


# An assessment of the Seychelles scale *Icerya seychellarum* (Westwood) as a potential insect of economic importance in South Africa

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Our attention was drawn to the scale insect *Icerya seychellarum* (Westwood) (Hemiptera: Monophlebidae), when a severe infestation was observed on a dwarf *Nandina domestica* (Berberidaceae) shrub in a garden in Stellenbosch, South Africa. This discovery represents a new host and locality record for the species.

*Icerya seychellarum* was described by Westwood (1855) from the Seychelles. It was first recorded from South Africa by Cockerell (1902) who received specimens collected from rose and *Ficus* in what is now the province KwaZulu-Natal. Cockerell (1902) considered it to be a native of South Africa rather than Mauritius or the Seychelles, but Brain & Kelly (1917) listed it as an introduced species. In 1914, it was found on palms in Durban (Brain 1915). Subsequently it has been collected intermittently in South Africa from various localities and hosts. The South African National Collection of Insects, Pretoria, houses specimens from Letsitele on litchi, Komatipoort on litchi and mango, Pretoria on *Hedera helix* and *Vitis vinifera*, Pietermaritzburg on blue gum, Isipingo on *Citrus* sp. and Boane in Mozambique on banana. Munro & Fouché (1936) also listed *Acalypha* spp., *Asparagus* spp., *Ficus carica*, *Michelia champaca*, palm and *Rosa* spp. as hosts.

Modern depictions and illustrations of the first instar nymph and adult of *I. seychellarum* are provided by Unruh & Gullan (2008). The adult female *I. seychellarum* may be easily recognised by the appearance of the white, mealy wax covering, which is arranged in about 26 distinctive tufts around the margin, an inner concentric row of approximately the same number, and a median longitudinal row of about five tufts (Fig. 1). The waxy tufts are tinged with yellow and there is also a fringe of long, fine wax threads around the body margin. Slides of the specimens collected are deposited in the South African National

Collection of Insects in Pretoria as accession number HC 7328.

Bedford (1965) investigated a heavy infestation of *I. seychellarum* on the Australian chestnut tree, *Castanospermum australe*, in the centre of Pietermaritzburg, South Africa, in 1959. It appeared that that the infestation had been severe since 1948 and that, although the insect was also abundant on several ornamental plants in gardens nearby, it was scarce in other parts of the city. He unsuccessfully tried to introduce the endoparasitic fly, *Cryptochetum monophlebi* Skuse (Diptera: Cryptochetidae), from Mauritius.

*Icerya seychellarum* has a wide distribution, with the electronic database ScaleNet listing 48 countries (García Morales *et al.* 2016). In Africa, it occurs mainly in countries along the East Coast opposite the Seychelles, such as South Africa, Malawi, Kenya, Uganda and Egypt. It is also present in many countries of the eastern hemisphere such as Pakistan, India, Sri Lanka, China, Japan, Indonesia and Australia. In Europe, it has been recorded in France, but only in Colombia, South America, in the Neotropics.

The species is highly polyphagous, with ScaleNet listing 126 genera from 57 families as hosts (García Morales *et al.* 2016). The list includes many woody plants of economic importance such as litchi, coffee, citrus, grapevine, mango, fig and avocado, but *I. seychellarum* is seldom reported as causing serious damage. In South Africa, *I. seychellarum* is found on litchi (Grové *et al.* 2014) and mango (Grové *et al.* 2017), but it is not considered to be of economic importance on the former, and it is not mentioned in a recent book on insects of cultivated plants in southern Africa (Prinsloo & Uys 2015). However, Moutia & Mamet (1946) considered it as a major pest of orchard and ornamental plants in Mauritius despite the presence of coccinellid predators and in certain areas of Egypt



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**Fig. 1.** Adult female of *Icerya seychellarum* on dwarf *Nandina domestica* (Berberidaceae).

it has become economically important on mango (Salem *et al.* 2006), apple (Mangoud 2008) and grape vines (Mangoud 2010). It has also been reported as a pest of guava and citrus in Fiji (Lever 1946) and killing citrus trees in Vanautu, an island in the South Pacific Ocean (Williams & Butcher 1987). As a phloem-feeding, honeydew-secreting insect occurring on valuable crops, *I. seychellarum* therefore has the potential of being of considerable economic importance. Newberry (1980) found that the species can significantly reduce plant growth.

The reason why *I. seychellarum* presently does not feature in crop protection strategies in South Africa is probably because it is under good biological control, like its relative *I. purchasi* (Maskell). The predatory coccinellid beetles *Rodolia cardinalis* (Mulsant) and *R. iceryae* Jenson were both found associated with *I. seychellarum* at Pietermaritzburg by Bedford (1965), although not effecting good biological control. In Egypt, Mangoud (2008, 2010) reported good biological control with releases of *R. cardinalis* on apple and grape vines, stating that this ladybird is very fast growing and can complete four generations in the time that *I. seychellarum* takes to complete one generation; when *R. cardinalis* is released into an orchard, it can control *I. seychellarum* within two months (Mangoud 2008). In addition to *Rodolia* spp., ScaleNet lists several species of hymenopteran parasitoids in the

families Aphelinidae, Encyrtidae, Eulophidae and Pteromalidae as parasitoids of *I. seychellarum* as well as the dipteroid *Cryptochetum iceryae* (García Morales *et al.* 2016).

In cases where biological control is not effective, the lack of control may be due to the presence of ants. Ants are commonly known to interfere with the parasitoids and predators of hemipteran insects from which they gather the excreted honeydew as a food source. This was the case in the biological control of the soft scale *Pulvinaria urbicola* Cockerell on Cousine Island in the Seychelles (Gaigher *et al.* 2013) where it was found that high populations of the scale on the tree *Pisonia grandis* collapsed when the ant *Pheidole megacephala* (Fabricius) was controlled. Significantly, this also happened to the populations of *I. seychellarum* which co-inhabited the trees with *P. urbicola* (Gaigher, pers. comm.).

We conclude that *I. seychellarum* has the potential to be of economic importance on several crop plants in South Africa and elsewhere, but appears to be under good biological control in most cases. Where biological control is not effective, the presence and selective removal (*e.g.* by baits or sticky barriers) of associated ants from scale insect populations should be investigated.

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