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The genus *Birdantis* Stål in Australia (Hemiptera: Fulgoromorpha: Fulgoridae)

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Abstract

Three new species of *Birdantis* Stål, 1863, *B. virginiae* **n. sp.**, *B. goemansi* **n. sp.** and *B. mouldsi* **n. sp.** are described from Queensland, Australia. The species are endemic in Australia and compared to the other species of the mainly Papuan genus. Male genitalia and habitus are illustrated. Distribution maps and an identification key are given.

Key words: Lantern-fly, Auchenorrhyncha, Cairns, Kuranda, Cape York, biodiversity

Introduction

The genus *Birdantis* presently comprises twelve species distributed in New Guinea and neighbouring islands (Nagai and Porion, 1996). It is divided into two subgenera: *Birdantis* Stål, 1863 (ten species and one subspecies), and *Myrilla* Distant 1888 (two species) (Fennah, 1977; Nagai and Porion, 1996). The genus is close to the Oriental *Polydictya* Guérin-Méneville, 1844 and *Gebenna* Stål, 1863, and the Australian *Desudaboides* Musgrave, 1927 (Lallemand, 1963; Nagai and Porion, 1996; Constant, 2010).

Lallemand (1963) synonymized *Myrilla* Distant, 1888 under *Birdantis* Stål, 1863 and proposed a key to the species of *Birdantis*. Fennah (1977) did not share this view, considering *Myrilla* as a subgenus of *Birdantis*, separating them on characters of the vertex, i.e. anterior margin of vertex straight, without deep transverse sulcus behind it in *Myrilla*; anterior margin of vertex concave, with a deep transverse sulcus behind it in *Birdantis* s.s. He additionally described two species in the subgenus *Birdantis* and keyed all the species. Nagai and Porion (1996) followed the view of Fennah (1977). The value of the subgenera as defined by Fennah (1977) is doubtful and needs to be tested at the scale of the whole genus as they are supported by a very small set of rather variable characters. For that reason, Lallemand's (1963) classification is followed here.

Fletcher (2005) first recorded the genus in Australia, with two species which he identified as *Birdantis obscura* (Distant, 1888) and *B. similis* Schmidt, 1911 on the basis of Lallemand's (1963) keys. Both species are actually undescribed and a third one, also new, has been found in Australian collections. *Birdantis obscura* (Distant, 1888) and *B. similis* Schmidt, 1911 are restricted to New Guinea, and all Australian species seem to be endemic in Northern Queensland.

Material and methods

The genitalia were dissected from softened specimens and boiled in potassium hydroxide for about one hour. Fine dissection was made in alcohol using a needle blade. The organs are preserved in glycerin, in a plastic tube fixed on the pin of the corresponding specimen. A distribution map produced by the software *CFF 2.0* (Barbier & Rasmont, 2000) and photos of habitus are provided.

The following acronyms are used for the measurements (taken as in Constant, 2004): BF, breadth of the frons; BT, breadth of the thorax; BTg, breadth of the tegmen; BV, breadth of the vertex; LF, length of the frons; LM, length of the mesonotum; LP, length of the pronotum; LT, total length; LTg, length of the tegmen; LV, length of the vertex.

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Label data is transcribed as it appears on the labels for holotype specimens designated herein with square brackets indicating separate labels. Label data for paratype specimens is presented in a standardised format to save space.

Acronyms used for the collections:

AMNH	American Museum of Natural History, New York, U.S.A. (R.T. Schuh)
AM	Australian Museum, Sydney, New South Wales, Australia (D. Britton)
ANIC	Australian National Insect Collection, CSIRO, Canberra, Australian Capital Territory, Australia (T.A. Weir).
ASCU	Agricultural Scientific Collections Unit, Orange Agricultural Institute, Orange, New South Wales, Australia (M.J. Fletcher)
QM	Queensland Museum, South Brisbane, Queensland, Australia (G. Monteith, C. Lambkin)
RBINS	Royal Belgian Institute of Natural Sciences, Brussels, Belgium (P. Grootaert)

Taxonomy

Family Fulgoridae Duméril, 1820

Subfamily Poiocerinae Haupt, 1929

Tribe Poiocerini Metcalf, 1938

Genus *Birdantis* Stål, 1863

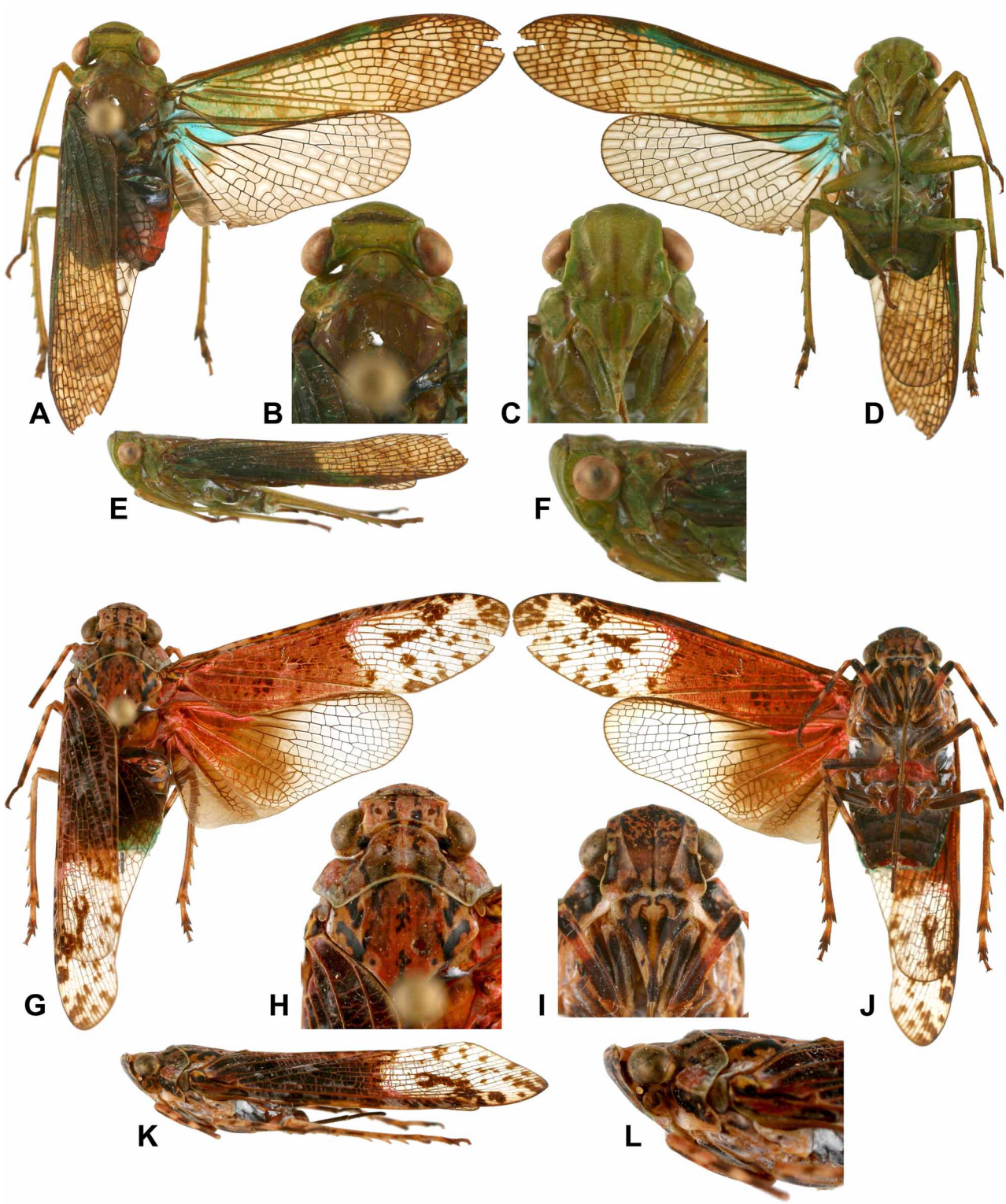
Type species: *Birdantis decens* Stål, 1863.

The genus is treated here as defined by Lallemand (1963).

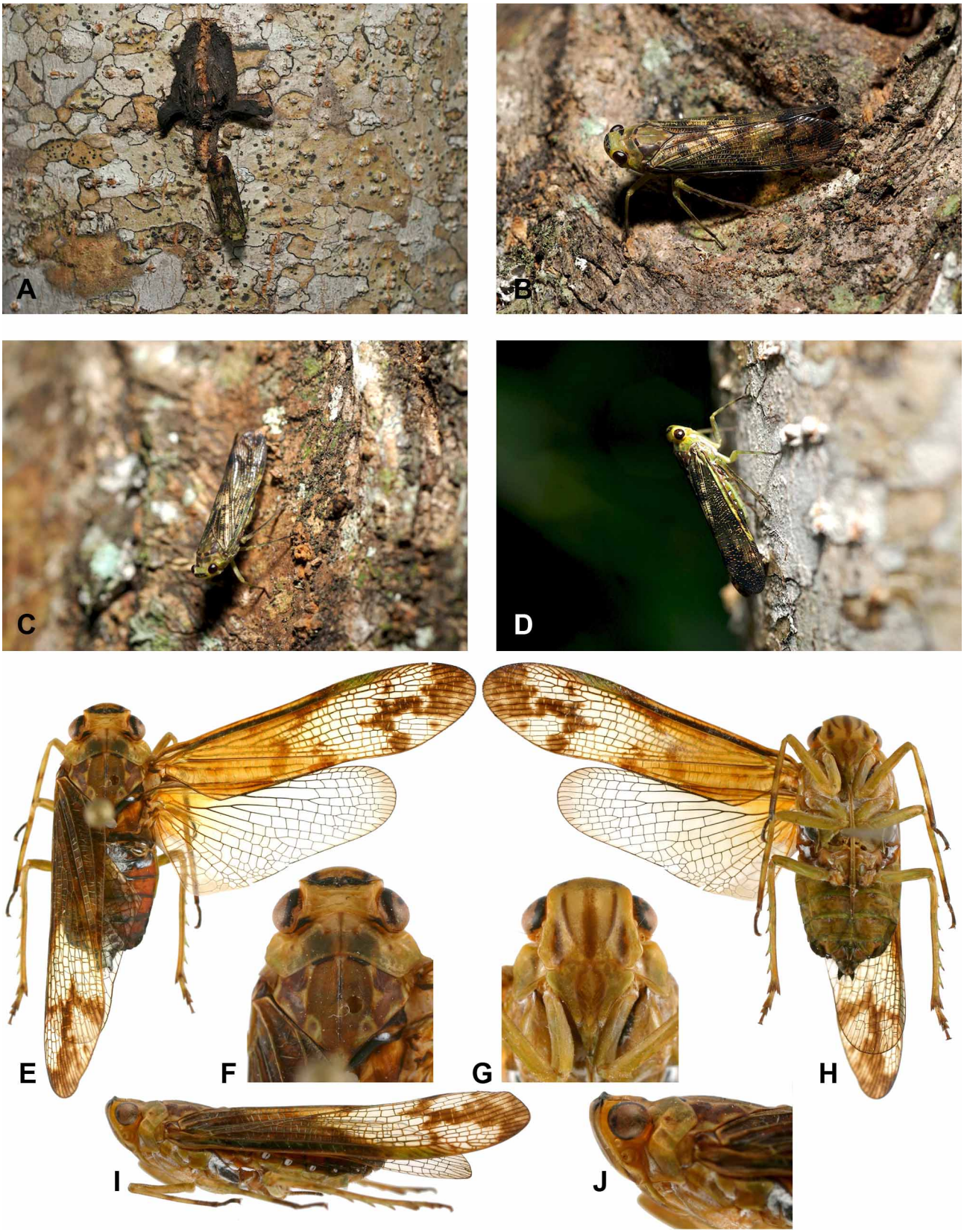
Distribution. New Guinea and adjacent islands, Australia (Northern Queensland).

Identification key to the Australian species of *Birdantis*

1.	hind wings with basal third brown-black and red markings basally; frons with irregular black-brown markings	*Birdantis mouldsi*
-	hind wings hyaline, tinged with orange or blue basally; frons unicolorous or with 5 brown stripes	2
2.	hind wings tinged with orange basally; frons with 5 brown stripes	*Birdantis virginiae*
-	hind wings blue basally; frons unicolorous, green	*Birdantis goemansi*



FIGURES 1. A–F, *Birdantis goemansi*. A, habitus, dorsal view (LT: 18.7 mm). B, head and thorax, dorsal view. C, frons, normal view. D, habitus, ventral view. E, habitus, lateral view. F, head and thorax, lateral view. **G–L**, *Birdantis mouldsi*. G, habitus, dorsal view (LT: 21.9 mm). H, head and thorax, dorsal view. I, frons, normal view. J, habitus, ventral view. K, habitus, lateral view. L, head and thorax, lateral view.



FIGURES 2. A–D, *Birdantis virginiae*, specimens on Red Cedar in Cairns (Photographs by Gary W. Wilson). **E–K**, *Birdantis virginiae*. E, habitus, dorsal view (LT: 20.2 mm). F, head and thorax, dorsal view. G, frons, normal view. H, habitus, ventral view. I, habitus, lateral view. J, head and thorax, lateral view.

***Birdantis goemansi* n. sp.**
Figs. 1 A–F; 3 A–C; 7 A.

Etymology. The species is dedicated to my friend Geert Goemans who works on Neotropical lanternflies.

Material examined. Holotype ♂: [12.44S 143.17E QLD, 8 km E by N Mt. Tozer, 7.vii.1986, J.C. Cardale, at MV light] (ANIC).

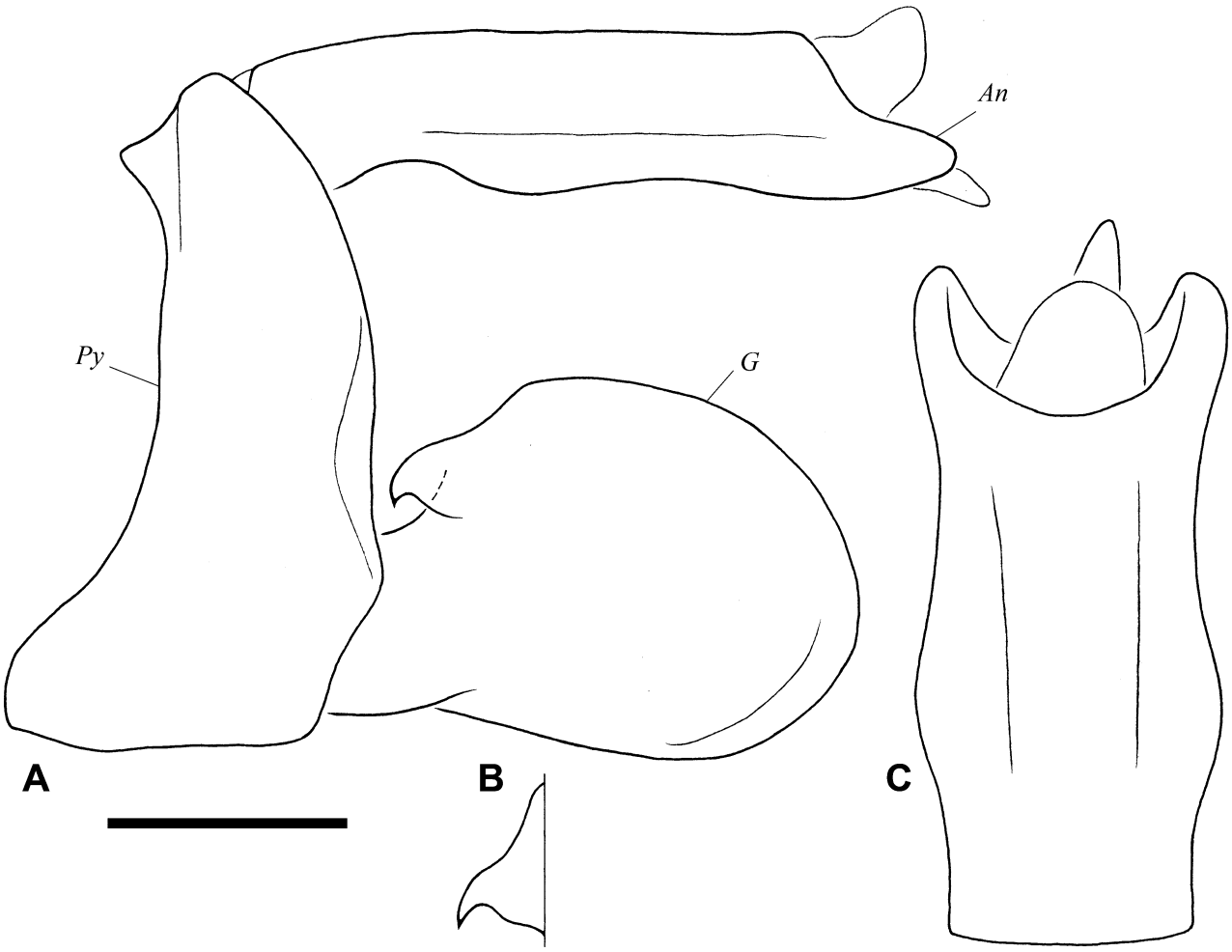
Paratypes: QUEENSLAND, 1 ♂: 1 mile NE Mt. Lamond, Iron Range, , 26.xii.1971, D.K. McAlpine, G.A. Holloway, D.P. Sands. coordinates: 12°44'S 143°13'E (AM); 1 ♂: West Claudie Riv., Iron Range, , 16.ix.1974, G. Daniels, MV lamp, coordinates: 12'44°S 143°17'E (QM).

Description. LT: ♂ (n = 3): 18.3 mm (18.0–18.7).

Head: eyes included, slightly less broad than thorax; green; vertex concave, with all margins carinate, and anterior margin straight; frons visible from above, separated from vertex by narrow, black groove (fig. 1 B); frons smooth, convex, with slight, longitudinal, carina on each side and 3 longitudinal brown stripes on basal half (fig. 1 C); clypeus narrower and about as long as frons, with 2 longitudinal brown stripes (fig. 1 C); labium green elongate, surpassing hind coxae, with last segment brown and much shorter than penultimate (fig. 1 D); ocelli present; pedicel of antennae bulbous (fig. 1 F); ratio BV/LV = 3.0; BF/LF = 1.2.

Thorax: pronotum green, smooth, with brown marking on each side of disc; mesonotum brown slightly variegated with green, and with 3 green markings near base, along carinae; 3 slight carinae on disc (figs. 1 B); ratio BT/LP+LM = 0.95.

Tegmina: infuscate with center of cells paler and some irregular brown markings on apical third; clavus, base and band along costal margin, green with irregular slightly marked brown markings; costal margin brown; veins



FIGURES 3. A–C, *Birdantis goemansi*, male genitalia. A, pygofer, anal tube and gonostyli, lateral view. B, dorsolateral process of gonostylus, posteroventral view. C, anal tube, dorsal view. Scale 1 mm.

green-brown, brown on apical third; costal and sutural margins subparallel, tegmina slightly broader near apex and with apical margin rounded (figs. 1 A, D, E); ratio LTg/BTg = 3.5.

Hind wings: infuscate with center of cells paler and baso-costal area blue; veins black; maximal breadth near base (figs. 1 A, D).

Legs: green with apex of tibiae and tarsi brown; tibiae III with 6–7 lateral and 6 apical spines (figs. 1 A, D).

Abdomen: green ventrally, dorsally red with base black (figs. 1 A, D).

Genitalia ♂: pygofer higher than long in lateral view; (fig. 3 A); anal tube elongate, with lateral margins bisinuate and subparallel (figs. 3 A, C); gonostyli slightly longer than high, with apical margin rounded (fig. 3 A); baso-dorsal process projecting latero-ventrally (fig. 3 B).

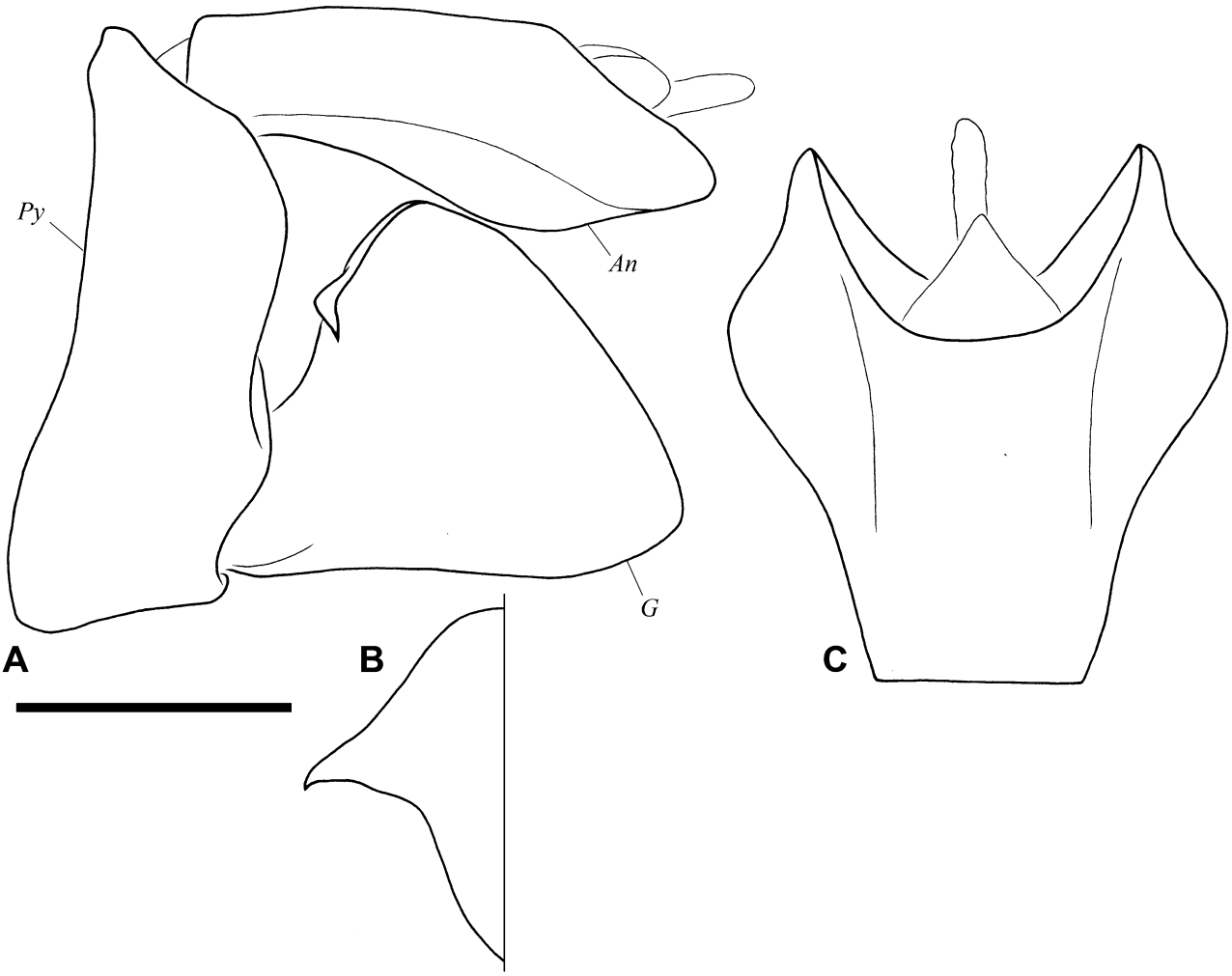
Biology. Nothing is known except that the species seems to be restricted to Cape York Peninsula, and that it is attracted to light traps.

***Birdantis mouldsi* n. sp.**

Figs. 1 G–L; 3 A–C; 7 B.

Etymology. The species is dedicated to Dr Max S. Moulds who collected the holotype of the species.

Material examined. Holotype ♂: [Peach Creek 25km NNE of Coen, N. Qld, 3.xi.1979, M.S. & B.J. Moulds] [Birdantis obscura (Distant), det: M.J. Fletcher] [MJF collection, MJF003020] coordinates: 13°37'S 143°05'E (ASCU)



FIGURES 4. A–C, *Birdantis mouldsi*, male genitalia. A, pygofer, anal tube and gonostyli, lateral view. B, dorsolateral process of gonostylus, posteroventral view. C, anal tube, dorsal view. Scale 1 mm.

Paratypes: QUEENSLAND, 2 ♀: 12.43S 143.18E QLD, 11 km ENE Mt. Tozer, 9.vii.1986, J.C. Cardale, at MV light (ANIC); 1 ♂, 1 ♀: 3 km E. of Lockerbie, C. York, 30.i–4.ii.1975, G.B. Monteith. At MV Light coordinates: 10°47'S 142°28'E (QM); 1 ♂, 3 ♀: West Claudie R., Iron Range,, 3–10.xii.1985, G. Monteith & D. Cook, Rainforest, 50m coordinates: 12'44°S 143°17'E (QM); 1 ♂: Claudie R. 5 miles W Mt. Lamond, 24.xii.1971 D.K. McAlpine, G.A. Holloway coordinates: 12°44'S 143°13'E (AM); 1 ♂: Eet Hill Vicinity, Moa (Banks) Is., Torres St., 9–13.vii1977, G.B. Monteith & D. Cook coordinates: 10°11'S 142°16'E (QM); 1 ♂: Iron Range, 2.v.1975, M.S. Moulds coordinates: 12°46'S 143°19'E (AM); 1 ♂: Iron Range, 29 Apr. May 1975, M.S. Moulds (AM); 1 ♀: Iron Range, Q. 7.iv.1964, I.F.B. Common & M.S. Upton (RBINS, ex ANIC); 1 ♂: Iron Range, 8.iv.1964, I.F.B. Common & M.S. Upton (RBINS, ex ANIC); 1 ♂: Iron Range, 15.iv.1964, I.F.B. Common & M.S. Upton (ANIC); 1 ♀: Iron Range, 9.iv.1964, I.F.B. Common & M.S. Upton (ANIC); 1 ♀: Holroyd River, S. of Coen, 29.ix.1974, M.S. Moulds coordinates: 14°12'S 141°38'E (AM); 1 ♀: Middle Claudie Riv., Iron Range, 13.x.1974, G. Daniels, at light (QM); 1 ♀: Mid Claudie Riv., Iron Range, 14.ix.1974, G. Daniels (QM); 1 ♂, 1 ♀: Capsize Ck, 64 km N. of Archer Xing, Cape York Pen., 29–30.vi.1975, G.B. Monteith coordinates: 13°02'S 143°23'E (QM); 1 ♀: Iron Range, Cape York Pen.; 1–4.v.1973, G.B. Monteith (QM); 1 ♂: 3 km E. of Lockerbie, C. York, 19–23.iii.1987, G.B. Monteith, Rainforest pitfall traps (QM); 1 ♀: Cape York Peninsula, E.J. Cooper, 15.vii.1946 (QM); 1 ♀: Middle Claudie R., Iron Range, 4.x.Oct. 1974, M.S. Moulds (AM)

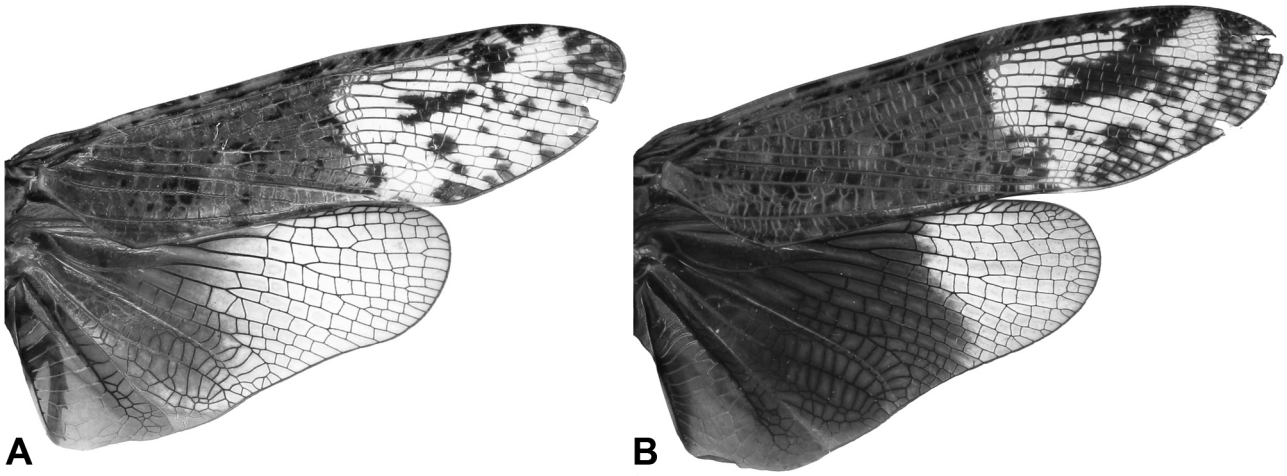
Description. LT: ♂ (n = 9): 21.7 mm (20.7 – 22.4); ♀ (n = 14): 23.1 mm (22.0 – 24.0).

Head: eyes included, slightly less broad than thorax; pale yellow-brown variegated with dark brown and black; vertex concave, with all margins carinate, and anterior margin slightly curved, disc with 2 longitudinal black stripes, 2 slightly impressed points and one small black spot on each side; frons visible from above, separated from vertex by narrow groove (figs. 1 G, H); frons smooth, convex, with 3 slight, longitudinal carinae, dark brown markings as illustrated on fig. 1 I; clypeus narrower and about as long as frons, with dark brown markings as illustrated on fig. 1 I; labium brown elongate, surpassing hind coxae, with last segment much shorter than penultimate (fig. 1 J); ocelli present; pedicel of antennae bulbous (fig. 1 L); ratio BV/LV = 3.6; BF/LF = 1.15.

Thorax: pronotum pale yellow-brown; disc with 3 irregular, black-brown, longitudinal, stripes on each side; ventral lobe of pronotum black-brown on dorsal half; slight median carina and 2 impressed points on disc (figs. 1 H, L); mesonotum brown with irregular black markings; metanotum brown (fig. 1 H); ratio BT/LP+LM = 0.95.

Tegmina: testaceous, with membrane hyaline after nodal line; irregular black-brown markings; largest and best defined markings on costal cell and on membrane, markings often confluent on latter; veins tinged with red, dark brown on membrane; costal and sutural margins subparallel, tegmina slightly broader at nodal line; apex rounded and with apical margin oblique (figs. 1 G, J, K); ratio LTg/BTg = 3.6.

Hind wings: black-brown with apical half hyaline; no clear limit between dark and hyaline zones; base strongly tinged with red; veins brown-black, red on basal third, on apical half; maximal breadth near base; slightly broader than tegmina (figs. 1 G, J).



FIGURES 5. A–B, *Birdantis mouldsi* and *B. obscura*, right wings. A, *Birdantis mouldsi*. B, *Birdantis obscura*.

Legs: coxae I and II brown with apex testaceous; trochanters I and II testaceous; femora I black-brown with base and one ring testaceous; femora II black-brown with testaceous ring; femora III black-brown with apex testa-

ceous; tibiae I and II black-brown with 3 testaceous rings; tarsi I and II black-brown; tibiae and tarsi III testaceous; tibiae III with 5–6 lateral and 6 apical spines black-brown apically (figs. 1 G, J).

Abdomen: black-brown with last segments pale green dorsally (figs. 1 G, J).

Genitalia ♂: pygofer in lateral view higher than long and with anterior and posterior margins subparallel (fig. 4 A); anal tube slightly longer than broad, with lateral margins strongly dilated on second third in dorsal view, slightly curved ventrad in lateral view (figs. 4 A, C); gonostyli subtriangular in lateral view, one strong tooth in middle on antero-dorsal margin, tooth directed laterally with apex slightly curved ventrally (figs 1 A, C).

Biology. Nothing is known except that the species seems to be restricted to Cape York Peninsula, and that it is attracted to light traps. One specimen has also been collected in a pitfall trap.

Notes. The species is close to *Birdantis obscura* (Distant, 1888) from Papua New Guinea but can be separated from the latter by its smaller size (in *B. obscura*, LT: ♂ (n = 2): 25 mm (24.7–25.3); ♀ (n = 7): 26.1 mm (25.0–27.0)) and different colour of the hind wings: hyaline area limited to apical third, without transition between dark and pale zones in *obscura* (extending to half of wing and progressively getting darker in *mouldsi*) and basal red markings less developed in *obscura*.

***Birdantis virginiae* n. sp.**

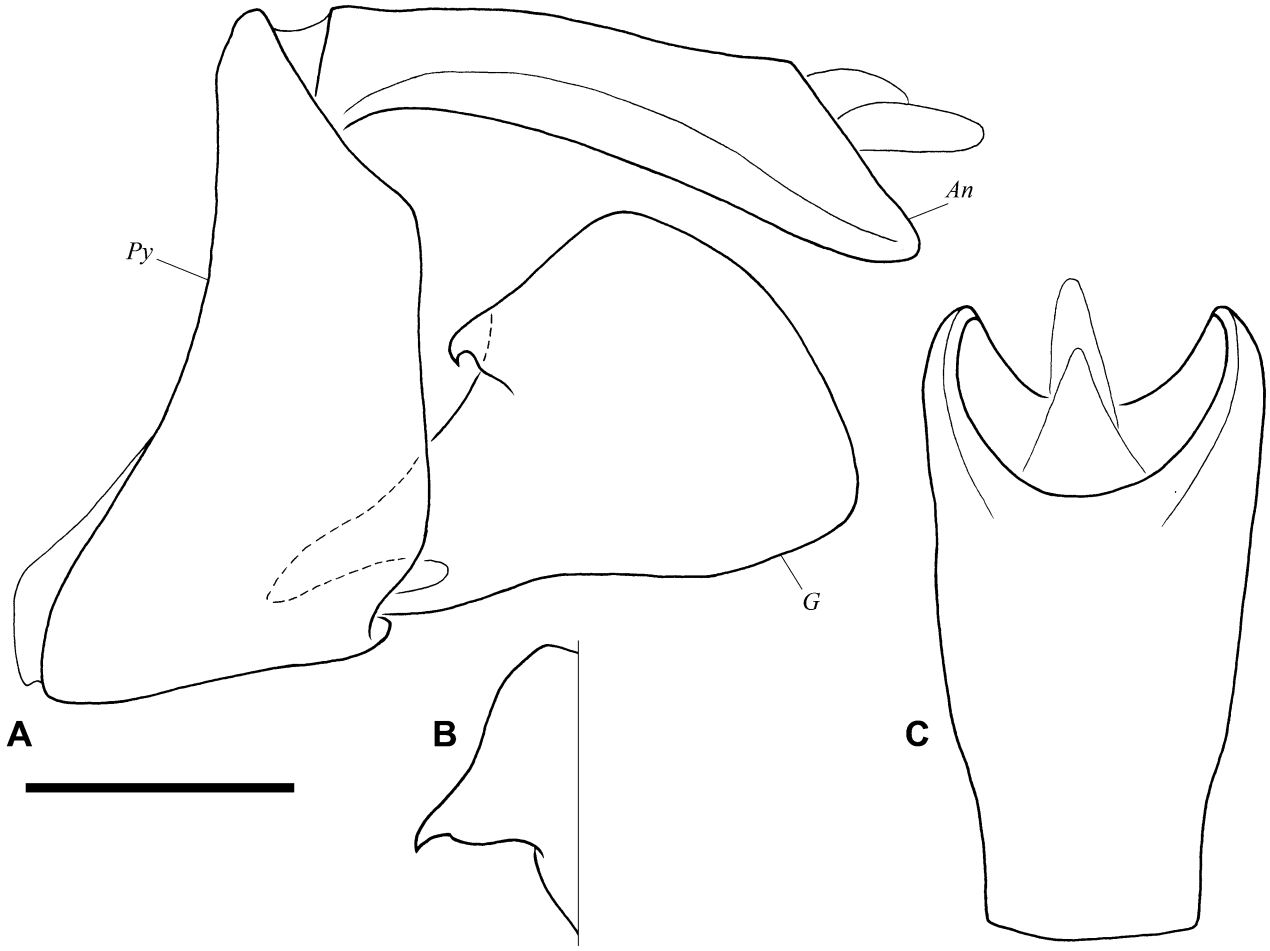
Figs. 1 A–D, 2, 3 F–I, 7 C.

Etymology. The species is dedicated to a promising young biologist, Miss Virginie Guibourt.

Material examined. Holotype ♂: [16.48’S 145.38’E. (GPS), Qld. Kuranda (335m) (top of the Range), 19 Butler Dr 1–15.ii.2010, DCF Rentz] [ANIC database No. 20 004475] (ANIC).

Paratypes: QUEENSLAND, 1 ♂: 16.48’S 145.38’E. (GPS), Kuranda (335m) (top of the Range), 19 Butler Dr 1–16.iv.2010, DCF Rentz (ANIC: 20 004474); 1 ♀: 16°49’S 145°41’E, Smithfield, James Cook University, near bldg E2, 8.i.2009, DCF Rentz, G. Wilson on trunk *Toona ciliata* M. Roem ANIC Database No. 20 004479 (RBINS, ex ANIC); 2 ♀: 16°49’S 145°41’E, Smithfield, James Cook University, near bldg E2, 8.i.2009, DCF Rentz, G. Wilson on trunk *Toona ciliata* M. Roem (ANIC: 20 004478, 20 004481); 1 ♂: upper Jardine R, Cape York Pen., 11°14’S 142°36’E, 26.x.1979, M.S. & B.J. Moulds *Birdantis similis* (Schmidt), det: M.J. Fletcher (ASCU: MJF003015); 1 ♂: same data as preceding, 24.x.1979 (RBINS: MJF003016); 1 ♂: upper Davies Ck, Lamb Rg, Mareeba Dist., 800m, 25.xii.1988, H. & A. Howden coordinates: 16°54'S 145°33'E (ASCU: MJF003017); 1 ♂: Gap Creek, Mt Finlayson Rg., S. of Cooktown, 2.i.1981, M.S. & B.J. Moulds *Birdantis similis* (Schmidt), det: M.J. Fletcher coordinates: 15°52'S 145°22'E (ASCU: MJF003018); 1 ♀: Claudie R., Cape York Pen., J. Kem, v.1961 Birdantis sp., M.S.K. Ghauri det. 1962 coordinates: 12°50'S 143°21'E (ASCU: MJF003200); 2 ♂, 2 ♀: Hinchinbrook Is., Gayndah Ck, 10 m, 7–15.xi.1984, Monteith, Cook & Thompson coordinates: 18°22'S 146°12'E (QM; 1♂, 1 ♀: RBINS); 4 ♂: 3 mls W of Mossman, 13.iii.1964, I.F.B. Common & M.S. Upton coordinates: 16°28’S 145°22’E (ANIC); 1 ♂: 2.i.1988, Polly Ck, Garradunga, J. Hasenpusch coordinates: 17°27’S 146°00’E (QM); 1 ♂: Polly Creek, Garradunga, 12.i.1999, J. Hasenpusch (QM); 1 ♂: 10°42.3’Sx142°13.5’E, Prince of Wales Is., camp., 3–7.i.2008. 15460, G. Monteith, K. Aland, 10m (QM); 4 ♂, 1 ♀: 9 mls E of El Arish, 7.iii.1964, I.F.B. Common & M.S. Upton coordinates: 17°48’S 146°00’E (ANIC); 5 ♂: Shiptons Flat, via Helenvale, 30.xi.1985, 200m, G. Monteith & D. Cook coordinates: 15°48’S 145°15’E (QM); 2 ♂: 15.47S 145.14E, Shiptons Flat, 17–19.x.1980 T. Weir (ANIC); 2 ♀: Lizard Is., NNE of Cooktown, 18.xi.1974, M.S. & B.J. Moulds coordinates: 14°40’S 145°28’E (AM); 2 ♀: Clump Pt., 6.iii.1964, I.F.B. Common & M.S. Upton coordinates: 17°51’S 146°07’E (ANIC); 1 ♂: Little Crystal Creek, Mt. Spec, 1000 ft., 3.i.1968, R. Dobson coordinates: 18°58’S 146°17’E (QM); 1 ♂: Russell R. at Bellenden Ker Landing, 5m, 24–31.x.1981, Earthwatch/Qld. Mus. *Birdantis similis* (Schmidt), det. M.J. Fletcher coordinates: 17°13’S 145°58’E (QM); 1 ♂, 1 ♀: Bellenden Ker Range, Cableway Base Stn, 100m, 17–24.x.1981, Earthwatch/Qld. Mus. At mercury vapour light, rainforest *Birdantis similis* (Schmidt), det. M.J. Fletcher coordinates: 17°15’S 145°52’E (QM); 1 ♂: Captain Billy Creek, Cape York Pen. 142°50’ E, 11°40’ S, 9–13.vii.1975, G.B. Monteith (QM); 1 ♂: Babinda, 28.xii.1972 M.S. Moulds coordinates: 17°21’S 145°55’E (AM); 2 ♀: Little Mulgrave, iii.1950, J.G. Brooks coordinates: 17°08’S 145°43’E (QM); 1 ♀: 15.47S 145.17E, Moses Ck. 4km N by E of Mt Finnigan, 14–16.x.1980 T. Weir (ANIC); 1 ♂: Middle Claudie River. Iron Range. Qld. 22.x.1974, M.S. Moulds coordinates: 12°43’S 143°17’E (AM); 1 ♂: Iron Range, 27.v.1975, M.S. Moulds coordinates: 12°46’S 143°19’E (AM); 1 ♂: Iron Range, 12.iv.1964, I.F.B. Common & M.S. Upton (ANIC); 1 ♀: Lockerbie, 14–

17.v.1948 Archbold Exped. North Queensland, Australia L.J. Brass Collector coordinates: 10°48'S 142°27'E (AMNH); 1 ♂: Lockerbie, Cape York, 1.iv.1964, I.F.B. Common & M.S. Upton (ANIC); 1 ♀: Gap Ck, Bloomfield district, 14.iv.1994, M.S. Moulds coordinates: 15°52'S 145°21'E (AM); 1 ♂: 15.50S 145.20E, Gap Ck. 5km ESE Mt Finnigan 13–16.v.1981, A. Calder (ANIC); 1 ♂: Daintree River, Cape York Peninsula. ix.1947, N. Geary, coordinates: 16°17'S 145°27'E (QM); 1 ♂: 15.04S 145.07E, Mt. Webb Nat. Pk. 28–30.ix.1980, T. Weir (ANIC); 1 ♀: 15.04S 145.07E, Mt. Webb Nat. Pk. 27–30.iv.1981, A. Calder at light (ANIC); 1 ♀: Graham Range, via Babinda, 9–10.iv.1979, G.B. Monteith coordinates: 17°19'S 145°59'E (QM); 1 ♀: 1 mile East of Kuranda, 4.v.1955, Norris & Common (ANIC); 1 ♂: 3 mls. N. of Kuranda, 24.iv.1955, Norris & Common (ANIC); 2 ♂: 25 mls. W. of Tully, 8.iii.1964, I.F.B. Common & M.S. Upton (ANIC); 1 ♂: Kirrama Range, W. of Kennedy 17.i.1990, MS & BJ Moulds coordinates: 18°06'S 145°42'E (AM); 1 ♂, 2 ♀: 5 mi. E. Cardstone, 13.i.1967 M V lamp, D.K. McAlpine & G. Holloway (AM, 1 ♀: RBINS ex AM); 1 ♂: Iron Range, 12.v.1975, M.S. Moulds (RBINS ex AM); 1 ♂: Iron Range, 18.v.1975, M.S. Moulds (RBINS ex AM); 1 ♀: 4mls. W. of Babinda, 9.iii.1964, I.F.B. Common & M.S. Upton (ANIC); 1 ♂: Kuranda, 15.i.1985, R. Straatman, at light (QM); 1 ♀: 1 ml. E. of Kuranda, 11.iii.1964, I.F.B. Common & M.S. Upton (ANIC); 1 ♀: 15.30S 145.16E, 1km SE of Mt. Cook, 13.x.1980, T. Weir (ANIC); 1 ♂: 15.50S 145.20E, Gap Ck. 5km ESE Mt. Finnigan, 13–16.v.1981, A. Calder at light (ANIC); 1 ♂: 9 mls. N. of Kuranda, 12.iii.1964, I.F.B. Common & M.S. Upton (ANIC).



FIGURES 6. A–C, *Birdantis virginiae*, male genitalia. A, pygofer, anal tube and gonostyli, lateral view. B, dorsolateral process of gonostylus, posteroventral view. C, anal tube, dorsal view. Scale 1 mm.

Description. LT: ♂ (n = 48): 17.6 mm (15.8–18.8); ♀ (n = 22): 20.0 mm (18.7–21.2).

Head: pale yellow-brown; vertex with transverse groove and all margins carinate (figs. 2 E, F); frons with 5 longitudinal brown lines: lines 1 and 5 limited to basal half, lines 2 and 4 curved internally basally and reaching upper margin of frons (sometimes limited to basal 4/5, especially in males), line 3 usually limited to basal 4/5, sometimes reaching upper margin; upper margin of frons marked by black line (fig. 2 G); clypeus with 2 curved brown lines (fig. 2 G); labium with penultimate segment surpassing hind coxae (fig. 2 H); ratio BV/LV = 3.85; BF/LF = 1.2.

Thorax: pronotum pale yellow-brown with median carina and impressed point on each side; small brown spot on each side of disc; mesonotum brown, sometimes with disc paler, and with median and peridiscal carinae sligtly marked; irregular yellow markings on sides; peridiscal carinae yellow with small yellow circle at base (figs. 2 E, F); metathoracic sternite black (fig. 2 H); ratio BT/LP+LM = 1.0.

Tegmina: orange-brown, on basal half and clavus, apical half hyaline; irregular black-brown markings; largest and best defined markings on membrane, markings often confluent on latter; costal cell and veins on basal half tinged with green; veins on apical half variegated black-brown and pale yellow; costal and sutural margins subparallel, tegmina slightly broader at nodal line; apex rounded and with apical margin oblique (figs. 2 E, I, H); ratio LTg/BTg = 3.77.

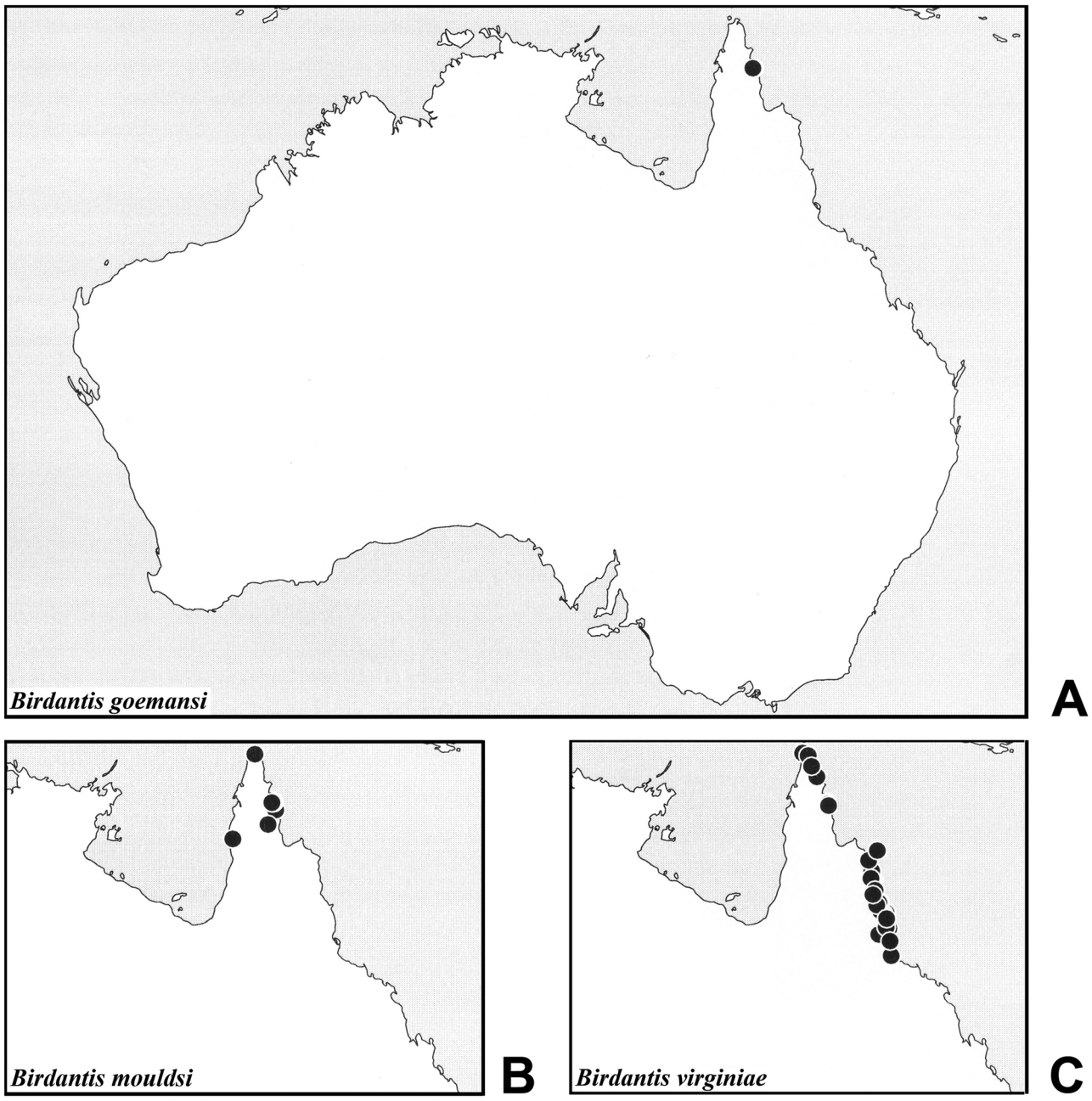


FIGURE 7. A–C, Distribution of the species of *Birdantis* in Australia. A, *B. goemansi*. B, *B. mouldsi*. C, *B. virginiae*.

Hind wings: hyaline with base orange; apex and baso-sutural area slightly infuscate; veins lack-brown, orange-brown at base; maximal breadth near base; slightly broader than tegmina (figs. 2 E, H).

Legs: yellow-green apex and one ring on tibiae I and II, and tarsi, brown; tibiae III with 6 lateral and 6 apical spines, brown (figs. 2 E, H).

Abdomen: brown dorsally with segments margined with black posteriorly; yellow-green ventrally (figs. 2 E, H).

Genitalia ♂: pygofer higher than long and with posterior margin emarginate at upper third in lateral view (fig. 6 A); anal tube elongate, slightly curved ventrally in lateral view and slightly broadening from base to apex in dorsal view (figs. 6 A, C); gonostyli with angles of posterior margin rounded and well marked, and one tooth in middle of dorsal margin (fig. 6 A); tooth projecting antero-laterally and with apex pointing ventrally (fig. 6 B).

Biology. The species seems to be restricted to Cape York Peninsula, and is attracted to light traps. *Toona ciliata* M. Roem (Meliaceae) is a host plant for this species. Several specimens were collected in Cairns on that species of tree by Gary Wilson (*pers. comm.*), who noticed the degree of camouflage of the animals when they were on or adjacent to old bark or wounds on the tree (the bark is generally light in colour).

Note. Some of the specimens had been identified by Fletcher (2005) as *Birdantis similis* (Schmidt, 1911) after Lallemand's (1963) revision. *B. virginiae* is easily separated from *B. similis* by the following characters of the latter: base of tegmina red; no black line between frons and vertex; three central lines of frons joining dorsally.

Discussion

The present description of three new species of *Birdantis* Stål, 1863 from Australia, if considered together with the recent description of four other new species in the genus *Desudaboides* Musgrave, 1927 (Constant, 2010) shows that the biodiversity of Australian Fulgoridae is much higher than previously reported. It is also obvious that additional new species await discovery.

All presently known species of Australian Fulgoridae are endemic in Australia, *Birdantis* being restricted to Northern Queensland in its Australian distribution. More field work is necessary to collect data on precise distribution, host plants, behaviour and phenology of those species.

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