

An adventive cockroach new to Queensland: implications for the future

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Abstract

The first record of the blattelline cockroach *Margattea nimbata nimbata* (Shelford) is reported from Queensland. A population of the species was discovered inhabiting the strand flora at Clifton Beach, north of Cairns. The species was recorded initially in Australia from the Darwin, Northern Territory area in the early 1960s but has not been recorded since. It is a well-known species in South Asia. Illustrations for identification and habitat notes are provided.

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Handling editor: Peter Valentine

Citation: Rentz DCF. 2016. An adventive cockroach new to Queensland: implications for the future. *North Queensland Naturalist* 46: 47-52.

Introduction

New Year's celebrations at Clifton Beach (not far from Cairns), north Queensland, lead to sitting on the sand in the dark awaiting the fireworks (9.00 pm) (Fig. 1A-C). I noticed a few adjacent strand shrubs, mostly Sea Lettuce Tree, *Scaevola taccada* (Gaertn.) Roxb. They formed the typical narrow strand, about 1.5 m in width just above the high tide line (Fig. 1A). They were in flower and fruit and I observed a few cockroaches feeding on the flowers in the dark. Just beyond the *Scaevola* there were plantings of Mangrove Lily, *Crinum pedunculatum* R. Br. which was also in flower and attracting a few cockroaches (Fig. 1B, C).

Growing around the *Crinum*, but not beyond the *Scaevola* was a dense carpet of Singapore Daisy, *Sphagneticola trilobata* (L.) Pruski (Fig. 1A, C). This plant is considered a weed in Australia. It is native to Central America and the Caribbean as well as northern South America. It has become naturalised in many parts of the world including South Africa, the south-eastern United States, Pacific Islands as well as tropical Asia. It is valued as a ground cover and its density at Clifton Beach can be considered as a useful stabiliser of the upper dunes. Such densities along rainforest margins, for example, are

not desired as the plant soon replaces native plants and tree seedlings forming a monoculture of the daisy.

It was soon discovered that the daisies were very attractive to a number of insects, especially cockroaches. A sample revealed at least 6 species. Returning a couple of nights later with net and camera yielded an impressive list of species (Table 1). Most of them were found on the flowers of the Singapore Daisies but sweeping the net through the leaves and stems revealed large populations of most of the cockroaches. The density of the daisy plants concealed the cockroaches during the day.

The cockroach in least abundance at Clifton Beach during the two collection forays was *Margattea nimbata* (Shelford) (Fig. 2B-H). This is the first record of this species from Queensland. Rentz (2014) provided notes and an illustration of the species. It is known from continental Australia from three specimens from Holmes Jungle, Palm Creek, 15 km NE of Darwin, NT, collected by J. & L. Gressitt in 1961 (Roth, 1989) and Berry Springs, 50 km SE of Darwin also collected in 1961 by the Gressitts. *M. nimbata* has also been recorded from



Figure 1. Clifton Beach, nr Deadman's Gully (nr Cairns, Qld.).

A narrow strip of vegetation, both native and introduced and cared for by local home-owners.

A, strand flora. The taller vegetation to the right is Sea Lettuce Tree, *Scaevola taccada*, followed by a narrow gap and then a virtual monoculture of Singapore Daisy, *Sphagneticola trilobata*. Double Island in the distance. **B**, strand flora with Singapore Daisy apparently limited by salty spray from the sea.

C, walking track that impinges on the encroachment of the Singapore Daisy. In the background are larger *Scaevola* shrubs that are protected by the Coconut Palms and larger trees. **D**, the extent of the habitat utilised by 16 cockroach species. The wood barrier in the background separates the strand flora from the road. The larger trees are several species of *Eucalyptus*.

the National Park on Christmas Island, Indian Ocean. Elsewhere the species is known from Kalimantan, Borneo; Sarawak, Java, Indonesia; Kei Island, Thailand, Taiwan and Japan.

Roth (1991) recognised two subspecies based on some evidence provided earlier by Asahina and Shiraki that resulted in the synonymy of *M. kumamotonis shirakii* Asahina with *M. nimbata*. The Australian taxon is currently identified as *Margattea nimbata nimbata* (Shelford).

Identification of *Margattea nimbata*

Margattea nimbata is amongst the plainest of cockroaches (Figs. 2B-D). The surface of the insect is medium brown, like many other cockroaches.

The frons is medium to dark brown and without distinctive markings (Fig. 2F). The colour and pattern of the pronotum is deceptively variable (Figs. 2B, E). The commonest form is with dark, poorly defined lines (Fig. 2B) but a number of individuals had pronotal markings very similar to those of *Balta scripta*, a species with which it was found (Fig. 2E). See Rentz (2014) for another pronotal pattern. The most easily recognisable feature of this cockroach in both sexes is the brownish yellow colour of the abdomen which is ringed by a narrow, unbroken dark brown band (Figs. 2C, D). The male genitalia are distinctive both externally and internally. The last abdominal tergite is minutely divided. This is emphasized by

Table 1. List of cockroaches along the strand at Clifton Beach.
 “I” introduced species.

Family/Subfamily	Genus and Species
Blaberidae; Epilamprinae	<i>Calolampra</i> sp.
Blaberidae; Pycnoscelinae	<i>Pycnoscelus surinamensis</i> (L.) (I)
Ectobiidae; Blattellinae	<i>Beybienkoa kurandensis</i> Roth
Ectobiidae; Blattellinae	<i>Beybienkoa cerciflavida</i> Roth
Ectobiidae; Blattellinae	<i>Beybienkoa</i> sp. 1 (undescribed)
Ectobiidae; Blattellinae	<i>Carbrunneria marci</i> (Roth)
Ectobiidae; Blattellinae	<i>Carbrunneria barrinensis</i> (Roth)
Ectobiidae; Blattellinae	<i>Johnrehnia</i> : 2 undescribed species
Ectobiidae; Blattellinae	<i>Paarasigmoidella atypicalis</i> Roth
Ectobiidae; Blattellinae	<i>Paratemnopteryx centralensis</i> (Roth)
Ectobiidae; Pseudophyllodromiinae	<i>Balta scripta</i> Hebard
Ectobiidae; Pseudophyllodromiinae	<i>Balta verticalis</i> Hebard
Ectobiidae; Pseudophyllodromiinae	<i>Balta</i> sp. 4
Ectobiidae; Pseudophyllodromiinae	<i>Megamareta phaneroptyga</i> (Chopard)
Ectobiidae; Pseudophyllodromiinae	<i>Margattea nimbata</i> (Shelford) I
Blattidae; Polyzosteriinae	<i>Melanozosteria</i> sp.

colour (Fig. 2H & 3). The male subgenital plate bears two similar styles that are equidistant from one another with only feeble production of the middle of the subgenital plate (Fig. 2G). Internally, the male median genital phallomere terminates in a divided claw-like structure (Fig. 2H & 3, arrow). The left phallomere is very complex (Fig. 2H & 3) and bears several spine-like processes. This is the only small blattelline cockroach found along the north Queensland coast with paired styles on the male subgenital plate that are similar to one another (Fig. 2G). Both sexes are similar to one another, fully winged and capable of flight.

Balta scripta, on the other hand, with which it occurs, has silvery eyes in life (Fig. 2A) and the veins of the tegmina are considerable lighter than the cells (Fig. 2A). The frons is not reddish brown but somewhat mottled and often with a few indistinct spots. Some specimens have a light bar between the eyes (Fig. 2A). The antennae are

uniform light brown and there is no dark brown ring around the perimeter of ventral surface of the abdomen.

Measurements in mm. Males (n=10) length body 11.4-11.7. Females (n=2) length body 11.8-11.9.

Record. 17°45.586'S 145°40.387'E (Car) Clifton Beach, QLD., Upolu Rd, (nr Deadman's Gully Environmental Reserve) 31 DEC. 2015, 1 FEB. 2016 DCF Rentz, J Green, K Martin collectors, 10 males, 2 females. Specimens will be deposited in the Australian National Insect Collection, Canberra; Australian Museum, Sydney; Department of Agriculture and Water Resources (NAQS Insect Collection), Cairns Airport; Queensland Museum, Brisbane.

Discussion

It seems quite likely that *M. nimbata* is an introduced species in Australia. The fact that no additional material of the Darwin records has

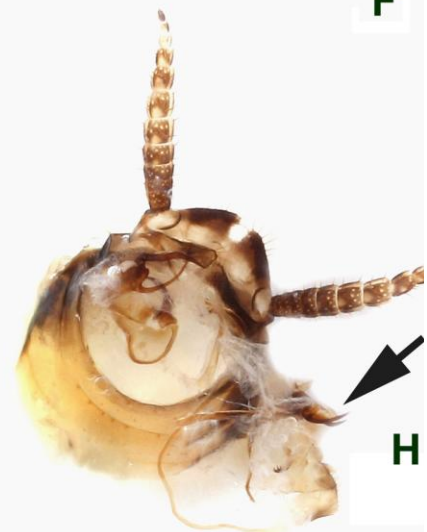


Figure 2. Caption on next page

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Figure 2. Key identification features of the cockroaches *Balta scripta* and *Margattea n. nimbata*. **A**, *Balta scripta* Hebard. Note light-coloured veins of tegmina, dark antennae and the whitish bar between the eyes. **B-H**, *Margattea n. nimbata* (Shelford). **B**, dorsal surface, female. Note relatively uniformly coloured tegmina, light coloured antennae and pronotal pattern. **C**, Ventral surface, female and **D**, ventral surface male. Note brown band around perimeter of abdomen. **E**, pronotal pattern that could be confused with that of *B. scripta*. **F**, reddish brown frons. **G**, male, ventral surface of abdomen. Note pair of similar styles. **H**, male terminalia, subgenital plate removed. Note median incision of subgenital plate and claw-like median genital phallomere (arrow). H is duplicated at larger scale as Fig. 3.



Figure 3. Male terminalia of the cockroach *Margattea n. nimbata*. The subgenital plate has been removed. Note median incision of subgenital plate and claw-like median genital phallomere, as indicated in Fig. 2H.

accrued over the years seems to indicate that the species is not well established there. However, specific collecting for cockroaches in that region has probably been minimal. There are many explanations for the Darwin records. Darwin is a port involved in Asian trade. In 1961 there was increased military activity between Australia and south Asia because of the Vietnam war. This could have led to the introduction of the cockroaches in goods or with personnel.

The cockroaches along the Queensland coast may be more recent introductions than those reported for Darwin. The present collection was made in a resort area that is frequented by many Asian tourists. With the numbers of the tourists increasing annually, the opportunity for adventive insects is also increasing. This coupled with the decline of entomological surveying and reduction of staff in the Queensland Department of Agriculture and Fisheries, Department of Agriculture and Water Resources, Universities and other monitoring agencies means that species can become naturalised years before they are discovered. Recent examples in the Cairns area are Asian Honeybees, Electric and Crazy Ants.

We searched several other localities north and south of Clifton Beach but failed to find *M. n. nimbata*. However, we found no habitats similar to that at Clifton Beach. So the species may be presently limited to that locality.

Acknowledgements

The author thanks Keith Martin, J. Green and Buck Richardson for help in collecting. Dr G. Beccaloni (Natural History Museum) is thanked for consultations. Max Moulds and YN Su are thanked for helping with the plates. Max, George and Margaret Humphrey provided helpful comments on the manuscript.

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