



Lobate lac scale

PARATACHARDINA PSEUDOLOBATA



Figure 1. Lobate lac scales on *Ficus* in Grand Bahama © Chris Malumphy

Background

A lac insect (Hemiptera: Kerriidae), originally identified as *Paratachardina lobata*, was first recorded in Florida (USA) in 1999. It subsequently became a serious pest, in part due to its polyphagy, feeding on more than 300 species of mostly woody plants assigned to 69 families. Kondo & Gullan (2007) published a comprehensive review of the genus *Paratachardina* in which they determined on the basis of morphological and molecular data that the lac insect scale occurring in Florida (and the Bahamas and Christmas Island) was a new species, which they named *P. pseudolobata* Kondo & Gullan. This pest is commonly known as the 'lobate lac scale'.

Within the UK Overseas Territories *P. pseudolobata* has been recorded from the British Virgin Islands, Cayman Islands and the Turks and Caicos Islands. Lobate lac scale poses a plant health risk to native and exotic plants in all the UKOTs in the Caribbean.

Geographical Distribution

Paratachardina pseudolobata is likely to be native to Asia (since all of the other eight described species of *Paratachardina* are reported from Asia), and has been introduced to the Indian Ocean, North America, and the Caribbean.

North America: USA (Florida, since 1999).

Caribbean: Bahamas (since 1992), British Virgin Islands (New record), Cayman Islands (New record), Cuba (since 2005), Puerto Rico (since 2010), and Turks and Caicos Islands (New record). It is likely to be more widespread in the Caribbean than currently reported.

Australasian: Christmas Island (since 2002).

Host Plants

Paratachardina pseudolobata is highly polyphagous, feeding on hundreds of species assigned to 205+ genera in 62 families, mostly on woody dicotyledonous plants. It shows a preference for plants in the families' Fabaceae, Myrtaceae and Moraceae. Only host plant families and genera are given below, further details are available from Howard *et al.* (2006).

Acanthaceae: *Graptophyllum*, *Justicia*,
Pachystachys, *Ruellia*.

Aceraceae: *Acer rubrum*.

Anacardiaceae: *Mangifera*, *Metopium*,
Pseudospondias, *Rhus*, *Schinus*,
Spondias, *Toxicodendron*.

Annonaceae: *Annona*, *Cananga*.

Apocynaceae: *Trachelospermum*.

Aquifoliaceae: *Ilex*.

Araceae: *Phoenix*.

Araliaceae: *Schefflera*.

Arecaceae: *Chrysobalanus*.

Asteraceae: *Ambrosia*, *Baccharis*, *Bidens*,
Flaveria, *Montanoa*, *Pluchea*, *Tridax*,
Verbesina.

Begoniaceae: *Begonia*.

Bignoniaceae: *Amphitecna*,
Dolichandrone, *Tecoma*.

Burseraceae: *Bursera*.

Cannabaceae: *Celtis*.

Capparaceae: *Capparis*.

Caprifoliaceae: *Viburnum*.

Casuarinaceae: *Casuarina*.

Celtidaceae: *Celtis*, *Trema*.

Chrysobalanaceae: *Licania*.

Clusiaceae: *Calophyllum*, *Clusia*, *Garcinia*,
Mesua, *Rheedia*.

Combretaceae: *Bucida*, *Combretum*,
Conocarpus, *Eombretum*,
Laguncularia, *Terminalia*.

Cupressaceae: *Juniperus*.

Ebenaceae: *Diospyros*.

Elaeocarpaceae: *Elacocarpus*.

Erythroxylaceae: *Erythoxylu*.

Euphorbiaceae: *Acalypha*, *Antidesma*,
Bischofia, *Bridelia*, *Chamaesyce*,
Codiaeum, *Euphorbia*, *Fluggea*,
Jatropha, *Mallotus*, *Sauropus*.

Fabaceae: *Acacia*, *Albizia*, *Amorpha*,
Archidendron, *Bouhinia*, *Brya*, *Butea*,
Caesalpinia, *Calliandra*, *Cassia*,
Dalbergia, *Dalea*, *Gigasiphon*, *Inga*,
Leucaena, *Lonchocarpus*, *Lysiloma*,
Parmentiera, *Peltophorum*,
Pithecellobium, *Pongamia*,
Pseudosamanea, *Samanea*,
Wallaceodendron.

Fagaceae: *Quercus*.

Flacourtiaceae: *Banara, Casearia, Dovyalis.*

Guttiferae: *Garcinia.*

Lamiaceae: *Leonotis, Ocimum, Rosmarinus, Salvia, Solanstemon.*

Lauraceae: *Cinnamomum, Laurus, Licaria, Ooteca, Persea.*

Lecythidaceae: *Lecythis.*

Lythraceae: *Ginoria, Lagerstroemia, Lawsonia.*

Magnoliaceae: *Magnolia, Michelia.*

Malvaceae: *Abutilon, Durio, Heritiera, Hibiscus, Malvaviscus, Pavonia, Ruizia, Trichospermum, Urena.*

Melastomataceae: *Tetrazygia.*

Meliaceae: *Aglia, Lansium.*

Moraceae: *Artocarpus, Brosimum, Ficus, Morus.*

Myricaceae: *Merciaria, Myrica, Pimenta.*

Myrsinaceae: *Ardisia, Ropanea.*

Myrtaceae: *Callistemon, Calyptranthes, Eucalyptus, Eugania, Marliera, Melaleuca, Mosiera, Myrcianthes, Pimenta, Psidium, Syzygium.*

Nyctaginaceae: *Bougainvillea, Osmanthus.*

Oleaceae: *Jasminum.*

Onagraceae: *Ludwigia.*

Orchidaceae: *Dendrobium.*

Oxalidaceae: *Averrhoa.*

Piperaceae: *Piper.*

Poaceae: *Bambusa, Phyllostachys.*

Polygalaceae: *Polygala.*

Polygonaceae: *Antipogon, Coccoloba, Triplaris.*

Proteaceae: *Macadamia.*

Rhamnaceae: *Krugiodendron, Ziziphus.*

Rhizophoraceae: *Rhizophora.*

Rosaceae: *Eriobotrya, Malus, Pyrus, Rosa.*

Rubiaceae: *Euthalis, Gardenia, Hamelia, Ixora, Mussaenda, Pentas, Psychotria, Rondeleria, Rondia, Spermacoe.*

Rutaceae: *Amyris, Citrus, Clausena, Evodia, Fortunella, Murraya, Zanthoxylum.*

Salicaceae: *Salix.*

Sapindaceae: *Alectryon, Allophylus, Blighia, Cupaniopsis, Dimocarpus, Dodonaea, Exothea, Filicium, Harpullia, Hypelate, Koelreuteria, Litchi, Melicocca, Talisia.*

Sapotaceae: *Bumelia, Calvaria, Chrysophyllum, Manilkara, Mimusops, Pouteria, Sideroxylon, Synsepalum.*

Solanaceae: *Brunfelsia, Cestrum, Solanum.*

Sterculiaceae: *Pterospermum, Sterculia.*

Taxodiaceae: *Taxodium.*

Theophrastaceae: *Jacquinia.*

Tiliaceae: *Grewia, Trumfetta.*

Urticaceae: *Pouzolzia.*

Verbenaceae: *Avicennia, Callicarpa, Citharexylum, Duranta, Petrea.*

Vitaceae: *Parthenocissus, Vitis.*

Zygophyllaceae: *Guaiacum.*

Description

The resinous scale covering (lac test) is light purplish red to dark reddish brown although old individuals will frequently appear black because of the sooty moulds. The scales smother infested twigs and branches of the host. The shape is globose with four lobes, the anterior lobes are smaller than the posterior lobes (Fig. 4), and young individuals generally appear more lobed than mature adults. Individuals in close proximity will frequently coalesce forming masses of several individuals. Young individuals often appear like a fat bow tie. The first-instar test is incorporated

into the adult test on mid-dorsum, with a circular opening on an elevated area just posterior to first-instar test for the excretion of honeydew (Fig. 4). The adult female test is 1.2–2.0 mm long, 0.7–2.0 mm wide, and 1.0–1.5 mm high. The lac texture is very hard, brittle, and shiny.

Kondo & Gullen (2007) provide detailed morphological descriptions and illustrations of the adult female, second and first instars of *P. pseudolobata*, and a key to the nine species assigned to the genus *Paratachardina*.

Paratachardina pseudolobata can be diagnosed by the following features:

- (i) test of the adult female 'X-letter' or 'bow tie-shaped' with each of the four lobes of the test rather smooth, purplish red to dark reddish brown, often black due to sooty mould (Fig. 4).
- (ii) ventral duct clusters totalling 4 pairs, with clusters of most anterior pair well separated and each usually with 20–45 (41–86 combined) micro-ducts (see Kondo & Gullen, 2007).



Figure 2 Typical resinous cases (test) of *Paratachardina pseudolobata* © Fera



Figure 3 *Paratachardina pseudolobata* adult female showing the hole through which honeydew is ejected and the "fat bow tie" appearance © Fera

Biology

Paratachardina pseudolobata is parthenogenetic, lays eggs and has two nymphal instars. The life cycle is relatively long taking 8-12 months. The scales feed on the bark and often occur in dense colonies. They egest honeydew which serves as a medium for the growth of sooty moulds.

Dispersal and Detection

The first instar (which is bright red) is the main natural dispersal stage and either crawls over the host plant in search of a suitable feeding site or may be carried in air currents or on other animals. They may also be dispersed over long distance in plant trade.

Paratachardina pseudolobata can be difficult to detect (or at least be recognised) in the field, due to their small size, dark colour and unusual appearance, particularly when occurring on plants with dark bark.



Figure 5 Sooty mould growing on the foliage of a *Ficus* heavily infested with lobate lac scales
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Economic Impact

Dense infestations are associated with branch dieback of some plant species, and in severe cases, highly infested shrubs and small trees have died. However, the lobate lac scale has not been a major economic pest in commercial plant nurseries in Florida and the Caribbean but it is considered to be a common landscape pest. It frequently occurs on native plant species in natural habitats and its potential environmental impact is unknown.

Advisory Information

Lobate lac scale is difficult to manage for the following reasons: initial infestations are typically unnoticed due to their small size and the shape and colour of the scale; scales live for a long time; scales infest natural areas where pesticide use is prohibited; scales have a very wide host range; the thick, resinous coat may make scales impervious to certain insecticides; and they lack natural enemies where they have been introduced (such as the Caribbean). A root drench with a systemic insecticide may be effective against Lobate lac scale. Before using any pesticide the appropriate government body or plant protection service needs to be contacted to check the current regulation and the label instructions must be followed. For low population densities of the lobate lac scale, horticultural oil applied to the branches and twigs can effectively manage populations.

References

Hamon, A. B. & Hodges, G. S. 2013. Pest Alert. Lobate lac scale, *Paratachardina pseudolobata* Kondo & Gullan (Hemiptera: Kerriidae). <http://www.freshfromflorida.com/Divisions-Offices/Plant-Industry/Plant-Industry-Publications/Pest-Alerts>. Accessed 1st February 2017.

- Howard, F. W. & Pemberton, R. W. 2003. The lobate lac scale, a new pest of trees and shrubs in Florida: implications for the Caribbean Region. *Proc. Caribbean Food Crops Soc.* **39**: 91-94.
- Howard, F. W., Pemberton, R. W., Hodges, G. S., Steinberg, B., McLean, D. & Liu, H. 2006. The host plant range of lobate lac scale, *Paratachardina lobata*, in Florida. *Proceedings of the Florida State Horticultural Society* **120**: 308-408.
- Kondo, T. & Gullan, P. J. 2007. Taxonomic review of the lac insect genus *Paratachardina* Balachowsky (Hemiptera: Coccoidea), with a revised key to genera of Kerriidae and description of two new species. *Zootaxa* **1617**: 1-41.
- Pemberton, R. W. 2003. Invasion of *Paratachardina lobata lobata* (Hemiptera: Kerriidae) in South Florida: a snapshot sample of an infestation in a residential yard. *Florida Entomologist* **86**: 373-377.

Authors

Chris Malumphy & Sharon Reid

Address: Fera Science Ltd., Sand Hutton, York, YO41 1LZ, UK. Email: Chris.malumphy@fera.co.uk

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