Diagnostics[1]
Diagnostic

Opogona sacchari

Specific scope

This standard describes a diagnostic protocol for *Opogona sacchari*.

Specific approval and amendment

Approved in 2005-09.

Introduction

Opogona sacchari originates in the humid tropical and subtropical regions of Africa, where it is not a significant pest. It first attracted attention as a serious pest on bananas in Spain (Islas Canarias) in the 1920s. In the 1970s, it was introduced into Brazil and Central America, and also started to appear in the EPPO region. *O. sacchari* has a wide host range, and is found mainly in the tropics on banana, pineapple, bamboos, maize and sugarcane in the field, and on various stored tubers. More recently, *O. sacchari* has been introduced into the USA (Florida) (Heppner *et al*., 1987) and China (Kun & Fang, 1997).

Identity

Name: *Opogona sacchari* (Bojer).
Synonyms: *Alucita sacchari* Bojer; *Tinea subcervinella* Walker; *Gelechia sanctaehelenae* Walker; *Gelechia ligniferella* Walker; *Laverna plumipes* Butler; *Hieroxestis sanctaehelenae* (Walker); *Hieroxestis plumipes* Butler; *Hieroxestis subcervinella* (Walker); *Euplocamus sanctaehelenae* (Walker); *Opogona subcervinella* (Walker); *Opogona sanctaehelenae* (Walker).
Taxonomic position: *Insecta: Lepidoptera: Tineidae: Hieroxestinae*.
EPPO code: OPOGSC.
Phytosanitary categorization: EPPO A2 list: no. 154, EU Annex designation: I/A.II.

[1]The Figures in this Standard marked 'Web Fig.' are published on the EPPO website www.eppo.org.

Detection

O. sacchari larvae are highly versatile pests, exploiting a wide range of live and dead plant material. The symptoms displayed largely depend on the type of host the larvae are infesting. In European glasshouses, they can infest various tropical or subtropical ornamentals, including mainly *Cactaceae*, *Dracaena*, *Strelizia* and *Yucca* (Billen, 1987), but also occasionally *Alpinia*, *Begonia*, *Bougainvillea*, *Bromeliaceae*, *Chamaedorea* and other *Arecaceae*, *Cordyline*, *Dieffenbachia*, *Euphorbia pulcherrima*, *Ficus*, *Heliconia*, *Hippeastrum*, *Maranta*, *Philodendron*, *Saintpaulia*, *Sansevieria* and *Sinningia speciosa*. Vegetable crops are also attacked: capsicum and aubergine (Billen, 1987). In import inspections, it is mainly *Dracaena* and *Yucca* which have been found to be infested (EPPO, 1997). In banana, normally the fruiting head is infested, but in ornamental plants the larvae mostly burrow in the stem (woody or fleshy plants like *Dracaena* or cacti) or sometimes leaves and petioles of less sturdy ornamentals (e.g. *Begonia*, *Saintpaulia*). Seedlings may be severely attacked.

The early stages of larval tunnelling in woody or fleshy stems are practically undetectable. The presence of older larvae can be detected by characteristic masses of bore-meal and frass deposits at the openings of bore-holes. Vacated pupal cases can often be found projecting out of bore-holes after the adults have emerged. In holes with frass, the excrements of young larvae are fine and crumbly, those of old larvae look like pellets. The larvae, which burrow in the plant tissue, are extremely mobile, voracious and avoid light. At a later stage, fleshy plants (cacti) may be completely hollowed out. In woody plants such as *Dracaena* and *Yucca,* the larvae live on dead and living portions of the cortex and pith, and infested tissues may feel soft. Leaves wilt because the larvae destroy the xylem, and, in an advanced

stage, leaves may fall and the plant may collapse. This type of damage is often incorrectly attributed to physiological problems or disease, prior to the pests being detected. In *Chamaedorea* palms, the larvae typically feed at the base of the plant where the aerial roots enter the soil.

The eggs are extremely difficult to detect. They are very small (0.5–0.55 mm; 0.38 mm diameter), light yellow at oviposition to yellowish brown prior to eclosion. They are deposited in crevices in plant tissue, and may be laid individually or in small groups;

Identification

Family *Tineidae*

Tineidae can be recognized by the single whorl of scales on each antennal flagellomere. The maxillary palpi are usually folded over the base of the proboscis; hindwing cubitus stem without pectin, forewing with media stem present in discal cell; head with erect 'bristly' vestiture (rough scaled), eyes without hair, labial palpi with stiff lateral pecten bristles, palpi not recurved, maxillary palpi often visible and folded, five segmented; (rough scaled) hind tibiae with 'bristly' vestiture (Watson & Dallwitz, 2003 and references therein).

Subfamily *Hieroxestinae*

Adults of the subfamily *Hieroxestinae* are distinguished from other *Tineidae* by the flat smooth-scaled frons, 'brow-ridged' vertex, narrow wings and reduced venation. Pecten bristles on the second segment of the labial palpus are sometimes short and concealed amongst scales. A key to the genera of the *Hieroxestinae* is given by Robinson & Tuck (1997).

Genus *Opogona*

The genus *Opogona* at present comprises 173 species. Within these, a smaller group is defined by Robinson & Tuck by having erect lamellar scales on the vertex: the St Helena group. These species are all endemic to St Helena, except for the two almost cosmopolitan species *O. omoscopa* and *O. sacchari*. These two species have a unique dorsal hindwing hair pencil in the male, missing in all other *Opogona* species, and seem to be sister-species (Robinson & Tuck, 1997).

Species *Opogona sacchari*

Excellent descriptions of all stages, including the genitalia, of *O. sacchari* are given by Süss (1974), Billen (1987) and Davis & Peña, 1990, Web Fig. 1).

The *larvae* of *O. sacchari*, dirty-white and somewhat transparent (so that the intestines are visible through body wall), have a bright reddish-brown head with one pair of lateral ocelli on each side (stemmata) (Web Fig. 2) and clearly visible brownish thoracic (segments 2–3) and abdominal (1–8) plates (Web Fig. 3). Abdominal segment 9 has one large and 2 small brownish plates and the anal shield is visible on abdominal segment 10. Abdominal prolegs A3–A6 with 43–45 hooks each and 20–22 hooks on anal proleg A10. Pre-tarsal claw of prothorax prolonged, with 2 axial lobes (Web Fig. 2). Larvae typically measure 26–35 mm in length with a diameter of 3 mm for the last instar. The larvae can be positively identified on the following criteria: one pair of lateral ocelli; characteristic chaetotaxy (Web Fig. 4, Davis & Peña, 1990; see also Süss, 1974) – separation of the spiracle from the pinaculum bearing L2 on the first eight abdominal segments, by the large number of crochets (A3–6 = 43–45, A10 = 20–22); complete encirclement of abdominal sternite by a band of small, secondary spines. In *O. omoscopa*, only one anterior ocellus (or stemma) has been observed, the first eight abdominal spiracles are united with L2 on a common pinaculum, the crochets are fewer in number, and the abdominal sternite A3–6 have spines only along the anterior margin (Davis & Peña, 1990).

The *pupae* are brown and less than 10 mm long and are formed in a cocoon, spun at the and of a feeding chamber/larval tunnel, measuring 15 mm. Two bent hooks, characteristic of the species, are visible at the end of the abdomen on the abandoned protruding skin (Web Fig. 5). The pupa of *O. sacchari* is very similar to that of *O. omoscopa*, but can be distinguished by the raised spiracle on A8 and the larger cremaster spines (Davis, 1978; Davis & Peña, 1990).

The *adult* is nocturnal, 11 mm long with a wingspan of 18–25 mm, bright yellowish-brown. The forewings may show longitudinal darker brown banding, and in the male a dark-brown spot towards the apex. The hindwings are paler and brighter (Süss, 1974; D'Aguilar & Martinez, 1982) with a frenulum of 5–7 bristles in the female, 1 bristle in the male (Davis & Peña, 1990) and a unique dorsal hindwing hair pencil rising from the base of the wing in the male (Robinson & Tuck, 1997). At rest, the long antennae point forwards. Most distinctive are the relatively large size compared with other *Opogona* spp., the male and female genitalia, and the unique hair pencil.

For identification to the species level, adults and larvae are both suitable. Adults can be positively identified by the genitalia and unique hair-pencil and larvae by their chaetotaxy (see above). The specimen should match the morphological description and illustrations. It should preferably be compared with other specimens identified by a specialist.

Reporting and documentation

Guidelines on reporting and documentation are given in EPPO Standard PM7/– (in preparation).

Further information

Further information on this organism can be obtained from:

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Acknowledgements

This protocol was originally drafted by H. Stigter, Plant Protection Service, Wageningen (NL).

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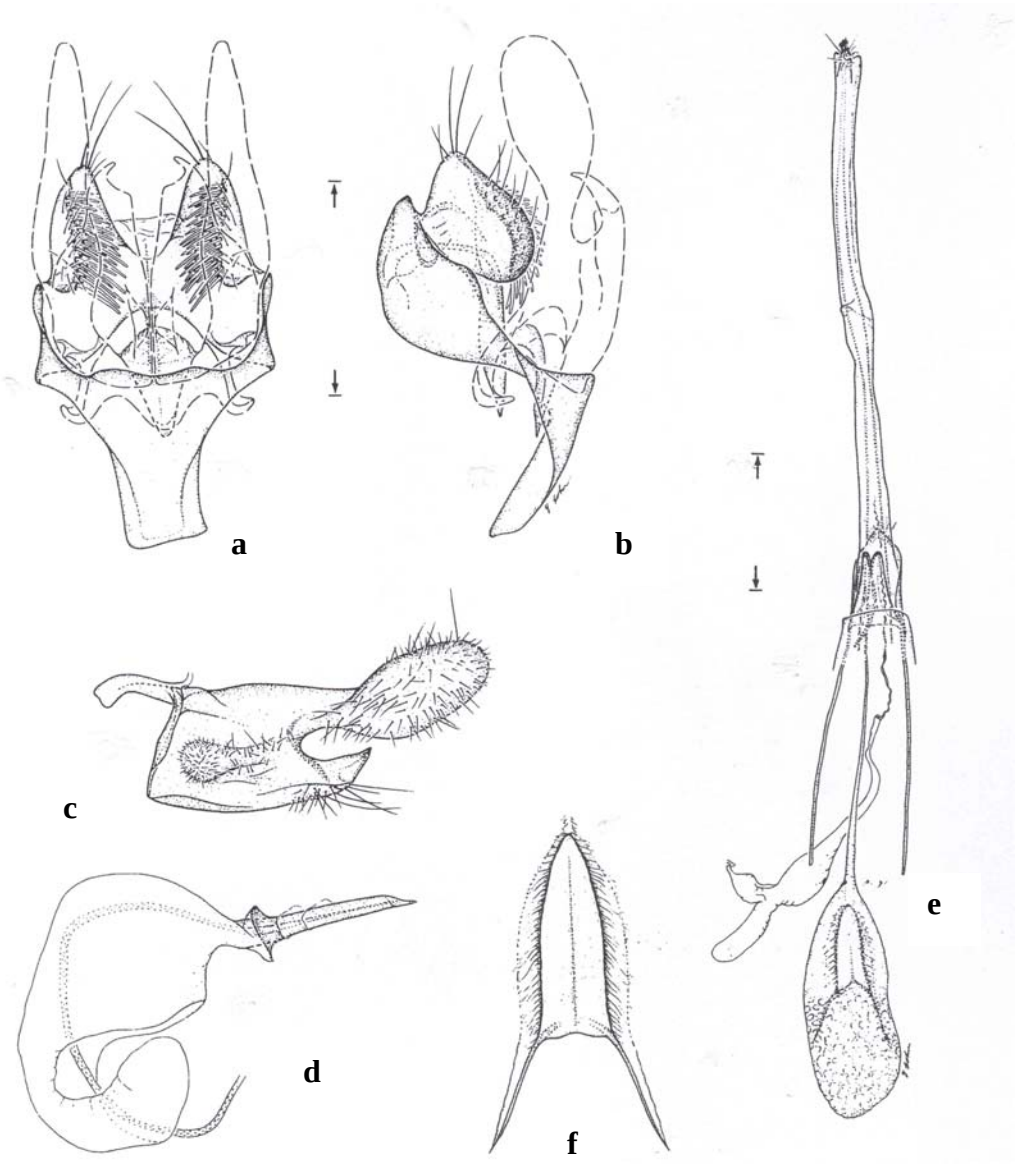
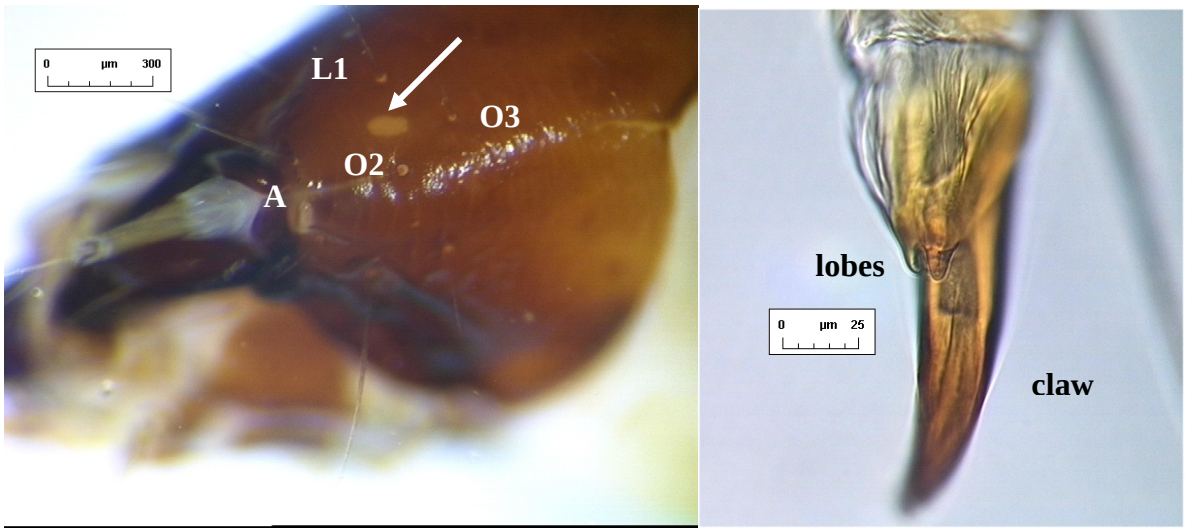
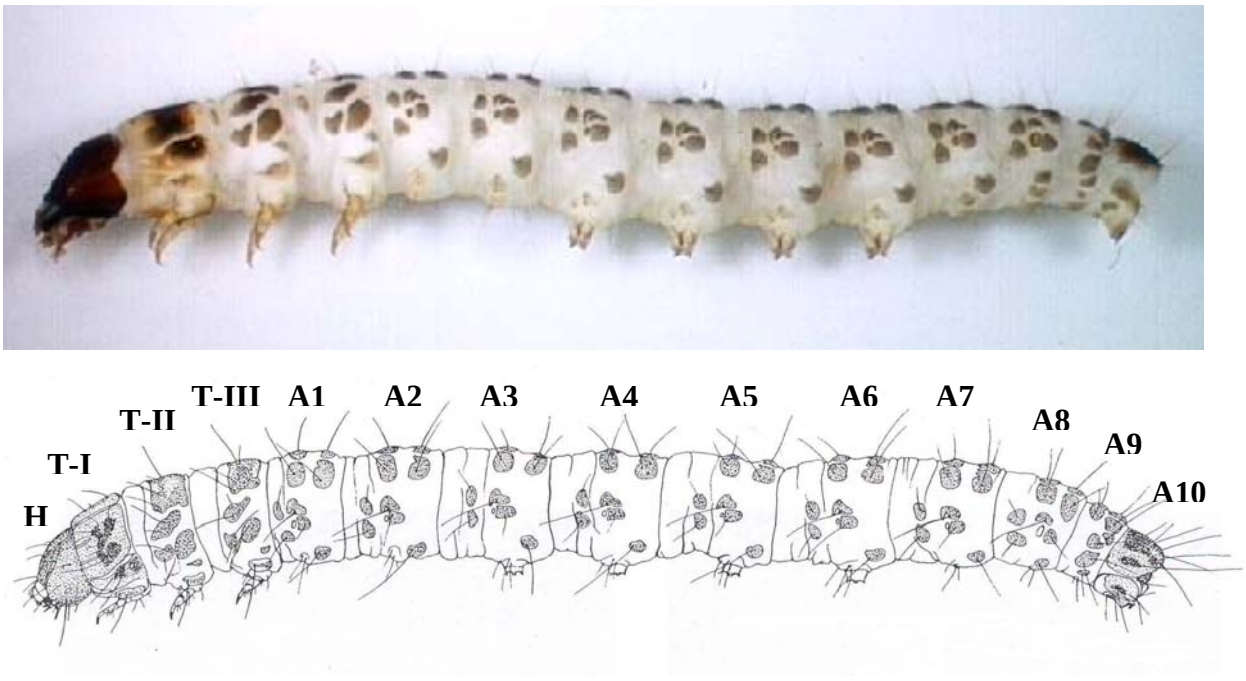


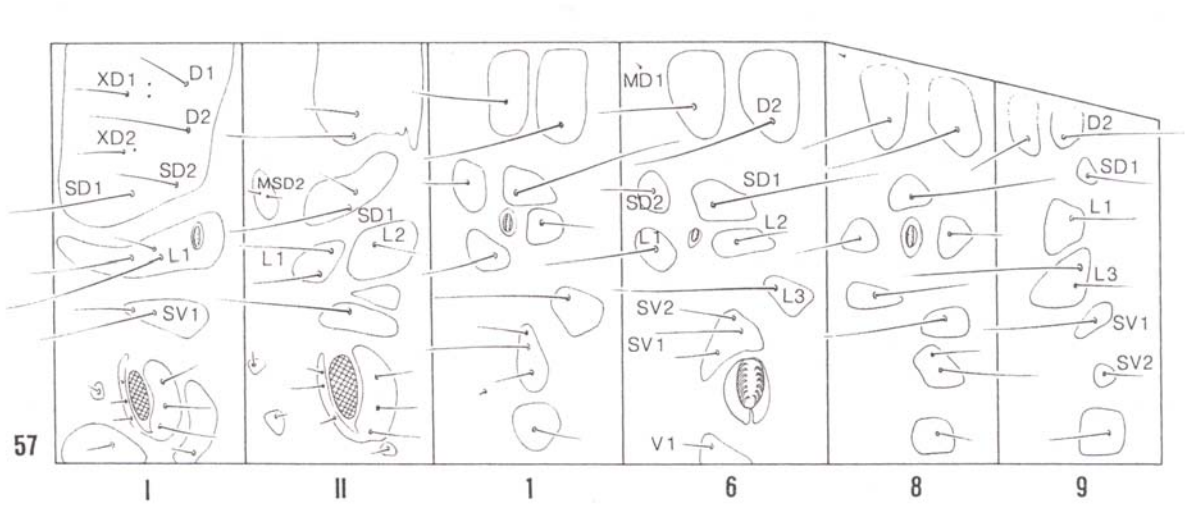
Web Fig 1. *Opogona sacchari*, adult genitalia. a), Male, ventral view (0.25 mm). b). Lateral view. c), Lateral view of valva. d). Aedoeagus, lateral view. e), Female, ventral view (1 mm). f), Detail of signum in Fig. 83. (Scale lengths in parenthesis) (from Davis & Peña, 1990).



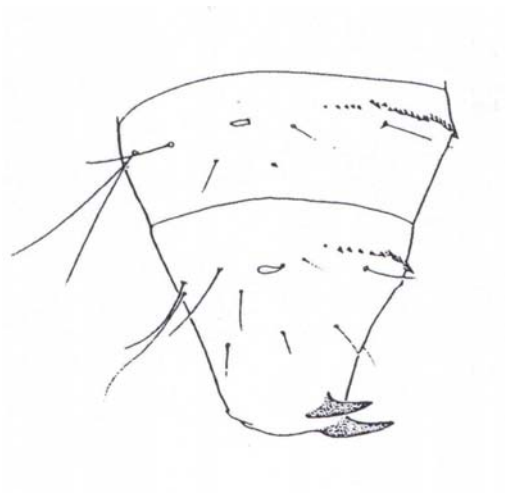
Web Fig 2. *Opogona sacchari* larva. Left: head lateral view, position of lateral ocellus (arrow), head capsule reddish-brown, ocellus cream-yellow; O2, O3 = ocellular setae 2 3; L1 = lateral seta 1; A = antenna; Right: pretarsal claw of prothorax (photos, Germain-INRA, 2003)



Web Fig 3. Last instar larva of *Opogona sacchari* (Bojer), lateral view; H = head; T = Thorax, A = abdomen (Top: photo Germain-INRA, 2003; bottom: drawing from Heppner *et al*., 1987).



Web Fig 4. *Opogona sacchari* larval chaetotaxy (from Davis & Pena, 1990): Body segments from thorax I, II and abdomen 1, 6, 8-9; XD, MD, D = dorsal, SD = subdorsal, L = lateral, V = ventral, SV = subventral setae



Web Fig 5. *Opogona sacchari*, caudal end of pupa (from Heppner *et al.*, 1987)