Prepared by CABI and EPPO for the EU under Contract 90/399003

Data Sheets on Quarantine Pests

Bactrocera tsuneonis

IDENTITY

Name: *Bactrocera tsuneonis* (Miyake)
Synonyms: *Dacus tsuneonis* Miyake
Dacus cheni Chao
Taxonomic position: Insecta: Diptera: Tephritidae
Common names: Japanese orange fly (English)
Japanische Mandarinenfliege (German)
Notes on taxonomy and nomenclature: *B. minax* (above) has erroneously been considered synonymous with *B. tsuneonis*.
Bayer computer code: DACUTS
EPPO A1 list: No. 236
EU Annex designation: I/A1 - as *Dacus tsuneonis*

HOSTS

B. tsuneonis attacks exclusively *Citrus*, especially mandarins (*C. reticulata*), and *Fortunella* spp., the former being the main potential hosts in the EPPO region.

GEOGRAPHICAL DISTRIBUTION

EPPO region: Absent.
Asia: China (Guangxi, Hunan, Jiangsu, Sichuan; Zhang, 1989), Japan (Kyushu, Ryukyu Islands), Taiwan, Viet Nam.
EU: Absent.
Distribution map: See IIE (1991, No. 410).

BIOLOGY

Eggs are laid below the skin of the host fruit. These hatch within 1-3 days and the larvae feed for another 4-35 days. Pupariation is in the soil under the host plant and adults emerge after 1-2 weeks (longer in cool conditions). In China, *B. tsuneonis* is reported to have a single generation a year and overwinter as the pupa (Zhang, 1989). Yasuda *et al*. (1994) suggest that the species has a pupal diapause. *B. tsuneonis* would probably be able to survive the winter in the south of the EPPO region.

DETECTION AND IDENTIFICATION

Symptoms

Attacked fruit will usually show signs of oviposition punctures. Fruit with a high sugar content, such as peaches, will exude a sugary liquid, which usually solidifies adjacent to the oviposition site.

Morphology

Larva

Not described.

Adult

Colour: Face with an elongate brown spot in each antennal furrow; scutum predominantly orange with medial and lateral yellow vittae; postpronotal lobe yellow; scutellum, katatergite and anatergite yellow; legs yellow or orange; costal margin of wing with a very broad darkened band from Sc to the wing apex, and extending in depth to vein R4+5; wing without any crossbanding; abdomen predominantly orange-brown.

Head: With reduced chaetotaxy, lacking ocellar and postocellar setae; first flagellomere at least three times as long as broad.

Thorax: With reduced chaetotaxy, lacking dorsocentral and katepisternal setae. Postpronotal lobes without any setae (sometimes with some small setulae or hairs); scutum with anterior supra-alar setae, but without prescutellar acrostichal setae; scutellum not bilobed, with only two marginal setae (the apical pair).

Wing: Vein Sc abruptly bent forward at nearly 90°, weakened beyond this bend and ending at subcostal break; vein R1 with dorsal setulae; cell cup very narrow, about half depth of cell bm; cup extension very long, equal or longer than length of vein A1+CuA2. 8-10 mm long.

Abdomen: All tergites separate (view from side to see overlapping sclerites); tergite five with a pair of slightly depressed areas (ceromata). Male with a row of setae (the pecten) on each side of tergite three.

Detection and inspection methods

Though most *Bactrocera* spp. can be monitored by traps baited with male lures, *B. tsuneonis* is not known to be attracted to any male lure.

MEANS OF MOVEMENT AND DISPERSAL

Adult flight and the transport of infested fruits are the main means of movement and dispersal to previously uninfested areas. Many *Bactrocera* spp. can fly 50-100 km (Fletcher, 1989).

PEST SIGNIFICANCE

Economic impact

B. tsuneonis is stenophagous, only attacking citrus fruits. It is a serious pest of citrus in parts of China (Zhang, 1989) and Japan.

Control

The following general control measures for control of *Bactrocera* spp. broadly apply to *B. tsuneonis*. When detected, it is important to gather all fallen and infested host fruits, and destroy them. Insecticidal protection is possible by using a cover spray or a bait spray. Malathion is the usual choice of insecticide for fruit fly control and this is usually combined with protein hydrolysate to form a bait spray (Roessler, 1989); practical details are given by Bateman (1982). Bait sprays work on the principle that both male and female tephritids are strongly attracted to a protein source from which ammonia emanates. Bait sprays have the advantage over cover sprays in that they can be applied as a spot treatment so that the flies are attracted to the insecticide and there is minimal impact on natural enemies.

Phytosanitary risk

EPPO lists *B. tsuneonis* as an A1 quarantine pest (OEPP/EPPO, 1983) within the broad category "non-European Trypetidae"; it is also of quarantine significance to APPPC and OIRSA. *B. tsuneonis* is indigenous to eastern Asia, but like other *Bactrocera* spp. is known by experience to have the potential to establish adventive populations in various other tropical areas. The direct risk of establishment of *B. tsuneonis* in most of the EPPO region is minimal, though populations might enter and multiply during the summer months. In southern areas, such populations could possibly survive one or several winters, though in any case the direct losses from such introductions would probably not be high. The major risk for EPPO countries arises from the probable imposition of much stricter phytosanitary restrictions on exported fruits (particularly to America) if *B. tsuneonis* enters and multiplies, even temporarily.

PHYTOSANITARY MEASURES

Consignments of fruits of *Citrus* and *Fortunella* from countries where *B. tsuneonis* occurs should be inspected for symptoms of infestation and those suspected should be cut open in order to look for larvae. EPPO recommends that such fruits should come from an area where *B. tsuneonis* does not occur, or from a place of production found free from the pest by regular inspection for 3 months before harvest. Fruits may also be treated, but specific treatment schedules have mostly not been developed for the Asiatic citrus fruit flies, since citrus is not much exported from the countries where they occur. Schedules developed for *Ceratitis capitata* on citrus will probably be adequate, e. g. treatment in transit by cold (e.g. 11, 12 or 14 days at 0.5, 1 or 1.5°C, respectively; USDA, 1994). Ethylene dibromide was previously widely used as a fumigant but is now generally withdrawn because of its carcinogenicity; methyl bromide is less satisfactory, damaging many fruits and reducing their shelf life, but treatment schedules are available (e.g. 32 g/m^3 for 2 h at 21-29.5°C, followed by refrigeration at 0.5-3°C for 4 days; USDA, 1994).

Plants of host species transported with roots from countries where *B. tsuneonis* occurs should be free from soil, or the soil should be treated against puparia. The plants should not carry fruits. Such plants may indeed be prohibited importation.

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