

Bibionidae (Diptera) of New Caledonia

SCOTT J. FITZGERALD

Department of Zoology, Oregon State University, Corvallis, Oregon 97331, USA;
email: fitzges@science.oregonstate.edu

Abstract

Five species of Bibionidae are recognized as occurring in New Caledonia: *Bibio illaudatus* Hardy, *Dilophus arboreus* n. sp., *D. proxilus* n. sp., *Plecia imocellata* n. sp., and *P. lusca* n. sp. A key to the Bibionidae of New Caledonia is provided and the subgenus *Plecia* (*Heteroplecia*) Hardy is discussed.

Introduction

Only 1 species of Bibionidae, *Bibio illaudatus* Hardy (1961: 94), was previously recorded from New Caledonia. Since that report over 40 years ago, additional specimens have accumulated and the current review of the bibionid fauna recognizes 5 species with 4 described as new. New Caledonia is well known for having a high percentage of endemic flora and fauna (Myers, 1988; Najt & Grandcolas, 2002) and thus it is not surprising that all of the bibionid species reported herein are apparently restricted to the islands.

Materials and Methods

Morphology and orientation primarily follows McAlpine (1981). Description of male synsternogonocoxite (ventrally fused gonocoxites + hypandrium) is in ventral view, epandrium in dorsal view, lateral lobe of gonocoxite in lateral view, female tergite 9 in dorsal view, and female sternite 8 in ventral view, unless otherwise specified.

The following persons and collections made material available for study [acronyms follow Samuelson & Evenhuis (2003)]: Neal Evenhuis, Keith Arakaki, and Tino Gonsalves, Bernice P. Bishop Museum, Hawaii (BPBM); Nigel Wyatt, The Natural History Museum, London (BMNH); Don Webb and Mike Irwin, Illinois Natural History Survey Insect Collection, (INHS); Loïc Matile, Eric Guilbert, Muséum National d'Histoire Naturelle, Paris (MNHN); Philip Clausen, University of Minnesota Insect Collection, St. Paul (UMSP); F. Christian Thompson, National Museum of Natural History, Smithsonian Institution (USNM).

Systematics

Key to the Bibionidae of New Caledonia

1. Rs unbranched (Figs. 6, 12); fore tibia with an apical circlet of spines (Figs. 2, 9, 10) or a strongly developed apical spine and variously developed apical spur (Fig. 1), ocelli present (Figs. 4, 14–16) 2
- Rs bifurcate; fore tibia simple (with only a minute apical spur), ocelli absent (Fig. 29) *Plecia* ... 4
2. Fore tibia with a strongly developed apical spine and weakly developed apical spur (Fig. 1) *Bibio illaudatus*
- Fore tibia with an apical circlet of spines (Figs. 2, 9, 10) *Dilophus* ... 3

3. Hind basitarsus of male slightly swollen (Figs. 7, 8), base of M and m-cu cross vein present, sclerotized rostrum of male 1/2–3/4 the length of lower region of compound eye (Fig. 14, 16), rostrum of female subequal to rest of length of head (Fig. 15), medial spines of fore tibia arranged in a 2:2 or 4 pattern (Figs. 9, 10), wing 3.5–4.0 mm *D. proxilus*
- . Hind basitarsus of male slender elongate (Fig. 3), base of M and m-cu absent (Fig. 6), rostrum short in both sexes (Fig. 4), medial spines of fore tibia arranged in a 2:2:1 or 2:3 pattern (Fig. 2), minute species (wing 2.6 mm) *D. arboreus*, n. sp.
4. Dorsum of thorax orange or brown-orange 5
- . Entire thorax black *Plecia* sp.
5. Male with lateral lobe of gonocoxite digitate (Figs. 17, 18) and gonostylus simple (Fig. 20). Female terminalia as in Fig. 22 *Plecia imocellata*, n. sp.
- . Male with lateral lobe of gonocoxite undeveloped (Fig. 23), gonostylus bifurcate and complex (Figs. 25, 26). Female terminalia as in Fig. 28 *Plecia lusca*, n. sp.

Bibio illaudatus Hardy

(Fig. 1)

Bibio illaudatus Hardy, 1961: 94. Holotype male (USNM), NEW CALEDONIA: Hienghene, 7 Jun. 1944, W. Crabb.

DIAGNOSIS. Hardy (1961) stated that *B. illaudatus* differs from *B. obediens* by having the fore tibial spur short and not more than 1/4 the length of the tibial spine and all femora black. However, some specimens of *B. illaudatus* examined herein have a slightly longer tibial spur (ca. 1/4–1/3 the length of the tibial spine) which overlaps the variation observed for *B. obediens*; specimens of *B. obediens* examined had spurs 1/3 to nearly 2/3 the length of the spine. The male terminalia of *B. illaudatus* and *B. obediens* are nearly identical; the gonostylus and epandrium, entirely so. Only the narrower cleft of the posterior margin of the synsternogonocoxite and the more convex (in dorsal or ventral views) lateral portion of the gonocoxites will distinguish the male terminalia of *B. illaudatus* from that of *B. obediens*.

MATERIAL EXAMINED. Holotype and 4 paratypes (USNM) and 1 male paratype (BPBM) of *B. illaudatus* as well as the following specimens of *B. obediens* (det. D.E. Hardy) were examined: Neth. Ind. – American New Guinea Exped., Sigi Camp 1500 m, 22 Feb. 1939, L.J. Toxopeus (BPBM)(1 female); New Guinea (Neth.), Wisselmeren: Enarotadi 2000 m, 5 Aug. 1955, J.L. Gressitt (BMBM)(1 female); New Guinea, Wau, 1750m, 23 Aug. 1965, Malaise trap, J. & M. Sedlacek (BPBM)(1 male); New Guinea: Papua, Owen Stanley Range, Goilala: Bome, 1950m, 1–15 Apr. 1958, W.W. Brandt (BPBM)(1 male).

DISCUSSION. Hardy (1961) discussed the possibility that *B. illaudatus* may be only a subspecies of *B. obediens* Osten Sacken, which was described from New Guinea. Small sample size prevents an adequate study of the inter- and intraspecific variation of *B. illaudatus* and *B. obediens*. Therefore, based upon the material examined herein these taxa are treated as distinct until additional data suggests otherwise. Hardy (1968a) stated that specimens of *B. obediens* were examined from New Hebrides; these specimens have not been examined, but may provide additional insight into the status of *B. illaudatus* and *B. obediens*. Based on Hardy's (1968a) discussion of *B. obediens* it appears that the species concepts of *Bibio* in the entire region (e.g., India, Philippines, New Caledonia, New Guinea) are in question and the genus probably requires a synthetic revision that reexamines all the species that have been described from these areas.

Dilophus arboreus Fitzgerald, new species

(Figs. 2–6)

DIAGNOSIS. *Dilophus arboreus* is most similar to *D. tuthilli* from New Zealand, but differs from this species because the head is not strongly modified with the eyes projecting at the front of the head and the face greatly receded (compare Fig. 4 to Hardy, 1953, Fig. 7a). However, it is possible that the unique structure of the head of *D. tuthilli* noted by Hardy (1953) is an artifact of preservation. The 5 paratypes of *D. tuthilli* that were examined (USNM) are pinned and the anterior and ventral surfaces of the head appear to have collapsed when the specimens dried up. Since the specimens of *D. arboreus* are preserved in alcohol (except for the holotype and paratype, which were pointed after treating with hexamethyldisilazane (HMDS) to reduce the collapse of structures (Nation, 1983)), the head is not collapsed and it remains unclear whether the difference in head shape in these taxa is an artifact or not. If the shape of the head is an artifact, these two taxa differ only in minor differences in the shape of the terminalia. In *D. arboreus* the apex of the gonostylus is slightly more blunt (more acute in *D. tuthilli*) and the dorsal sclerite of the paramere of *D. arboreus* is slightly broader than in *D. tuthilli* (Fig. 5).

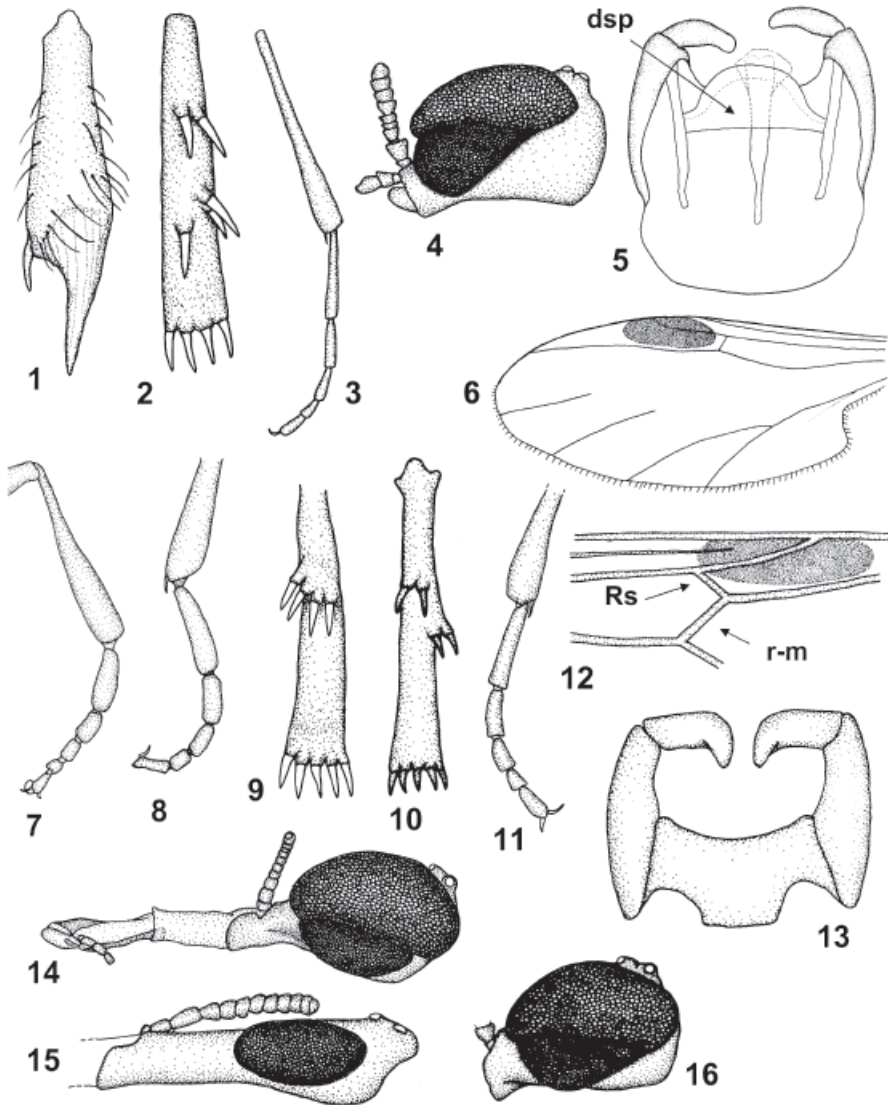
MALE. Head black with short dark setae. Ocelli present. Ocellar tubercle only slightly developed; in lateral view ocelli just above level of compound eye. Sclerotized portion of head anterior to compound eye undeveloped beyond antennae (Fig. 4). Antennae brown with 7–8 flagellomeres; apical flagellomeres 4–5 closely compacted together forming a weak club. When 8 flagellomeres present the apical segment is minute and button-like. Compound eye with minute, dark, erect, sparse hair; lower 1/3 of eye divided into region of smaller facets by a distinct thin sclerotized longitudinal band. Thorax dark brown; dorsum shining with dorsocentral rows and lateral rows of dark setae. Prothoracic comb with 8 spines; medially undivided. Metathoracic comb with 7 smaller spines. Fore coxa yellowish brown, mid and hind coxae brown. All femora clavate, basally yellowish brown and distally brown. Fore tibia brownish yellow with an apical circllet of 7 spines. Fore tibia dorsally with medial spines above the apical set; beginning basally and moving distally there is a pair of dorsal spines, a pair of posterodorsal spines, and then a single dorsal spine (Fig. 2). Occasionally the distal 3 spines appear to be in a single row rather than the most distal spine set off by a small gap. Inner surface of hind tibia with 21–22 ($N = 2$) sensilla. Mid and hind tibia yellow-brown basally and brown distally. Tarsi brown. Hind basitarsus slender elongate, $9 \times$ as long as wide. Hind tibia subparallel. All legs with short dark setae. Halter light brown. Wing 2.6 mm slightly light brown fumose, veins brown. Pterostigma brown. Radius with short black evenly spaced setae and minute transverse striations. Costa extending almost to wing tip, considerably beyond end of Rs (Fig. 6). Subcosta complete. Base and fork of M absent; only apices of M_1 and M_2 present (Fig 6). M-cu crossvein absent. Wing with evenly spaced microtrichia. Anal lobe well developed. Hind margin of wing with a fringe of setae. Abdomen dark brown with sparse black setae. Posterior margin of epandrium nearly straight; not emarginated. Gonostylus short, thick, slightly tapered apically, apex blunt (Fig. 5).

FEMALE. As in male except the following: Head and thorax brown. Eye dichoptic, undivided. Prothoracic comb with 6–8 spines, metathoracic comb with 8–9 spines. Abdomen weakly sclerotized and abdominal pleurae extensive; sternites often anteromedially excised or entirely longitudinally divided. Ocellar tubercle absent. Inner surface of hind tibia with 24–26 sensilla ($N = 2$). In dorsal view a thin longitudinal carina present from lateral edge of prothoracic comb to lateral edge of metathoracic comb delineating 2 anterolateral regions of the mesonotum that are yellowish brown and contrast the darker remainder of the dorsum. Hind basitarsus slender elongate, approximately $12 \times$ as long as wide. Wing 2.6 mm.

TYPE SPECIMENS. Holotype male: NEW CALEDONIA: Rivière Bleue (P6), Forêt dense, fogging 21 Oct. 92, Chazeau, Guilbert, Bonnet de Larbogne (MNHN). Paratypes: Same as holotype, 1 female (MNHN).

ADDITIONAL MATERIAL EXAMINED. Same as holotype label, 1 male, 16 females (in alcohol)(MNHN); same as holotype label except 16 Jul. 92, 1 male, 1 female (MNHN).

DISCUSSION. Although all specimens of *D. arboreus* were collected as part of a canopy fogging study in Rivière Bleue Provincial Park (Guilbert, 1997), it seems unlikely that this minute



Figs. 1-16. Bibioninae. 1, *Bibio illaudatus*, male fore tibia; 2-6, *Dilophus arboreus*, male; 2, fore tibia; 3, hind tibia and tarsi; 4, head, lateral; 5, terminalia, dorsal (epandrium removed); 6, wing; 7-16, *Dilophus proxilus*; 7-8, male hind tibia and tarsi; 9-10, male fore tibia; 11, female hind tibia and tarsi; 12, male, portion of wing; 13, male terminalia, dorsal; 14, male head, lateral; 15, female head, lateral; 16, male head, lateral (excluding mouthparts and antennal flagellum); dsp – dorsal sclerite of paramere; r-m – radial-medial crossvein; Rs – base of radial sector.

species is strictly associated with the canopy. The site (Rivière Bleue P6) at which the type series was collected is characterized as dense evergreen forest on ultramafic alluvium (Guilbert, 1997). The site has been described by Bonnet de Larbogne *et al.* (1991) and the vegetation further characterized by Jaffré & Veillon (1990) and Jaffré *et al.* (1993).

Dilophus arboreus belongs to an apparent complex of species in the south Pacific that are characterized in part by the absence of the base of M and the m-cu crossvein (Hardy 1968a, 1982). Also included in this “group” is *Dilophus tuthilli* (Hardy) (New Zealand), the *D. exiguus* complex (Hardy, 1968a, 1968b) (New Guinea and the Bismarck Islands), and *D. collessi* Hardy, *D. discretus* Hardy, *D. modicus* Hardy, *D. parvus* Hardy, *D. pictipes* Skuse, and *D. sexspinosus* Hardy (Australia).

ETYMOLOGY. The specific epithet is derived from the Latin “*arboreus*” (of trees) as the only specimens of this species were collected via canopy fogging studies.

Dilophus proxilus Fitzgerald, new species

(Figs. 7–16)

DIAGNOSIS. *Dilophus proxilus* is most similar to *D. dichromatus* Hardy from New Guinea. Although the male gonostylus of these 2 species is nearly identical, males of *D. proxilus* can be distinguished by having the posterior margin of the epandrium straight rather than with a V-shaped cleft, having 10 rather than 11 antennal flagellomeres, and its slightly smaller size (wing 3.5 mm rather than 4.5 mm). Females of *D. proxilus* can be distinguished by having 10 rather than 11 antennal flagellomeres, thorax with dark stripes rather than entirely orange, legs yellow rather than black, and its smaller size (wing 4.0 mm rather than 6.5–7.0 mm).

MALE. Head black with long black hair. Ocelli present, ocellar tubercle only slightly developed with ocelli projecting just above level of compound eye. Sclerotized portion of head anterior to compound eye 1/2–3/4 length of lower division of compound eye (Figs. 14, 16). Antenna dark brown with 10 flagellomeres; apical flagellomere minute, button-like; basal flagellomere subequal in length to following flagellomere. Compound eye with minute, sparse, erect hair; lower 1/4 eye divided into region of smaller facets. Dorsum of thorax black to dark brown, shining, bare, except long yellow hair forming a dorsocentral pair and a lateral pair of stripes. Prothoracic comb on a well developed ridge, slightly divided medially, with 12 strong spines. Mesothoracic comb on well developed ridge with small spines. Thoracic pleura dark brown to black, bare, shining. Coxae dark brown to black; fore coxa with long yellow to brown hair. Legs dark brown to black; femora always slightly darker, with dense long, dark hair. Fore tibia with an apical circlet of 8 dark brown spines and a longer black anteroventral spur. Fore tibia dorsosubmedially with a row of well developed spines. Submedian spines variable; either 3–4 spines in a single angulate row (Fig. 9) or 2 dorsal and 2 slightly more distal dorsoposterior spines (Fig. 10). Hind tibia apically swollen, about 3 × width base of tibia. Hind basitarsus slightly to moderately swollen, 3–5 × as long as wide (Figs. 7, 8). Halter light brown. Wing 3.5 mm, nearly hyaline, light brown fumose anteriorly. Anterior veins and pterostigma dark brown, posterior veins pigmented, light brown, crossvein m-cu and base of M_{1+2} present. R_1 and R_{4+5} with short, sparse, erect, black, evenly spaced setae; space between hairs much wider than length of seta. Base of Rs 1/4–1/2 length of crossvein r-m (Fig. 12). Abdomen dark brown with long yellow hair laterally and ventrally; tergites 1–3 medially pubescent. Posterior margin of the synsternogonocoxite with broadly rounded median projection. In ventral view, gonostylus robust basally, tapered and narrowly rounded apically; in posterolateral view, narrow, kidney-shaped, apically rounded; in dorsal view simple, elbowed at about half way point with apex pointing anteriorly, apex rounded to slightly truncate (Fig. 13). Epandrium 2 × as wide as long; posterior margin uncleft, nearly straight; anterior margin nearly straight to sinuate (Fig. 13).

FEMALE. Head black with black hair, ocelli present. Ocellar tubercle very weakly developed, ocelli nearly at level of vertex. Compound eye dichoptic, undivided, with minute, erect, sparse hair. Sclerotized portion of head anterior to compound eye elongate, longer than eye, nearly equal to length of remainder of head (Fig. 15). Antenna dark brown, except pedicel light brown, with 10 fla-

gellomeres; basal flagellomere $2 \times$ as long as following flagellomere; apical flagellomere minute, button-like. Humeral ridge dark brown, pronotal lobe brown-yellow. Prothoracic comb on well developed yellow ridge; medially divided to undivided, with 13–14 robust dark brown spines. Mesothoracic comb black to dark brown medially, yellow laterally, with 15 dark brown spines; spines more weakly developed than those of prothoracic comb. Thorax yellow in ground color; dorsum with 3 broad black to dark brown stripes; pleura marked with brown; ventral 2/3 of katapisternum brown. Scutellum brown-yellow. Dorsum of thorax with yellow hair in dorsocentral rows and laterally. Thoracic pleura bare. Fore and mid coxa yellow, hind coxa brown. Trochanter brown. Femora, tibia, and tarsi primarily yellow, except tipped with brown distally; with brown hair. Hind basitarsus slender, elongate, $5 \times$ as long as wide (Fig. 11). Spines of fore tibia likely variable as in male, however, all specimens examined with only a single angulate row of 4 submedian spines. Abdomen brown with yellow hair. Wing 4.0 mm; venation as in male.

TYPE SPECIMENS. Holotype male: NEW CALEDONIA: Rivière des Pirogues, 7–9 Feb. 1984, Pogue & Epstein, black light (UMSP). Paratypes: Same as holotype, 2 males, 1 female (UMSP); New Caledonia, Rivière Bleue Prov. Pk., Trail to Vallée de Pourina, 19 Nov. 1992, 750 m, D.W. Webb, Malaise trap across forest path, 1 male, 1 female (INHS); Nouvelle Calédonie, Mont do, 900–950m, Forêt, 27 Nov. 1983, L. Matile et J. Chazeau, 2 males, 1 female (MNHN).

ADDITIONAL MATERIAL EXAMINED. NEW CALEDONIA: Rivière Bleue (P6), Forêt dense, fogging 21 Oct. 92, Chazeau, Guilbert, Bonnet de Larbogne, 1 male (in alcohol)(MNHN); Mt. Painter, 1360 m., 10 Oct. 1967, J. & M. Sedlacek, 5 males (BPBM); Mt. Koghi, 450–600 m., 4–6 Oct. 1967, J. & M. Sedlacek, 1 male (BPBM); 9.2 km NE Col d'Amieu on Rte. 5, slopes of Mt. Rembai, 375–675 m, 23 Sep. 1979, 1 female (BPBM).

ETYMOLOGY. The specific epithet is derived from the Latin “proxilus” (stretched out long) for the elongate rostrum of this species.

Plecia (Heteroplecia) Hardy

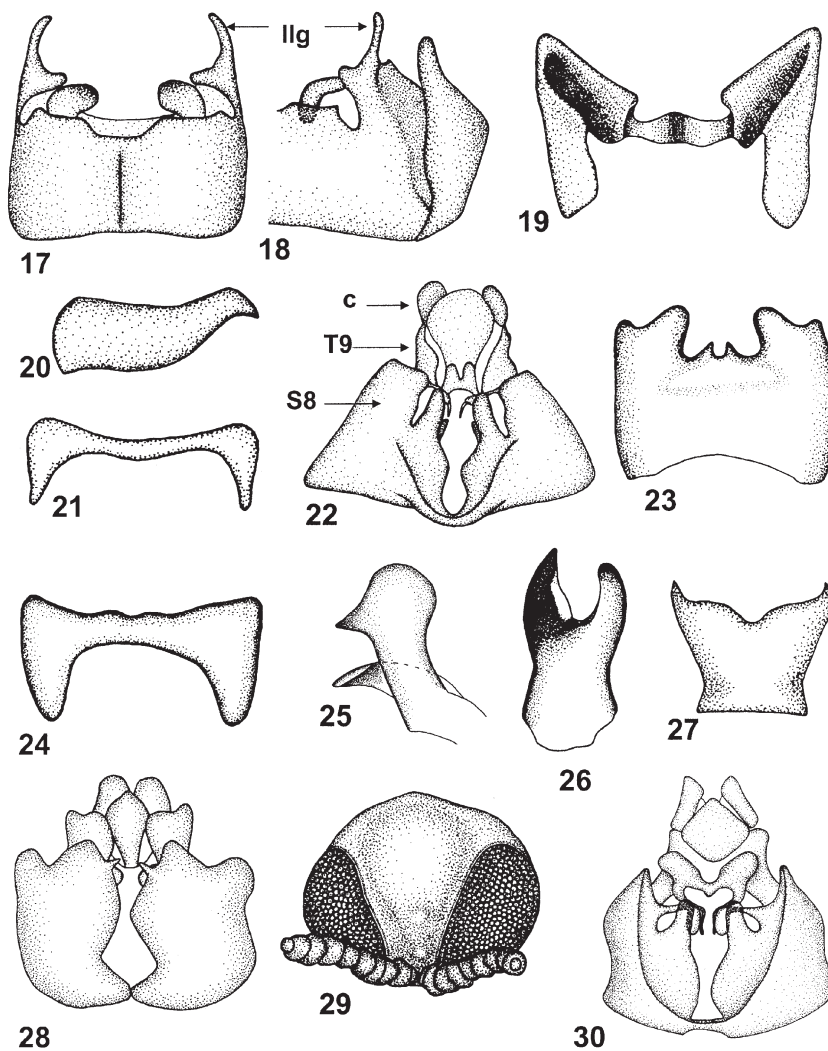
Hardy (1950) erected the monotypic subgenus *Heteroplecia* for the species *Plecia visenda* Hardy from New Guinea. This subgenus is distinguished from the nominate subgenus by the lack of ocelli and an ocellar tubercle. Later, Hardy (1968a) stated that the lack of the ocelli and tubercle is probably only of specific importance and questioned whether *Heteroplecia* should be retained as a distinct subgenus. The 3 *Plecia* species discussed herein are the only other species known to lack these structures and thus would be assigned to *Heteroplecia*. Hardy (1968a) noted that *P. visenda* shows “considerable relationship” to the *decora* complex because of the strongly developed epandrium and short broad ninth sternum, but differ from this complex in a number of aspects. *Plecia lusca* and *P. imocellata* do not fit Hardy’s definition of the *decora* complex and are not easily assigned to any of the species groups defined by Hardy (1968a) and Hardy & Delfinado (1969). Considering this, the species described below are tentatively placed in the subgenus *Heteroplecia* until a phylogenetic study of *Plecia* can help to define the subgenera and species groups.

Plecia imocellata Fitzgerald, new species

(Figs. 17–22)

DIAGNOSIS. *Plecia imocellata* is most similar to *P. visenda* and *P. lusca*. Males are easily distinguished by the digitate lateral lobe of the gonocoxite (Figs. 17, 18) and the simple (rather than bifurcate) gonostylus (Fig. 20). Females are distinguished by the shape of sternite 8 (Fig. 22) and tergite 9 (Fig. 21).

MALE. Head brown. Ocelli and ocellar tubercle absent, compound eyes meeting posterodorsally. Compound eye with minute, erect, sparse hair; lower 1/3 of eye divided into region of smaller facets. Face not produced. Clypeus + proboscis brown, short, subequal to length of antenna. Except for orange pedicel, antenna orange-brown to dark brown with 8 flagellomeres; basal flagellomere $2 \times$ length following flagellomere; apical flagellomere minute, nipple-like. Entire thorax



Figs. 17–30. *Plecia*. 17–22, *P. inocellata*; 17, male terminalia, ventral; 18, male terminalia, lateral; 19, epandrium, dorsal; 20, gonostylus, lateral; 21, female tergite 9, dorsal; 22, female terminalia, ventral; 23–29, *P. lusca*; 23, male terminalia, ventral; 24, male epandrium, dorsal; 25, male gonostylus, lateral; 26, male gonostylus, posterior; 27, female tergite 9, dorsal; 28, female terminalia, ventral; 29, female head, dorsal; 30, *Plecia* sp., female terminalia, ventral; **c** – cerci; **llg** – lateral lobe of gonocoxite; **S8** – sternite 8; **T9** – tergite 9.

opaque orange; dorsum with lateral portion of mesonotum and dorsal 1/2 katepisternum with sparse, short, appressed, pale hair. Scutellum with median light brown stripe. Halter brown apically, orange basally. Wing 6.5–7.0 mm, hyaline; veins and pterostigma light brown. R_{2+3} nearly straight, approximately 1/4 length R_{4+5} . Coxa, trochanter, legs light brown to orange-brown, except apical tarsomeres dark brown; with dense, long, light brown hair. Hind tibia slender. Hind basitarsus slender, elongate, $10 \times$ as long as wide. Abdomen dark brown with dense, long, light brown hair. Posterior and anterior margin of epandrium emarginate leaving only a narrow transverse strip of the epandrium medially (Fig. 19). Gonostylus stout, elongate apically tapered (Fig. 20). Lateral lobe of gonocoxite well developed, digitate (Figs. 17–18). Posterior margin of synsternogonocoxite without median or submedian lobes (Fig. 17).

FEMALE. As in male except: Eye dichoptic, undivided. Frons bulbous, keel-like just posterior of antenna base with a small rounded tubercle. Antenna with 8 flagellomeres. Wing 7.0–8.0 mm. Hind basitarsus $7 \times$ as long as wide. Ventrally, female terminalia as Fig. 22. Tergite 9 as in Fig. 21.

TYPE SPECIMENS. Holotype male: NEW CALEDONIA: Rivière Bleue Prov. Pk., km 21.9 Riv. Bleue road, 3–5 Nov. 1992, 290 m, Malaise trap in Maquis, D.W. Webb, (INHS). Paratypes. NEW CALEDONIA: Same as holotype 6 males (INHS); Mt. Koghi, 500 m, 23–27 Aug. 1967, M. Sedlacek, 1 male (BPBM), same except 23–27 Oct., 500–800 m, J. & M. Sedlacek, light trap, 2 male, 1 female (BPBM); Port Boisé, 13 Aug. 1971, J. Holloway, Acc. #1981.232, 1 male (BPBM); Mt. Stream up Boulari R., light trap, 3 Nov. 1958, C.R. Joyce, 3 males (BPBM); Plaine des Lacs area, 5 Nov. 1958, C.R. Joyce, 1 male, 2 females (BPBM); On Hgts. between Thio & Nakety, 12 Nov. 1958, C.R. Joyce, 3 males, 1 female (BPBM); Mt. Khogis, 500 m, 17 km NNE Nouméa, 5–15 Nov. 1992, Malaise trap in tropical forest, D.W. Webb, 1 male (INHS), same except 30–31 Oct., M.E. Irwin, D.W. Webb, 3 males (INHS), same except 1–3 Nov., M.E. Irwin, D.W. Webb, 1 male (INHS); Rivière Bleue, 30 km NW Yale, Malaise, 29 Sep.–13 Oct. 1986, L.B. deLarboigne, J. Chazeau, A. & S. Tiller, Station Parc 5, collection # 216, 3 males (INHS).

ADDITIONAL MATERIAL EXAMINED. NEW CALEDONIA: Pic du Pin, 300 m, Site 69, 06880/75385, J.D. Holloway, 8 Aug. 1971, swept *Nothofagus* forest, B.M. 1971-507, 1 female (BMNH).

ETYMOLOGY. The specific epithet is derived from the Latin “*im-*” (without) + “*ocellatus*” (having little eyes) describing the lack of the ocelli.

Plecia lusca Fitzgerald, new species

(Figs. 23–29)

DIAGNOSIS. Males of *P. lusca* are most similar to *P. visenda* and *P. imocellata*, but can be distinguished by the bifurcate gonostylus (Figs. 25–26), lack of a lateral lobe of the gonocoxite (Fig. 23), and posterior margin of the synsternogonocoxite developed into a pair of small median lobes (Fig. 23). Females can be distinguished by the shape of sternite 8 (Fig. 28) and tergite 9 (Fig. 27).

MALE. Head dark brown. Eyes holoptic, meeting along entire margin of vertex; ocelli and ocellar tubercle absent. Compound eye with sparse, minute, pale hair; not divided into 2 regions of different-sized facets. Antenna brown-orange with 8 flagellomeres; apical flagellomere minute and nipple-like. Palps orange-brown, with 4 segments. Clypeus + proboscis dark brown, short, 1/2 length of antenna. Thorax opaque orange-brown; anepisternum and portions of surrounding thoracic pleurae tinged with dark brown. Femur orange-brown basally, becoming slightly darker distally. Tibia and tarsi orange-brown to brown; distal tarsomeres dark brown. Hind basitarsus slender, elongate, $7 \times$ as long as wide. Abdomen brown with orange tinge, darker posteriorly. Wing 4.0–5.0 mm, hyaline to light brown fumose, stigma and veins brown. R_{2+3} 1/3 length R_{4+5} , nearly straight, at 45 degrees to R_{4+5} . Halter orange-brown basally, light brown apically. Posterior margin of epandrium nearly straight, except 2 slight humps medially (Fig. 24). Anterior margin of epandrium strongly excavated; cleft nearly 3/4 length of epandrium (Fig. 24). Inner surface of epandrium lacking clumps of setae. Posterior margin of synsternogonocoxite developed into 2 pairs of sublateral lobes (submedian lobes of Hardy & Delfinado 1969) and a pair of small, slender, digitate median lobes (Fig. 23); the inner pair of sublateral lobes slightly larger. Synsternogonocoxite with a posterior median triangular membranous area which is widest anteriorly and terminates at the median lobes of the poste-

rior margin of the synsternogonocoxite (Fig. 23). Lateral lobe of gonocoxite undeveloped. Epandrium and synsternogonocoxite very narrowly fused anterolaterally. Gonostylus bifurcate; in posterior view inner lobe rounded, outer lobe acute (Fig. 26); in lateral view inner lobe evenly curved downward, apically acute, outer lobe chicken-head shaped (Fig. 25).

FEMALE. As in male except as follows: Eye dichoptic, undivided. Vertex and frons bulbous with 2 small, rounded, tubercles anteromedially (Fig. 29). Wing 5.0–6.0 mm. Sternite 8 divided medially; the inner margin sinuous with an inward and posteriorly directed, small, tooth-like lobe posteriorly (Fig. 28). Posterior margin of sternite 8 with a broadly rounded lateral lobe, and a broad apically rounded median lobe (Fig. 28). In dorsal view tergite 9 whale-tail shaped; basally constricted, apically expanded; posterior margin with broad, shallow, V-shaped excavation; lateral lobes apically acute (Fig. 27).

TYPE SPECIMENS. Holotype male: NEW CALEDONIA: Plaine des Lacs 5 km. E. Grand Lac, Jan. 22–25 1984, Pogue & Epstein, black light, (UMSP). Paratypes. Same data as holotype, 11 males, 11 females (7 pairs in copula) (UMSP).

ADDITIONAL MATERIAL EXAMINED. In addition to the type material listed above, the following specimens were examined: Nouvelle Calédonie, Rivière Bleue, 20 Feb. 1990, Michel Boulard *réc.*, 2 males, 2 females, (2 pairs in copula) (MNHN).

ETYMOLOGY. The specific epithet is derived from the Latin “lusc” (half blind) describing the lack of ocelli.

Plecia sp.
(Fig. 30)

MATERIAL EXAMINED. NEW CALEDONIA: On Hgts. between Thio & Nakety, 12 Nov. 1958, 1 male (BPBM); Rivière Bleue Prov. Pk., 30 km NW Yaté, 270 m, 27 Dec. 1991, M.E. Irwin, D.W. Webb, Malaise trap across forest path, 1 female (INHS).

DISCUSSION. Among the material examined there was one female and one male which had the entire thorax black. The female terminalia (Fig. 30) was similar to, but slightly different from *P. imocellata* and this specimen may represent an undescribed species. The male with the black thorax is not associated with this female, was collected from a different locality, and is missing the tip of the abdomen. It was collected from the same locality and date as a series of *P. imocellata*. Considering this, it is possible that the male specimen represents a black morph of *P. imocellata*. However, additional material is needed to resolve the identity of both of these specimens.

Other Bibionidae that may occur in New Caledonia

The known limits of geographic distribution of *Plecia amplipennis* Skuse is the Bismarck Archipelago and New Guinea in the north and New South Wales, Australia in the south. The relatively widespread range of this species and occurrence on adjacent Vanuatu make it possible that it may also occur in New Caledonia. This species is distinguished from the New Caledonian *Plecia* species by the presence of ocelli and differences in the male terminalia (Hardy, 1968a; Fig. 15).

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