

Rapid Assessment of the need for a detailed Pest Risk Analysis for *Ceroplastes rubens* Maskell

Disclaimer: This document provides a rapid assessment of the risks posed by the pest to the UK in order to assist Risk Managers decide on a response to a new or revised pest threat. It does not constitute a detailed Pest Risk Analysis (PRA) but includes advice on whether it would be helpful to develop such a PRA and, if so, whether the PRA area should be the UK or the EU and whether to use the UK or the EPPO PRA scheme.

STAGE 1: INITIATION

1. What is the name of the pest?

Ceroplastes rubens Maskell (Hemiptera: Coccidae) – pink wax scale or red wax scale

Synonymy: *Ceroplastes rubens minor* Maskell

2. What is the pest's status in the EC Plant Health Directive (Council Directive 2000/29/EC) and in the lists of EPPO?

Ceroplastes rubens is not listed in the EC Plant Health Directive and is not recommended for regulation as a quarantine pest by EPPO, nor is it on the EPPO Alert List.

3. What is the reason for the Rapid Assessment?

Ceroplastes rubens has been intercepted on several occasions in England and Wales and statutory action has been taken twice to prevent the introduction of the scale insect (on an unspecified plant, 2007, and *Aglaonema*, 2011). A rapid assessment is required to determine if continued statutory action is justified.

STAGE 2: RISK ASSESSMENT

4. What is the pest's present geographical distribution?

Despite the fact that *C. rubens* is one of the most widely distributed of all wax scales (Ceroplastinae), it is probable that it is even more widely distributed than the list below indicates, but is under-recorded due to difficulties in identifying *Ceroplastes* spp.

C. rubens has been recorded from Egypt (Hall, 1924), The Netherlands (Jansen, 1995) and the UK (Malumphy, 2010), but these records are based on interceptions or transient outbreaks and there is no conclusive evidence that *C. rubens* has become established in Europe or the Mediterranean region (Malumphy, 2010; Pellizzari & Germain, 2010).

The following list is based on Ben-Dov (1993, 2011), CPC (2008) and verified USDA interception records USDA (2007).

North America: United States of America (Florida).

Central America: (strongly suspected to be present despite the lack of official records)

South America: Colombia; Venezuela.

Caribbean: Dominica; Guadeloupe; Haiti; Jamaica; Martinique; Puerto Rico & Vieques Island; St Lucia; Trinidad & Tobago; US Virgin Islands (St John).

Europe: absent.

Africa: Ethiopia; Kenya; Seychelles; South Africa; Tanzania; Zanzibar.

Middle East: absent.

Asia: China; Hong Kong; India; Indonesia; Japan; Malaysia; Maldives; North Korea; Pakistan; Philippines; Ryukyu Islands; South Korea; Sri Lanka; Taiwan; Thailand; Vietnam

Oceania: Australia; Cocos Islands; Cook Islands; Fiji; French Polynesia (Tahiti); Guam; Hawaiian Islands; Kiribati; New Caledonia; Nieu; Norfolk Island; Northern Mariana Islands (Rota Island, Saipan Island); Palau; Papua New Guinea; Samoa; Solomon Islands; Vanuatu.

5. Is the pest established or transient, or suspected to be established/transient in the UK? (Include information on interceptions and outbreaks here).

Ceroplastes rubens is absent from the UK.

It has been intercepted in Britain on eight occasions, listed in chronological order: Merseyside, Liverpool, on a *Cycas* sp. from Thailand, 1984 (Seymour *et al.*, 1985b); West Sussex, Gatwick Airport, on longan (*Dimocarpus longan*) foliage from Thailand, 1999; Surrey, at a botanical collection on *Rhaphidophora* sp. from the USA, 2002; West Sussex, commercial nursery, on kaffir lime (*Citrus hystrix*) foliage from Thailand, 2005 (Malumphy, 2007); Manchester Airport, on an unspecified aquatic plant from Thailand, 2007; and Manchester Airport and on *Aglaonema* plants from Sri Lanka, 29.viii.2011, 10.x.2011 and 9.xi.2011.

6. What are the pest's natural and experimental host plants; of these, which are of economic and/or environmental importance in the UK?

It is extremely polyphagous occurring on hundreds of plant species assigned to 80+ families. A summary of the host plant families and genera are listed in Appendix 1. The most economically important host plants in the UK include the crop genera *Malus*, *Prunus* and *Pyrus*, although it is primarily a pest of tropical and sub-tropical crops. It also occurs on numerous ornamental plants grown outdoors and under protection in the UK, including plants belonging to the genera *Acacia*, *Acer*, *Aglaonema*, *Anthurium*, *Aralia*, *Buxus*, *Camellia*, *Citrus*, *Crataegus*, *Cycas*, *Cydonia*, *Dieffenbachia*, *Euonymus*, *Euphorbia*, *Fatsia*, *Ficus*, *Hedera*, *Hibiscus*, *Ilex*, *Laurus*, *Ligustrum*, *Magnolia*, *Malus*, *Monstera*, *Morus*, *Nerium*, *Olea*, *Pittosporum*, *Prunus*, *Pyrus*, *Rhododendron*, *Rhus*, *Rosa*, *Schefflera*, *Spiraea*, *Viburnum*, *Wisteria* and many others. It also occurs on *Pinus*, an important forestry crop.

7. If the pest needs a vector, is it present in the UK?

Ceroplastes rubens does not need a vector.

8. What are the pathways on which the pest is likely to move and how likely is the pest to enter the UK? (By pathway):

Interceptions of live adults and nymphs have occurred in the past (see 5. above).

Pathway 1. Growing plants from third countries where *C. rubens* occurs

It has occasionally been found on imported growing plants. However, the incidence is very low considering the large volume of plants imported from countries where *C. rubens* occurs.

Very unlikely Unlikely Moderately likely Likely Very likely

Pathway 2. On produce (fruit and foliage) from third countries where *C. rubens* occurs
Rarely intercepted on foliage.

Very unlikely Unlikely Moderately likely Likely Very likely

9. How likely is the pest to establish outdoors or under protection in the UK?

Ceroplastes rubens occurs widely in tropical, subtropical and warm temperate areas. It is very unlikely to be able to overwinter outdoors in the UK and therefore establishment will be restricted to protected ornamental plants.

Outdoors	Very unlikely	<input checked="" type="checkbox"/>	Unlikely	<input type="checkbox"/>	Moderately likely	<input type="checkbox"/>	Likely	<input type="checkbox"/>	Very likely	<input type="checkbox"/>
Under protection		<input type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

10. How quickly could the pest spread in the UK?

There is no specific data available on the dispersal rate of *C. rubens*. The main dispersal stage is the first instar which can actively crawl over short distances or be carried in air currents or on other animals (birds, other insects). Long distance dispersal is likely to be in trade.

Natural dispersal	Very slowly	<input checked="" type="checkbox"/>	Slowly	<input type="checkbox"/>	Moderate pace	<input type="checkbox"/>	Quickly	<input type="checkbox"/>	Very Quickly	<input type="checkbox"/>
Spread in trade	Very slowly	<input type="checkbox"/>	Slowly	<input type="checkbox"/>	Moderate pace	<input checked="" type="checkbox"/>	Quickly	<input type="checkbox"/>	Very Quickly	<input type="checkbox"/>

11. What is the area endangered by the pest?

The endangered area is protected ornamentals.

12. What is the pest's economic, environmental or social impact within its existing distribution?

Ceroplastes rubens is a widespread pest of *Citrus*, coffee, tea, *Cinnamomum*, mango, avocado and litchi (CPC, 2008). It is considered a major pest of citrus in Australia, Hawaii, Korea, China and Japan (CPC, 2008). Economic damage is caused directly through phloem feeding and indirectly through the promotion of sooty mould growth, which lowers the market value of fresh fruit and can reduce photosynthetic efficiency, causing reduced growth (CPC, 2008).

C. rubens is the subject of quarantine inspection in some countries where it is not already established, for example, in New Zealand.

Very small	<input type="checkbox"/>	Small	<input type="checkbox"/>	Medium	<input checked="" type="checkbox"/>	Large	<input checked="" type="checkbox"/>	Very large	<input type="checkbox"/>
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13. What is the pest's potential to cause economic, environmental or social impacts in the UK?

Citrus, coffee, tea, *Cinnamomum*, mango, avocado and litchi are not grown as crops in the UK. *Ceroplastes rubens* may lower the aesthetic appearance and therefore market value of ornamental plants although the potential losses are likely to be relatively small.

Very small	<input checked="" type="checkbox"/>	Small	<input type="checkbox"/>	Medium	<input type="checkbox"/>	Large	<input type="checkbox"/>	Very large	<input type="checkbox"/>
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14. What is the pest's potential as a vector of plant pathogens?

Ceroplastes rubens is not known to be a vector.

STAGE 3: PEST RISK MANAGEMENT

15. What are the risk management options for the UK? (Consider exclusion, eradication, containment, and non-statutory controls; under protection and/or outdoors).

Exclusion is possible as the main pathway of introduction (on ornamental plants imported from Asia) is regulated. The simplest and most straightforward way of achieving eradication would be destruction of infested plants and precautionary treatment of those remaining. Non-statutory control of scales is usually difficult in practice, although biological control agents exist. Light infestations can be easily dealt with by physically removing the conspicuous waxy females. Contact chemicals must be applied before the scales have completely covered themselves with white wax since once the wax cover is completed, it will shed pesticide applications.

16. Summary and conclusion of rapid assessment.

This rapid assessment shows:

Risk of entry – very unlikely

The main route of entry is likely to be on growing ornamental plants from countries where the scale has been reported. However, despite the large volume of imported plants the incidence of *C. rubens* is very low. Detection of early instars is difficult, particularly when present at low density. The scale may only be observed when mature specimens are present or numbers have built up to such a density that they are already causing damage.

Risk of establishment – in protected ornamentals is moderately likely

It is very unlikely to naturalise and overwinter outdoors in Britain but could establish on indoor plantings, at least as transient populations.

Rate of spread – very slow (natural spread) to moderate pace (in trade)

Spread is most likely to be with infested plants in trade.

Economic impact – very small

It is an important economic pest of many tropical and subtropical crops, and citrus, none of which are grown as commercial crops in the UK. It may have a small impact on the aesthetic quality and market value of indoor ornamental plants but there is little data available to quantify the economic implications.

Endangered area – protected ornamentals

Risk management

In the absence of phytosanitary measures the scale is likely to continue to enter the UK. It may be controlled using the same products used for other soft scales already present in the UK.

17. Is there a need for a detailed PRA? If yes, select the PRA area (UK or EU) and the PRA scheme (UK or EPPO) to be used.

With the information that we currently have available on the scale it is not of sufficient concern to the UK to justify a more detailed assessment.

No	X				
Yes		PRA area: UK or EU		PRA scheme: UK or EPPO	

18. Given the information assembled within the time scale required, is statutory action considered appropriate / justified?

Based on its biology and low potential impact continued action on this pest in the UK would not be considered appropriate. It is likely to be of more concern to southern Member States of the EU, as it is an economic pest of citrus.

Yes
Statutory action

No
Statutory action

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Author (s): Chris Malumphy PPP.

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IMAGES OF PEST AND SYMPTOMS



Images of *Ceroplastes rubens*

Appendix 1. Host plants of *Ceroplastes rubens*

Table 1. Host plant genera of *Ceroplastes rubens*

Plant Family	Plant genera
Acanthaceae	<i>Strobilanthes</i>
Aceraceae	<i>Acer</i>
Amaranthaceae	<i>Celosia</i>
Anacardiaceae	<i>Anacardium, Mangifera, Rhus, Schinus</i>
Annonaceae	<i>Annona</i>
Apocynaceae	<i>Allamanda Alyxia Melodinus Nerium Plumeria Thevetia</i>
Aquifoliaceae	<i>Ilex</i>
Araceae	<i>Aglaonema, Anthurium, Dieffenbachia, Epipremnum, Rhabdophora, Syngonium, Zantedeschia</i>
Araliaceae	<i>Aralia, Brassia, Dizygotheca, Fatsia, Hedera, Meryta, Philodendron, Polyscias, Schefflera</i>
Arecaceae	<i>Cocos, Monstera</i>
Aspleniaceae	<i>Asplenium</i>
Asteraceae	<i>Artemisi, Chrysanthemum, Fitchia, Gerbera, Helianthus</i>
Berberidaceae	<i>Nandina</i>
Bischofiaceae	<i>Bischofia</i>
Bixaceae	<i>Bixa</i>
Blechnaceae	<i>Blechnum</i>
Buxaceae	<i>Buxus</i>
Campanulaceae	<i>Siphonodon</i>
Caprifoliaceae	<i>Viburnum</i>
Celastraceae	<i>Celastrus, Elaeodendron, Euonymus</i>
Clusiaceae	<i>Calophyllum, Garcinia, Montrouziera</i>
Cucurbitaceae	Unidentified
Cunoniaceae	<i>Weinmannia</i>
Cycadaceae	<i>Cycas</i>
Davalliaceae	<i>Arthropteris, Davallia</i>
Dicksoniaceae	<i>Cibotium</i>
Ebenaceae	<i>Diospyros</i>
Elaeocarpaceae	<i>Elaeocarpus</i>
Ericaceae	<i>Rhododendron</i>
Euphorbiaceae	<i>Euphorbia</i>
Fabaceae	<i>Acacia, Cytisus, Dioclea, Inocarpus, Palaquium, Spartium</i>
Gleicheniaceae	<i>Dicranopteris, Gleichenia</i>
Heliconiaceae	<i>Heliconia</i>
Hernandiaceae	<i>Hernandia</i>
Hypoxidaceae	<i>Curculigo, Molineria</i>
Lauraceae	<i>Cinnamomum, Cryptocarya, Laurus, Lindera, Machilus, Persea</i>
Lecythydaceae	<i>Barringtonia</i>
Lomariopsidaceae	<i>Elaphoglossum</i>
Loranthaceae	<i>Loranthus</i>
Magnoliaceae	<i>Illicium, Magnolia</i>
Malvaceae	<i>Hibiscus</i>
Melastomataceae	<i>Astronidium</i>
Monimiaceae	<i>Wilkiea</i>
Moraceae	<i>Artocarpus, Cudrania, Ficus, Morus</i>

Musaceae	<i>Musa</i>
Myristicaceae	<i>Myristica</i>
Myrsinaceae	<i>Ardisia Myrsine Rapanea</i>
Myrtaceae	<i>Agonis, Callistemon, Eucalyptus, Eugenia, Feijoa, Melaleuca, Metrosideros, Pimenta, Psidium, Rhodomyrtus, Syzygium</i>
Nyctaginaceae	<i>Bougainvillea</i>
Oleaceae	<i>Ligustrum, Olea</i>
Oleandraceae	<i>Nephrolepis</i>
Orchidaceae	<i>Grammatophyllum, Stanhopea</i>
Peperomiaceae	<i>Peperomia</i>
Phyllanthaceae	<i>Antidesma</i>
Pinaceae	<i>Pinus,</i>
Piperaceae	<i>Macropiper, Piper</i>
Pittosporaceae	<i>Pittosporum</i>
Poaceae	<i>Tristania</i>
Polygonaceae	<i>Coccoloba</i>
Polypodiaceae	<i>Belvisia, Phymatodes, Platycerium, Polypodium</i>
Pteridaceae	<i>Acrostichum, Pteris</i>
Punicaceae	<i>Punica</i>
Rhizophoraceae	<i>Rhizophora</i>
Rosaceae	<i>Chaenomeles, Crataegus, Cydonia, Eriobotrya, Malus, Photinia, Prunus, Pyrus, Rosa, Spiraea</i>
Rubiaceae	<i>Coffea, Gardenia, Gouldia, Ixora, Paederia, Psychotria, Randia, Straussia</i>
Rutaceae	<i>Citrus, Eremocitrus, Evodia, Flindersia, Pelea, Poncirus</i>
Santalaceae	<i>Exocarpos</i>
Sapindaceae	<i>Cupaniopsis, Dimocarpus, Euphoria, Litchi, Nephelium</i>
Sapotaceae	<i>Calocarpum, Pouteria</i>
Schisandraceae	<i>Kadsura</i>
Sinopteridaceae	<i>Aspidotis, Pellaea</i>
Symplocaceae	<i>Symplocos</i>
Tamaricaceae	<i>Tamarix</i>
Taxaceae	<i>Cephalotaxus, Podocarpus</i>
Theaceae	<i>Camellia, Cleyera, Eurya, Ternstroemia</i>
Thymelaeaceae	<i>Daphne</i>
Ulmaceae	<i>Celtis</i>
Verbenaceae	<i>Premna</i>
Zingiberaceae	<i>Alpinia, Zingiber</i>