

Data Sheets on Quarantine Pests

*Aleurocanthus woglumi***IDENTITY****Name:** *Aleurocanthus woglumi* Ashby**Synonyms:** *Aleurocanthus punjabensis* Corbett**Taxonomic position:** Insecta: Hemiptera: Homoptera: Aleyrodidae**Common names:** Citrus blackfly (English)

Aleurode noir des agrumes (French)

Mosca prieta de los cítricos (Spanish)

Notes on taxonomy and nomenclature: *A. husaini* is a minor taxon occurring within the range of *A. woglumi*, which has been considered as a separate species, or else synonymized with *A. woglumi* (Martin, 1985).**Bayer computer code:** ALECWO**EPPO A1 list:** No. 103**EU Annex designation:** II/A1, under "*Aleurocanthus* spp."**HOSTS**

Citrus spp. are the main hosts of economic importance but *A. woglumi* occurs commonly on a wide range of other crops, mostly fruit trees, including avocados (*Persea americana*), bananas (*Musa* spp.), cashews (*Anacardium occidentale*), coffee (*Coffea arabica*), ginger (*Zingiber officinale*), grapes (*Vitis vinifera*), guavas (*Psidium guajava*), lychees (*Litchi chinensis*), mangoes (*Mangifera indica*), pawpaws (*Carica papaya*), pears (*Pyrus* spp.), pomegranates (*Punica granatum*), quinces (*Cydonia oblonga*) and roses (*Rosa* spp.). In Mexico, 75 species in 38 families have been reported as hosts on which *Aleurocanthus woglumi* can complete its life cycle (Shaw, 1950).

The potential host range in the EPPO region would be essentially citrus, with some possibility of establishment on other woody plantation crops growing in the southern part of the region in climatic conditions suitable for the pest.

GEOGRAPHICAL DISTRIBUTION

A. woglumi originated from south-east Asia and has spread widely in tropical and subtropical regions, overlapping the distribution of *A. spiniferus* (EPPO/CABI, 1996) in some regions.

EPPO region: Absent. Previously erroneously thought to occur in Tunisia (OEPP/EPPO, 1979). The CIE map record in Portugal (Azores) is also an error.**Asia:** Bangladesh, Bhutan, Cambodia, China (Guangdong), Hong Kong, India (Andhra Pradesh, Assam, Bihar, Delhi, Goa, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal), Indonesia (Irian Jaya, Java, Kalimantan, Sulawesi, Sumatra), Iran, Lao, Malaysia (Peninsular, Sabah, Sarawak), Maldives, Myanmar, Nepal, Oman, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, United Arab Emirates, Viet Nam, Yemen. Records in Korea Democratic People's

Republic and Korea Republic are now considered erroneous (deleted from latest version of IIE map).

Africa: Kenya, Seychelles, South Africa, Swaziland, Tanzania, Uganda, Zimbabwe.

North America: Bermuda, Mexico, USA (Florida, Hawaii, Texas).

Central America and Caribbean: Bahamas, Barbados, Belize, Cayman Islands, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Guatemala, Haiti, Jamaica, Netherlands Antilles, Nicaragua, Panama, Puerto Rico.

South America: Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela.

Oceania: Papua New Guinea (Morobe Province), Solomon Islands.

EU: Absent.

Distribution map: See IIE (1995, No. 91).

BIOLOGY

In tropical conditions all stages of *A. woglumi* may be found throughout the year, but little breeding occurs during cold periods. Eggs, laid in a spiral path on leaf undersides in batches of 35-50, hatch in 4 to 12 days depending on conditions. Active, black, flattened six-legged crawlers (nymphs) emerge. They disperse for a short time, staying mainly on lower leaf surfaces to avoid strong sunlight. The crawlers then insert their mouthparts into the leaves and begin sucking phloem sap. They then moult, losing their legs in the process, to become minute, flattened, oval bodies attached to the leaf by their mouthparts. Immature stages often form dense colonies of up to several hundred individuals on a single leaf. After two more moults the adults emerge. Both sexes are winged and feed by sucking phloem sap. Each female may lay 35-100 or more eggs in her lifetime. Depending on conditions, the life cycle generally takes 2-4 months but there can be three to six overlapping generations a year.

Development in *A. woglumi* is most favoured by temperatures of 20-34°C (optimum 25.6°C) and relative humidities of 70-80%. The species does not survive at temperatures below freezing and is not found in areas with temperatures of 43°C or over. More information on the biology of *A. woglumi* is given by Shaw (1950), Martinez & Angeles (1973) and Enkerlins (1976). The occurrence of *A. woglumi* and *A. spiniferus* on citrus in Kenya, at lower and higher altitudes respectively, suggests these species may differ in their ecological tolerances.

DETECTION AND IDENTIFICATION

Symptoms

Dense colonies of immature stages develop on leaf undersides; the adults fly actively when disturbed. Leaves and fruit have spots of sticky, transparent honeydew, which become covered in black sooty mould fungus. A heavy infestation gives trees an almost completely black appearance.

Morphology

Eggs

Elongate-oval to kidney-shaped, 0.2 mm long, laid in a very characteristic spiral pattern, attached to the underside of leaves by a short pedicel; yellowish at first, turning darker to brown and black as the embryo develops.

Nymph

1st instar: 6-legged, elongate, 0.3 x 0.15 mm, dusky in colour, with 2 long and several shorter, radiating spiny filaments.

2nd instar: No legs, ovate-convex, 0.4 x 0.2 mm, dark-brown to pale-black with yellow markings, with easily distinguished, radiating spiny filaments.

3rd instar: More ovate, 0.74-0.87 mm, generally black with a rounded, greenish spot on the anterior part of the abdomen, spiny filaments obvious.

4th instar = "puparium": Ovate, shiny-black, females about 1.25 mm in diameter, males slightly smaller, up to 1 mm in diameter. Dorsal surface with many long, acute glandular spines; insect surrounded by a white fringe of waxy secretion. Exuviae of earlier instars often remain stacked up on median area of immature insect.

Authoritative identification of *Aleurocanthus* spp. involves detailed microscopic study of external puparial morphology by a specialist.

Adult

Females about 1.7 mm in length, males up to 1.35 mm long: at rest, the general appearance is metallic grey-blue, being the colour of the wings which cover most of the body; light markings on the wings appear to form a band across the middle of the red abdomen. The eyes are reddish-brown and the antennae and legs are white with pale-yellow markings.

MEANS OF MOVEMENT AND DISPERSAL

Adults of *A. woglumi* are capable of limited down-wind flight (up to 187 m in 24 h) but this is not a major means of long-range dispersal (Meyerdink *et al.*, 1979). The whiteflies are most likely to be moved between countries on planting material of citrus or other host species, or possibly on fruits. Species of *Aleurocanthus* have been intercepted on the leaves of infested host plants moving in international trade (e.g. USDA, 1988).

PEST SIGNIFICANCE

Economic impact

A. woglumi excretes copious amounts of sugary honeydew, which coats leaf and fruit surfaces. Sooty mould fungus develops on the honeydew, reducing respiration and photosynthesis and rendering plants and fruit unsightly and unsaleable. Badly contaminated foliage may drop. Nitrogen levels in infested leaves are reduced and young leaf growth is damaged by heavy infestations. Fruit set is greatly reduced, losses caused by *A. woglumi* being up to 80% and more (Eberling, 1954). *A. woglumi* has long been a threat to citrus crops in Mexico. Other crops, such as coffee, mangoes and pears, can also be attacked if planted near citrus groves heavily infested with the pest (Steinberg & Dowell, 1980). There is some evidence that *A. woglumi* can infest many hosts but can only maintain an infestation of more than three generations' duration on species of *Citrus*. *A. woglumi* is a constant menace to citrus and other crops in the USA and Venezuela. It has not been recorded as a glasshouse pest.

Control

Chemical control of *A. woglumi* is possible but biological control, using hymenopteran parasites, has proved more economic and effective in several parts of the world (Smith, 1945; Quezada, 1974; Clausen, 1978). *Encarsia* spp., *Amitus hesperidum* Silvestri, *Eretmocerus serius* Silvestri and *Encarsia opulenta* (Silvestri) have been used. In southern Texas (USA), *Encarsia opulenta*, introduced from southern India, has provided complete biological control and is competitively replacing other parasites (Summy *et al.*, 1985). The neuropterans *Chrysopa* spp. and the coccinellids *Scymnus* spp. and *Delphastus* spp. are predators of *A. woglumi*.

In Florida (USA), it has been found that insecticide sprays against other orchard pests can be used without disrupting the parasites of *A. woglumi*, providing the pesticides used are highly water-soluble (Fitzpatrick & Dowell, 1981); this implies that integrated pest management of citrus orchards should be possible.

Phytosanitary risk

A. woglumi is an A1 quarantine pest for EPPO (OEPP/EPPO, 1979), and is also a quarantine pest for COSAVE and NAPPO. It mainly presents a risk to citrus in Mediterranean countries. It has a well documented history of spread around the world from its south-east Asian origin.

PHYTOSANITARY MEASURES

EPPO recommends (OEPP/EPPO, 1990) that all imported host plants, as planting material and as cut branches, must have come from a nursery found free from *A. woglumi* during the previous growing season. Planting material and cut branches of host plants shipped from countries where *A. woglumi* occurs are required to be fumigated. Fresh fruit of host plants must be imported with a phytosanitary certificate, although a tolerance for *A. woglumi* may be acceptable during the winter months.

Methyl bromide fumigation has been tested as a quarantine treatment of young citrus plants against *A. woglumi* and a fumigation procedure is recommended by OEPP/EPPO (1994).

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