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Data Sheets on Quarantine Pests

Bactrocera cucumis

IDENTITY

Name: *Bactrocera cucumis* (French)
Synonyms: *Austrodacus cucumis* (French)
Dacus cucumis French
Dacus tryoni var. *cucumis* French
Taxonomic position: Insecta: Diptera: Tephritidae
Common names: Cucumber fly (English)
Bayer computer code: DACUCM
EPPO A1 list: No. 203
EU Annex designation: I/A1

HOSTS

B. cucumis occurs mainly on cucurbits, but tomatoes (*Lycopersicon esculentum*) and pawpaws (*Carica papaya*) have also been recorded as hosts. Nearly all cucurbits may be attacked but *B. cucumis* has been reported mainly on courgettes (*Cucurbita pepo*), cucumbers (*Cucumis sativa*), melons (*Cucumis melo*) and other *Cucurbita* spp. such as pumpkins. It also has a wide range of wild cucurbitaceous hosts. According to Fitt (1986), this host specificity is determined primarily by the adult female's preferences for oviposition; larvae will develop in any fruit if artificially placed there.

GEOGRAPHICAL DISTRIBUTION

EPPO region: Absent.
Oceania: Australia (common in Queensland coastal and sub-coastal districts; also present in the extreme north-east of New South Wales; has been reported in the Northern Territory and Prince of Wales Island in the Torres Straits (Fitt, 1980; possibly not established in both territories).
EU: Absent.

BIOLOGY

The eggs are laid beneath the rind, and the cream-coloured maggots tunnel the fruit. The larvae mature in about a week and then burrow in the soil to pupate. The whole life cycle can be completed in two weeks so populations can increase very rapidly (Hely *et al.*, 1982).

DETECTION AND IDENTIFICATION

Symptoms

Attacked fruits (mature, damaged and/or sunburned fruits) show signs of oviposition punctures. When the flies are abundant, they attack immature fruits in which the eggs

usually fail to hatch. Such unsuccessful punctures may show up later as calloused deformities on the fruits.

Morphology

Larva

Described by Exley (1955), White & Elson-Harris (1992).

Adult

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. Scutelum not bilobed, with 4 marginal setae. Postpronotal lobes without well developed setae. Scutum with medial and lateral yellow stripes, without anterior supra-alar and without prescutellar acrostichal setae.

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. Vein M not curved forward in apical quarter of cell dm. Wing length: 4.7-6.1 mm.

Abdomen: All tergites separate (view from side to see overlapping sclerites); tergite five with a pair of slightly depressed areas (ceromata). Tergite three of male without a pecten. Aculeus length 1.7 mm (White & Elson-Harris, 1992).

Detection and inspection methods

Males are not known to be attracted to either cue lure or methyl eugenol.

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.

PEST SIGNIFICANCE

Economic impact

B. cucumis is a serious pest of cucurbits, tomatoes and pawpaws in Queensland, Australia. Other Australian territories have taken quarantine measures to prevent its introduction from Queensland (e.g. Victoria state; Swaine *et al.*, 1978).

Control

Elimination of the breeding sources (damaged or over-ripe fruits) is recommended (Hely *et al.*, 1982). 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

B. cucumis was recently considered by EPPO to deserve addition to the A1 quarantine pest, as an another specific member of the broad category "non-European Trypetidae", presenting a risk very similar to that of *B. cucurbitae* (EPPO/CABI, 1996). The direct risk of establishment of *B. cucumis* in most of the EPPO region is minimal, though populations

might enter and multiply during the summer months. In southern areas, some populations might survive one or several winters, though in any case the direct losses from such introductions would probably not be high. *B. cucumis* is not considered to present a particular risk to cucurbit crops grown in glasshouses. The major risk for EPPO countries arises from the probable imposition of much stricter phytosanitary restrictions on exported fruits (particularly to America) if *B. cucumis* enters and multiplies, even temporarily.

PHYTOSANITARY MEASURES

Consignments of fruits of *Citrullus*, *Cucumis* and *Cucurbita* from countries where *B. cucumis* 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. cucumis* does not occur, or from a place of production found free from the pest by regular inspection for 3 months before harvest. By analogy with *B. cucurbitae*, fruits may also be treated in transit by cold treatment (e.g. 13, 15 or 17 days at 0.5, 1 or 1.5°C, respectively) or, for certain types of fruits, by vapour heat (e.g. keeping at 43°C for 4-6 h, USDA, 1994; 45°C for 30 min, Corcoran *et al*., 1993) or forced hot-air treatment (Armstrong *et al*., 1995). Cucurbit fruits can be disinfested by a fenthion or dimethoate dip (Heather *et al*., 1992). 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. 40 g/m^3 for 2 h at 21-29.5°C; USDA, 1994).

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