EPPO Datasheet: *Opogona sacchari*

Last updated: 2022-06-20

IDENTITY

Preferred name: *Opogona sacchari*
Authority: (Bojer)
Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta: Lepidoptera: Tineidae
Other scientific names: *Alucita sacchari* Bojer, *Opogona subcervinella* (Walker), *Tinea subcervinella* Walker
Common names: banana moth, sugarcane borer, sugarcane moth
view more common names online...
EPPO Categorization: A2 list
view more categorizations online...
EU Categorization: RNQP ((EU) 2019/2072 Annex IV)
EPPO Code: OPOGSC

more photos...

Notes on taxonomy and nomenclature

Billen (1987) has reviewed the taxonomy, biology, distribution and control of *O. sacchari* and refers to the existence of several species with similar biology in Africa, possibly to be regarded as members of the same complex. In addition, Robinson and Tuck (1997) examined the morphology and phylogeny of different *Opogona* species from museum collections, in their work on the Hieroxestinae subfamily.

HOSTS

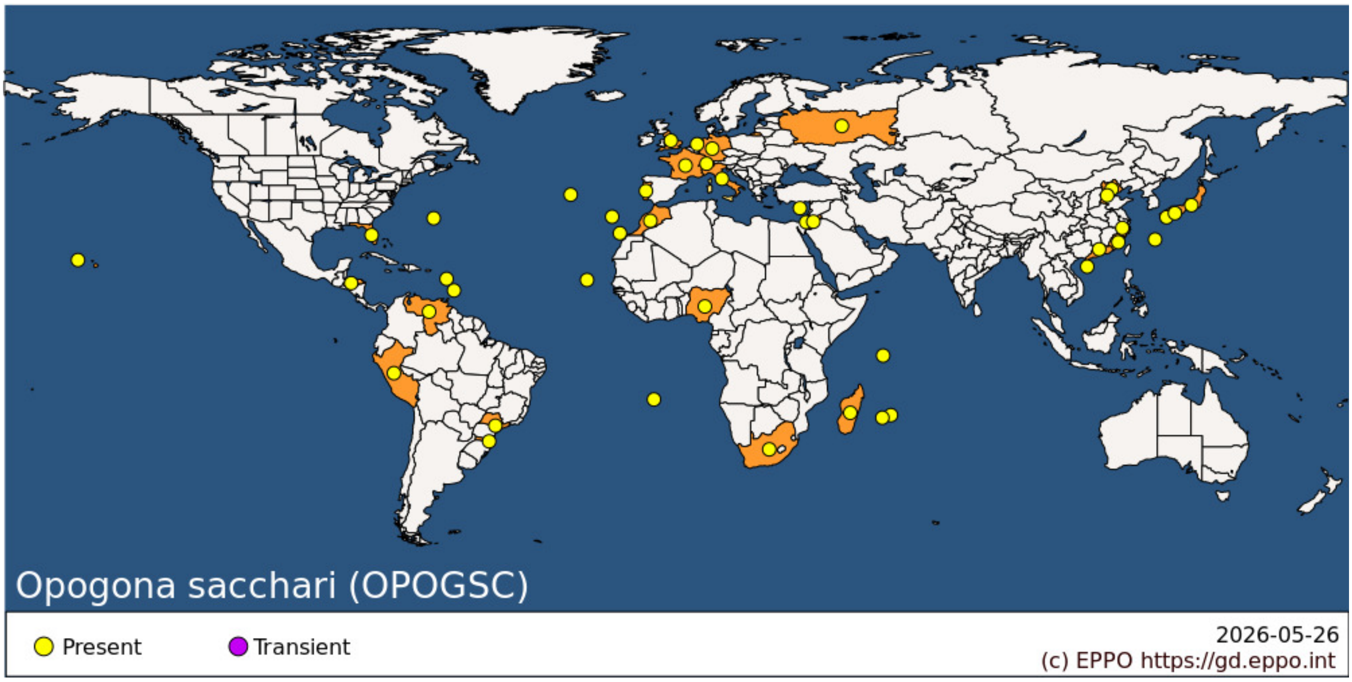
Opogona sacchari is a polyphagous insect and has a wide host range. It is found mainly in the tropics on bananas, pineapples, bamboo, maize and sugarcane in the field, and on various stored tubers. In glasshouses in EPPO countries, it has been found infesting a variety of plant species, mainly tropical or subtropical. A list of host plants for which published references are available is provided below but its host range is likely larger considering the plants on which it was intercepted, and unpublished observations.

Host list: *Adonidia merrillii*, *Aechmea fasciata*, *Aechmea sp.*, *Albizia julibrissin*, *Alocasia wentii*, *Alocasia x amazonica*, *Alocasia*, *Aloe comosa*, *Alpinia*, *Ananas comosus*, *Anthurium andraeanum*, *Anthurium crystallinum*, *Archontophoenix alexandrae*, *Areca*, *Arecaceae*, *Attalea phalerata*, *Bactris gasipaes*, *Bambusa vulgaris*, *Beaucarnea recurvata*, *Beaucarnea*, *Begonia hybrids*, *Beschorneria albiflora*, *Bombax ceiba*, *Bougainvillea spectabilis*, *Bromeliaceae*, *Cactaceae*, *Carica papaya*, *Carludovica palmata*, *Caryota sp.*, *Cattleya*, *Chamaedorea elegans*, *Chamaedorea seifrizii*, *Chamaedorea*, *Chrysalidocarpus decaryi*, *Chrysalidocarpus lastellianus*, *Chrysalidocarpus leptocheilos*, *Clerodendrum sp.*, *Cocos nucifera*, *Coffea arabica*, *Colocasia esculenta*, *Cordyline fruticosa*, *Cordyline* , *Costus afer*, *Costus spiralis*, *Crassula*, *Crinum*, *Cycas revoluta*, *Cycas*, *Cyperus papyrus*, *Cyperus*, *Dahlia sp.*, *Dieffenbachia maculata*, *Dieffenbachia*, *Dimerocostus strobilaceus*, *Dioscorea sp.*, *Dracaena draco*, *Dracaena fragrans*, *Dracaena marginata*, *Dracaena reflexa*, *Dracaena*, *Dypsis*, *Enterolobium sp.*, *Erythrina variegata*, *Euphorbia pulcherrima*, *Ficus elastica*, *Ficus pseudopalma*, *Ficus retusa*, *Ficus*, *Gladiolus sp.*, *Gloxinia sp.*, *Guzmania lingulata*, *Heliconia psittacorum*, *Heliconia*, *Hippeastrum hybrids*, *Hippeastrum vittatum*, *Howea*, *Hyophorbe lagenicaulis*, *Hyophorbe sp.*, *Ipomoea batatas*, *Lentinula edodes*, *Leucocasia gigantea*, *Licuala grandis*, *Mammillaria*, *Maranta leuconeura*, *Maranta*, *Monstera tenuis*, *Musa acuminata*, *Musa sp.*, *Musa x paradisiaca*, *Pachira macrocarpa*, *Pachira*, *Pandanus tectorius*, *Pandanus utilis*, *Pandanus*, *Philodendron giganteum*, *Philodendron hederaceum*, *Philodendron*, *Phoenix*, *Polyscias fruticosa*, *Pritchardia thurstonii*, *Pritchardia*, *Quercus suber*, *Rhapis excelsa*, *Roystonea regia*, *Roystonea sp.*, *Russelia*, *Saccharum officinarum*, *Salix babylonica*, *Sansevieria trifasciata*, *Sansevieria*, *Schlumbergera*, *Sinningia*, *Solanum tuberosum*, *Strelitzia reginae*, *Strelitzia*, *Streptocarpus ionanthus*, *Stromanthe thalia*, *Styphnolobium japonicum*, *Syagrus romanzoffiana*, *Thaumatophyllum bipinnatifidum*, *Thrinax radiata*, *Tillandsia harrisii*, *Tillandsia stricta*, *Trachycarpus fortunei*, *Tradescantia spathacea*, *Washingtonia*, *Wisteria sinensis*, *Wodyetia bifurcata*, *Wodyetia sp.*, *Yucca gigantea*, *Yucca*, *Zamioculcas zamiifolia*

, *Zea mays*

GEOGRAPHICAL DISTRIBUTION

O. 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 the Canary Islands in the 1920s. In the 1970s, it was introduced into Brazil and Central America, and started to appear in greenhouses in the EPPO region. It was later introduced in Japan in the 1980s, and China and the USA in the 1990s.



EPPO Region: Cyprus, France (mainland), Germany, Israel, Italy (mainland), Jordan, Morocco, Netherlands, Portugal (mainland, Azores, Madeira), Russian Federation (Central Russia), Spain (Islas Canárias), Switzerland, United Kingdom (England)
Africa: Cabo Verde, Madagascar, Mauritius, Morocco, Nigeria, Reunion, Saint Helena, Seychelles, South Africa
Asia: China (Beijing, Fujian, Guangdong, Hainan, Hebei, Zhejiang), Israel, Japan (Honshu, Kyushu, Ryukyu Archipelago, Shikoku), Jordan
North America: United States of America (Florida, Hawaii)
Central America and Caribbean: Barbados, Bermuda, Guadeloupe, Honduras
South America: Brazil (Santa Catarina, Sao Paulo), Peru, Venezuela

BIOLOGY

At 15°C, the life cycle of *O. sacchari* lasts approximately 3 months: eggs hatch in 12 days; larval development takes 50 days; the pupal stage lasts 20 days; the adult lives 6 days (Veenenbos, 1981). This period may be considerably reduced under warmer conditions, allowing up to eight generations per year (Giannotti *et al*., 1977; Heppner *et al*., 1987, Fonseca *et al*., 2019). The female lays eggs in crevices in plant tissue, in groups of about five eggs, 50-200 in total, by means of a long ovipositor. The larvae, which burrow in the plant tissue, are extremely mobile and avoid light. They are very voracious.

In banana, the fruiting head is normally infested (Suplicy & Sampaio, 1982), but in ornamental plants the larvae mostly burrow in the stem (woody or fleshy plants such as *Dracaena* or cacti) or sometimes leaves and petioles (*Begonia, Saintpaulia*). Seedlings may be severely attacked (Aguilar & Martinez, 1982).

DETECTION AND IDENTIFICATION

Symptoms

The early stages of larval tunnelling in woody or fleshy stems are practically undetectable. 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 caterpillars destroy the xylem, and, at an advanced stage, leaves may fall and the plant may collapse. The damage can be also visible at the leaf base, where significant amount of frass and tissue rot can be found (Hrn?i? *et al*. 2017). In *Chamaedorea* palms, the larvae typically feed at the base of the plant where the aerial roots enter the soil (Heppner *et al*., 1987).

Morphology

Eggs

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 a small group.

Larva

The larvae, dirty-white and somewhat transparent (so that the intestines can be seen), have a bright reddish-brown head with one lateral ocellus at each side and clearly visible brownish thoracic and abdominal plates. The last instar typically measure 26-35 mm in length with a diameter of 3 mm. The presence of older larvae can be detected by characteristic masses of bore-meal and frass at the openings of bore-holes.

Pupa

The pupae are brown and less than 10 mm long and are formed in a cocoon, spun at the end of a mine, measuring 15 mm. As maturation approaches, the pupae work themselves partially out of the tissue to allow emergence of the adult. Two bent hooks, characteristic of the species, show at the end of the abdomen on the abandoned protruding pupal skin.

Adult

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; Aguilar & Martinez, 1982). At rest, the long antennae point forwards.

Detection and inspection methods

Visual inspection is the most common method for detecting the pest in consignments and in places of production. Early stages of infestation are not visible, therefore, keeping incoming material in post-entry quarantine with follow up inspections (post-border) is recommended. Later stages of infestation result in wilt, dieback, rot and collapse of the plant. Excessive amount of frass can also be seen on infested plants. Examination of samples usually confirms the presence of the larvae.

Light and pheromone traps can be used to monitor the presence of adult moths and they are recommended for glasshouses and nurseries.

The EPPO Diagnostic Protocol for *Opogona sacchari* provides recommendations on how to detect and identify the pest (EPPO Standard PM 7/71, 2005).

PATHWAYS FOR MOVEMENT

Opogona sacchari can naturally disperse by flight within glasshouses or over short distances in the field. In international trade eggs and larvae are liable to be carried in or on plants and plant material (e.g. propagation material of host plants, for example cuttings of *Dracaena*). *O. sacchari* is regularly intercepted in trade of ornamental plants (Veenenbos, 1981; van der Gaag *et al*., 2013). Although the pest may be present in imported fruits, there is very little chance that this pathway could lead to establishment in glasshouses. There are no reports of interception in fruits in the European Union (van der Gaag *et al*., 2013).

PEST SIGNIFICANCE

Economic impact

Limited information has been published on the economic impact of *O. sacchari.* It is a serious pest of bananas in Madeira and Brazil (Ribeiro *et al*., 2008; Sampaio *et al.*, 1983). Though quite widespread in Africa, its impact is relatively minor plausibly because the moth does not have significant impact to the banana plantations within its natural environment. It could be a threat to the increasing production of bananas under polythene in e.g. Morocco and Spain. *O. sacchari.* is considered as a significant pest of ornamentals.

Elsewhere in the EPPO region, this pest presents a risk principally for the production of woody and perennial ornamentals grown in glasshouses (Carrai & Loi, 1987; Mourikis & Vassilaina-Alexopoulou, 1981; van der Gaag *et al*., 2013).

Control

Eradication by chemical treatment and sanitation has proved possible in several Northern European countries, but not in Italy, France or Israel, where the pest is established in greenhouses. The initial aim is to control the adults before they can lay eggs. Currently, and due to changes in legislation on plant protection products, this can be difficult but the use of pheromone traps is expected to provide some reduction in adult moth numbers and to disrupt mating. When an affected greenhouse is cleared and replanted, the soil should be steamed (or removed) to eliminate any residual pupae. Control of the larvae is difficult as they feed within the plant tissues. Insecticides used for other Lepidoptera are used to target the larvae. Systemic pesticides provide a good control, however as many of them are withdrawn, other alternatives should be adopted. Pyrethroid and *Bacillus thuringiensis* (Bt) pesticides, have been suggested as effective products to control the larvae (Nelson and Wright, 2005). A sex pheromone (Jang *et al*., 2010) is commercially available from many companies and can be used for monitoring and control (mating disruption) of the moth. Natural enemies, such as *Trichogramma* spp. which parasitize the moth eggs have been studied as biological control agents with positive results in Brazil (De Carli *et al.*, 2017). Entomopathogenic nematode species (e.g. *Steinernema* spp., *Heterorhabditis bacteriophora*) have been also studied and used as control agents (Peña *et al* ., 1990; Sharma *et al*., 2011).

Lastly, destruction of infested plant material by incineration is also used to eliminate the insect population and stop spread, especially in glasshouses. Additionally, as the larvae feed on dead plant tissues removal of plant debris helps to reduce pest numbers.

Phytosanitary risk

Opogona sacchari is a damaging greenhouse pest and has a very wide host range. As a tropical pest, *O. sacchari* is not expected to be able to survive outdoor conditions in winter over most of the EPPO region. It is assessed that *O. sacchari* can probably establish outdoors in southern Europe but that the climatic conditions are not highly favourable for population development (van der Gaag *et al*., 2013). Its presence in the Atlantic Islands of Portugal and Spain, as well as in Morocco and Israel suggests that it could establish outdoors in other countries around the Mediterranean basin. In Northern and Eastern Europe, the pest could only establish in greenhouses.

PHYTOSANITARY MEASURES

O. sacchari is difficult to detect at import inspection. Imported planting material should come from pest-free areas or pest free places/sites of production. Alternatively, plants for planting may be kept under pre- or post-entry quarantine for a minimum period of 3 months at a minimum temperature of 20°C. Eradication has proved possible in some situations but is costly and difficult. Treatment is an option for some host species but may damage others. Fumigation has been used for cuttings of *Dracaena* and *Yucca* (EPPO, 2008) but is no longer recommended as methyl bromide has been phased out. Hot water treatment is a possible treatment for cuttings of *Dracaena* and *Yucca* (EPPO, 2008).

Banana fruit constitutes a very minor risk. Irradiation treatment of fruits, which aims to sterilize immature stages of *O. sacchari*, has been tested as a quarantine measure prior to fruit exports (Hollingsworth *et al*. 2007; Follett 2009).

REFERENCES

Aguilar J & Martinez M (1982) *Opogona sacchari* présent dans les cultures sous serres en France. *Bulletin de la Société Entomologique de France* **87**, 28-30.

Billen W (1987) [Information on the banana shoot borer *Opogona sacchari*]. *Gesunde Pflanzen* **39**, 458-465 (in German).

Carrai C & Loi G (1987) [*Opogona sacchari*, a lepidopteran pest of ornamentals]. *Informatore Fitopatologico* **37**(2), 28-32 (in Italian).

de Carli M, Coelho Jr A, Maria M, Cristiane J, Cristiane N & Parra JR (2017) Selection of *Trichogramma* species as potential natural enemies for the control of *Opogona sacchari* (Bojer). *Scientia Agricola* **74**, 401-404.

EPPO (2005) EPPO Standard PM7/71 Diagnostic Protocol for *Opogona sacchari. EPPO Bulletin* **36**, 171–173. Available at https://gd.eppo.int/taxon/OPOGSC/documents

EPPO (2008) EPPO Standard PM10/002(1) Hot water treatment of *Dracaena* and *Yucca* cuttings against *Opogona sacchari*. *EPPO Bulletin* **39**, 28. Available at https://gd.eppo.int/taxon/OPOGSC/documents

EPPO (2008) EPPO Standard PM10/003(1) Methyl bromide fumigation of *Dracaena* and *Yucca* cuttings against *Opogona sacchari.* Standard withdrawn in 2015.

Follett PA (2009) Generic radiation quarantine treatments: the next steps. *Journal of Economic Entomology* **102**(4), 1399–1406.

Fonseca Lacerda L, Coelho Jr A, Gomes Garcia A, Sentelhas PC & Postali Parra JR (2019) Biology at different temperatures, thermal requirements, and ecological zoning of *Opogona sacchari* (Lepidoptera: Tineidae). *Journal of Economic Entomology* **112**(4), 1676-1682.

Giannotti O, Oliveira BS, Ioneda T & Fell D (1977) [Observations on the development and sexual behaviour of *Opogona sacchari* in the laboratory]. *Arquivos do Instituto Biológico Sao Paulo* **44**, 209-212 (in Portuguese).

Heppner JB, Pena JE & Glenn H (1987) The banana moth *Opogona sacchari* in Florida. *Entomology Circular* No. 293. Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville (US).

Hollingsworth R & Follett P (2007) Ionizing radiation for quarantine control of *Opogona sacchari* (Lepidoptera: Tineidae). *Journal of economic entomology* **100**, 1519-24.

Hrn?i? S, Radonji? S & Perovic T (2017) The impact of alien horticultural pests on urban landscape in the southern part of Montenegro. *Acta Zoologica Bulgarica* **9**, 191-202.

Jang EB, Siderhurst MS, Hollingsworth RG, Showalter DN & Troyer EJ (2010) Sex attractant for the banana moth, *Opogona sacchari* Bojer (Lepidoptera: Tineidae): provisional identification and field evaluation. *Pest Management Science* 66(4), 454-460.

Mourikis PA & Vassilaina-Alexopoulou P (1981) Data on the biology of *Opogona sacchari*, a new pest for ornamental plants in Greece. *Annales de l'Institut Phytopathologique Benaki* N.S. **13**, 59-64.

Nelson SC & Wright MG (2005) Banana Moth: A potentially fatal pest of *Pritchardia* and other palms. IP-24. Cooperative Research and Extension Services, University of Hawaii at Manoa, Honolulu.

Pena JE, Schroeder WJ & Osborne LS (1990) Use of entomogenous nematodes of the families Heterorhabditidae and Steinernematidae to control banana moth (Opogona sachari). *Nematropica* **20**(1), 51-55.

Ribeiro L, Silva JA, Aguiar AM, Pestana M & Rodrigues M (2008) Main pests and diseases of bananas on Madeira island. *Livro de Actas* 123-132.

Robinson G & Tuck K (1997) Phylogeny and composition of the Hieroxestinae (Lepidoptera: Tineidae). *Systematic Entomology* **22**(4), 363–396. https://doi.org/10.1046/j.1365-3113.1997.d01-47.x

Sampaio AS, Myazaki I, Suplicy N & Oliveira DA (1983) [Infestation levels of *Opogona sacchari* in banana plantations in the coastal area of São Paulo State, Brazil]. *Biológico São Paulo* **49**(2), 27-33 (in Portuguese).

Sharma M, Sharma A & Hussaini SS (2011) Entomopathogenic nematodes, a potential microbial biopesticide: Mass production and commercialisation status - a mini review. *Archives of Phytopathology and Plant Protection* **44**(9), 855-870.

Suplicy Filho N & Sampaio AS (1982) [Banana pests]. *Biológico* **48**(7), 169-182 (in Portuguese).

Süss L (1974) [*Opogona sacchari*, a new insect pest of glasshouse ornamentals]. *Bollettino di Zoologia Agraria e di Bachicoltura Milano* Serie 2, **12**, 1-28 (in Italian).

van der Gaag DJ, van der Straten M, Ramel JM, Baufeld P & Schrader G (2013) Pest Risk Analysis for *Opogona sacchari*. *Netherlands Food and Consumer Product Safety Authority*. 48 pp. Available at https://pra.eppo.int/pra/2823b66f-ce73-48eb-8272-082124412092.

Veenenbos JAJ (1981) *Opogona sacchari*, a pest risk from imports of ornamental plants of tropical origin. *EPPO Bulletin* **11**, 235-238.

ACKNOWLEDGEMENTS

This datasheet was extensively revised in 2022 by Dr Fryni Drizou (Royal Horticultural Society, UK). Her valuable contribution is gratefully acknowledged.

How to cite this datasheet?

EPPO (2026) *Opogona sacchari*. EPPO datasheets on pests recommended for regulation. Available online. https://gd.eppo.int

Datasheet history

This datasheet was first published 1988 in the EPPO Bulletin, revised in the two editions of 'Quarantine Pests for Europe' in 1992 and 1997, as well as in 2022. It is now 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. CABI/EPPO (1992/1997) *Quarantine Pests for Europe (1st and 2nd edition)*. CABI, Wallingford (GB).

EPPO (1988) Data sheets on quarantine organisms No. 154, *Opogona sacchari*. *EPPO Bulletin* **18**, 513-516.

Co-funded by the European Union