

What is a lace bug?

Lace bugs are small insects, usually 3 to 4 mm in length; they comprise the family Tingidae within the order Hemiptera (the true bugs). Lace bugs have piercing/sucking mouthparts, which they use to pierce plant tissues to feed on sap. Lace bugs get their name from the pattern of cells on their hemelytra and thorax, and the complex ornamentation of some species. Their small size makes them hard to detect with the naked eye, but they are readily distinguishable under a hand lens or microscope.

Life history

Most lace bugs feed on the leaves of plants, though some species feed on flowers. Lace bugs can cause damage to plant tissues through their feeding. Each lace bug species typically feeds on very specific plants; the plant species, or hosts, are often closely related to each other, like *Grevillea* and *Macadamia*.

Eggs are laid within plant tissues, and nymphs emerge within a few days. The nymphs remain near where they hatch, and feed in the same manner as adults. However, nymphs lack wings, and undergo 5 stages, called instars, before they become adults. Adults are able to fly, and disperse readily between populations. Recent genetic studies indicate that adults are able to disperse considerable distances, with populations up to 20 km apart being highly related to one another. This ability enables lace bugs to rapidly recolonise areas where they have been eradicated.

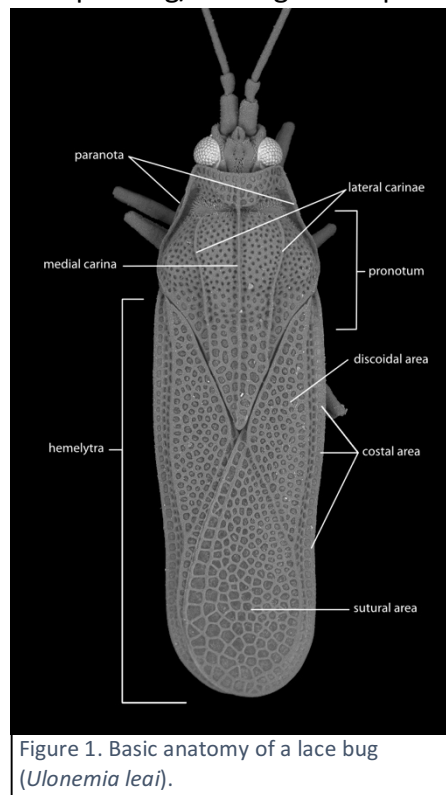


Figure 1. Basic anatomy of a lace bug (*Ulonemia lei*).



Figure 2. Lace bug damage to a macadamia flower.

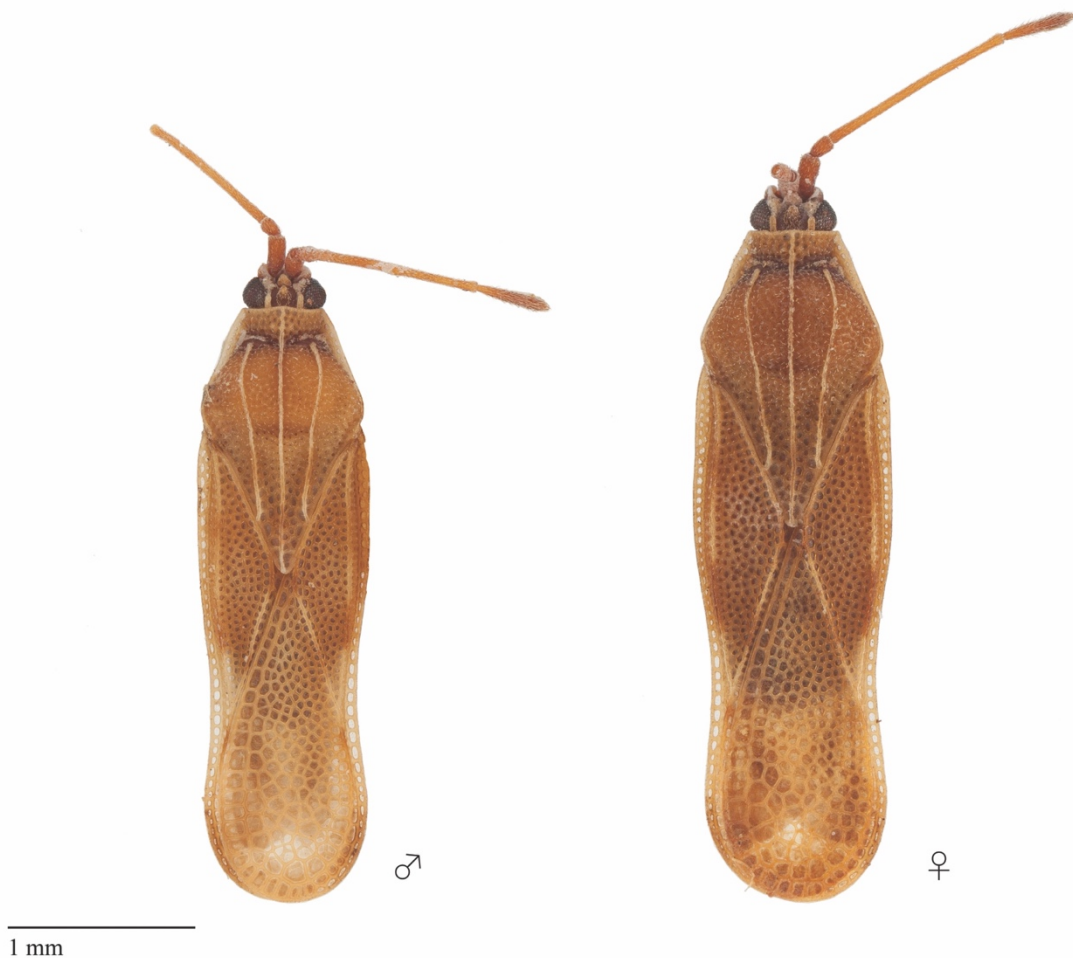
Impact on macadamias

Several species of lace bugs in the genus *Ulonemia*, which are native to Australia, have become important agricultural pests and are responsible for major economic losses within the macadamia industry. They feed on and damage macadamia flowers, and their populations can build up rapidly if left unchecked. Recent changes to industry regulations and lack of knowledge on these insects has led to difficulties with their control. The varying life histories and host plants between species means that proper identification is crucial so that a proper management regime can be enacted.

Identification

The next section serves as an identification guide to lace bugs found on macadamias in Australia, as well as an additional related species that occurs in macadamia growing regions and may have pest potential.

Ulonemia concava



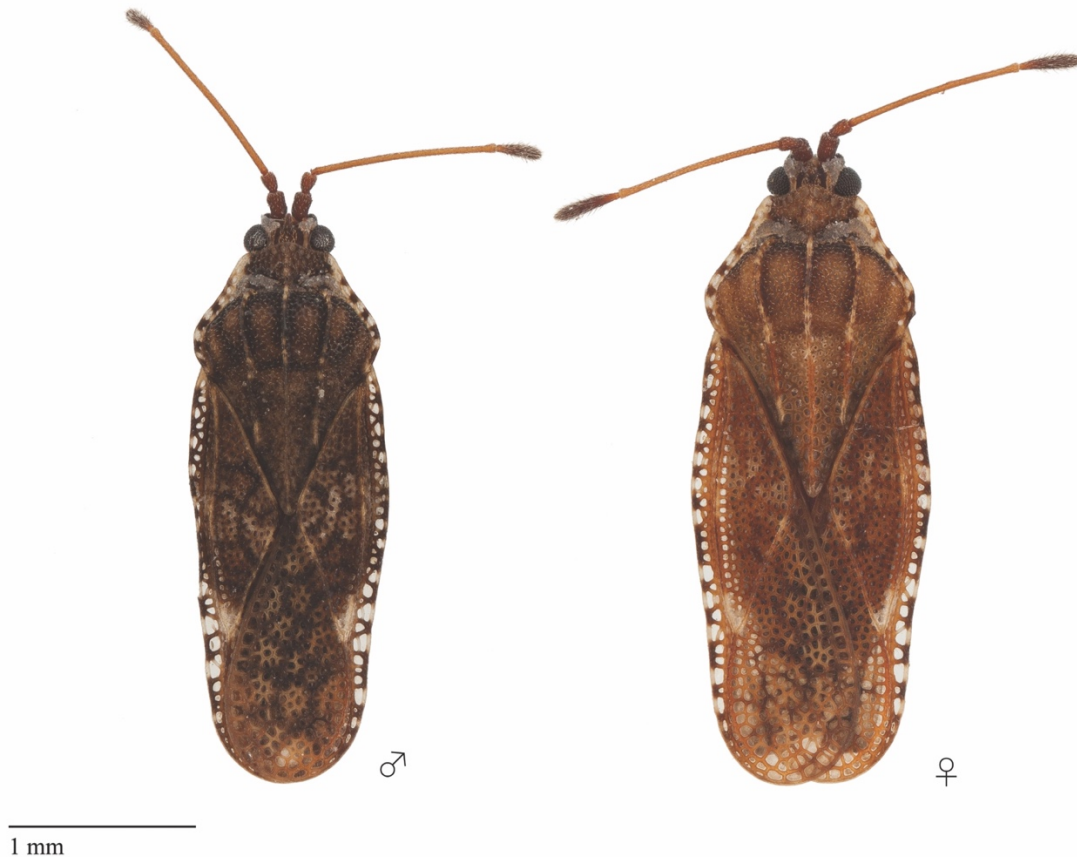
- 3.4-3.9 mm in length
- Dark eyes
- “Narrow-waisted”: wings narrow and then flare out again to approximately the width of the body
- Paranota appear fused to the thorax
- Front of thorax mostly straight
- Found on macadamias
- Previously collected from Maleny (likely occurs in nearby regions)
- Last confirmed sighting in 1967

Ulonemia decoris



- 3.1-3.6 mm in length
- Red eyes
- “Narrow-waisted”: wings narrow and then flare out again to approximately the width of the body
- Paranota raised away from thorax, with many small cells visible
- Wings with large inverted heart-shaped dark brown or black marking
- Found on macadamias
- Major pest that can cause considerable nut loss
- Southeast Queensland from Gympie to Mt. Glorious, Beerwah, south to Springbrook National Park; North-eastern New South Wales from the Border Ranges, across the Northern Rivers region, south to at least Nambucca

Ulonemia new species



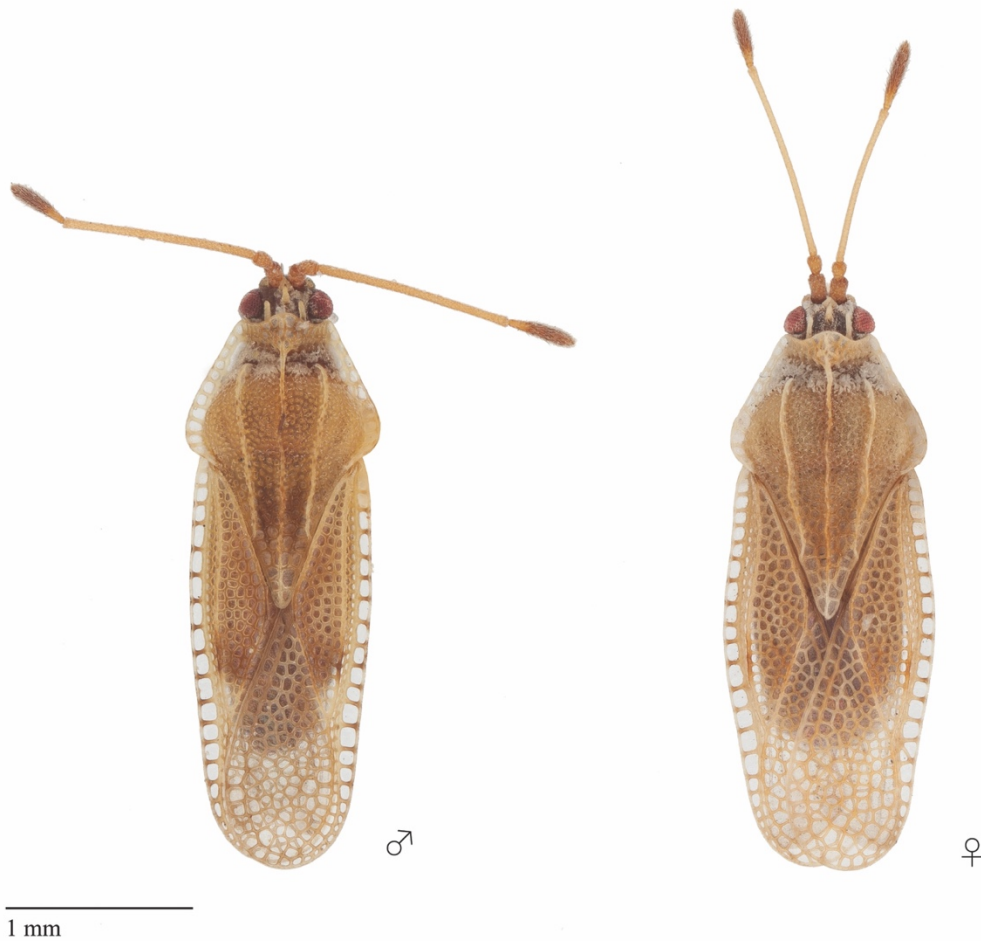
- 2.8-3.4 mm in length
- Dark eyes
- Reddish-brown to black reticulate pattern on hemelytra
- Cells in costal area irregularly shaped (rather than roughly rectangular)
- Wing ends narrower than the width of the body
- Paranota raised away from thorax, 1-2 cell rows visible
- Found on macadamias
- Major pest that can cause considerable nut loss
- Southeast Queensland from Gympie to Mt. Glorious, Beerwah, south to Springbrook National Park, a single specimen is known from Bundaberg; North-eastern New South Wales from the Border Ranges, and across the Northern Rivers region

Ulonemia leai



- 3.1-3.6 mm in length
- Red eyes
- Wings ends narrower than body, less “narrow-waisted” than *U. concava* or *U. decoris*
- Paranota almost appearing fused with thorax, but a single row of cells is visible along their entire length
- Front of thorax noticeably curved
- Found on macadamias and silky oak (*Grevillea robusta*)
- Major pest that can cause considerable nut loss
- Wet tropics and Atherton Tableland in Queensland; recently collected 1,400 km south near Springbrook National Park, likely widespread across eastern Queensland

Ulonemia mjobergi



- 3.0-3.5 mm in length
- Red eyes
- Wings ends narrower than body
- Paranota raised away from thorax, single row of cells clearly visible
- Front of thorax noticeably curved forward in the middle
- Cells of costal region large and square-like
- Found on various *Grevillea* species
- Not yet recorded from macadamias, but is closely related to pest species, and occurs near macadamia growing areas
- From the Kimberley in northern Western Australia, across the Top End into northern Queensland including Cape York, south to around Mareeba, isolated record from White Mountains National Park; recent record from the Glasshouse Mountains in south-eastern Queensland

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