

## A new species of deltocephaline leafhoppers of the genus *Horouta* from Barrow Island, Western Australia (Hemiptera: Cicadellidae)

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**Abstract** - The new species *Horouta darwini* is described from Barrow Island, Western Australia. The genus *Horouta* Knight, originally described as an endemic taxon in New Zealand, now contains seven Australian species and a single New Zealand species. *H. darwini* represents the first record of the genus in Western Australia. Most described species show some degree of brachyptery.

### INTRODUCTION

The leafhopper genus *Horouta* Knight, 1975, was created for the single endemic New Zealand species *Horouta inconstans* Knight, 1975. For almost thirty years, the genus was regarded as a New Zealand endemic but Fletcher (2004) added six Australian species to the genus, two of which were new and four of which were transferred from other genera in which they had been erroneously placed. This changed the status of the genus from endemic New Zealand to primarily Australian with a single representative, the type species, in New Zealand. The Australian records provided by Fletcher (2004) were all from Qld, NSW, Victoria and Tasmania but this paper now extends the known distribution of the genus to Barrow Island, Western Australia.

Barrow Island is a 202 square km nature reserve situated about 70 km off the Pilbara coast of Western Australia. Its arid climate supports flat spinifex grasslands dotted with termite mounds and sandhills. It was once a turtle fishery but the island became the site of Western Australia's first commercial oil field in 1967. More recently, the Gorgon Gas Development was established to utilise large natural gas reserves under the Timor Sea and, because of the environmental sensitivity of the island, major environmental surveys were initiated to monitor possible impacts of this development (Majer *et al.* 2008a, 2008b).

These surveys have revealed a number of novel forms of Auchenorrhyncha, a summary of which was provided by Fletcher and Moir (2008). One of these is a new species of *Horouta* and is described herein in honour of Charles Darwin.

### MATERIALS AND METHODS

The specimens examined here were collected into ethanol from which they were subsequently

removed and pinned. Male genitalia were examined after the abdomen was removed and cleared, some in 10% potassium hydroxide, and others in Proteinase K for DNA isolation. Specimens were examined under Leitz TS microscope, and images were photographed using a Micropublisher 5 RTV digital camera (QImaging) through a Leica MZ12.5 stereomicroscope and montaged images produced with AutoMontage Pro (Synchroscope Pty Ltd). Line illustrations were prepared using Photoshop® CS from pencil originals scanned with an HP Scanjet 7400C scanner using the technique described in Fletcher (2008).

The following abbreviations have been used in this paper: ASCU, NSW Agricultural Scientific Collections Unit, Orange, New South Wales; WAM, Western Australian Museum, Perth, Western Australia.

### Family Cicadellidae Latreille, 1825

### Subfamily Deltocephalinae Dallas, 1870

### Genus *Horouta* Knight, 1975

*Horouta* Knight, 1975: 205.

### Type species

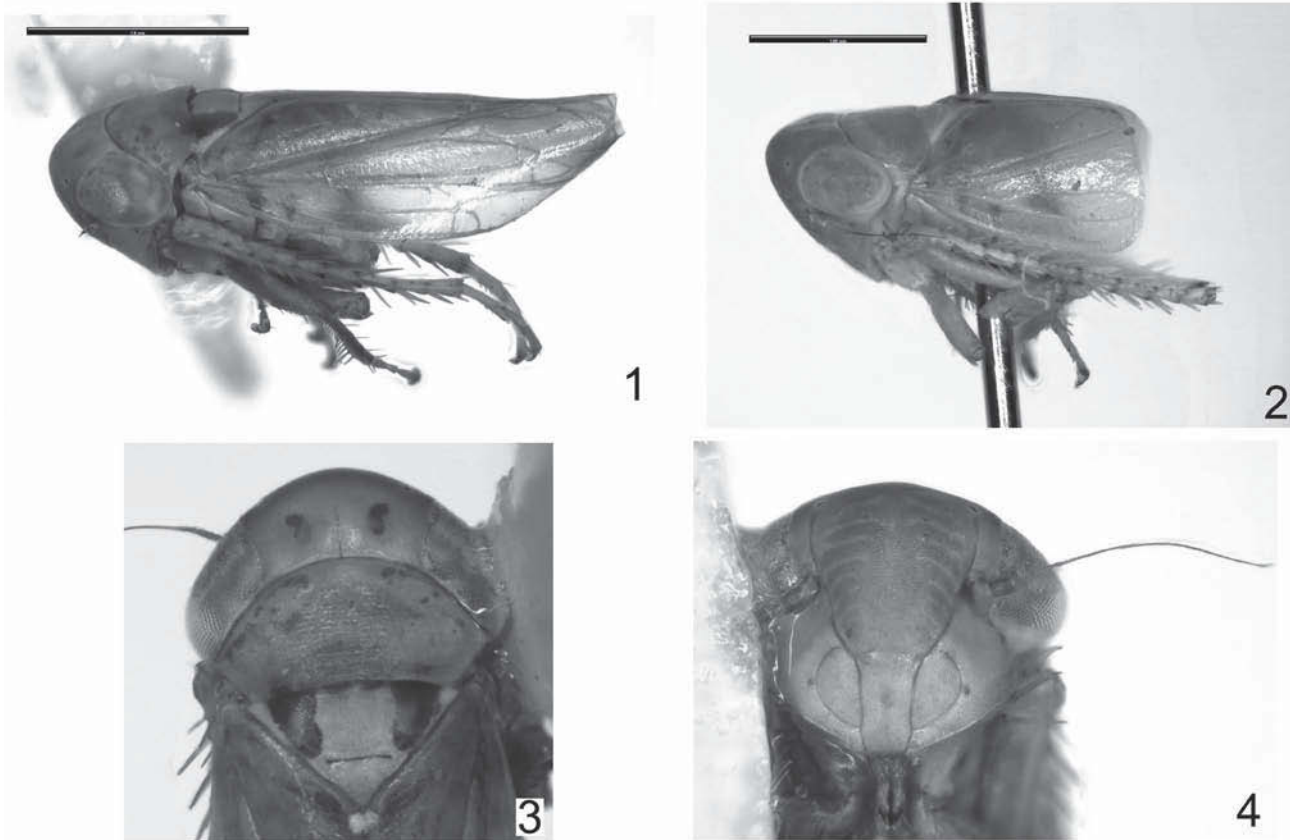
*Horouta inconstans* Knight, 1975, by original designation.

### *Horouta darwini* sp. nov. Figures 1–11

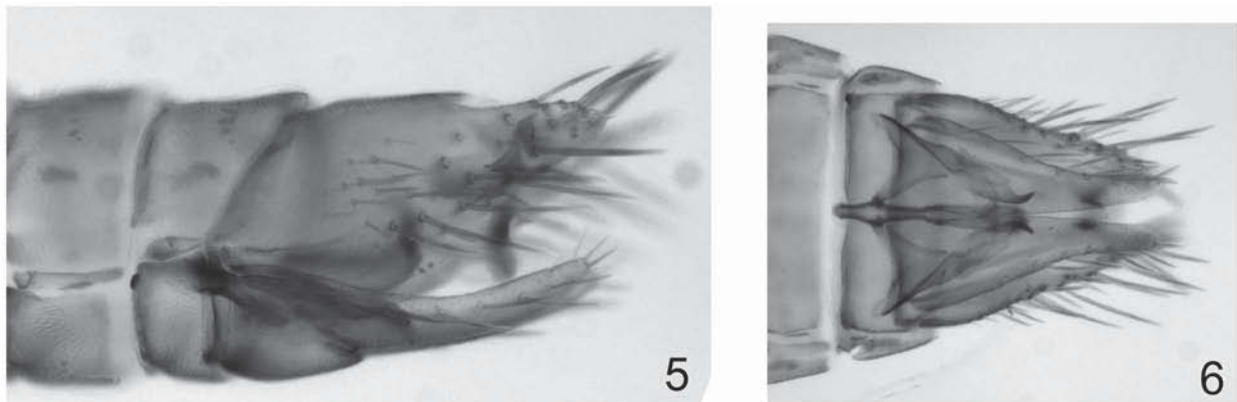
### Material examined

#### Holotype

Australia: Western Australia: ♂, Barrow Island,



Figures 1–4 *Horouta darwini*, sp. nov. 1, habitus, holotype male; 2, habitus, paratype female; 3, dorsum, holotype; 4, face, holotype. Scale line = 1 mm



Figures 5–6 *Horouta darwini*, sp. nov. paratype, male terminalia: 5, lateral view; 6, ventral view.

site GP2, 20°47'38"S, 115°27'27"E, 15 March 2006, S. Callan and R. Graham (WAM Entomology Registration No. 71379).

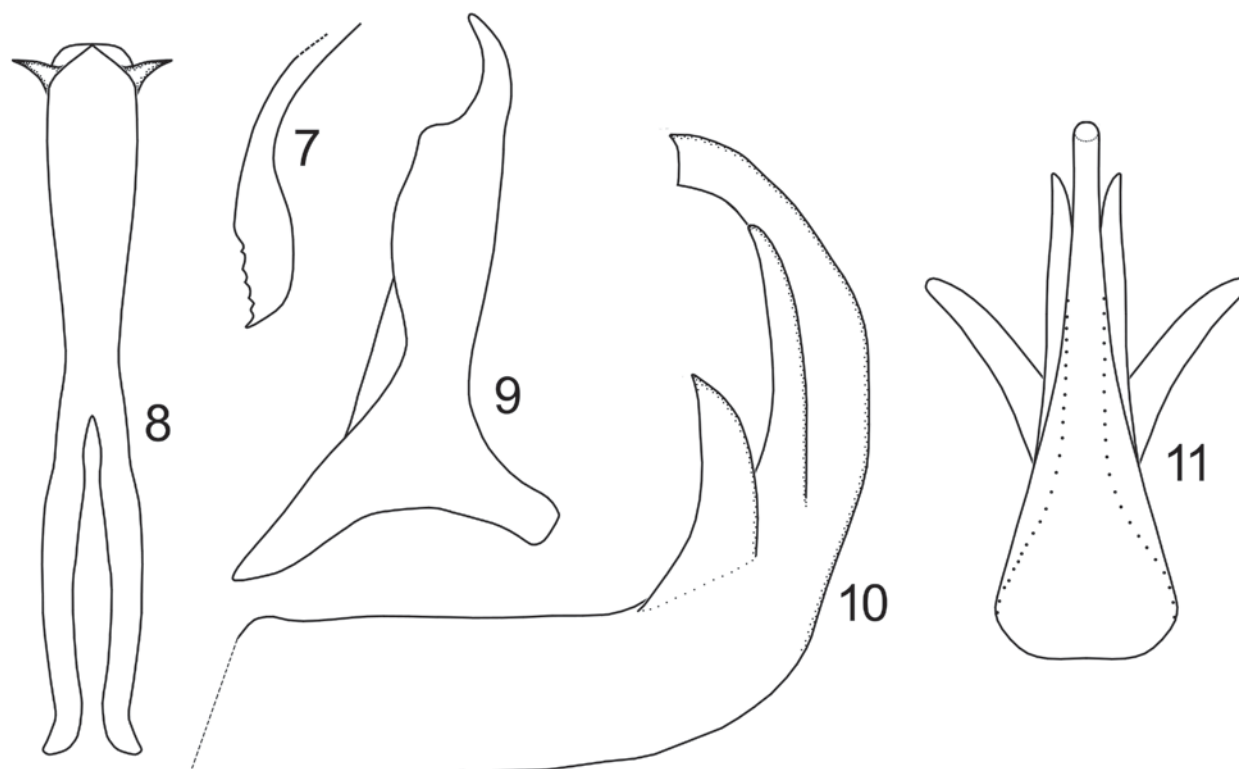
#### Paratypes

**Australia: Western Australia:** 1 ♂, same data as holotype but site GP8, 20°47'59"S 115°26'25"E (ASCU); 1 ♂, same data as holotype but site GP6, 20°47'05"S 115°26'28"E (ASCU); 1 ♂, same data as holotype but site GPX, 20°47'45"S 115°27'08"E (ASCU); 1 ♂, same data as holotype but site GP7, 20°47'51"S 115°26'27"E (WAM); 1 ♂, same data as holotype but site CC2, 20°49'02"S 115°26'23"E

(WAM); 1 ♂, same data as holotype but site N11, 20°48'52"S 115°22'32"E, 6 May 2006 (WAM); 1 ♀, same data as previous but site N05, 20°51'53"S 115°24'24"E (WAM).

#### Diagnosis

*Horouta darwini* differs from all other species of the genus, except for *H. spinosa* Fletcher, by the presence of well developed pygofer processes. In *H. spinosa* the processes extend transversely while in *H. darwini* they are mounted dorsally and curve forwards along the margin of the pygofer then ventrally as parallel processes. In addition, the



**Figures 7–11** *Horouta darwini*, sp. nov.: 7, pygofer process, lateral view; 8, connective and base of aedeagus, ventral view; 9, paramere; 10, aedeagus, lateral view; 11, aedeagus, posterior view.

subbasal processes on the aedeagus extend dorsally in *H. darwini* but are directed posteriorly in *H. spinosa*. The head is more angulate anteriorly in *H. spinosa* than in *H. darwini* in which the anterior margin of the head is broadly rounded.

## Description

### Adults

Total length: male, macropterous (Figure 1) (n=7) 2.4–2.8 mm (mean=2.61 mm); female, brachypterous (Figure 2) (n=1) 2.8 mm (estimate).

Colour: Entirely pale brown, tending to slightly darker around apex of head, except for apex of labium and bases of tibia spines which are dark brown (Figures 1–4).

Male genitalia: Pygofer (Figure 5) elongated posteriorly and covered with macrosetae increasing in length from near base to apex of posterior lobe. Inner margins of posterior lobes each bearing elongate process extending along margin then curving ventrally, apically leaf-shaped with anterior margin bearing short, irregular teeth (Figure 7). In posterior view, processes extend ventrally parallel to each other. Subgenital plates (Figure 6) narrow triangular, almost acuminate apically with single marginal row of seven macrosetae extending entire length except at very base and small group of short macrosetae at very apex of plate. Parameres (Figure

9) narrow with narrow, curved apical process and small preapical shoulder. Connective (Figure 8) fused with base of aedeagus, with long arms parallel to each other. Aedeagus (Figures 10–11) with elongate basal half extending posteriorly, then curving dorsally and finally anteriorly at very apex. Two pairs of elongate, triangular processes at point where shaft curves dorsally, the inner extending towards apex of shaft, the outer pair shorter and curving outwards from shaft. Gonopore apical.

## Etymology

This species is named in honour of Charles Darwin to mark the 200<sup>th</sup> anniversary of his birth and the 150<sup>th</sup> anniversary of the publication of “The Origin of Species” (Darwin 1859) one of the foundation publications in modern evolutionary science.

## Remarks

The number of different collecting sites in this list indicates that the species is quite widespread across the island. A number of collecting methods were used in the surveys, including pitfall trapping, suction sampling, beating and hand collecting (both diurnal and nocturnal) but the samples from the 2006 survey were pooled for each site and no information is therefore available on the methods used to collect particular specimens.

## DISCUSSION

This is the first record of the genus *Horouta* in Western Australia, all other species being limited to eastern coastal localities with the single species, *H. inconstans* endemic to New Zealand (Fletcher 2004). This indicates that further species may eventually be found across central or northern Australia. Most of the species show distinct brachyptery with only *H. jahmoi* Fletcher being macropterous in all known specimens. However, since only two specimens are known of this species there is a possibility that a brachypterous form of *H. jahmoi* also exists. *Horouta lotis* (Kirkaldy) and *H. inconstans* are known in both a macropterous and a brachypterous form with Knight (1975) indicating that *H. inconstans* is also known in a semimacropterous form. *Horouta austrina* (Kirkaldy) is only known in a semimacropterous form with the wings extended to near the apex of the abdomen. All the known specimens of *H. spinosa*, *H. aristarche* and *H. perparous* are brachypterous and, as the latter two species are well represented in collections, if macroptery exists, it is very uncommon. In *H. darwini*, the only known female is brachypterous (Figure 2) while the holotype (Figure 1) and all other paratypes are macropterous males.

## ACKNOWLEDGEMENTS

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Water, Heritage and the Arts, has provided funding support for taxonomic work on the Australian Deltocephalinae.

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