1964). After leaving the galls, the larvae drop to the ground for pupation (Inouye, 1964; Yukawa *et al.*, 2024). Overall, the species biology remains poorly studied.

DETECTION AND IDENTIFICATION

Symptoms

Small quadrangular pyramid-shaped swellings (galls) appear on the apical buds of juvenile shoots, which are particularly prominent in bonsai junipers (Inouye, 1964; Yukawa *et al.*, 2024). The occurrence of galls on the apical buds in spring is the first sign of infestation (Inouye, 1964; Baker, 1995). This is followed by desiccation and browning of the twigs the following spring – early summer, after adult emergence (Inouye, 1964; Yukawa *et al.*, 2024).

Morphology

Morphological characteristics of larvae, pupae and adults are given in Inouye (1964) and Yukawa *et al.* (2024).

Eggs

No information available.

Larva

The larva is elliptical, elongated (about 2.6 mm) and flat, reddish-yellow when fully grown, legless, with a well-developed but weakly chitinized head (Inouye, 1964). The mature larva has 8 papillae on the last body segment: 6 with a short conical protuberance and 2 with a prominent, pigmented conical protuberance (Yukawa *et al.*, 2024).

Pupa

The pupa is cylindrical, with a pair of relatively long (about 130 ?m) cephalic setae, a pair of lower facial papillae and two pairs of lateral facial papillae, each with a minute seta; and a long (about 220 ?m) prothoracic spiracle (Yukawa *et al.*, 2024). Head and thorax are yellow-brown (Inouye, 1964).

Adult

The adult is yellow-brown, with long legs and antennae and a pair of wings. It resembles a mosquito and is about 1.8 mm long in males (including male genitalia) and 1.8 mm (including ovipositor) in females (Inouye, 1964). The female has a short (approximately 0.16 mm long) ovipositor (Inouye, 1964; Yukawa *et al.*, 2024).

Detection and inspection methods

So far, only visual inspection has been used to detect the damage caused by the larvae of *B. eppoi*. No traps, nor semiochemical attractants have been developed (Bell *et al.*, 2013; Yukawa *et al.*, 2024).

PATHWAYS FOR MOVEMENT

Adults of *B. eppoi* can spread naturally by flying over short distances. The main pathways of entry and spread are associated with plants for planting (EFSA, 2018). The pest can be transported over longer distances mainly with Chinese juniper plants, in particular bonsais (Baker, 1995). In Europe, several interceptions of *J. chinensis* bonsai plants originating from Japan have been made due to the presence of *B. eppoi*. For example, multiple infested consignments were detected in the United Kingdom during the 1970s (Bowman & Bartlett, 1978), and in 2021, two consignments were intercepted in the Netherlands (Karnkowski, 2021).

While there is a general prohibition on the import of *Juniperus* plants, *Juniperus* bonsai plants may be imported in accordance with requirements outlined in Commission Implementing Regulation (EU) 2023/1310. During the two years preceding export, *Juniperus* plants should have been grown in authorized nurseries, and subjected to official inspections at least six times per year to verify the absence of *B. eppoi* (Commission Implementing Regulation, 2023).

PEST SIGNIFICANCE

Economic impact

Severe infestation over two to three successive years results in diminished foliage density and stunted growth of the terminal shoots (Inouye, 1964). Affected plants, particularly bonsai trees, loose their commercial value (Karnkowski, 2021).

Control

No particular control measures have been established, and in Japan no specific insecticides have been registered for use against *B. eppoi* (Yukawa *et al.*, 2024). Destruction of the infested plants seems to be the only control measure (Yukawa *et al.*, 2024).

Phytosanitary risk

Phytosanitary risk is currently low as in a large part of the EPPO region (i.e. European Union), the trade of *Juniperus* plants for planting is strictly regulated (Commission Implementing Regulation, 2023). Several interceptions of infested bonsai trees have been documented in Europe: in the United Kingdom (Bowman & Bartlett, 1978) and the Netherlands (Karnkowski, 2021), thus showing that the insect can be moved between continents via trade. However, *Juniper* bonsai trees are usually kept indoors and, thus, the risk of spreading and impacting juniper trees growing outdoor is low (EFSA, 2018). Moreover, *B. eppoi* is not known to infest juniper species of European origin (e.g. *J. communis*

). However, as data is generally lacking on the biology of *B. eppoi*, the latter cannot be fully excluded (Karnkowski, 2021). In Sweden, studies have shown that the climatic conditions prevailing in this country would not support the species establishment (Björklund & Boberg, 2021).

PHYTOSANITARY MEASURES

Strict restrictions on the movement of *Juniperus* plants for planting from countries where it occurs can be implemented to avoid the introduction of *B. eppoi*. The production of *Juniperus* bonsai trees within officially registered and controlled nurseries, as well as thorough and repeated inspections of plants in the country of origin prior to export are the main phytosanitary measures for preventing the entry of the pest into areas where it is absent (EFSA, 2018).

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Datasheet history

This datasheet was first published online in 2024. It is maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', ‘Hosts’, and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

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