

Two new species of the Australian planthopper genus *Solonaima* Kirkaldy (Hemiptera: Fulgoromorpha: Cixiidae)

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Abstract

Two new epigean species of the cixiid genus *Solonaima* Kirkaldy, which is endemic in eastern Australia, are described from Queensland (Lamington National Park) and New South Wales (Rosebank): *S. nielseni* n. sp. and *S. monteithia* n.sp.

Keywords: Hemiptera, Fulgoromorpha, Cixiidae, *Solonaima*, new species, Australia

Introduction

The genus *Solonaima* has hitherto been represented by 7 epigean and 6 cavernicolous species (Hoch 1988, Hoch & Howarth 1989). It appears to be monophyletic on the basis of morphological characters in the male and female genitalia regarded as synapomorphies (Hoch & Howarth 1989). *Solonaima* has been shown to be an excellent model to study cave adaptation (Hoch & Howarth 1989): within *Solonaima* several separate lineages colonized caves and adapted to a life underground. These cavernicolous species are found in limestone caves in the Chillagoe and Mt. Mulgrave Karst areas as well as lava tubes in Undara. They display various degrees of troglomorphy (reduction of eyes, wings and bodily pigment) and include troglophilic (facultative cave species) as well as highly modified, blind, flight- and pigmentless obligately cavernicolous (troglobitic) species (Hoch and Howarth 1989).

Epigean *Solonaima* species were known from Queensland only (Hoch 1988). Since then, additional *Solonaima* specimens were discovered in the Australian National Insect Collection (CSIRO, Canberra) and in the collection of the University of Queensland, Brisbane. Examination of this material revealed the existence of two more *Solonaima* species from Queensland and, for the first time, from New South Wales. They differ significantly from all other congeners and are described below.

Type specimens are deposited in the Australian National Insect Collection, Canberra, Australia (ANIC) and the University of Queensland Insect Collection, Brisbane, Australia (U.Q.I.C.)

Measurements of body length equal the distance between the apex of head and distal margin of tegmen.

Solonaima Kirkaldy, 1906

Solonaima Kirkaldy, 1906: 396 (type species *Solonaima solonaima* Kirkaldy, 1906, by monotypy).
Talaloa Distant, 1907: 297 (type species *Talaloa pallescens* Distant, 1907), by original designation, synonymized by Muir, 1925: 104.

For generic diagnosis see Hoch (1988) and Hoch & Howarth (1989).

Solonaima nielseni n.sp.

(Figs 1–4, 6–11)

Type material. Holotype-male: 7mls. West of Rosebank, NSW, 4.March 1965, M.S. Upton, in ANIC; Paratypes — 1 male: Lamington National Park, Queensland, 28. Jan.–3. Feb. 1963, G. Monteith, in U.Q.I.C.; 1 female: same data as holotype.

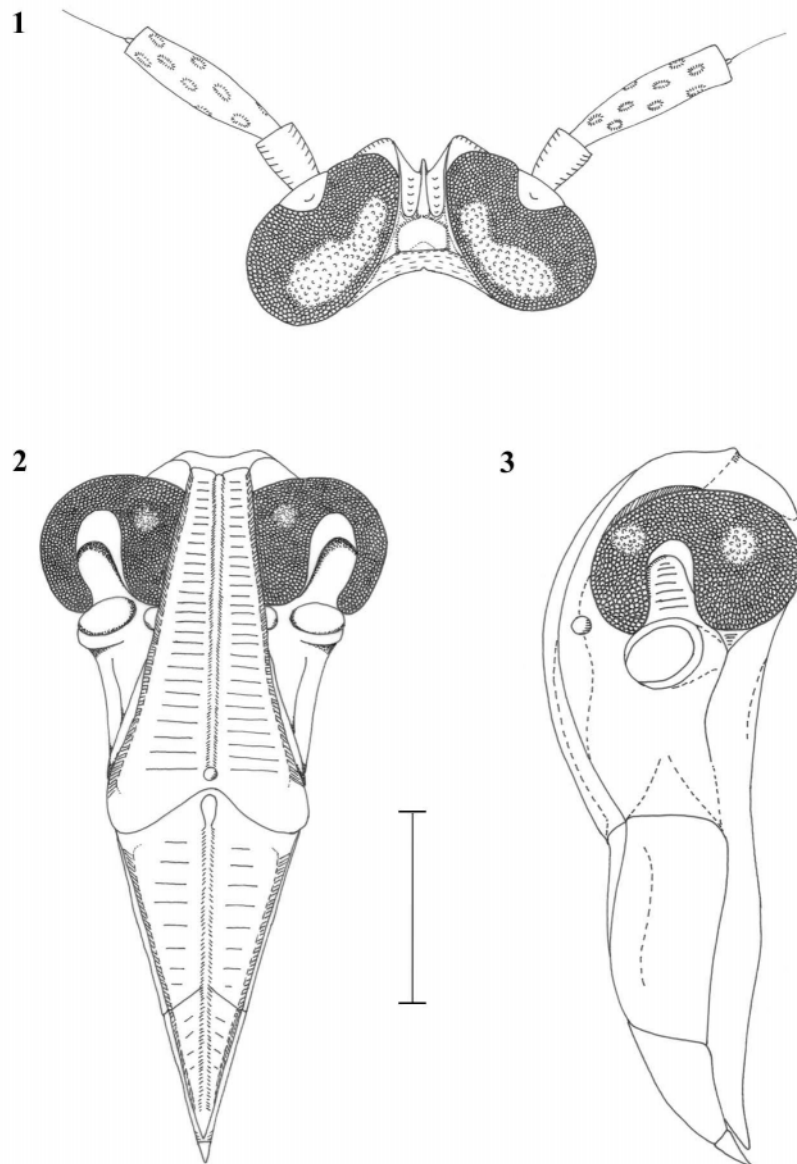
Description. Body generally dark brown. Tegmen translucent, with dark brown markings along distal and proximal crossveins and inner apical cell, pterostigma distinct. Total length. Holotype: 7.8 mm; male paratype: 7.7 mm; female paratype: 9.1 mm.

Head. Anterior portion of vertex nearly pentagonal, about as long in midline as basally wide. Frons twice as long as maximum width, with median carina sharply ridged; area of frons concave. Post- and anteclypeus together only slightly shorter than frons. Second antennal segment about 3 times as long as first.

Thorax. Pronotum about as long as anterior portion of vertex, and 1.4 times as wide as maximum width of head. Mesonotum in midline about 9.3 times the length of pronotum. Basal tarsal segment of hind leg with 7, second tarsal segment with 6 to 7 apical teeth. Tegmen about 2.4 times as long as maximally wide. Longitudinal veins inconspicuously papillate.

Male genitalia. Genital segment in lateral aspect relatively broad with laterodorsal margins rounded. Anal segment in dorsal aspect nearly ovate, distal part broadened and slightly bent ventrad. Parameres slender, apically dilated, with dorsal tip acute and directed cephalad. Basal part of aedeagus with laterally on each side with a short terete spine directed caudad. Basal part of aedeagus with dorsal portion differentiated into a sub-apical ear-shaped lobe and a more acute process, both forming a groove through which a long and slender, terete spine which arises subapically on the right side of the aedeagal basis, is lead to the left side. Distal part of aedeagus bispinose, with both spines arising at

mid-length of membranous distal part: the longer spine in repose curved basoventrad, the shorter one curved dorsobasad. Distal part of aedeagus apically granulate.



FIGURES 1–3. *Solonaima nielsenii* n. sp., head. 1, dorsal aspect; 2, ventral aspect; 3, lateral aspect (holotype). Scale bar 0.5 mm.

Female genitalia: as in other congeners with complete ensiform ovipositor and median dorsoventral division of wax-secreting area of the 9th tergite (see Hoch & Howarth 1989).

Etymology. Named in honor of the late Ebbe Schmidt Nielsen, former director of the Australian National Insect Collection, CSIRO, Canberra.

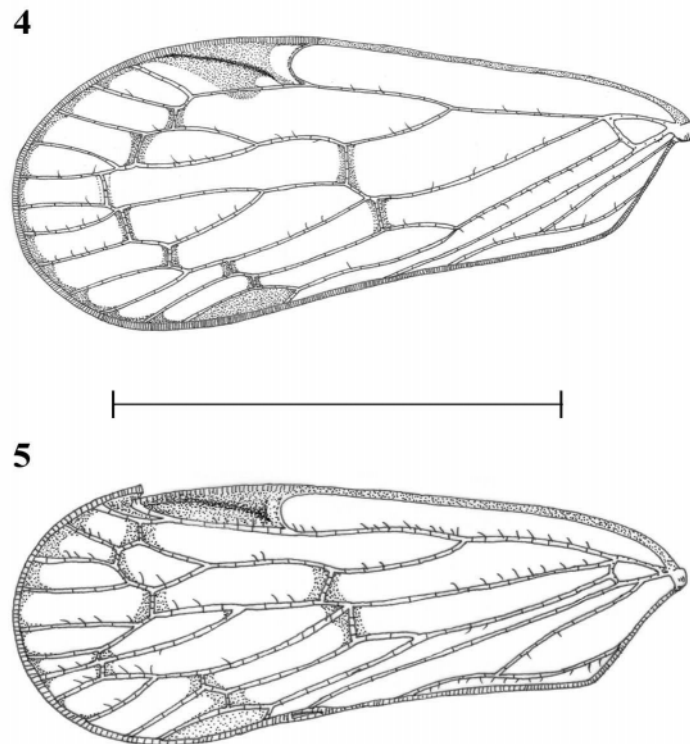


FIGURE 4. *Solonaima nielsenii* n. sp., tegmen (holotype). Scale bar 5 mm. **FIGURE 5.** *Solonaima monteithia* n. sp., tegmen (holotype). Scale bar 5 mm.

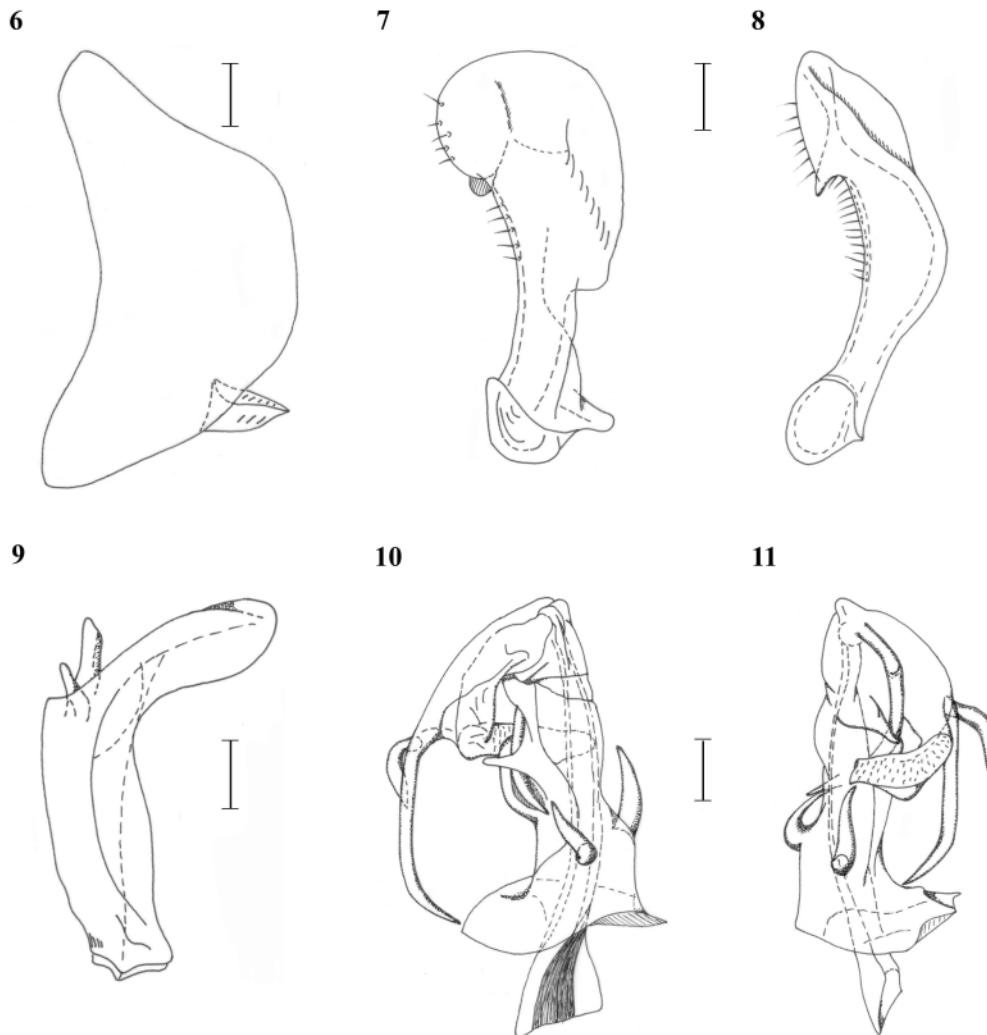
Distribution. Known from localities in Queensland and New South Wales, the species expands the range of the genus to NSW.

***Solonaima monteithia* n. sp.**
(Figs 5, 13–18)

Type material. Holotype – male (head missing), Lamington Nationalpark, Queensland, 28. Jan.– 3. Feb., G. Monteith, U.Q.I.C. Female unknown.

Description. Generally dark brown. Tegmen translucent, with conspicuous dark brown markings along distal and proximal crossveins and inner apical cell, pterostigma distinct. Total length is not measurable since in the only known specimen of the species the head is missing. Body length (anterior margin of pronotum to tip of abdomen: 3.6 mm).

Thorax. Mesonotum in midline about 6.3 times the length of pronotum. Hind legs missing. Tegmen about 2.6 times as long as wide. Longitudinal veins inconspicuously papillate.



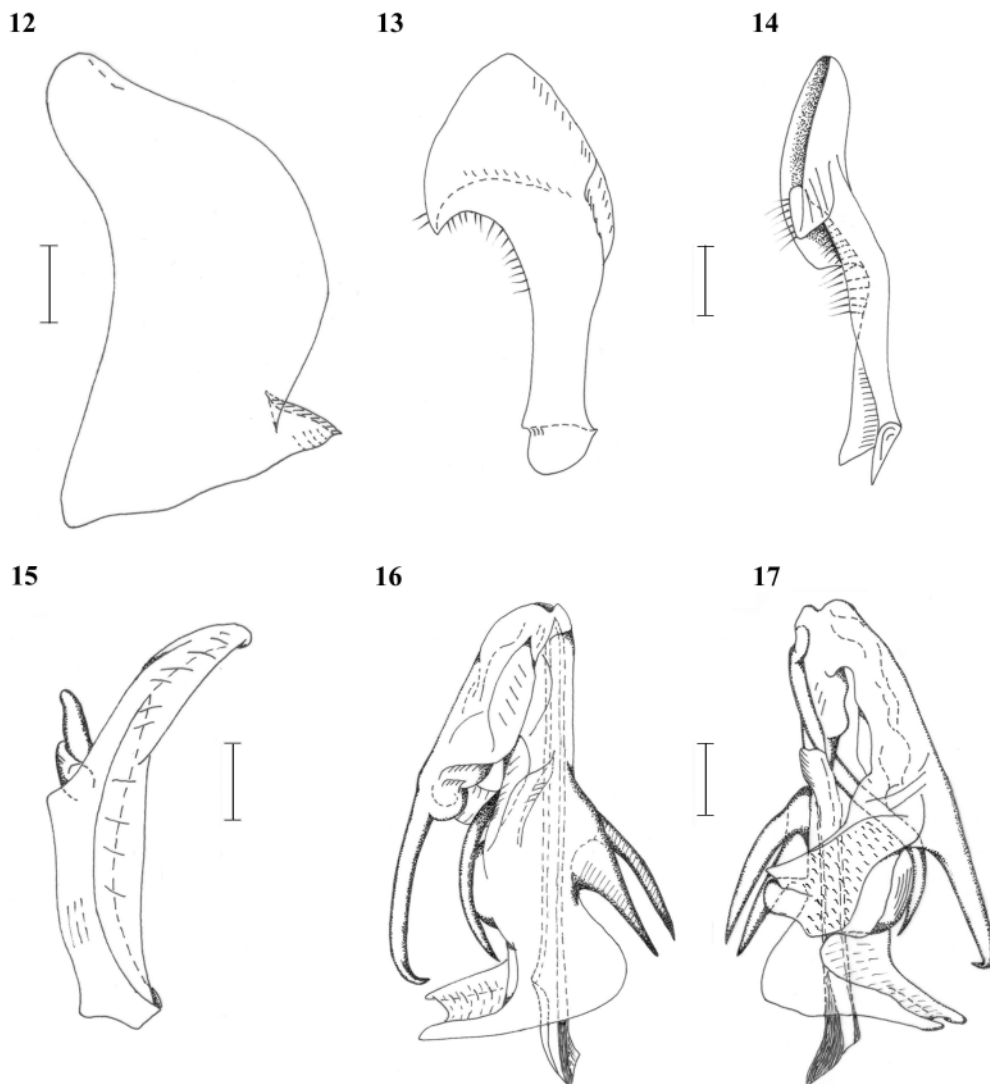
FIGURES 6–11. *Solonaima nielseni* n. sp., male genitalia (holotype). 6, genital segment, left lateral aspect; 7, left paramere, lateral aspect; 8, same, dorsal aspect; 9, anal segment, left lateral aspect; 10, aedeagus, left lateral aspect; 11, same, right lateral aspect. Scale bars 0.1 mm.

Male genitalia. Genital segment in lateral aspect relatively broad with all margins rounded. Anal segment nearly ovate, hood-like and slender. Parameres comparatively broad at base, apically dilated, dorsal tip acute and directed cephalad. Basal part of aedeagus ventrally with two prominent terete spines arising from a common basis, directed basad. Basal part of aedeagus with dorsal portion differentiated into a subapical fold and a bulbous protrusion basad of it, both forming a groove for a long, slender, terete spine, which arises subapically on the right side of the aedeagal basis, in repose passing through the groove to the left side. Distal part of the aedeagus with a long, massive spine, arising at

midlength of distal part and is curved basolaterad to the left side. Distal part of aedeagus apically granulate.

Female genitalia. Female unknown.

Etymology. Named in honor of our colleague Geoff Monteith, Queensland Museum, Brisbane, who collected the only known specimen of this species.



FIGURES 12–17. *Solonaima monteithia* n. sp., male genitalia (holotype). 12, genital segment, left lateral aspect; 13, left paramere, left lateral aspect; 14, same, dorsal aspect; 15, anal segment, left lateral aspect; 16, aedeagus, left lateral aspect; 17, same, right lateral aspect. Scale bars 0.1 mm.

Remarks. We base our decision to describe this taxon as a new species on the configuration of the male genitalia which does not appear to lie inside the range of variability of any of the other *Solonaima* species where male specimens are available. *S. ornata* Hoch, 1988, the only *Solonaima* species which was described on the basis of a single female differs from other congeners by an obsolete median carina of the frons and a distinct color pattern of the tegmina. Although the head configuration is unknown in *S. monteithia*, the color pattern of the tegmina differs significantly ; thus we assume that *S. monteithia* and *S. ornata* belong to separate reproductive entities.

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