

# Two new species of the Australian bee fly genus *Comptosia* (Diptera: Bombyliidae) from Barrow Island, Western Australia

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**ABSTRACT** – Two new species of the bee fly genus *Comptosia* Macquart from Western Australia, *C. barrowensis* and *C. karijinii*, are described.

**KEYWORDS:** taxonomy, *Comptosia*, *C. barrowensis* sp. nov., *C. karijinii* sp. nov.

## INTRODUCTION

The Australian bee fly genus *Comptosia* was first erected by Macquart in 1840 and has received several revisions (Rondani 1863; Schiner 1868; Hardy 1921, 1941; Edwards 1934; Bowden 1971; Hull 1973; Evenhuis 1980). The latest revisions by Yeates (1988, 1990, 1991a, 1991b) synonymised *Comptosia* Macquart 1840 with the genus *Alyosia* Rondani 1863 and the sub-genera *Epidosia* Hull 1973, *Opsonia* Hull 1973, *Paradosia* Hull 1973 and *Anthocolon* Hull 1973, and also proposed several synonymies at the species level. Yeates (1991b) recognised 138 species of *Comptosia* divided into 19 species-groups. Characters most useful in identifying species include distance between the eyes in males, integumental colour, shape of antennal flagellum, form of labium and subcranial cavity, and shape of the loop in wing vein  $R_{2+3}$  (radial loop). The known distribution of *Comptosia* extends across Australia, with most species in the south-east and the south-west of the continent. Adults feed on nectar and pollen and larvae are thought to be insect parasitoids (Yeates and Dodson 1990).

We here describe two more species of *Comptosia* belonging to different species groups, and extend its known distribution in Western Australia including to one of the territory's pristine offshore islands, Barrow Island.

## MATERIAL AND METHODS

### SPECIMENS

In total 12 specimens were examined, sourced from the Australian National Insect Collection (ANIC) and collections made from Barrow Island. Specimens were examined using a binocular microscope (Zeiss SV11). Images were taken with a Canon EOS 5D Mark II camera on a BK Passport system (Visionary Digital™) and edited using Adobe Photoshop CS5. Distribution maps were generated using BioLink 3.0.

### MORPHOLOGY

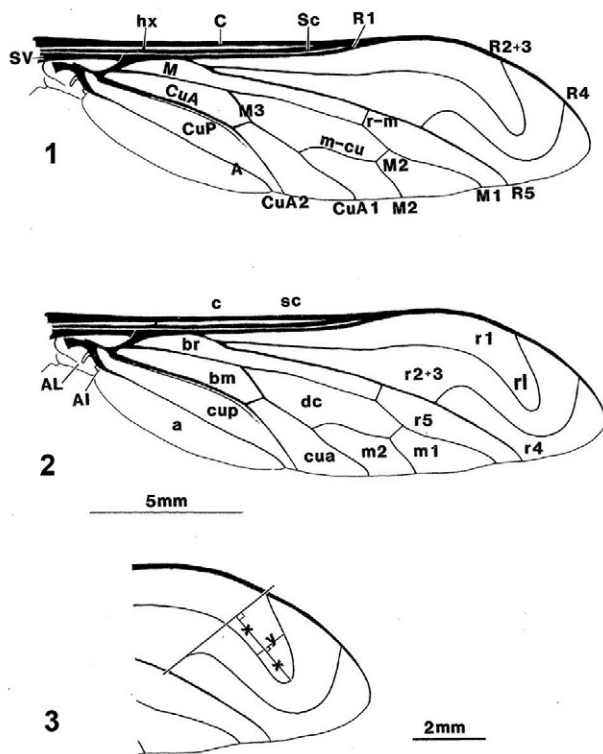
Morphological terminology follows McAlpine (1981) and Yeates (1988, 1990, 1991a, 1991b). The dimensions of the radial loop in wing vein  $R_{2+3}$  are described by the radial loop index (RLI) following Yeates (1991b) (Figures 1–3). This index is a measure of the depth of the loop divided by its width. It is calculated by measuring the depth of the loop ( $2x$ ) perpendicular to a line that passes through the base of  $R_4$  and the apex of vein  $R_{2+3}$ . The width of the loop is measured halfway along its depth. The length of the labium refers to the shaft of the labium and is related to the length of the foretibia, as done in Yeates (1988, 1990, 1991a, 1991b).

The extensive surveys of male genitalic morphology in *Comptosia* and related lomatiine

genera conducted by the senior author in earlier studies (e.g. Yeates 1991a, 1991b) has shown that male genitalic characters are not reliably diagnostic at species level in these groups. Given that these two new species are adequately and reliably diagnosed from other described and undescribed species by external morphology, we did not examine their genitalic characters.

Specimens are deposited in the Australian National Insect Collection (ANIC, CSIRO Ecosystem Sciences, Canberra) except the holotypes and Barrow Island specimen of *C. karijinii* in the Western Australian Museum (WAM).

Abbreviations used: AL: length of abdomen from apex to apex of scutellum; AN: anepisternum; EI: eye indentation; FW: frons width; HH: maximum head height; HW: maximum head width; K: katepisternum; MS: metepisternum; MT: mediotergite; OL: occipital lobes; PA: prealar bristles; PO: postalar bristles; PW: postalar wall; RLI: radial loop index; SC: subcranial cavity; SS: scutoscutellar suture; SW: width of the subcranial cavity; TL: length of thorax from anterior margin of scutum to apex of scutellum; TS: transverse suture of scutum; T1–T10: abdominal tergites 1–10; WF: width of the face; WL: wing length.



FIGURES 1–6 1–3, Terminology of wing venation, showing wing of *Comptosia heliophila*, as taken from Yeates (1991b): 1, wing showing veins and crossveins, using standard abbreviations except as follows: hx, humeral crossvein; SV, stem vein; 2, wing showing cells, most cell names denoted (in lower case) by the vein on their anterior border, other abbreviations as follows: Al, alular incision; AL, alula; bm, basal median cell; br basal radial cell; dc, discal cell; rl, radial loop; 3, apex of wing showing method for calculating the radial loop index (RLI),  $RLI = 2x/y$ ; 4–6, Right wings of the two new species of *Comptosia*: 4, *C. barrowensis* sp. nov., holotype male (ANIC database no. 29-030053); 5, *C. karijinii* sp. nov., holotype male (ANIC database no. 29-015821); 6, *C. karijinii* sp. nov., paratype female (ANIC database no. 29-015820).



FIGURES 7–8 Habitus view of the two new species of *Comptosia*: 7, *C. barrowensis* sp. nov., holotype male (ANIC database no. 29-030053); 8, *C. karjini* holotype male (ANIC database no. 29-015821).

## SYSTEMATICS

### Family Bombyliidae Latreille, 1802

### Genus *Comptosia* Macquart, 1840

*Comptosia* Macquart, 1840: 80.

#### TYPE SPECIES

*Comptosia fascipennis* Macquart, 1840, by monotypy.

#### *Comptosia barrowensis* sp. nov.

Figures 4, 7, 9

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#### MATERIAL EXAMINED

##### *Holotype*

**Australia: Western Australia:** ♂, Barrow Island, 20°47'27"S, 115°27'27"E, 14–24 March 2011, N. Gunawardene (WAM, ANIC database no. 29-030053). Condition good. Measurements: TL 7.7mm, AL 10.5 mm, WL 20.05 mm, HH 3.9 mm and HW 3.9 mm, WF 1.8 mm, SW 1.1 mm, RLI 1.4 (lodged in WAM).

##### *Paratype*

**Australia: Western Australia:** ♀, Mining Camp Mitchell Plateau, 14°29'24"S, 125°30'00"E, 9–19 May 1983, I.D. Naumann, J.C. Cardale (ANIC database no. 29-030054).

#### DIAGNOSIS

A large species, with wingspan almost 50 mm (Figure 7); wing and body strikingly marked,

wings with white wing tip in both sexes, remainder of apical half of wing dark brown, proximal remainder of wing yellowish brown (Figure 4). Face, antennae and frons with long silver hairs and shorter silver tomentum; face with median, dark tomentose stripe (Figure 9). Thorax with golden tomentum and short golden hairs. Abdomen with integumental colour of segments dark brown with short dark brown hairs and tomentum, except apical quarter reddish brown with golden hairs and tomentum (Figure 7).

#### DESCRIPTION

*Labium:* 0.5 x length of foretibia.

*Antennal flagellum:* Conical, base 1/2 total length.

*Wings* (Figure 4): Length 20.5 mm; RLI 1.4. Pattern with white wing tips, remainder of distal half dark brown, base yellow brown with some darker clouding at the distal half of cells cup and the anal cell. Venation typical for the genus, such as *C. bancrofti*, without inter-radial cross veins.

*Integumental colour:* *Head* all black except rim of SC brown. *Thorax* mostly black with PW dark brown, legs black. *Abdomen* with basal 3/4 of tergites black, apical remainder reddish-brown, sternites reddish-brown (Figure 7).

*Vestiture: Male, Head.* Hairs on frons dense, decumbent, white. Scape with short white hairs dorsally, long white hairs ventrally. Face with white hairs. OL with scattered white hairs, tomentum dark grey on dorsal 1/3 (Figure 9).

*Thorax.* Cervical fringe with yellow hairs. Hairs on scutum golden; tomentum yellow, concentrated laterally and posterior to TS. Scutellum with golden hairs; tomentum yellow. PA and PO yellow. AN with light yellow hairs, more dense and longer on dorsal 1/3. K, MS and MT with white hairs.



Halter knob yellow. Legs, coxae with white hairs. Fore- and mid-femorae with a few short black setae ventrally; hairs and scales mostly black, a few silver on dorsal and anterior face. Hindfemorae with short, black setae concentrated in 2 dorsal and 2 ventral rows; short black hairs on anterior face; scales yellow except black on anterior face. Foretibiae with dense, short brown hairs. Mid and hindtibiae with 2 dorsal and 1 ventral rows of short, black setae; hairs black; scales silver except black on distal 2/3 of anterior face.

*Abdomen.* T1 with long, yellow hairs, dense laterally; tomentum on apical margin, yellow. T2–T7 with short, black hairs and tomentum on basal 3/4, longer yellow hairs and tomentum on apical 1/4, longer yellow in lateral fringe. Sternites with long, white hairs and white tomentum.

#### REMARKS

This species is only known from a male and a female from Barrow Island and Mitchell Plateau respectively. This species belongs to the *C. praeargentata* species-group in Yeates (1991b), where it keys to couplet 13, but can be differentiated from the species there by a combination of labium about 0.5 times the length of the fore tibia, but has a long narrow antennal flagellum with base only 1/6 length.

#### ETYMOLOGY

This species is named after its locality, Barrow Island.

#### DISTRIBUTION

Only known from Western Australia, on Barrow Island, off the Pilbara coast and in the Kimberley district (Figure 11).

#### *Comptosia karijinii* sp. nov.

Figures 5, 6, 8, 10

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#### MATERIAL EXAMINED

##### *Holotype*

**Australia: Western Australia:** ♂, Millstream-Chichester National Park, Black Hill Pool, 21°20'01"S, 117°15'10"E, 3–7 May 2003, malaise over wide dry rocky creek bed, Eucalyptus, D. Yeates, C. Lambkin (WAM, ANIC database no. 29-015821). Condition good. Measurements: TL 2.8 mm, AL 4.9 mm, WL 9.0 mm, HH 2.1 mm and HW 2.2 mm, SW 0.5 mm, FW 0.9 mm, RLI 0.7 (lodged in WAM).



FIGURES 9–10 Face view of the two new species of *Comptosia*: 9, *C. barrowensis* sp. nov., holotype male (ANIC database no. 29-030053); 10, *C. karijinii* sp. nov., holotype male (ANIC database no. 29-015821).

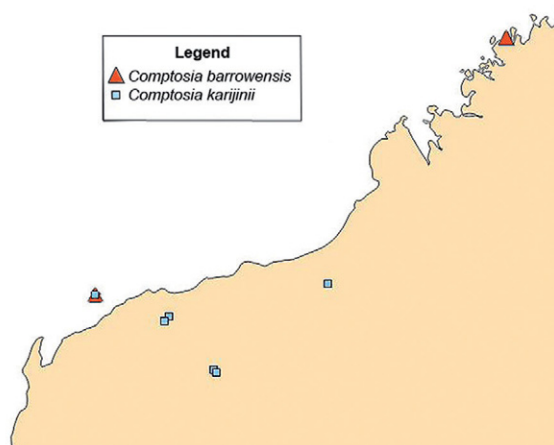


FIGURE 11 Map of north-western Australia showing known distribution of *Comptosia barrowensis* sp. nov. and *C. karajinii* sp. nov.

#### Paratypes

**Australia: Western Australia:** 2 ♀, collected with holotype (ANIC database nos. 29-015822, 29-015820); 1 ♂, Millstream-Chichester National Park, Roebourne Rd, 21°26'29"S, 117°09'28"E, 27 April–3 May 2003, Lambkin, C. and Weir, T. (ANIC database no. 29-105823); 1 ♀, Millstream-Chichester National Park, Black Hill Pool, 21°20'01"S, 117°15'10"E, 30 April to 3 May 2003, Lambkin, C. and Weir, T. (ANIC database no. 29-105825); 1 ♀, Karajini National Park, Hamersley, Mt Bruce Rd, 22°37'27"S, 118°20'47"E, 20–25 April 2003, Lambkin, C. and Weir, T. (ANIC database no. 29-105826); 1 ♀, 80 km S Pardoo Rd, House of Shay Gap Rd, 20°31'11"S, 12°08'00"E, 1–14 May 2003, Irwin, M.E. and Parker, F. (ANIC database no. 29-105828);

#### Other material

**Australia: Western Australia:** 1 ♀, Millstream-Chichester Nat Park Black Hill Pool, 21°20'01"S 117°15'10"E, 27–30 April 2003, C. Lambkin, T. Weir (ANIC database no. 29-015824); 1 ♀, Karajini National Park, Juna Downs Rd, 22°41'57"S, 118°25'06"E, 19–25 April 2003, Lambkin, C. and Weir, T. (ANIC database no. 29-015827); 1 ♂, Barrow Island, 20°47'45"S, 115°27'08"E, 15 March 2006, Callan, S. and Graham, R. (ANIC database no. 29-030055) (WAM).

#### DIAGNOSIS

A relatively small species, with wingspan of approximately 20 mm (Figure 8); wing hyaline

with pale yellow brown infuscation in cells on anterobasal half of wing, more pronounced in females (Figures 5 and 6). Head with grey pruinescence and light yellow hairs on frons, scape with hair black dorsally and light yellow ventrally, and face with white hairs but darker colouration around the eyes (Figure 10). Thorax with golden tomentum and yellow hairs. Abdomen with integumental colour of segments black, except apical quarter and lateral margins brown, with long yellow hairs (Figure 8).

#### DESCRIPTION

*Labium:* 0.8 x length of foretibia.

*Male eye separation:* very narrow, about 0.5 x maximum diameter of median ocellus.

*Antennal flagellum:* Conical, and tapering smoothly to apex, base 1/6 x length.

*Wings* (Figures 5, 6): Length 9.0 mm; RLI 0.7. Wing hyaline, with pale yellow brown infuscation in cells of anterobasal half of wing. Venation typical for genus and species group.

*Integumental colour:* Head all black except palps brown, rim of SC yellow-brown. Thorax black; halter yellow. Abdomen with tergites black except apical quarter and lateral margins, sternites brown (Figure 8).

*Vestiture: Male, Head.* Pruinescence of frons grey, median vita conspicuous, darker; hairs light yellow. Scape with hairs black dorsally, light yellow ventrally. Face with white hairs. OL with short decumbent, light yellow hairs in EI and on dorsal 1/2. Ocellar triangle with long, anteriorly directed, dark brown hairs (Figure 10).

*Thorax.* Cervical fringe with yellow hairs on dorsal 1/2, fading to white on ventral 1/2. Hairs on scutum dense, yellow; tomentum golden yellow, posterior to TS only. PA and PO yellow. Scutellum with yellow hairs; tomentum golden yellow. AN with dense, yellow hairs dorsally, fading to white ventrally. K and MS with white hairs; MT with yellow hairs. Legs, coxae with hairs white. Forefemora without setae; hairs mostly white, some black admixed; scales white. Midfemora similar to fore except, in addition, a few black setae ventrally. Hindfemora similar except black setae in 1 dorsal and 1 ventral row on anterior face. Foretibiae with a few black setae; dense, short, brown hairs ventrally; scales white. Mid- and hindtibia with black setae in 2 dorsal and 2 ventral rows; scales white.

*Abdomen.* T1 with long, yellow hairs; tomentum golden yellow in apical 1/2. T2–T7 with hairs long, yellow laterally on each segment. Tomentum on T2–T7 black on basal 2/3 of each segment, golden yellow on apex. Sternites with hairs yellow;

tomentum white. Lateral fringe on abdomen yellow with black admixed on T4–T7.

*Female:* As in male except eyes separated by width of ocellar triangle, hairs on scutum and abdomen shorter and less dense; tomentum on these areas more dense. Wing infuscation slightly darker than in male (Figure 6).

#### REMARKS

This species belongs to the *C. australensis* group, and Yeates (1991b) noted the presence of 16 undescribed species also in Australian collections. *C. karijini* is one of those species, and can be distinguished from the only other described species in the group by the yellowish brown infuscation in the anterobasal portion of the wing.

#### ETYMOLOGY

This species is named after one of its localities, the Karijini National Park.

#### DISTRIBUTION

This species is known from several localities in Western Australia (Figure 11).

#### ACKNOWLEDGEMENTS

We would like to thank Chris Manchester (ANIC, Ecosystem Sciences, Canberra) for his technical assistance and Nikolai Tatarnic (Department of Terrestrial Zoology, Western Australian Museum) for his help with searching for specimens in collections.

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