

**Data sheets on quarantine pests**  
**Fiches informatives sur les organismes de quarantaine**

## ***Rhizoecus hibisci***

### **Identity**

**Name:** *Rhizoecus hibisci* Kawai & Takagi

**Synonym:** *Ripersiella hibisci* (Kawai & Takagi)

**Taxonomic position:** *Insecta: Hemiptera: Homoptera: Pseudococcidae*

**Common names:** root mealybug (English)

**Notes on taxonomy and nomenclature:** Matile-Ferrero (1976) revised the Genus *Rhizoecus* and formed the new combination *Ripersiella hibisci*. However, the original combination was later reinstated by Ben-Dov (1994). 'Root mealybug' is a generic term for a number of hypogeal *Pseudococcidae*

**EPPO code:** RHIOHI

**Phytosanitary categorization:** EPPO A1 list no. 300; EU Annex designation I/AII

### **Hosts**

*R. hibisci* is a polyphagous species feeding on both monocotyledonous and dicotyledonous plants. It was first described from the roots of tea (*Camellia sinensis*) and presumably has various wild, free-living hosts in its natural state, but these are not documented. The literature mainly refers to pot plants (especially bonsais). Most such records are on the bonsai plant *Serissa foetida* (*Rubiaceae*). Other hosts include ornamentals (*Cuphea*, *Hibiscus rosa-sinensis*, *Nerium oleander*, *Pelargonium*, *Rhododendron*), other bonsais (*Ligustrum ovalifolium*, *Punica granatum*, *Sageretia theezans*, *Ulmus parvifolia*, *Zelkova serrata*), foliage plants (*Calathea*, *Dieffenbachia*, *Ficus*), various *Arecaceae*. In all, 20 plant families are represented.

### **Geographical distribution**

*R. hibisci* was first described from 10 plant species in Tokyo (Japan) in 1971 (Kawai & Takagi, 1971). It has spread to a limited extent to North America and Europe.

**EPPO region:** Netherlands (Jansen, 1994, 2001); no later infestations found. *R. hibisci* was reported once in Italy on imported plants (Pellizzari & Pavan, 1994; misidentified as *R. saintpauliae* Williams), but has not been found again

**Asia:** Japan (Kawai & Takagi, 1971), Taiwan (Williams, 1996). It may be more widely present in south-east and east Asia (Hara *et al.*, 2001). In particular, it has been detected on bonsai plants imported from China into European countries

**North America:** USA [Florida (USDA, 1979); Hawaii (Beardsley, 1995)]

**Central America and Caribbean:** Puerto Rico (Williams & Granara de Willink, 1992)

**EU:** found very locally in association with imported plants, but not since 2001

**Distribution map:** see CABI/EPPO (2002)

### **Biology**

The biology varies with host species (Jansen, 2001). In a Dutch laboratory at 21°C, one generation lasted 61 days on *Serissa* and about 90 days on *Nerium*. Eggs are laid in a waxy ovisac and the number of eggs observed in individual ovisacs was 11–84, varying between hosts. On average the eggs hatched after 9 days. Nymphs disperse locally by crawling. Once a suitable site is located they begin to feed. There are four instars in the female and five in the male including two pupal stages. Adult females live for about a month, whereas the winged adult males are short-lived and rarely observed. There can be multiple overlapping generations, so that all life stages can be found together. Individuals feed on plant roots and are usually associated with plants grown in containers under protection. Individuals occur throughout the rootball but are more abundant between the rootball and container interface. They also occasionally occur on the soil surface.

### **Detection and identification**

#### **Symptoms**

There are often little or no diagnostic symptoms. Infested plants may show slow or poor growth. Leaves wilt, become pale and turn yellow or grey; alternatively they can become soft and brown. Wax deposits around the roots, on the soil or on the inner surface of the plant container are symptoms of infestation, but such symptoms can be difficult to detect on large plants whose roots are not easily examined.

## Morphology

### Eggs

Eggs are oval, about 2.0 mm long, and laid in white waxy ovisacs.

### Nymphs

Immatures look similar to adults but are smaller and difficult to see. When plants are heavily infested, nymphs can be seen walking on the soil surface.

### Adult

Adult females are creamy white, elongate oval, 1.2–2.4 mm long with short, well developed legs and antennae. They are coated with mealy wax and resemble *Collembola*. Reliable identification to species requires careful microscopic examination by an expert since there are several similar species present in the EPPO region. Detailed morphological descriptions and illustrations of adult female *R. hibisci* are provided by Kawai & Takagi (1971), Williams (1996) and Williams & Granara de Willink (1992). The immature stages are described by Jansen (2001).

## Detection and inspection methods

*R. hibisci* inhabits the rootball or the area between the rootball and the plant container, where the pest can be difficult to detect. Pots should be removed for inspection of the soil and rootball, unless root infestation is so heavy that mealybugs are found on top of the soil, gathered around the main stem.

## Pathways for movement

*R. hibisci* is mainly moved with pot plants in trade, being carried on the roots and rootballs of host plants. Nymphs are mobile, but adult females are sluggish. Infestations may spread rapidly in glasshouses when nymphs are carried on water used to flood benches. Mealybugs are then spread from pot to pot. Alternatively, nymphs can walk over moist soil surfaces and from one pot to another although spread in this way is much slower and occurs over shorter distances (Jansen, 1994).

## Pest significance

### Economic impact

Root mealybugs feed exclusively on roots, particularly new roots in the upper layer of the soil, reducing nutrient and water uptake by the host. Such feeding reduces plant growth and may cause hosts to shrivel or crinkle. Infested plants can be prevented from flowering and can eventually die (Jansen, 1994). The most serious damage is caused to potted ornamentals in glasshouses. Occasional serious damage has been recorded on *Cuphea*, *Hibiscus*, *Pelargonium*, *Phoenix* and *Serissa* spp. when large aggregations of root mealybugs have built up. Containerized palms and other slow-growing

ornamentals are particularly at risk from *R. hibisci* and other root mealybugs since such plants are grown and kept in protection for a considerable time before they are marketed allowing infestations to build up. Financial losses have occurred in Hawaii as a result of pot ornamentals for export being rejected due to the presence of *R. hibisci* (Hara *et al.*, 2001).

### Control

If an infestation is found, hot water treatment of rootballs is very effective (Hu *et al.*, 1996). Growing media incorporating imidacloprid can also significantly reduce the number of individuals in an infestation (Hata *et al.*, 1996).

### Phytosanitary risk

*R. hibisci* has spread from Asia to USA (Hawaii and Florida) and has established in some ornamental glasshouses in Europe. Though there are also European species of *Rhizoecus* with similar biology, *R. hibisci* is a potentially serious pest in the EPPO region, particularly on glasshouse pot plants. Moreover, it has significance as an indicator that pot plants (especially bonsai plants) produced in eastern Asia, and exported to the EPPO region, have not been grown under adequately controlled conditions (as defined for example in EU, 2000), and may accordingly be infested by other non-European pests.

## Phytosanitary measures

*R. hibisci* was added in 2001 to the EPPO A2 list of regulated pests. Nurseries producing pot plants for export to the EPPO region should maintain good standards of hygiene, and in particular should respect EPPO Standard PM 3/54 growing plants in growing medium prior to export (OEPP/EPPO, 1994). Bonsai plants for export to the EPPO region should respect the requirements set out in EU (2000) or equivalent requirements. Consignments of containerized host species from areas where *R. hibisci* occurs should have containers removed and the roots inspected.

## Acknowledgements

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