

New records of mango shield scale *Milviscutulus mangiferae* (Green) (Hemiptera: Coccidae) and *Brevennia rehi* (Lindinger) (Hemiptera: Pseudococcidae) in north Queensland

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Abstract The first Australian records of mango shield scale (*Milviscutulus mangiferae*) from north Queensland and additional records from parts of Papua New Guinea are presented. The majority of specimens were collected from mango leaves (*Mangifera indica*). A summary of its known distribution, other hosts, identification and damage levels is also presented. Also, the detection of rice mealybug (*Brevennia rehi*) in far north Queensland is reported for the first time. This pest is known to occur in the Northern Territory. The north Queensland detections are from native grasses. The records presented here, for both species, are regarded as new detections, rather than new incursions.

Key words *Mangifera indica*, mango, rice, rice mealybug.

INTRODUCTION

Scientists of the Northern Australia Quarantine Strategy (NAQS) carry out surveillance across northern Australia and parts of New Guinea as part of the Australian Quarantine and Inspection Service's border protection operations. Early warning of new pests likely to arrive, or recently arrived on our northern shores enhances the probability of successful application of eradication or control measures. Regularly reviewed target lists of pest species known, or suspected to occur on the nearby land masses of New Guinea, Indonesia and East Timor are used to assist in focusing the surveillance.

METHODS

During the 2004 review of the NAQS insect target list, one of the species considered for inclusion was *Milviscutulus mangiferae* (Green) (Hemiptera: Coccidae). It was not included because several NAQS surveys in Queensland had already recorded a scale insect identified as *Milviscutulus* sp.; these specimens were re-examined by the second author and identified as *M. mangiferae*. This was later confirmed by Penny Gullan, at the University of California, Davis, USA, on a selection of specimens.

During a routine NAQS survey of the Weipa area in August 2001, specimens of mealybugs were collected from grasses at the town dumps in Weipa (from *Heterachne abortiva*) and Napranum (from *Cynodon dactylon* var. *dactylon*). These were forwarded to John Donaldson at the Queensland Department of Primary Industries and Fisheries in Brisbane for his expert

identification. His provisional identification (January 2003) was *Brevennia rehi* (Lindinger) (Hemiptera: Pseudococcidae). This was later confirmed by Penny Gullan at the University of California, Davis, USA.

RESULTS

Milviscutulus mangiferae (Green). Mango shield scale

Taxonomy

Milviscutulus mangiferae (Green, 1889) (= *Lecanium mangiferae* Green; *L. psidii* Green, 1904; *L. wardi* Newstead, 1917; *L. desolatium* Green, 1922; *L. ixorae* Green, 1922; *Coccus mangiferae* (Green); *Protospulvinaria mangiferae* (Green); *P. ixorae* (Green)).

Williams and Watson (1990) provide a key to distinguish this species from others in the genus, and illustrate this species.

Distribution

This scale insect is a cosmopolitan species with a wide distribution in the Pacific area. Records from the literature include Israel, Africa, India, Sri Lanka, Bangladesh, Pakistan, Oceania (Fiji, Hawaiian Islands, Palau, Solomon Islands, Tonga, Western Samoa), Taiwan, Vietnam, Hong Kong, South and Central America, Mexico and the USA, Singapore, Malaysia, Papua New Guinea (PNG) (West Sepik=Sandaun, Central, East and West New Britain Provinces), Indonesia (Java, Irian Jaya=Papua), Thailand and the Philippines (Scalenet 2005a; Williams & Watson 1990).

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The oldest Australian records presented here are from early quarantine surveys in November 1988. Records from New Guinea (Papua and PNG) are not the first records for that island; Williams and Watson (1990) examined material from Irian Jaya and sites on the mainland of PNG. There are also records from some of the island territories such as East and West New Britain and Bougainville. However, they did not examine any material from the Western Province, NAQS records from Australia and the Western Province of PNG are published here for the first time.

Material examined

All the specimens are lodged in the Department of Primary Industries and Fisheries Insect Collection at Indooroopilly, Brisbane. Records are listed from the most northerly to most southerly. **PNG: Sandaun Province:** Vanimu, A. Postle, 25.ix.2004, ex *Mangifera indica*; **Western Province:** Rumginae Mission, J.F.G. & M. Kame, 3.ix.2003, ex *Syzygium aqueum*; Kiunga, J.F.G., 27.v.1995, ex *Ficus copiosa*; Wipim, J.F.G., 7.v.1992, ex *Annona muricata*; Daru, J.W.T., 27.xi.1989, ex *Syzygium* sp.; J.F.G., 23.xi.1990, ex *M. indica*; J.F.G., 7.vi.1999, ex *M. indica*; Sigabaduru, J.W.T., 30.xi.1989, ex *Citrus* sp.; Mabaduan, J.W.T., 29.xi.1989, ex leguminous vine; J.F.G., 25.xi.1990, ex *M. indica*; Old Mawata, J.F.G., 25.xi.1990, ex *M. indica*; Buzi, J.F.G., 27.xi.1990, ex *M. indica*; **Australia: Torres Strait:** Boigu Island, J.F.G., 12.ii.1991, ex *Syzygium suborbiculare*; Saibai Island, K.L. Anderson, 27.ii.2001, ex *Syzygium branderhorstii*; Yam Island, J.F. Donaldson, 3.iv.1990, ex *Bruguiera gymnorhiza*; Badu Island, J.F.G., 17.i.1997, ex *S. branderhorstii*; Hammond Island, J.F.G., 8.ii.2000, ex *M. indica*; J.F.G., 1.vii.1996, ex *M. indica*; Thursday Island, J.F.G., 19.x.1996, ex *M. indica*; Prince of Wales Island, J.W.T., 31.viii.1989, ex *M. indica*; **Cape York Peninsula:** Fly Point, W.H.T. Yarrow, 21.xi.1988, ex *Syzygium* sp.; Bamaga, J.W.T., 4.xi.1989, ex *Syzygium* sp.; J.W.T., 4.xi.1989, ex *Syzygium* sp.; Umagico, J.F.G., 14.i.1997, ex *S. suborbiculare*; Old Mapoon, J.F.G. & R. Davis, 24.vii.2001, ex *Planchonia careya*; Portland Roads, J.F.G., 5.x.2000, ex *M. indica*; 'Wenlock', J.F.G. & B.M. Waterhouse, 23.ix.2003, ex *M. indica*; Archer River Roadhouse, J.F.G., 26.vii.1998, ex *M. indica*; Lizard Island Resort, K.L. Anderson, 21.ii.2001, ex *M. indica*; Cape Tribulation, N. Bluthgen, 15.x.1999, ex *Acmena graveolens*; N. Bluthgen, 1.v.2002, ex *Ardisia pachyrrhachis*; N. Bluthgen, 4.vi.2002, ex *A. pachyrrhachis*; N. Bluthgen, 17.vi.2002, ex *Syzygium erythrocalyx*; Cairns, J. Royer & M. Trinca, 27.xi.2001, ex *M. indica*. (J.F.G. = Judy F. Grimshaw; J.W.T. = John W. Turner.)

Damage levels

Peña and Mohyuddin (in Litz 1997) comment that the mango shield scale damages mangoes as a result of the amount of 'honeydew' produced and the subsequent growth of sooty mould. Heavy infestations will result in reduced tree vigour and leaf size, causing yellowing of the leaves, leaf drop and

death of branches. NAQS records show that in all except a few cases the damage levels were reported to be 'light' and pest abundance on the host was 'light' to 'medium'. The preponderance of records from mango listed in this report is likely to be a reflection the focus of NAQS surveys on crops and related plants, rather than a representation of its host range.

Recorded hosts ex literature

Milviscutulus mangiferae is polyphagous; records from Scalenet (2005a) and Williams and Watson (1990) include 68 genera in 40 families, including papaya (*Carica papaya*), avocado (*Persea americana*), breadfruit (*Artocarpus altilis*), *Syzygium* spp., *Vanilla* sp., guava (*Psidium guajava*), coconut (*Cocos nucifera*), orange and lemon (*Citrus sinensis*, *C. limon*).

Brevennia rehi (Lindinger). Rice mealybug

Taxonomy

Brevennia rehi (Lindinger, 1943) (= *Ripersia sacchari oryzae* Fletcher, 1917; *Ripersia oryzae* Green, 1931; *Ripersia rehi* Lindinger, 1943 (replacement name for *Ripersia oryzae* Green); *Tychaea rehi* (Lindinger); *Heterococcus rehi* (Lindinger)).

For a description and illustration of this insect see Williams and Watson (1988).

Distribution

Brevennia rehi is a mealybug that feeds on grasses, including rice on which it can become a pest. Kalshoven (1981) in 'The Pests of Crops in Indonesia' mentions it as occurring in India, Pakistan, the Philippines and possibly at Bogor in Java. Williams (1985) in 'Australian mealybugs' records this pest from Darwin, collected from green couch *Cynodon dactylon*. Williams had previously recorded this pest from the Darwin area (Williams *et al.* 1981), where he speculated that it was recently introduced. He also recorded its presence in east New Britain Province collected in 1941 from couch grass (Williams & Watson 1988).

Material examined

All the specimens are lodged in the Department of Primary Industries and Fisheries Insect Collection at Indooroopilly, Brisbane. Records are listed from the most northerly to most southerly. **Australia: Queensland: Weipa:** 27.viii.2001, J.F. Grimshaw, ex *Heterachne abortiva*; **Napranum:** 25.viii.2001, J.F. Grimshaw, ex *C. dactylon* var *dactylon*.

Damage levels

The pest abundance recorded in Weipa and Napranum was 'medium' on the *Cynodon* species, and 'high' on the *H. abortiva*. The flower heads of *H. abortiva* comprise a large number of densely packed spikelets which overlap each other

presenting as a compact 'ball' of growth; this provides an excellent habitat for the mealybug. See Flora of Australia Vol. 44B (2005) for an illustration of this unusual grass. The damage levels were medium on both hosts.

Recorded hosts ex literature

The genus seems to be confined to grass-like monocots and in the South Pacific area is represented by this single species, which is probably introduced from South-East Asia (Williams & Watson 1988). Scalenet (2005b) lists hosts from three families: two species of *Cyperus* (including nut grass) within the Cyperaceae; *Juncellus pygmaeus* within the Juncaceae; and 32 species, from 23 genera, of Poaceae, including rice and sugarcane.

Dispersal of this pest is mainly short range by the early crawler stage walking between hosts. However, some crawlers may be dispersed on the wind over longer distances. In the adult phase, only the males are mobile and fly to the females which remain feeding on the host plant.

DISCUSSION

The records of *M. mangiferae* presented here are regarded as new detections, rather than new incursions. Damage levels on mango, noted by the collectors, have been recorded as 'light'. It is anticipated that the management practices already in operation to control other scale insects in mango production orchards will control this pest.

Williams *et al.* (1981) speculated that *B. rehi* should be considered as a potential pest of rice in Australia. However, officers within Queensland Department of Primary Industries and Fisheries responded to notification of the detection by recording that Northern Territory entomologists have reported that the insect had not become a pest there, despite its presence in the Darwin area for more than 20 years. This experience indicates that the rice mealybug is unlikely to become a threat to field crops or ornamental plants in Queensland.

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