AUSTRALIAN JOURNAL of ENTOMOLOGY

Australian Journal of Entomology (2009) **48**, 29–35

The Australian endemic woodwasp genus *Austrocyrta* Riek (Hymenoptera: Xiphydriidae)

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Abstract The Australian xiphydriid woodwasp genus *Austrocyrta*, previously known only from a single species, *A. australiensis* Riek, is revised. A second distinctive species from Carnarvon National Park in south-central Queensland, *A. fasciculata* Jennings & Austin, sp. nov., is described, and a key to separate the males of the two species is provided.

Key words Derecyrtinae, Symphyta, taxonomy, Xiphydrioidea.

INTRODUCTION

Xiphydriid woodwasps are worldwide in distribution, except Africa (Smith 1978; Taeger & Blank 2006). In Australia there are four described species in two subfamilies of Xiphydriidae; Derecyrtinae Ashmead (*sensu* Benson 1954) (1 sp.) and Xiphydriinae Ashmead (*sensu* Benson 1954) (3 spp.) (Smith 1978; Jennings *et al.* 2007). Derecyrtinae are Gondwanan in distribution, and comprises three genera restricted to Central and South America: *Brachyxiphus* Philippi (3 spp.), *Derecyrta* F. Smith (13 spp.), *Steirocephala* Benson (4 spp.) (Benson 1954; Smith 1978, 1988, 1995a,b, 2004; Mecke *et al.* 2000), and the monotypic Australian genus *Austrocyrta* Riek (Riek 1955).

Riek (1955) proposed *Austrocyrta* and included a single species, *A. australiensis* Riek, primarily on the basis of the shape of the pronotal collar being 'produced caudally into a rounded eminence on either side of the meson' (the midline) and the hind tarsus which bears short rounded 'pulvilli' (plantulae – *sensu* Schulmeister 2003).

As part of a revision of Australian Xiphydriidae, a distinctive new species of *Austrocyrta* from Carnarvon National Park (NP), south-central Queensland is described based on a series of male specimens. *Austrocyrta australiensis* is redescribed, and the distribution of the two species is discussed. A key to separate the males of the two species is provided.

MATERIALS AND METHODS

Images were taken using a Nikon DXM1200 digital camera attached to a Leica MZ16 microscope, and captured with Auto-Montage software ver. 4.02.0014. Terms for surface sculpturing follow Harris (1979) and morphological terms generally follow Huber and Sharkey (1993). Where morphometric measurements are based on more than one specimen, data are presented as the mean followed by the range. Character states that are the same as for the generic diagnosis are generally not repeated in the species descriptions.

Abbreviations for institutions that are the repository of specimens are as follows: Australian National Insect Collection, Canberra (ANIC); Museum of Victoria, Melbourne (MVMA); Queensland Museum, Brisbane; University of Queensland Insect Collection, St Lucia (UQIC); and Waite Insect and Nematode Collection, The University of Adelaide, Adelaide (WINC).

Systematics

According to Benson (1954) and Smith (1988, 1995b), among characters which define the Derecyrtinae are: (1) pronotal collar not deeply emarginate in front; hind femur not swollen (three to seven times as long as broad); (2) hind claw enlarged and at least 1.5 times as long as middle claw; and (3) mesoscutellum with a clearly defined dorsal area margined by a carina and usually with a prominent tubercle near its apex. Benson (1954) also proposed two tribes, Derecyrtini (*Derecyrta* and *Steirocephala*) and Brachyxiphini (*Brachyxiphus*). A key character originally used to separate these tribes was the presence of fore wing vein 2r in Brachyxiphini and its absence in Derecyrtini (Benson 1954). Since *D. beechei* Smith from Chile, which possesses fore wing vein 2r, was included in Derecyrtinae (Smith 1995b), the presence/absence of this vein is no longer applicable to separate the tribes. Characters used to separate Derecyrtini from Brachyxiphini include: (1) surface sculpturing and setation of vertex and gena (almost impunctate posteriorly and glabrous in Derecyrtinae, whereas Brachyxiphini have long hairs and, vertex and gena are usually dull and punctate); (2) shape of hind femur (swollen medially, approximately 3–5 times as long as broad in Derecyrtinae, but

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doi:10.1111/j.1440-6055.2008.00680.x

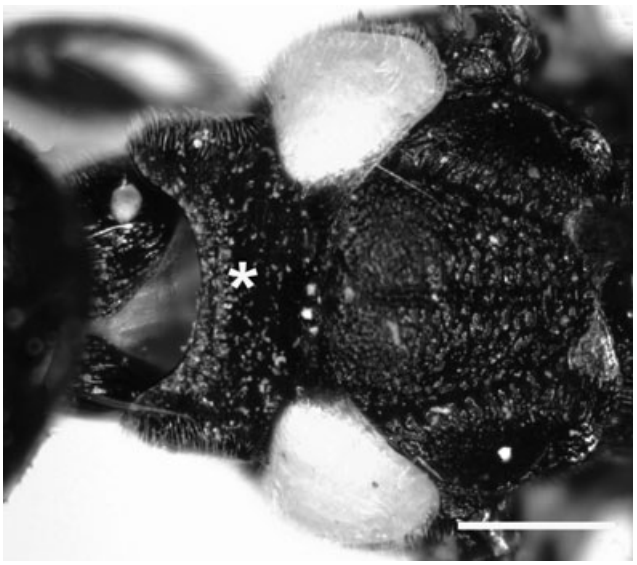


Fig. 1. Pronotum and mesocutum of *Austrocyrta australiensis*, allotype male, dorsal view, showing pronotal collar (*). Scale bar = 0.5 mm.

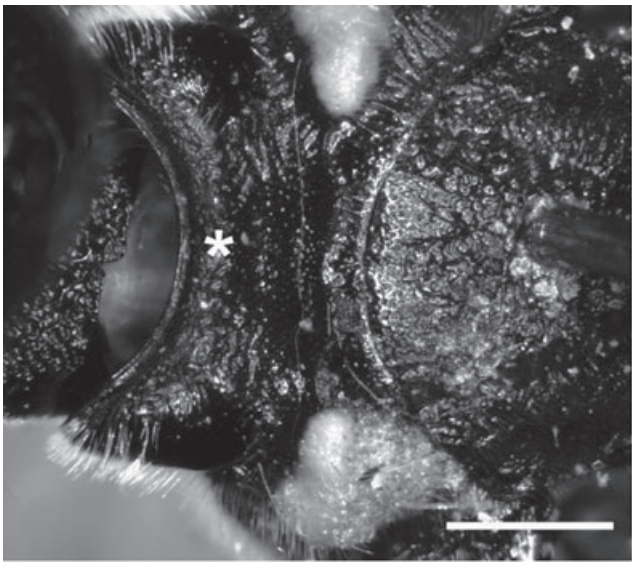


Fig. 2. Pronotum and mesocutum of *Austrocyrta fasciculata*, paratype male, dorsal view, showing pronotal collar (*). Scale bar = 0.5 mm.

slender and nearly seven times longer than broad in Brachyxiphini); and (3) length of apical hind tarsal segment of female (shorter than basitarus in Derecyrtinae, much longer than basitarsus in Brachyxiphini) (Benson 1954; Smith 1995a).

Genus *Austrocyrta* Riek

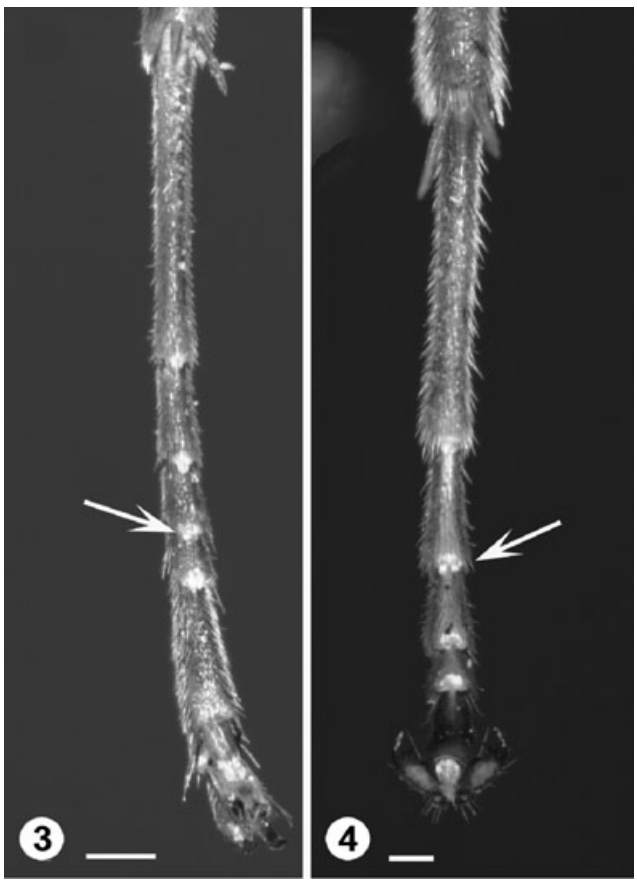
Austrocyrta (Riek 1955, p. 282). By original designation.
Type species. Austrocyrta australiensis Riek (1955).

Diagnosis

Maxillary palp 7-segmented. Labial palp 4-segmented, apical segment longer than first segment, clavate. Malar depression on gena without raised carinate margin. Vertex and gena largely glabrous and shiny. Antenna with 17–23 flagellomeres. Pronotal collar emarginate at midline, total emargination approximately 0.85 × remaining medial length of collar (Figs 1,2). Hind femur swollen medially, approximately 3–5 times as long as broad. Small bilobed tarsal plantulae present distally on segments 1–4 (Figs 3,4). Fore wing vein 2r absent (Fig. 5).

Comments

Austrocyrta clearly belongs in the subfamily Derecyrtinae as it possesses the characters of the subfamily as defined by Benson (1954) and modified by Smith (1995b), including a clearly defined dorsal area margined by a carina on the mesoscutellum and a prominent tubercle near its apex. The emargination of the posterior margin of the pronotum is shallow, vertex and gena of head almost impunctate posteriorly and glabrous, and the hind femur is swollen medially, approximately 3–5 times as long as broad.



Figs 3,4. Left hind tarsus showing distal bilobed plantulae (arrowed) of: (**3**) *Austrocyrta australiensis*, female; (**4**) *Austrocyrta fasciculata*, paratype male. Scale bars = 0.2 mm.

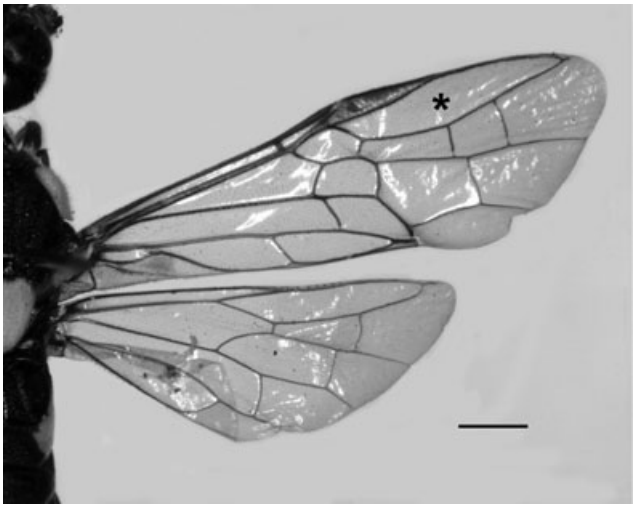


Fig. 5. Right wings of *Austrocyrta australiensis*, female; fore wing vein 2r absent (*). Scale bar = 1 mm.

Within the Derecyrtini, *Austrocyrta* differs from the other two genera, both from Central and South America, as follows: *Steirocephala* has a well-developed genal carina on the lower lateral margin of the head (Benson 1954) which is absent in both *Derecyrta* (Smith 1988) and *Austrocyrta*, and both *Steirocephala* (Smith 1988) and *Austrocyrta* have tarsal plantulae which are lacking in *Derecyrta* (Riek 1955; Smith 1988) suggested that *Austrocyrta* is allied to the South American *Steirocephala*, although he did not place the genus into Benson's (1954) tribal classification.

In Australia, the only other xiphydriids known to occur is *Rhysacephala* Benson (Xiphydriinae). *Austrocyrta* is readily distinguished from the three species, *R. leai* (Forsius), *R. obtusiventris* (Rohwer) and *R. wilsoni* Benson, all of which lack the carina and tubercle on the mesoscutellum (Benson 1954; Riek 1955; Jennings *et al.* 2007), possess fore wing vein 2r (Jennings *et al.* 2007), and lack bilobed tarsal plantulae.

Key to *Austrocyrta* males

1 Abdomen 2.0 × length thorax (2.2–2.3 × in female), tergites not convex at centre (Fig. 6); abdomen dark brown, with yellow patch laterally on segments 2 and 9 (female lacks patch on segment 9); antennae with 19 flagellomeres (23 in female); distance between antennal sockets 2.0 × distance between an antennal socket and front of clypeus …… *Austrocyrta australiensis* Riek.

Abdomen 2.6 (2.5–2.8) × length thorax, tergites distinctly convex at centre (Fig. 7); abdomen black except segments 2–5 orange centrally, segment 8 orange in posterior three-quarters, and segment 9 entirely orange; antennae with 17 flagellomeres (female unknown); distance between antennal sockets 1.5 × distance between an antennal socket and front of clypeus…… *A. fasciculata* Jennings & Austin sp. nov.

Fig. 6. Habitus of *Austrocyrta australiensis*, allotype male. Scale bar = 1.0 mm.

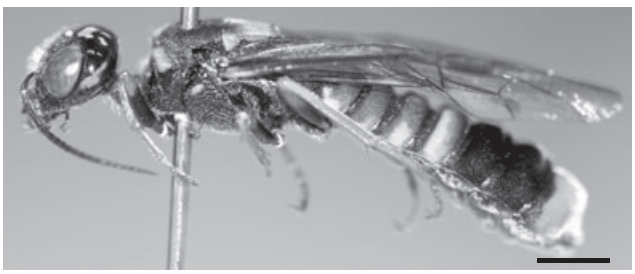


Fig. 7. Habitus of *Austrocyrta fasciculata*, paratype male. Scale bar = 1 mm.

Austrocyrta australiensis Riek 1955 (Figs 1,3,5,6,8–11)

Austrocyrta australiensis Riek (1955, p. 282).

Types

Queensland. Holotype female, Brisbane, 20.ix.1942, Ian Common (ANIC). Right antenna with last 10 flagellomeres and right hind tarsus missing. **Victoria.** Allotype male, Beaconsfield, 8.xii.1923, G.F. Hill (MVMA). **Other material examined. Victoria.** 1 female, Ringwood, 23.xi.1934, K. Guichard (ANIC). **New South Wales.** 1 female, Styx River, 21.xii.1959, E.F. Riek (ANIC).

Description

Female. Length 10.3 (10.0–11.0) mm, excluding sheath (Fig. 9). Head and thorax black with yellow markings on lateral pronotum, scutellum and basal third of hind tibia. Mesoscutellum yellow, apical tubercle yellow. Tibiae and tarsi brown, lighter on fore leg. Cenchri cream. Abdomen dark brown, with yellow patch laterally on segment 2. Wings with a slight pale brown tint.

Head. 1.4 (1.3–1.5) × wider than long when viewed dorsally (Fig. 10). Face rugose. Distance between antennal sockets 2 × distance between an antennal socket and front

Fig. 8. Distribution of *Austrocyrta* in: (a) eastern Australia; (b) Carnarvon National Park, Queensland. ● = *A. australiensis* and ▲ = *A. fasciculata.*

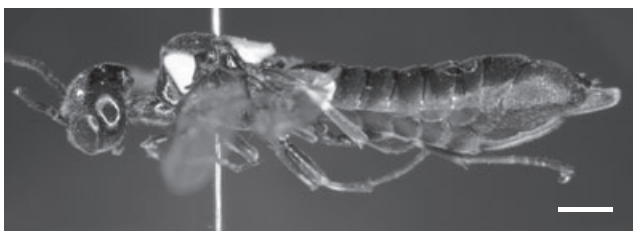


Fig. 9. Habitus of *Austrocyrta australiensis*, female. Scale bar = 1.0 mm.

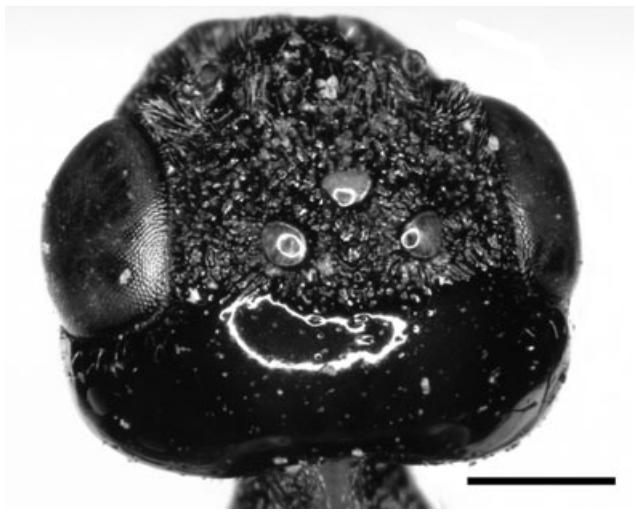


Fig. 10. Head of *Austrocyrta australiensis*, allotype male, dorsal view. Scale bar = 0.5 mm.

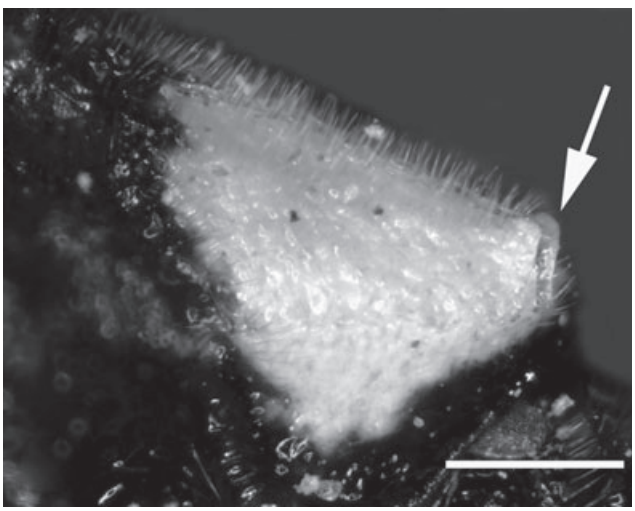


Fig. 11. Mesoscutellum of *Austrocyrta australiensis*, allotype male, dorsolateral view, showing tubercule (arrow). Scale bar = 0.5 mm.

of clypeus. Vertex shiny, glabrous, except for a few scattered shallow punctures posteromedially, rugulose around ocelli except posteriorly (Fig. 10). Gena shiny, punctulate. Malar space 0.25 × height of eye. Clypeus punctate. Antenna with 23 flagellomeres, scape 2.1 × length pedicel, first flagellomere 0.9 × length of scape, 1.6 × as long as second flagellomere. Pedicel 1.5 × longer than wide.

Thorax. Lateral corner of pronotal collar weakly punctulate (Fig. 1). Mesoscutum rugose, mesoscutellum, axilla, metascutellum, metapostnotum, mesepisternum, mesopleuron and metapleuron rugulose. Hind femur 3.3 × as long as broad.

Fig. 12. Head of *Austrocyrta fasciculata*, paratype male, dorsal view. Scale bar = 0.5 mm.

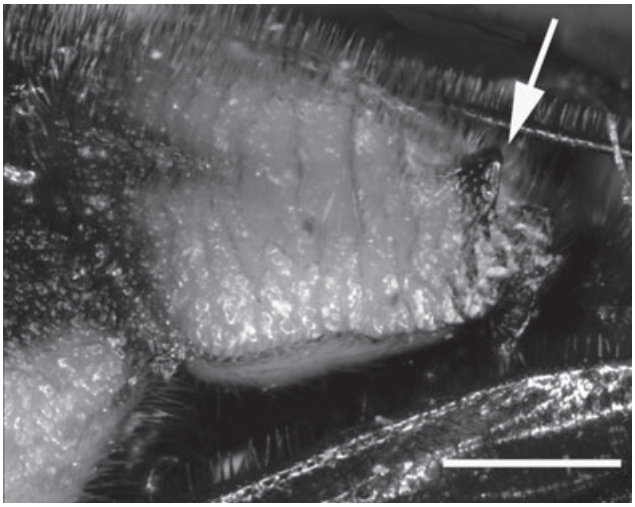


Fig. 13. Mesoscutellum of *Austrocyrta fasciculata*, paratype male, dorsolateral view, showing tubercule (arrow). Scale bar = 0.5 mm.

Hind femur 0.7 (0.6–0.8) × length hind tibia. Hind basitarsus 0.75 (0.7–0.8) × length remaining segments combined. Hind wing with 12 hamuli.

Abdomen. 2.3 (2.20–2.33) × length thorax (Fig. 9). Tergites not convex (Fig. 9), rugose-punctate, except T1 smooth with scattered punctures.

Male. Similar to female except length 8.5 mm; basal third of all tibiae and apex of femora yellow, abdominal segment 9 with large yellow patch laterally; antenna with 19 flagellomeres; hind femur 3.8 × as long as broad; hind basitarsus 0.6 × length remaining segments combined; abdomen 2.0 × length thorax.

Remarks

It should be noted that, as indicated by Riek (1955), the holotype has been affected by cyanide, with the various yellow markings appearing dark orange-red, and the abdomen very dark, almost black.

Both sexes of *A. australiensis* are similar, although the male has fewer flagellomeres (19 compared with 23 in female) and is a little smaller. For a comparison of the two species, see remarks under *A. fasciculata.*

In the past 50 years, only one additional specimen has been collected (from the Styx River, northern NSW – see Fig. 8). Although there is an apparently broad, or possibly disjunct, distribution of this species in eastern Australia, clearly further collecting is required to elucidate the very large gaps in the distribution. The host plant(s) remain(s) unknown.

Austrocyrta fasciculata Jennings & Austin, sp. n. (Figs 2,4,7,8,12,13)

Types

Queensland. Holotype. Male, Carnarvon NP, Mt Moffat Section, 1130 m, summit of Mount Rugged, 24.54°S 148.0°E, 24.xi.1995, D.K. Yeates & C.J. Burwell (UQIC). **Paratypes. Queensland**. 3 males, Carnarvon NP, Mt Moffat Section, 1130 m, summit of Mount Rugged, 24.54°S 148.0°E, 24.xi.1995, D.K. Yeates & C.J. Burwell (UQIC); 3 males, same data, C.J. Burwell (Queensland Museum, Brisbane); 2 males, Carnarvon NP, Mt Moffat Section, 1097 m, summit of Mount Moffatt, sweeping above *Callitris* spp., 24.xi.1999, J.T. Jennings & P. Gillespie (WINC).

Description

Male. Length 13.3 (10.9–16.1) mm (Fig. 7). Head black except for irregular shaped orange spots on vertex posterior to each lateral ocellus and on gena between eye and occipital carina. Face below antennal insertions yellow, variable amounts of brown on base and apex of scape and on pedicel, mandible brown with black margins. Thorax black except dorsal corners of pronotum, mesoscutellum (tubercle black) and spot on axillae and mesopleuron orange, cenchri pale orange, legs orange brown except variable amounts of black on coxae and femorae. Abdomen black except segments 2–5 orange centrally, segment 8 orange in posterior three-quarters and segment 9 almost entirely orange. Wings with a pale brown tint.

Head. 1.3 (1.1–1.5) × wider than long when viewed dorsally (Fig. 12). Face rugose-striate dorsally, punctate ventrally (in yellow patch). Distance between antennal sockets 1.5 × distance between an antennal socket and front of clypeus. Vertex shiny, glabrous, except rugulose immediately behind ocelli (Fig. 12). Gena shiny, almost smooth. Malar space 0.2 × height of eye. Clypeus punctate. 17 flagellomeres, scape 2.5 (2.2–2.9) × length pedicel, first flagellomere 1.0 (0.8–1.1) length of scape, 2.3 (2.0–2.6) × as long as second flagellomere. Pedicel 1.4 (1.2–2.0) × longer than wide.

Thorax. Lateral corner of pronotal collar weakly punctulate. Axilla, metascutellum, metapostnotum, mesepisternum,

mesopleuron and metapleuron rugulose. Mesoscutellum strigate (Fig. 13). Hind femur 4.3 (3.6–4.6) × as long as broad. Hind femur 1.5 (1.1–2.0) × length hind tibia. Hind basitarsus 0.8 (0.7–0.9) × length remaining segments combined. Hind wing with 9–11 hamuli.

Abdomen. 2.6 (2.5–2.8) × length thorax. Tergites distinctly convex at centre (Fig. 7), rugose-punctate.

Female. Unknown.

Etymology. The species name is derived from the Latin for 'banded', referring to the banded appearance of the abdomen.

Remarks

The males of the two species can be readily separated by the character states given in the key. The male of *A. australiensis* has a body length of 8.5 mm (10.0–11.0 mm in the female) compared with 13.3 (10.9–16.1) mm for *A. fasciculata.*

This species has been collected on the summits of Mt Moffatt and Mt Rugged, Carnarvon NP, south-central Queensland (Fig. 8). The Mt Moffatt section of the park is approximately 220 km north of Mitchell, which is itself approximately 590 km west of Brisbane (Fig. 8b). This southern section of the Park is a mosaic of open woodlands, forests and plains, with numerous sandstone ridges and outcrops, including Mt Moffatt (1097 m) (Fig. 8b). Mt Rugged (1130 m) is north of Mt Moffatt (Fig. 8b). Given the number of ridges and outcrops in and around the area, it would not be surprising to find this species is more widespread than collecting to date would indicate. It is also interesting to note that the occurrence of this species is very remote from the locations where *A. australiensis* has been collected (Fig. 8).

Although two males were collected sweeping above white cypress pine (*Callitris glaucophylla*) on the summit of Mt Moffatt (Fig. 14), there is no indication that this is the host plant.

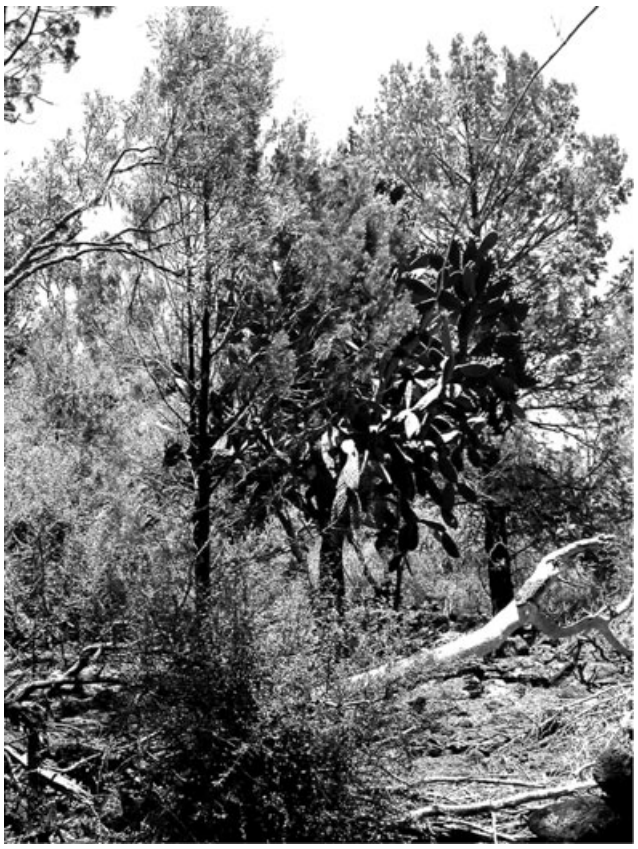


Fig. 14. Summit of Mt Moffatt showing white cypress pine (*Callitris glaucophylla*) along with velvety tree pear (*Opuntia tomentosa*).

ACKNOWLEDGEMENTS

We thank the various curators for access to specimens; Greg Daniels, University of Queensland Insect Collection, for organising two collecting trips to Carnarvon NP in 1999 and 2005; David Smith, Smithsonian Institution, and Lars Krogmann for providing valuable comments on an early version of the manuscript; and Lars Krogmann for photographic expertise. This work was carried out with the assistance of an Australian Biological Resources Study grant to JTJ and NMS.

REFERENCES

Benson RB. 1954. Classification of the Xiphydriidae (Hymenoptera). *Transactions of the Royal Entomological Society of London* **105**, 151–162.

Harris RA. 1979. A glossary of surface sculpturing. *Californian Department of Food and Agriculture, Bureau of Entomology, Occasional Papers* **28**, 1–28.

Huber JT & Sharkey MJ. 1993. Structure. In: *Hymenoptera of the World: An Identification Guide to Families* (eds H Goulet & JT Huber), pp. 13–59. Research Branch, Agriculture Canada, Ottawa, Canada. Publication 1894/E.

Jennings JT, Austin AD & Schiff NM. 2007. *Rhysacephala novacaledonicus* sp. nov. (Hymenoptera: Xiphydriidae), the first xiphydriid woodwasp recorded from New Caledonia. *Zootaxa* **1516**, 23–30.

Mecke R, Barbosa MC & Engels W. 2000. A new Brazilian sawfly, *Derecyrta araucariae* spec. nov. (Hymenoptera: Xiphydriidae), associated with *Araucaria angustifolia* (Bert.) O. Kuntze. *Journal of the Kansas Entomological Society* **73**, 177–182.

Riek EF. 1955. The Australian Xiphydriidae (Hymenoptera: Symphyta). *Australian Journal of Zoology* **3**, 281–285.

Schulmeister S. 2003. Morphology and evolution of the tarsal plantulae in Hymenoptera (Insecta), focussing on the basal lineages. *Zoologica Scripta* **32**, 153–172.

Smith DR 1978. Suborder Symphyta (Xyelidae, Pararchexyelidae, Parapamphiliidae, Xyelydidae, Karatavitidae, Gigasirididae, Sepulcidae, Pseudosiricidae, Anaxyelidae, Siricidae, Xiphydriidae, Paroryssidae, Xyelotomidae, Blasticotomidae, Pergidae). In: *Hymenopterorum Catalogus* (eds J van der Vecht & RD Shenefelt), p. 198, Pars 14. W. Junk, The Hague, the Netherlands.

Smith DR. 1988. A synopsis of the sawflies (Hymenoptera: Symphyta) of America south of the United States: introduction, Xyelidae, Pamphiliidae, Cimbicidae, Diprionidae, Xiphydriidae, Siricidae, Orussidae, Cephidae. *Systematic Entomology* **13**, 205–261.

Smith DR. 1995a. Rediscovery of *Corynophilus pumilus* (Klug), and a new genus and two new species of Symphyta from South America (Hymenoptera, Pergidae & Xiphydriidae). *Revista Brazileira de Entomologia* **39**, 161–169.

Smith DR. 1995b. A new species of Xiphydriidae (Hymenoptera) from Chile. *Revista Chileana de Entomología* **22**, 21–24.

Smith DR. 2004. A new species of *Derecyrta* Smith (Hymenoptera: Xiphydriidae) from Colombia and Ecuador. *Proceedings of the Entomological Society of Washington* **106**, 675–678.

Taeger A & Blank SM. 2006. ECatSym – electronic world catalog of symphyta (insecta, hymenoptera). – version 2.0 (11 August, 2006), ecatsym online service müncheberg. [Cited 12 May 2007.] Available from URL: http://www.zalf.de/home_zalf/institute/dei/php_e/ecatsym/ecatsym.php

Accepted for publication 7 June 2008.