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THE TABANIDAE (DIPTERA) OF NEW CALEDONIA

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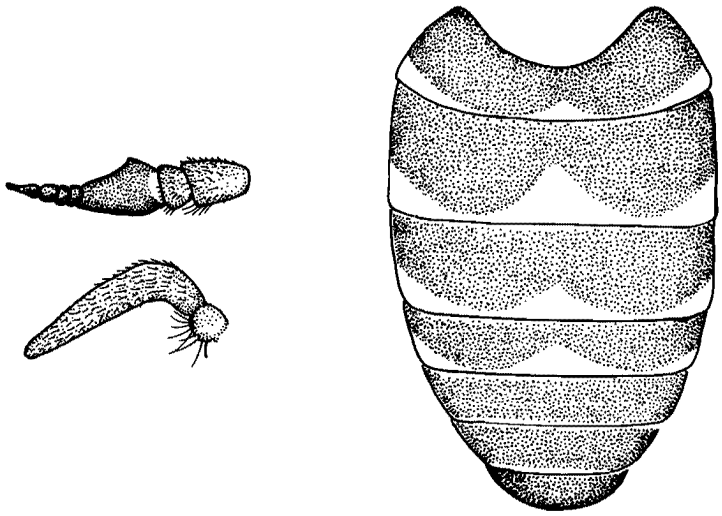

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THE TABANIDAE (DIPTERA) OF NEW CALEDONIA

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ABSTRACT. The Tabanidae of New Caledonia, the Isle of Pines, and the Loyalty Islands are reviewed. Sixteen species in 4 genera are described as new: *Chasmia brunnea* n. sp., *Ch. maculata* n. sp., *Ch. neocaledonica* n. sp., *Cydistomyia (C.) atrata* n. sp., *C. kraussi* n. sp., *C. longicornis* n. sp., *C. longipennis* n. sp., *C. longistyla* n. sp., *C. metallica* n. sp., *C. minuta* n. sp., *C. pinensis* n. sp., *C. quadrimaculata* n. sp., *Dasybasis evenhuisi* n. sp., *D. gracilipalpis* n. sp., *D. ponandouensis* n. sp., and *D. setipalpis* n. sp. Males of 7 species, previously known only from females, are described for the first time. Criteria for generic distinction of taxa occurring on New Caledonia are reviewed and revised, and the genus *Chasmiella*, previously resurrected for 5 New Caledonian species, is synonymized with *Chasmia*. Three recently described species are placed in synonymy: *Cydistomyia danutae* = *C. risbeci* n. syn., *Dasybasis lydiae* = *D. kuniae* n. syn., and *Cydistomyia norae* = *Dasybasis grenieri* n. syn. New combinations are proposed for 7 species: *Chasmiella bozennae* = *Chasmia bozennae* n. comb., *Chasmiella conradi* = *Chasmia conradi* n. comb., *Chasmiella leszeki* = *Chasmia leszeki* n. comb., *Chasmiella kuniae* = *Dasybasis kuniae* n. comb., *Chasmiella cohici* = *Chasmia cohici* n. comb., *Cydistomyia norae* = *Dasybasis norae* n. comb., and *Cydistomyia tiwakai* = *Dasybasis tiwakai* n. comb. A brief summary of the geology and biogeography of New Caledonia is provided from existing literature, as well as comments on the distribution and possible dispersal patterns of Tabanidae. At present, 41 species of Tabanidae in 4 genera are known from New Caledonia, the Isle of Pines and the Loyalty Islands.

INTRODUCTION

The island of New Caledonia has a poorly-known and complex geological history. It possesses both continental and oceanic island characteristics. The geological and biogeographic history, climate, and topography have been summarized by Holloway (1979). The time of emergence and the tectonic history of the island still is incompletely known, but at least parts of the present-day dry land have been above water since the Upper Jurassic (150-170 Ma), and much of the island has been above water since at least the Eocene, and possibly as early as the Late Cretaceous. Present-day New Caledonia may be composed of at least 2 separate continental fragments, but the horse fly fauna, as presently known, does not reflect this.

New Caledonia has been isolated from other land masses for at least 65 Myr. Its geological history is clearly similar to that of the northern island of New Zealand, with its Triassic rocks and fossils similar to those of New Zealand. New Caledonia is at the northern extremity of the Norfolk Ridge, which extends south to New Zealand, but it is not clear whether New Caledonia and New Zealand were connected by dry land or a series of "stepping stones" between them.

Kamp (1980) has provided evidence for the existence of a "lost" continent of Pacifica, based on the present circum-Pacific distribution of quartzo-feldspathic sediments. This continent would have included at least parts of both New Zealand and New Caledonia, confirming the close association between them, based on Triassic rocks and fossils, and some present-day plants and animals. Pacifica is hypothesized to have lain off eastern Gondwanaland until the Triassic, when fragmentation occurred, resulting in the present-day exotic blocks of continental crust within the circum-Pacific Cordillera. This would explain both the continental nature of New Caledonia and its long isolation from other continental masses. Based on reconstructions by Kamp (Map C, Fig. 2) for the late Jurassic, New Caledonia was relatively close to the southeastern coast of Australia, separated by the Lord Howe Rise.

Relationships to other land areas are less clear. Kamp suggests that the present Chesterfield Reefs and Bellong Plateau may be remnants of "stepping stones" between Australia and New Caledonia. New Caledonia may have been associated with SE New Guinea through the Louisiade Rise as part of an inner Melanesian arc, although any connection may have been through an archipelago and not a continuous connection of dry land. Finally, there is some biogeographic evidence that present-day New Caledonia may have had some contact with Africa, possibly through a series of archipelagos running north of present-day Australia.

The age, isolation, size, mild tropical climates, complex topography and serpentine peridotite soils of New Caledonia have contributed to an amazingly diverse and archaic flora and fauna. There are 15 plant families unique to New Caledonia, as are 15% of the plant genera and 92% of the plant species (Holloway, 1979).

The composition of New Caledonia's horse fly fauna mirrors its past relationships with present-day continents and islands. Adult Tabanidae are relatively strong fliers, and archipelagic connections with New Caledonia probably did not prove too formidible a barrier to them. The major requirements for establishment of taxa would be suitable habitat for the immature stages, and food for adult females, which are thought to be predominantly haematophagous on mammals. Since there are no mammals native to New Caledonia, it is not certain what adult females may have used for food. Some Tabanidae are known to be autogenous, at least facultatively, and perhaps most or all of the species occurring on New Caledonia do not require blood from mammals, or they may feed on other hosts. Unfortunately, nothing has been published on the feeding habits of adult Tabanidae or larval habitats of New Caledonian species.

The horse fly fauna of New Caledonia consists entirely of members of the tribes Philolichini and Diachlorini, which probably dispersed during the early Mesozoic era (Mackerras, 1961). Within the Diachlorini, *Dasybasis* Macquart probably is structurally the least specialized genus. *Cydistomyia* Taylor and *Chasmia* Enderlein are more derived. The highly successful and invasive Chrysopsini and Tabanini (*Chrysops* Meigen and *Tabanus* Linnaeus) are not present, attesting to the long isolation of New Caledonia from continental land masses. Considering the age of New Caledonia, it is surprising to find no *Tabanus* there, since this genus has readily colonized recently emerged island groups of Melanesia and Samoa. Perhaps the absence of suitable hosts for haematophagous adult females has prevented *Tabanus* species from establishing populations there.

Mackerras (1961) discussed relationships of New Caledonian Tabanidae with those of surrounding lands. Species of *Dasybasis,* which he placed in the subgenus

Protodasyommia Enderlein, clearly are related to those of the same subgenus on New Zealand. At least 5 species of *Cydistomyia* representing 3 different Papuan species groups, and the species of *Chasmia*, are derived from ancestors of the New Guinea fauna. *Dasybasis rubricallosa* (Ricardo) and some *Cydistomyia* species appear to be closest to species from Queensland and New South Wales. The 3 *Philoliche* species are unequivocally related to Afrotropical species, not Oriental ones, and their closest relative, *Philoliche pennata* Oldroyd, is known only from Mauritius. *Philoliche amboinensis* (Fabricius), recorded from Timor and Maluku, seems to be most closely related to the Indo-Oriental fauna (Oldroyd, 1947). Species of *Philoliche* possibly reached New Caledonia via an archipelago of islands running to the north of present-day Australia. No genera of Tabanidae are unique to New Caledonia and adjacent islands, but all of the known species occur nowhere else.

Considering the present species richness of Tabanidae on New Caledonia, surprisingly little was known of the fauna as recently as 35 years ago. The first species recorded was *Pangonia dorsalis* Macquart in 1837, but the name was preoccupied by a Latreille species. Mégnin (1878) described *Pangonia neocaledonica* Mégnin. Bigot (1892) described *Corizoneura leucopicta* Bigot (subsequently synonymized with *neocaledonica*) and *Tabanus lifuensis* Bigot (now *Cydistomyia lifuensis*). Ricardo (1914) added 2 more species, *Tabanus caledonica* Ricardo (now *Cydistomyia caledonica*) and *Tabanus rubricallosus* Ricardo (now *Dasybasis rubricallosa*). Until 1958, only these 4 species were known from New Caledonia. Mackerras and Rageau (1958) added 11 species to the fauna (2 *Philoliche*, 9 *Cydistomyia*). Mackerras (1962) subsequently added one species of *Dasybasis*, and transferred one described species from *Cydistomyia* to *Dasybasis*. Trojan (1991) added 12 more species to the fauna, recorded the genus *Chasmiella* Enderlein from New Caledonia for the first time, and rearranged the generic placement of some *Cydistomyia* species. My study adds another 16 species to the fauna, revises some of Trojan's generic concepts, and synonymizes 3 of his taxa with previously described species. In the past 34 years, the number of tabanid species recorded from New Caledonia, the Isle of Pines and the Loyalty Islands has risen from 4 to 41, with little indication that total species richness is yet recorded. The number of *Cydistomyia* species known to occur on New Caledonia (19) now exceeds that of Australia. Of the 41 species treated here, 37 occur only on the main island, 1 is known only from the Isle of Pines, 3 occur on the Isle of Pines and on New Caledonia, and 2 are known from the Loyalty Islands as well as New Caledonia.

A total of 926 specimens from 52 localities in New Caledonia were examined. Through the kindness of Dr. Loïc Matile, Museum National d'Histoire Naturelle, Paris, and Mr. John E. Chainey, The Natural History Museum [British Museum (Natural History)], London, I was able to study all but 2 of Trojan's holotypes, selected paratypes and other specimens determined by Mackerras and/or Rageau to verify the identity of described species. The data for these specimens has been published previously and is not included under material examined for individual taxa. The following acronyms are used for the museums from which specimens were examined: BPBM: Bernice P. Bishop Museum, Honolulu, Hawaii U.S.A.; FSCA: Florida State Collection of Arthropods, Gainesville, Florida, U.S.A.; MCZ: Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, U.S.A.

GENERIC CONCEPTS IN NEW CALEDONIA TABANIDAE

Trojan (1991) rightly criticizes the criteria used to separate *Cydistomyia* and *Dasybasis* in New Caledonia and elsewhere, particularly the use of width of the front (or frontal index), the hairiness of the eyes, and the presence or absence of a spur on vein R_4. These characters are so variable that they are of limited value. He proposed using a parafacial index (relative width of the gena) to separate these genera. I prefer to follow the usage of Teskey (1990) and others, using the term gena for the area of the face between the eye margins and the frontoclypeus. The term genal index will be used in this work. The genal index is obtained by dividing the length of the frontoclypeal suture, from the subantennal suture to the tentorial pit, by the the width of the gena below the subantennal suture (Trojan, 1991, fig. 1). This character seems to work well for the species studied. However, the range of the index given by Trojan for *Dasybasis* (0.9 -1.37) and for *Cydistomyia* (1.8 - 2.5) is not nearly as clear-cut as he suggests. For example, the genal index of the holotype of *Cydistomyia brachypalpus* is 1.58. Based on examination of Trojan's holotypes and the species described here, a more accurate range for the genal index is 0.9 - 1.37 for *Dasybasis* and 1.5 - 2.5 for *Cydistomyia*. This character, however, is still useful for separating the 2 genera.

Trojan (1991) used differences in the width of the frons (frontal index) to separate *Dasybasis* from *Cydistomyia*. This character does not consistently separate these genera when used in combination with the genal index. The configuration of the margins of the frons, whether convergent, parallel or divergent below, has some diagnostic value and is used in my key to genera.

Trojan (1991) described 3 species from New Caledonia in the genus *Chasmiella* Enderlein, and transferred 2 species formerly placed in *Cydistomyia* to *Chasmiella*. Review of characters Enderlein (1922) used to define *Chasmiella* and to separate it from *Chasmia* Enderlein strongly suggests that *Chasmiella* should be synonymized with *Chasmia*. Enderlein (1922) proposed *Chasmia* and *Chasmiella* as new genera within the subfamily Chasmiinae in his "Tabanidensystem". He separated *Chasmia* from *Chasmiella* by the longer, cylindrical antennal scape in the former (shorter and triangular in *Chasmiella*), basal flagellomere with only an "insignificant" tooth ("more or less" distinct in *Chasmiella*), the Cu_2 and A_1 veins meeting at the wing margin (open in *Chasmiella*), and the ocelli and/or tubercle absent (median ocellar remnant and/or tubercle present in *Chasmiella*).

Enderlein (1925) provided a suite of characters for a diagnosis of his subfamily Chasmiinae. These included: small (6 - 9 mm), compact, rotund species, proboscis long relative to the head, labella small, 1/3 the length of the proboscis, anal cell open or barely closed, median ocellar rudiment present, vertex usually deeply grooved, antenna "more or less" elongate, and vein R_4 making an acute angle with R_5.

Oldroyd (1949) recognized both genera in his study of the Tabanidae of New Guinea. Mackerras (1964), however, in a similar study, synonymized both *Chasmia* and *Chasmiella* with *Cydistomyia*, including taxa formerly assigned to both genera in the *basifasciata* group. Daniels (1989) recognized *Chasmia* but considered *Chasmiella* to be a synonym of *Chasmia*. None of the differences between *Chasmia* and *Chasmiella* cited by Enderlein and Oldroyd are consistent. Even some of the characters given for the "Chasmiinae" are variable, particularly the presence or absence of the median ocellar

rudiment, the shape of the antennal scape and basal flagellomere, and the configuration of vein R_4. The small, compact, rotund body, relatively long proboscis with small labellum, the Cu_2+A_1 veins meeting at or near the margin of the wing, and the tectiform (tent-like) cerci of the female will characterize *Chasmia*. Males are similar to females, except for the usual sexual differences. The upper area of large eye facets is sharply differentiated from the area of smaller facets below and the postocular fringe of hairs is long and curved forward over the ocular rim. I agree with Daniels that *Chasmia* should be recognized as valid, with *Chasmiella* placed as a junior synonym.

LIST OF NAMES OF NEW CALEDONIA TABANIDAE

Subfamily **Pangoniinae**, Tribe **Philolichini**

GENUS *PHILOLICHE*

buxtoni Mackerras & Rageau, 1958
dorsalis (Macquart), 1837 (*Pangonia*), preocc. Latreille, 1812 = **neocaledonica** (Mégnin), 1878 [1879]
leucopicta (Bigot), 1892 (*Corizoneura*) = **neocaledonica** (Mégnin), 1878 [1879]
neocaledonica (Mégnin), 1878 [1879] (*Pangonia*)
verventi Mackerras & Rageau, 1958

Subfamily **Tabaninae**, Tribe **Diachlorini**

GENUS *CHASMIA*

bozennae (Trojan), 1991 (*Chasmiella*)
brunnea, n. sp.
cohici (Mackerras & Rageau), 1958 (*Cydistomyia*)
conradi (Trojan), 1991 (*Chasmiella*)
leszeki (Trojan), 1991 (*Chasmiella*)
maculata, n. sp.
neocaledonica, n. sp.

GENUS *CYDISTOMYIA*

albonotatus (Bigot), 1892 (*Atylotus*) = **caledonica** (Ricardo), 1914
atrata, n. sp.
brachypalpus Trojan, 1991
bugnicourti Mackerras & Rageau, 1958
caledonica (Ricardo), 1914 (*Tabanus*)
colasbelcouri Mackerras & Rageau, 1958
danutae Trojan, 1991 = **risbeci** Mackerras & Rageau, 1958
diasi Mackerras & Rageau, 1958
kraussi, n. sp.
lifuensis (Bigot), 1892 (*Tabanus*)
longicornis, n. sp.
longipennis, n. sp.
longistyla, n. sp.
massali Mackerras & Rageau, 1958 = **lifuensis** (Bigot), 1892

matilei Trojan, 1991
metallica, n. sp.
minuta, n. sp.
pinensis, n. sp.
quadrimaculata, n. sp.
risbeci Mackerras & Rageau, 1958
roubaudi Mackerras & Rageau, 1958
toumanoffi Mackerras & Rageau, 1958

GENUS *DASYBASIS*

chazeaui Trojan, 1991
danielae Trojan, 1991
evenhuisi, n. sp.
gracilipalpis, n. sp.
grenieri (Mackerras & Rageau), 1958 (*Cydistomyia*)
kuniae (Mackerras & Rageau), 1958 (*Cydistomyia*)
lydiae (Trojan), 1991 = **kuniae** (Mackerras & Rageau), 1958
norae (Trojan), 1991 (*Cydistomyia*) = **grenieri** (Mackerras & Rageau), 1958
ponandouensis, n. sp.
rageaui Mackerras, 1962
rubricallosa (Ricardo), 1914 (*Tabanus*)
setipalpis, n. sp.
tillierorum Trojan, 1991
tiwakai (Trojan), 1991 (*Cydistomyia*)

KEY TO GENERA AND SPECIES OF NEW CALEDONIA TABANIDAE

(Species are numbered according to sequence of treatment in the text)

1 Flagellum of antenna consisting of 8 divisions; hind tibial spurs present; proboscis long, labellum slender . . . (Pangoniinae, Philolichini). . . . . ***Philoliche*** Wiedemann . . . **4**

— Flagellum of antenna consisting of an enlarged basal flagellomere and 4 apical flagellomeres; hind tibial spurs absent; proboscis not greatly elongate and labellum usually rather large . . . . . Tabaninae, Diachlorini . . . **2**

2(1) Relatively small, compact often rotund species; proboscis relatively long and slender, labellum small and compact, occupying about 1/3 length of proboscis; apical palpomere long and slender; vein $A_1 + CuA_2$ fused at or very near wing margin . . . . . ***Chasmia*** Enderlein . . . **8**

— Usually more elongate and slender species; proboscis short, labellum large, occupying at least half length of proboscis; apical palpomere swollen basally; vein $A_1 + CuA_2$ fused well before wing margin **3**

3(2) Gena relatively broad, genal index (length of frontoclypeal suture from subantennal suture to anterior tentorial pit divided by width of gena at level of subantennal suture) 1.4 or less; frons parallel or strongly divergent below; upper eye

facets of males densely pilose (except in *setipalpis*) . . . . . ***Dasybasis*** Macquart . . . **14**

— Gena narrower, genal index 1.5 or greater; frons parallel or convergent below, if divergent, only slightly so (except in *metallica*); large upper eye facets of males bare or microscopically pilose (except in *risbeci* and *toumanoffi*) . . . . . ***Cydistomyia*** Taylor. . . 25

4(1) Mesanepisternum mostly gray tomentose, brown tomentose on posterior 1/4; frons brown tomentose, contrasting with gray tomentose face . . . . . 1. ***P. buxtoni*** Mackerras & Rageau

— Mesanepisternum brown or velvety black tomentose and black pilose with small gray tomentose spot near upper margin; frons gray tomentose, concolorous with face **5**

5(4) Eyes separated by frons; females **6**

— Eyes contiguous; males **7**

6(5) Abdomen, legs, antennae and maxillary palpi black; large, robust species (15-18 mm long) . . . . . 2. ***P. neocaledonica*** (Mégnin)

— Abdomen, legs, antennae and maxillary palpi light brown; smaller species (11-13 mm long) . . . . . 3. ***P. verventi*** Mackerras & Rageau

7(5) Gray tomentum present only posteriorly on abdominal tergites 1, 2, and 4 along lateral margins, absent laterally on tergite 3; sternites 1-4 not entirely gray tomentose, anterior margins brown, and gray tomentum interrupted medianly on sternite 3; hairs of genae and beard yellowish, or with some black hairs intermixed; legs dark brown to black; larger (13-16 mm) species . . . . . 2. ***P. neocaledonica*** (Mégnin)

— Abdominal tergites 1-4 entirely silvery gray tomentose and white pilose laterally; sternites 1-4 entirely silvery gray tomentose; hairs of genae and anterior part of beard black, beard yellowish only posteriorly; legs yellowish brown relatively small (10-12 mm) species . . . . . 3. ***P. verventi*** Mackerras & Rageau

8(2) Mesoscutum brown with broad sublateral and lateral gray tomentose stripes and large oval dark brown spot anterior to scutellum . . . . . 9. ***Ch. maculata*** n. sp.

— Mesoscutum yellow, brown or bluish black, sublateral pale stripes, if present, narrow and without oval dark brown spot anterior to scutellum **9**

9(8) Entire body unicolorous yellow to light yellow-brown . . . . 8. ***Ch. leszeki*** (Trojan)

— Mesoscutum gray-brown, brown or bluish black. **10**

10(9) Mesoscutum bluish black . . . . . 6. ***Ch. cohici*** (Mackerras & Rageau)

— Mesoscutum gray-brown or black **11**

11(10) Wings with unusually large black pterostigma; abdomen shining dark brown, tergites 2-6 with small median white tomentose triangles progressively widened on posterior tergites . . . . . 4. ***Ch. bozennae*** (Trojan)

— Wings with pterostigma narrower and paler; abdomen yellow-brown or brown, without distinct pale median triangles **12**

12(11) Small (5-8 mm), compact dark brown species with brown beard . . . . . 5. ***Ch. brunnea*** n. sp.

— Larger (9-11 mm) more elongate light brown or yellowish brown and gray species with white beards 13

13(12)Yellowish brown and gray species; face, genae and pleurae white tomentose and

pilose; basal flagellomere very long and slender, black; mesoscutum gray tomentose; frontal callus black, narrowly separated from eye margins ..... 10. ***Ch. neocaledonica*** n. sp.

— Light brown species; face, genae and pleurae grayish brown tomentose; basal flagellomere shorter, brown; mesoscutum light brown tomentose; fronta callus light brown, widely separated from eye margins ..... 7. ***Ch. conradi*** (Trojan)

14(3)Medium-sized gray species with large reddish frontal callus entirely filling lower half of frons; antennae stout, black; abdominal tergites 2-5 with large gray median triangles ..... 38. ***D. rubricallosa*** (Ricardo)

— Brown or blackish species with smaller brown or black frontal callus not entirely filling base of frons 15

15(14) Abdominal tergites with large, distinct pale tomentose and pilose median triangles. 16

— Abdominal tergites with or without pale tomentose posterior margins; if pale median triangles are present, they are very small or indistinct 17

16(15) Relatively large (16-17.6 mm) stout gray and brownish to black species; basal flagellomere black, bearing a distinct dorsobasal tooth; median gray tomentose triangles on abdomen equilateral, extending half the length of respective tergites; ventral surface of abdomen with broad median dark gray tomentose stripe, yellowish laterally..... 41. ***D. tiwakai*** Trojan

— Smaller (9 mm) slender blackish species; basal flagellomere reddish (occasionally black), without a dorsobasal tooth; median gray tomentose triangles on abdomen tall, extending entire length of tergites 2-6; ventral surface of abdomen shining black, sternites with pale posterior margins ..... 32. ***D. evenhuisi*** n. sp.

17(15) Abdominal tergites without pale tomentose posterior margins..... 18

— Abdominal tergites with distinct or indistinct pale tomentose posterior margins... 19

18(17) Abdominal tergites brown; frontal callus vestigial, represented only by a small brown median streak; apical palpomere very slender basally; legs brown..... 33. ***D. gracilipalpis*** n. sp.

— Abdominal tergites shining black; frontal callus well developed; apical palpomere relatively stout basally; legs black ..... 31. ***D. danielae*** Trojan

19(17) Abdominal tergites black with white tomentose and pilose posterior margins... 20

— Abdominal tergites predominantly brown or gray-brown with some blackish tones posteriorly 22

20(19) Frontal callus transverse below, with very short, indistinct dorsal prolongation; beard black; basal flagellomere slender, without a dorsobasal tooth ..... 37. ***D. rageaui*** Mackerras

— Frontal callus bulbiform, with distinct dorsal prolongation; beard white or white with a few black hairs intermixed; basal flagellomere with distinct dorsobasal tooth or angle 21

21(20) Basal flagellomere short and stout, distinctly shorter than apical flagellomeres; apical palpomere short and stout, blunt apically; pale posterior margins of abdominal tergites narrow; ventral surface of abdomen black, sternites with pale posterior margins ..... 40. ***D. tillierorum*** Trojan

— Basal flagellomere elongate and slender, reddish to reddish brown, often darkened apically, as long as or slightly longer than apical flagellomeres; apical

palpomere very stout basally, drawn out to a slender, pointed apex; pale posterior margins of abdominal tergites broad; ventral surface of abdomen gray tomentose, sternites 2-5 narrowly brown tomentose basally ..... 35. ***D. kuniae*** (Mackerras & Rageau)

22(19) Frontal callus broad basally, wider than tall; apical palpomere unusually short, .. bearing semi-erect black setae; basal flagellomere reddish, apical flagellomeres black; scutellum yellowish brown with a subbasal brown tomentose bar; legs uniformly light yellowish brown..... 39. ***D. setipalpis*** n. sp.

— Frontal callus not wider than tall, broadly or narrowly pyriform; apical palpomere longer, bearing recumbent setae or hairs; basal flagellomere reddish brown basally, darker apically; scutellum black or gray-black; legs brown to yellowish brown 23

23(22) Flagellum black; frontoclypeus, genae and pleurae whitish gray tomentose; beard and pleural hairs white; femora black, tibiae brown; ventral surface of abdomen with broad dark gray tomentose median band ..... 34. ***D. grenieri*** (Mackerras & Rageau)

— Basal flagellomere reddish brown at least basally; face, genae and pleurae dark gray to brownish gray tomentose; beard and pleural hairs grayish to yellowish; femora brown; ventral surface of abdomen with or without a distinct dark-haired median band 24

24(23) Mesoscutum and scutellum black-brown, strongly contrasting with light brown abdomen and notopleural lobes; frontal callus brown, bulbiform; costal cell of wing hyaline ..... 30. ***D. chazeaui*** Trojan

— Mesoscutum and scutellum dark gray-brown tomentose, not strongly contrasting with dark brown-gray abdominal tergites; frontal callus black, narrowly pyriform; costal cell of wing light brown tinted ..... 36. ***D. ponandouensis*** n. sp.

25(3)Abdominal tergites black and black-haired, at most with narrow posterior fringe of pale hairs and tomentum 26

— Abdomen not entirely black; if predominantly black, pale tomentose and pilose areas or prominent pale-haired markings present 30

26(25) Mesoscutum bright yellow-orange, strongly contrasting with black abdomen; wings heavily fumose except hyaline apically and along posterior margin..... 15. ***C. colasbelcouri*** Mackerras & Rageau

— Mesoscutum black or gray and black, not strongly contrasting with abdomen; wings hyaline 27

27(26) Abdomen with narrow posterior fringe of pale hairs and tomentum on tergites and sternites ..... 19. ***C. longicornis*** n. sp.

— Abdominal tergites entirely black and black pilose, without pale hairs (some specimens of *C. roubaudi* have traces of pale tomentum apically on some tergites).. 28

28(27) Apical flagellomeres unusually long, nearly twice as long as basal flagellomere; femora and tibiae reddish brown; abdominal sternites pale pilose ..... 21. ***C. longistyla*** n. sp.

— Apical flagellomeres not unusually long, rarely longer than basal flagellomere; legs black; abdominal sternites entirely black pilose 29

29(28) Frontal callus large, shiny, bulbiform, conspicuously raised above surface of frons;

frontal index about 3.6; basal flagellomere of antenna entirely black except for small reddish spot at extreme base; stout-bodied species. . . . . 28. ***C. roubaudi*** Mackerras & Rageau

— Frontal callus smaller, triangular and rugose, not prominently raised abovesurface of frons; frontal index 4.1; basal flagellomere of antenna reddish brown basally, black apically; slender-bodied species . . . . . 11. ***C. atrata*** n. sp.

30(25) Large, stout-bodied species, length 16-20 mm. 31

— Smaller species, length not exceeding 15.5 mm and rarely 15 mm. 32

31(30) Abdominal tergites 1-5 with median pale tomentose and pilose triangles and white lateral hair patches; sternites 2-5 with narrow posterior white hair fringes (present only laterally in male); frontal callus with long, broad dorsal prolongation. . . . . 14. ***C. caledonica*** Mackerras & Rageau

— Abdominal tergites 1-4 with silvery hair patches present medianly and on lateral margins, the median patch on tergite 1 small; sternites 2-4 with lateral silvery hair patches; frontal callus narrowly triangular with very short dorsal prolonga tion. . . . . 26. ***C. quadrimaculata*** n. sp.

32(30) Small (9.6 mm), compact bluish green metallic *Chasmia*-like species with orange antennae and golden beard and pleural hairs. . . . . .23. ***C. metallica*** n. sp.

— More slender or larger non-metallic species with antennae, beard and pleural hairs otherwise colored. 33

33(32) Bright yellow to yellow-brown species with yellow basal flagellomere strongly contrasting with black apical flagellomeres. . . 16. ***C. diasi*** Mackerras & Rageau

— Body brown, black-brown or blackish, with paler thoracic or abdominal markings. 34

34(33) Predominantly black and grayish species; abdominal tergites shining blackish with distinct gray tomentose posterior margins and narrow distinct or indistinct pale tomentose median triangle on tergite 2; rarely with reddish tinges laterally on tergites 1-22. . . . . 7. ***C. risbeci*** Mackerras & Rageau

— Predominantly brownish species; if abdomen is blackish posteriorly, anterior segments are predominantly brown or reddish brown. 35

35(34) Relatively large brownish species with unusually short, stout apical palpomere that is 2.5 times longer than broad at base. . . . . 12. ***C. brachypalpus*** Trojan

— Smaller species (usually 14 mm or less except for unusually large specimens of *C. toumanoffi*); apical palpomere not unusually short and stout, 4-5 times longer than broad at base. 36

36(35) Abdominal tergites with distinct median pale tomentose triangles. 37

— Abdominal tergites without distinct median pale tomentose triangles, at most pale tomentose posterior margins only slightly enlarged medianly and not forming distinct triangles. 40

37(36) Medium-sized (11-14 mm), stout-bodied species. 38

— Small (7-8 mm) or slender-bodied species. 39

38(37) Mesoscutum dark brown with prominent gray sublateral and lateral stripes; antennae blackish; beard and pleural hairs black and white intermixed; wing veins brown-margined. . . . . 13. ***C. bugnicourti*** Mackerras & Rageau

— Mesoscutum brown with less distinct paler sublateral and lateral stripes (these some times evanescent); antennae brown; beard and pleural hairs pale yellowish;

wings hyaline. . . . . .18. ***C. lifuensis*** (Bigot)

39(37) Elongate, slender dark brown species with large tomentose triangles on abdominal tergites 2-6; mesoscutum without conspicuous paler markings; pterostigma light brown. . . . . 20. ***C. longipennis*** n. sp.

— Very small (7-8 mm), slender brown species with median white tomentose triangles on tergites 2-4 and concolorous triangles on lateral margins of tergites 1-4; mesoscutum with prominent gray sublateral and lateral stripes, sublateral ones incomplete; scutellum pale yellowish gray tomentose except brownish at base; pterostigma large, dark brown, strongly contrasting with hyaline wing membrane. . . . . 22. ***C. matilei*** Trojan

40(36) Very small (5.8-6.5 mm) species; abdomen brown-black to black (brown in males); tergites 2-6 with broad gray tomentose posterior bands that may or may not be slightly enlarged medianly; tergite 1 with gray tomentose band present only laterally; flagellum of antenna short and stout, basal flagellomere only slightly longer than tall; mesoscutum brown with distinct gray tomentose sublateral stripes; scutellum with posterior margin broadly yellowish gray tomentos. . . . . 24. ***C. minuta*** n. sp.

— Larger (10 mm or larger) species; without the above combination of characters. . . 41

41(40) Abdominal tergites 1-3 broadly brown laterally, black medianly, tergites 4-7 black with gray tomentose posterior margins; frontal callus black, pyramidal, gradually tapering to pointed apex; femora black. . . . . 17. ***C. kraussi*** n. sp.

— Abdomen brown to reddish brown; frontal callus brown, dorsal prolongation narrow; femora brown. 42

42(41) Basal flagellomere of antenna relatively short and stout, with prominent dorsal angle, apical flagellomeres long, nearly twice as long as basal flagellomere; wings hyaline; frontal callus broadly oval below. . . . . 25. ***C. pinensis*** n. sp.

— Basal flagellomere of antenna longer and more slender, apical flagellomeres shorter, subequal in length to basal flagellomere; wings lightly tinted brown, especially along longitudinal wing veins; frontal callus narrowly oval below. . . . . 29. ***C. toumanoffi*** Mackerras & Rageau

SPECIES DESCRIPTIONS AND NOTES

Subfamily PANGONIINAE, Tribe PHILOLICHINI

1. *Philoliche buxtoni* Mackerras & Rageau

1958. Ann. Parasitol. Hum. Comp. 33: 703, figs. 7C-E, 8B.

Specimens examined. 61 ♀♀, 12 ♂♂; BPBM except as noted. NEW CALEDONIA: Mt. Koghi, 400-600 m, II. 1962 (N. L. H. Krauss), 3 ♀♀, 3 ♂♂; I. 1963 (Krauss), 1 ♀, 1 ♂; 26-30. I. 1963 (C. M. Yoshimoto), 1 ♀; 15. II. 1963 (Krauss), 7 ♀♀; I. 1969 (Krauss), 1 ♂; II. 1973 (Krauss), 1 ♂; 500 m, 11. II. 1978 (Krauss) 1 ♀, 1 ♂; II. 1980 (Krauss)(Acc. No. 1980.128), 1 ♀; Col des Roussettes, 450-550 m, 4-6. II. 1963 (Krauss, Yoshimoto & J. L. Gressitt), 10 ♀♀, 2 ♂♂; Col des Pirogues, 14. II. 1963 (Yoshimoto), 1 ♀; 330 m, 21. II. 1963 (Yoshimoto), 1 ♀; La Crouen, 1. 1963 (Krauss), 2 ♀♀; 10 km S. of Koh, 31. I. '63 (Yoshimoto), 2 ♀♀; Sarraméa, 12. II. 1963 (Krauss), 2 ♀♀; II. 1971 (Krauss), 1 ♀; Yahoué, 20. II. 1963 (Yoshimoto), 1 ♀; II. 1976 (Krauss), 1 ♀; Mt. Mou,

1200 m, 3. III. 1963 (Yoshimoto), 1 ♀; 11. II. 1962 (Krauss), 1 ♀; Mouriance Pass, I. 62 (Krauss), 1 ♀; Mt. Ignambi, 900-1100 m, 4. II. 1964, sweeping (R. Straatman), 6 ♀♀; Hienghène, 0-50 m, I. 1969 (Krauss), 8 ♀♀; 25 km from Col des Roussettes, 6. II. 1963 (Krauss), 1 ♀; Rivière des Piroges, 7-9. II. 1984, u.v. light (Pogue & Epstein), 2 ♀♀, 3 ♂♂ (FSCA); Mt. Dzumac, 27-28. II. 1984, u.v. light (Pogue & Epstein), 2 ♀♀ (FSCA); Col de Mouirange, 12 March 1977 (D. Habeck), 1 ♀ (FSCA).

Remarks. Specimens of *P. buxtoni* examined agreed well with the original description, except being smaller than the size range given. Males examined were 10.4-12.0 mm long; females were 9.2-13.3 mm long. No specimens approached 15 mm, the upper limit given in the original description. This species is widely distributed on New Caledonia and appears to be abundant. Mackerras and Rageau (1958) also reported it from Forêt de la Thy (Saint-Louis), La Tontouta, La Foa to Canala, Le Rat, Négropo, Tchamba River basin, and Rivière Nahoué. It has been collected from January to March.

2. *Philoliche neocaledonica* (Mégnin)

Pangonia dorsalis Macquart, 1837. Ann. Soc. Entomol. Fr. 6: 430 [1838. Mém. Soc. R. Soc. Agric. Arts, Lille 1838 (2): 104 (100).

Pangonia neo-caledonica Mégnin, 1878. Bull. Bimens. Soc. Entomol. Fr. 134: 198 [1879. Bull. Soc. Entomol. Fr. 5 (8). cxlv.

Corizoneura leucopicta Bigot, 1892. Mém. Soc. Zool. Fr. 5: 616.

Philoliche (Philoliche) neocaledonica (Mégnin): Mackerras & Rageau, 1958. Ann. Parasitol. Hum. Comp. 33: 699, figs. 6, 7F.

Specimens examined. 264 ♀♀, 14 ♂♂; BPBM except as noted. NEW CALEDONIA: Col des Roussettes, 300 m, 5-6. II. 1963, Malaise trap (C. Yoshimoto & N. Krauss), 30 ♀♀; 350-450 m, 3. II. 1971 (Yoshimoto & Krauss), 2 ♀♀; La Crouen, III. 59 (Krauss), 5 ♀♀; 16. II. 1961 (Krauss), 1 ♀; 31. I. 1963 (Krauss), 10 ♀♀; I. 1963 (Krauss), 6 ♀♀; II. 1973 (Krauss), 2 ♀♀; Col d'Amieu, 650 m, 31. III. 1968 (J. L. Gressitt & T. C. Maa), 1 ♀; Mt. W. of Houaïlou, 5. II. 1962 (Krauss), 2 ♀♀; Mt. Koghi, II. 1962 (Krauss), 5 ♀♀; 18. III. 1968, light trap (Gressitt & Maa), 1 ♀; Yahoué, 2. III. 1978 (Krauss), 3 ♀♀; II. 1980 (Krauss)(Acc. No. 1980.128), 1 ♀; Pouébo, 150 m, 17. I. 1964, light trap (R. Straatman), 1 ♀; 26-30. I. 1964, light trap (Straatman), 1 ♂; Hienghène, 0-50 m, I. 1969 (Krauss), 5 ♂♂; I. 1971 (Krauss), 3 ♀♀; 17 km S.W. of La Crouen, 15. III. 1961 (J. Sedlacek), 1 ♀; Sarraméa, 70-150 m, 12. II. 1963 (Krauss), 4 ♀♀; II. 1971 (Krauss), 5 ♀♀; Tao, 8-10. II. 1963 (Krauss), 39 ♀♀; II. 1963 (Krauss), 1 ♀; La Foa, 17. III. 1961 (Sedlacek), 1 ♀; [no date] (C. L. Remington), 12 ♀♀ (MCZ); 7 mi. SE La Foa, 23 Feb 1945 (Remington), 2 ♀♀ (MCZ); Forêt de la Thy, 100-300 m, 24. III. 1961 (Sedlacek), 3 ♀♀; Mt. Koghi/Forêt de la Thy, 530 m, 8. III. 1961 (Sedlacek), 3 ♀♀; Tchamba R., Jan., 1956 (J. Rageau), 1 ♀(MCZ); [no locality], 20 Feb. 1945 (coll. Webb), 1 ♀(MCZ); 9. IV. 1970 (S. Keenan & A. N. Gillogly), 2 ♀♀; 11 mi. inland from Bouloupari, Feb. 25, 1945 (H. E. Milliron), 1 ♀(FSCA); St. Louis Valley, Mar. 17, 1945 (H. E. Milliron), 1 ♀ (FSCA); Tchamba R., Jan. 1956 (Rageau), 2 ♀♀ (FSCA).

Remarks. This large, striking species appears to be the most commonly collected tabanid on New Caledonia. Mackerras and Rageau (1958) examined 200 ♀♀ and 2 ♂♂. Collections from the Bishop Museum contained 244 ♀♀ and 14 ♂♂ (144 ♀♀ and 6 ♂♂ are documented here). Also, 16 ♀♀ from the Museum of Comparative Zoology, Harvard University (MCZ) and 4 ♀♀ from the Florida State Collection of Arthropods (FSCA)

were examined. The specimens examined agree well with the description by Mackerras and Rageau (1958). Size of females examined was 13.6-17.6 mm; the males were 13.3-16 mm. In addition to localities listed above, Mackerras and Rageau (1958) recorded it from Île des Pins (Isle of Pines), La Dumbéa, Négropo, Oubatche, Gomen, Néhoué, and Bourail. *P. neocaledonica* is widely distributed throughout the island, and on the Isle of Pines, and has been collected from January to April.

Mégnin (1878) believed that *neocaledonica* might be responsible for an outbreak of anthrax in horses and humans on the Isle of Pines, since he observed females buzzing around horses and humans, however Mackerras and Rageau (1958) state that they did not observe it feeding on animals, and speculated that it might feed on body secretions (sweat).

3. *Philoliche verventi* Mackerras & Rageau

1958. Ann. Parasitol. Hum. Comp. 33: 703, fig. 8A.

Specimens examined. 1 ♀, 6 ♂♂; FSCA. NEW CALEDONIA: Plaine des Lacs, 5 km E. Grand Lac, 300 m, 22°16'S 166°58'E, 22-25 Jan. 1984 (M. Pogue & M. Epstein).

Remarks. The female examined here agrees well with the original description except the legs are uniformly light brown and the costal cell of the wing is hyaline. The color pattern on the abdomen unfortunately has been obliterated because the specimen has been in a preservative fluid. It also is smaller (12 mm) than the size range (14-15 mm) indicated by Mackerras and Rageau.

The male was not previously known. It is quite different from the female in general appearance and is described here in detail. Length: 9.6 - 11.2 mm. Eyes black, with sparse hairs; frontal triangle, genae and clypeus silver-gray tomentose, clypeus with long black hairs laterally; scape and pedicel black-brown with gray tomentum, flagellum black; maxillary palpi black, apical palpomere slender, pointed.

Mesoscutum dark brown with lighter brown median, sublateral and lateral stripes, entirely long black pilose; scutellum light brown tomentose basally, darker apically; pleurae similar to female; legs uniformly brown, black haired; wings light brown tinted, paler on posterior half, R_4 vein with short spur.

Abdomen dark brown and silvery gray tomentose, tergite 1 entirely silvery gray tomentose except brown beneath scutellum, tergites 2-4 broadly silvery gray tomentose laterally, tergites 2-5 with small median silvery gray tomentose triangles, dark and light areas black and white pilose, respectively; sternites 1-4 silvery white tomentose and white pilose, remaining sternites light brown tomentose and black pilose.

Subfamily TABANINAE, Tribe DIACHLORINI

4. *Chasmia bozennae* (Trojan), **n. comb.**

Chasmiella bozennae Trojan, 1991. Mém. Mus. natn. Hist. nat. (A). 149: 263, fig. 15a-c.

Remarks. I examined the holotype female, which has been in liquid preservative and is somewhat shrivelled and denuded. The colors, therefore, may be slightly lighter than in living specimens. Trojan (1991) described the subcallus as yellow in the key and orange in the original description. It is really light brown. The mesoscutum is brown to dark brown, not yellow as described. The median pale triangles on the abdomen are progressively widened on posterior segments.

5. *Chasmia brunnea*, n. sp. Fig. 1

A small, compact brown species with brown legs and hyaline wings. Both females unfortunately are denuded due to immersion in a fluid preservative.

Holotype ♀. Length 5.6 mm. Frontal index (height divided by width at base) 3, divergent below, silvery gray tomentose, except darker blackish gray at vertex, bearing scattered black hairs; vertex depressed below level of eyes, rudimentary median ocellus present; frontal callus brown, reddish basally, narrowly bulbiform basally, with a broad dorsal prolongation extending 3/4 distance to vertex, widely separated from eye margins; subcallus brown, gray tomentose; genae and clypeus brown, gray tomentose, hairs of the genae and beard brown, sparse; scape, pedicel and basal half of basal flagellomere brown, apical half of basal flagellomere and apical flagellomeres black, basal flagellomere with small dorsobasal tooth and shallow dorsal excision; maxillary palpi brown, apical palpomere slender, bearing black hairs; eyes brown, without pattern in relaxed specimens, essentially bare (minute scattered hairs visible under high magnification).

Mesoscutum and scutellum dark brown, mesoscutum with 2 broad pale tomentose sublateral stripes extending to transverse suture and paler brown integument on lateral margins and anterior to scutellum, hairs abraded; pleurae dark brown, dark brown pilose; legs brown and dark brown pilose, femora darker brown than tibiae; wings hyaline, vein R_4 without spur.

Abdomen dark brown with traces of pale haired posterior margins and tufts of white hairs laterally on tergites 2-4; sternites concolorous with tergites.

Male.- Length: 7.2 - 8.4 mm. Frontal triangle dark gray tomentose, slightly protruding; apical palpomere light brown, gray tomentose; eyes with upper area of large facets strongly differentiated from smaller facets below; postocular fringe of hairs long, black, curved forward over ocular rim; mesoscutum brown tomentose and pilose, bearing broad gray sublateral stripes similar to female; pleuron light brown with grayish tomentum; wing hyaline except costal cell very slightly yellowish, vein R_4 with trace of spur; abdomen subshining dark brown, with some blackish tones on posterior segments, bearing mixed brassy and black hairs, first tergite paler gray-brown; otherwise similar to female.

Type data. Holotype ♀, NEW CALEDONIA: 5 km E. of Grand Lac, 24-25. I. 1984, u.v. light trap (Pogue & Epstein)(FSCA). Paratypes, 1 ♀, 2♂♂; ♀ same data as holotype; Mt. Mou, 3. II. 1963 (N. L. H. Krauss), ♂; 1200 m, 13. II. 1984, light trap (Pogue & Epstein) (FSCA), ♂.

Remarks. The paratype female is very similar to the holotype, except the dorsal tooth of the basal flagellomere is evanescent, the basal flagellomere is entirely brown, and the R_4 vein has a trace of a spur. The male collected by Krauss, on which the description of the male is based, is in excellent condition, and is the only specimen that was not placed in fluid. It is thus probably more characteristic of the color and size of this species in life.

6. *Chasmia cohici* (Mackerras & Rageau), **n. comb.** Fig. 2

Cydistomyia (C.) cohici Mackerras & Rageau, 1958. Ann. Parasitol. Hum. Comp. 33: 715, fig. 9F.

Chasmiella cohici (Mackerras & Rageau): Trojan, 1991. Mém. Mus. natn. Hist. nat. (A) 149: 264, figs. 4, 11.

Specimens examined. 2♀♀, 4♂♂; BPBM except as noted. NEW CALEDONIA:

Mt. Koghi, 26-30. I. 1963, light trap (C. Yoshimoto, N. Krauss), 1 ♀; 28. I. 1963, 2♂♂; Fôret de la Thy, 550 m, III. 6. 1960 (J. L. Gressitt), 1♂; 100-200 m, 9. III. 1961 (J. Sedlacek), 1♂; Plaine des Lacs, 5 km E. Grand Lac, 300 m, 22° 16'S 166° 58'E, 22-25 Jan. 1984 (M. Pogue & M. Epstein), 1 ♀ (FSCA).

Remarks.- The original description of *Ch. cohici* (as *Cydistomyia*), while generally accurate, does not convey well the general appearance of this striking fly. It resembles a metallic blow fly with bluish black metallic reflections on the thorax and abdomen. The small, compact body, long, slender proboscis with compact labellum, slender maxillary palpi, A_1+CuA_2 vein meeting near the wing margin, and tectiform (tent-like) cerci clearly place this species in *Chasmia*. The size range of specimens examined here was 6.4 - 8.8 mm.

The male of *Ch. cohici* has not been previously described. It is similar to the female except for the following: scape, pedicel and basal flagellomere bright yellow, contrasting with the black apical flagellomeres; maxillary palpi dark brown with grayish tomentum, slender, pointed apically; eyes with large upper eye facets sharply differentiated from lower ones; postocular fringe of hairs long and black; sublateral stripes of the mesoscutum and the surface of the scutellum with strong metallic bluish reflections; femora black, tibiae and tarsi dark brown; lateral margins of abdominal tergites without silvery tufts of hairs.

7. *Chasmia conradi* (Trojan), **n. comb.**

Chasmiella conradi Trojan, 1991. Mém. Mus. natn. Hist. nat. (A) 149: 264, figs. 3,16a-c.

Remarks. The holotype female has been in liquid preservative and is shrivelled, denuded and possibly discolored. The frontal callus is brown, not yellow as described. The basal flagellomere is darker than the scape and pedicel and is very narrow apically. The mesoscutum is light brown. The costal cell of the wing is tinted light brown, and there is faint infuscation along anterior wing veins. The abdomen is light brown.

8. *Chasmia leszeki* (Trojan), **n. comb.** Fig. 3

Chasmiella leszeki Trojan, 1991. Mém. Mus. natn. Hist. nat. (A) 149: 265, figs. 13,17a-c.

Specimens examined. 3 ♀♀, 5♂♂; BPBM except as noted. NEW CALEDONIA: Mt. Koghi, II. 1962 (N. L. H. Krauss), 2♂♂; 26-30. I. 1963, Malaise trap (C. Yoshimoto, N. Krauss), 1 ♀; II. 1963 (N. L. H. Krauss), 1♂; 19. III. 1968, 600 m, (J. L. Gressitt, T. C. Maa), 1♂; II. 1973, 600 m, (N. L. H. Krauss), 1♂; Col de la Pirogue, 330 m, 21. II. 1963 (C. M. Yoshimoto), 1 ♀; Mt. Dzumac region forest, 800 m, 17-18. I. 1984, u.v. light trap (Pogue & Epstein), 1 ♀(FSCA).

Remarks. The females examined here agree well with the holotype except the frontal callus is deep black-brown, the subcallus is gray tomentose with a yellowish tinge, and the hairs on the mesoscutum are predominantly black, with scattered yellow ones intermixed. The mesoscutum appears light yellowish brown rather than yellow.

The male of *Ch. leszeki* has not been described previously. It is similar to the female in general appearance, differing only in the following features: length 7.6 - 8.8 mm; upper eye facets enlarged, sharply differentiated from the smaller facets below; postocular fringe of hairs very long, black, curved forward; apical palpomere of the maxillary palpi slender, rounded apically, about 4 times longer than wide; mesoscutum, scutellum and anterior tergites of the abdomen bearing dense, erect black hairs, posterior tergites with

semi-erect black hairs.

9. *Chasmia maculata*, n. sp. Fig. 5

A striking, ornate species with conspicuous gray stripes and a large dark brown spot on the mesoscutum anterior to the scutellum, gray scutellum and large gray tomentose triangles on abdominal tergites 2-4, contrasting strongly with the black posterior tergites.

Holotype ♀. Length: 9.6 mm. Frons gray tomentose and sparsely white pilose, parallel-sided, index 4.1; vertex depressed, median ocellar remnant present; frontal callus reddish brown, bulbiform, dorsal prolongation short, extending less than half way to vertex; subcallus brown tomentose; genae and clypeus yellowish gray tomentose and white pilose with a few black hairs intermixed; beard white, sparse; scape and pedicel yellowish and black setose, flagellum black, basal flagellomere with a well-developed dorsobasal tooth; maxillary palpi yellowish with gray tomentum, apical palpomere slender, bearing mixed black and white hairs; eyes black; postocular fringe of white hairs relatively long.

Mesoscutum brown, bearing a narrow median and 2 pairs of broad sublateral gray tomentose stripes and a large median posterior oval dark brown spot, clothed with intermixed black and white hairs, notopleural lobes dark brown tomentose and black pilose, post-alar calli yellowish tomentose; scutellum gray tomentose, white pilose; pleuron yellowish brown and gray tomentose, white pilose; legs yellowish brown, mid-and hind femora slightly darker basally; wings hyaline, veins yellow basally, brown beyond br and bm cells, vein R_4 without spur.

Abdominal tergites 1-4 yellow-brown, bearing large median and lateral gray tomentose triangles, black and white hairs on yellow-brown and gray tomentose areas, respectively, tergites 5-7 brown-black, strongly contrasting with lighter anterior tergites, entirely black pilose; cerci tectiform; sternites 1-4 yellow-brown with gray tomentose hind margins, sternites 5-7 black-brown.

Type data. Holotype ♀, NEW CALEDONIA: Mandjélia, 29-31. I. 1984, u.v. light trap (Pogue & Epstein) (FSCA).

Remarks. The ornate gray stripes, dark brown spot on the mesoscutum and the large gray tomentose triangles contrasting vividly with the yellow and dark brown integument on the abdomen will immediately distinguish this species from other species of *Chasmia* from New Caledonia.

10. *Chasmia neocaledonica*, n. sp. Fig. 4

A relatively small yellowish and gray species with pale grayish white face, slender, pointed palpi, very long and slender basal flagellomere, yellowish brown legs, and grayish tinted wings with no spur on vein R_4.

Holotype ♀. Length: 11 mm. Frons relatively narrow (index: 4.5), parallel-sided, brown tomentose with paler gray tomentum surrounding lower part of frontal callus and along eye margins; vertex with trace of ocellar tubercle and ocellar remnants; frontal callus black, oval below, with 2 narrow lateral spurs above, dorsal prolongation narrow, extending 2/3 distance to vertex; subcallus yellowish brown tomentose, strongly contrasting with grayish white tomentose and pilose gena and clypeus; beard white; scape, pedicel, and base of basal flagellomere reddish brown, remainder of basal flagellomere black; basal flagellomere very long and slender, about 4X longer than tall, dorsobasal tooth low,

dorsal excision shallow; apical flagellomeres black (apical 3 flagellomeres lost); maxillary palpi pale yellowish, apical palpomere slender, pale haired ventrally, black haired dorsally; eyes (relaxed) black, without pattern, with minute scattered hairs.

Mesoscutum and scutellum yellowish gray tomentose, bearing mixed yellow and black hairs; pleuron gray tomentose, white pilose; coxae gray tomentose; femora and tibiae yellowish brown, femora pale pilose, tibiae mixed pale and black pilose; tarsi slightly darker brown; wings grayish tinted, costal cell yellowish brown, vein R_4 without spur.

Abdomen yellowish brown tomentose; tergites 2-6 with sublateral basal patches of gray tomentum and black hairs, giving abdomen appearance of having median yellow pilose stripe; cerci tectiform; sternum pale yellowish gray, yellowish white pilose except sternite 7 black pilose.

Male.- Length: 8 - 11 mm. Subcallus yellowish; flagellum of antennae long and slender; basal flagellomere about 3X longer than high; apical flagellomeres black, subequal in length to basal flagellomere; maxillary palpi elongate-oval, about 3X longer than broad; upper eye facets moderately enlarged but not sharply divided from smaller facets below; postocular rim with sparse long recurved dark hairs; femora and tibiae light yellow-brown; tarsi dark brown; abdomen with bright yellow tomentum above; otherwise similar to female.

Type data. Holotype ♀ (BPBM No. 15,129), NEW CALEDONIA: Mt. Mou, 1200 m, 3. II. 1963 (C. M. Yoshimoto). Paratypes, 4 ♂♂. 10 km S of Koh, 31.I.1968 (Yoshimoto), 1 ♂ (BPBM); Rivière des Pirogues, 7-9. II. 1984, u.v. light trap (Pogue & Epstein), 3 ♂♂ (FSCA).

Remarks. The apical 3 flagellomeres of the holotype's antennae are lost, but they probably are similar to those of the paratype ♂, elongate and black, subequal in length to the basal flagellomere. The gray face and pleuron strongly contrasting with the grayish yellow mesoscutum and yellowish amber abdomen make it unlikely that this species would be confused with any other species known from New Caledonia. It appears to be closest to *Ch. leszeki*, but is easily distinguished by its larger size, grayish mesoscutum and darker more elongate basal flagellomere.

11. *Cydistomyia (C.) atrata*, n. sp. Fig. 6

A relatively small black species with dark brown frons, gena, and clypeus, black beard, slender black palpi, black legs, and hyaline wings without spur on vein R_4.

Holotype ♀. Length: 11.2 mm. Frons moderately broad (index: 4.3), parallel-sided, dark brown tomentose, paler ventrally along eye margins, rather densely black pilose; vertex with remnant of median ocellus, without tubercle; frontal callus triangular, well separated from eye margins, dark reddish ventrally, black above, dorsal prolongation gradually tapered above, extending about half way to vertex; subcallus, gena and clypeus dark brown tomentose, black pilose; genal index 1.6; postgena gray tomentose; beard black; scape and pedicel blackish; basal flagellomere elongate, reddish basally, becoming blackish apically, dorsobasal tooth rather low, dorsal excision shallow; apical flagellomeres black; maxillary palpi black, apical palpomere relatively slender, black pilose; eyes (relaxed) dark green, without pattern, bearing scattered short hairs.

Mesoscutum black with thin grayish tomentum and black hairs, area anterior to transverse suture with median and sublateral gray tomentose stripes, area around postpronotal and notopleural lobes gray tomentose; scutellum and pleuron concolorous with

mesoscutum; laterotergite gray tomentose; legs black, black pilose; wings hyaline, vein R_4 without spur.

Abdomen black, black pilose; extreme posterior margins of tergites and sternites pale tomentose.

Type data. Holotype ♀ (BPBM No. 15,130), NEW CALEDONIA: Mt. Koghi, 500-700 m, 25-26. X. 1967 (J. & M. Sedlacek).

Remarks. This species is most similar to *Cydistomyia (C.) roubaudi* Mackerras & Rageau. It differs from *roubaudi* in being smaller and less stout, and has a narrower frons, smaller, less protuberant frontal callus, darker gena and clypeus, and more elongate basal flagellomere that is reddish brown basally.

12. *Cydistomyia (C.) brachypalpus* Trojan

1991. Mém. Mus. natn. Hist. nat. (A) 149: 268, fig. 20a-c.

Remarks. The holotype female from Forêt de la Thi is in good condition. The frontal callus is brown only on the base; the remainder is black. The distinctive, short and stout maxillary palpi are gray tomentose. The mesoscutum is somewhat abraded, possibly obscuring the presutural narrow gray sublateral bands. The wings are tinted light brown along the longitudinal veins, with paler hyaline areas between the veins. The ventral surface of the abdomen is dark gray medianly and yellowish laterally. This species is close to *C. toumanoffi* as indicated by Trojan. It is somewhat larger, stouter and generally darker in appearance than most specimens of *C. toumanoffi* I have examined.

13. *Cydistomyia (C.) bugnicourti* Mackerras & Rageau

1958. Ann. Parasitol. Hum. Comp. 33: 722, fig. 12D.

Cydistomyia bugnicourti Mackerras & Rageau: Trojan, 1991. Mém. Mus. natn. Hist. nat. (A) 149: 269, fig. 18.

Specimens examined. 20 ♀♀; BPBM except as noted. NEW CALEDONIA: In Mts. up Boulari R., 3-4. XI. 58 (C. R. Joyce), 4 ♀♀; 17. XI. 58, 4 ♀♀; Plaine des Lacs area, 30. X. 1958 (Joyce), 5 ♀♀; Yaté, 30. X. 1958 (Joyce), 1 ♀; Rivière Bleue (Yaté), 35 km SE of Nouméa, 160-180 m, 14. XI. 1963 (R. Straatman), 1 ♀; Mt. Koghi, 500 m, 23-27. VIII. 1967 (M. Sedlacek), 1 ♀; Forêt de la Thy, 29. X. - 1. XI. 1967 (J. & M. Sedlacek), 1 ♀; La Foa (C. L. Remington), 3 ♀♀ (MCZ).

Remarks. Specimens examined agree well with the original description by Mackerras and Rageau (1958), except for the specimen from Mt. Koghi, which appears to be melanistic, with darker brown legs, thorax and abdomen, and blackish antennae. Size varies from 12-13 mm. The genal index is 1.8. The male is undescribed. *C. bugnicourti* also was reported from Montagne des Sources by Mackerras and Rageau. Recent specimens were collected from August to November, during the dry season, but Mackerras and Rageau report specimens from December to March. It has been collected from the southern half of the island.

14. *Cydistomyia (C.) caledonica* (Ricardo)

Atylotus albonotatus Bigot, 1892. Soc. Zool. de France, Mém. 5: 670 (preocc. Bellardi, 1859).

Tabanus caledonicus Ricardo, 1914. Ann. Mag. Nat. Hist. (8) 13: 477 (n. name for *albonotatus*).

Cydistomyia (C.) caledonica (Ricardo): Mackerras & Rageau, 1958. Ann. Parasitol. Hum. Comp. 33: 716, figs. 12A, 13.

Specimens examined. 4 ♀♀, 7 ♂♂; BPBM except as noted. NEW CALEDONIA: 10 km S. of Koh, 31. I. 1963 (C. M. Yoshimoto), 1 ♀; La Crouen, 12. III. 1963 (J. Sedlacek), 1 ♂; Col d'Amieu, 750 m, III. 3. '60 (J. L. Gressitt), 1 ♀; Mt. Koghi, 26-30. I. 1963 (Yoshimoto), 1 ♂; Pouébo, NE Coast, 10 m, 11. I. 1964, light trap (R. Straatman), 2 ♂♂; 10 km s. Pouébo, 400 m, 24. I. 1964, light trap (Straatman), 1 ♂; Plaine des Lacs, 10. II. 1914 (P. D. Montagne), 1 ♀ (MCZ); 24. II. 1914 (Montagne), 2 ♀♀ (MCZ).

Remarks. This species and *Cydistomyia quadrimaculata*, described below, are the largest species of *Cydistomyia* known from New Caledonia. The striking black pilose abdomen with conspicuous silvery median and lateral hair tufts is distinctive. Specimens examined agree well with Ricardo's original description and that of Mackerras and Rageau (1958), except the antennae tend to be reddish brown, the frons narrower (index: 4), and size varies from 17-20 mm. The genal index is 1.7. Mackerras and Rageau also recorded it from Mount Mou (November-December), and Thy (Saint-Louis)(February). This species was collected from November to March but is most commonly collected in January. *C. caledonica* is widely distributed both geographically and altitudinally in New Caledonia, occurring from sea-level to 700 m and from Pouébo in the north to Plaine des Lacs in the south.

15. *Cydistomyia (C.) colasbelcouri* Mackerras & Rageau
1958. Ann. Parasitol. Hum. Comp. 33: 725, figs. 9D, 14.

Specimens examined. 8 ♀♀, 1 ♂. NEW CALEDONIA: Mt. Koghi, 500 m, I. 1969 (N. L. H. Krauss), 1 ♂ (BPBM); La Foa (C. L. Remington), 6 ♀♀ (MCZ); 7 mi. SE La Foa (Remington), 2 ♀♀ (MCZ).

Remarks. The male of *C. colasbelcouri* was previously unknown. It is similar in general appearance to the female. The following description will supplement that of the female. Length: 12.8 mm. Frontal triangle yellow-gray; scape and pedicel of antennae dark gray tomentose; basal flagellomere reddish at extreme base; apical palpomere elongate-oval and slender, 3X longer than broad; eyes with upper area of facets greatly enlarged, sharply demarcated from smaller lower facets, occupying upper 2/3 of eyes; mesoscutum with black and orange erect hairs intermixed, entirely orange-haired laterally and posteriorly; abdomen without traces of pale color; otherwise similar to female.

This striking ochre and black-colored species is so distinctive, it cannot be confused with any other *Cydistomyia* species from New Caledonia. According to Mackerras and Rageau (1958), it is similar to *Cydistomyia (C.) imitans* Oldroyd from New Guinea. The ochre thorax, black abdomen and legs, and black wings with hyaline apex and posterior margin will easily distinguish it. *C. colasbelcouri* has been collected only in January and February in the southern half of the island.

16. *Cydistomyia (C.) diasi* Mackerras & Rageau
1958. Ann. Parasitol. Hum. Comp. 33: 727, fig. 9E.

Specimens examined. 79 ♀♀; BPBM. NEW CALEDONIA: Col des Roussettes, 450-550 m, 29. I. 63 (J. L. Gressitt), 1 ♀; 4-6. II. 1963 (Gressitt), 33 ♀♀; Mt. Panié Trail, 400-600 m, 8-9. II. 63 (C. M. Yoshimoto), 2 ♀♀; Col d'Amieu, 26. XII. 63 (Yoshimoto), 1 ♀; 31. I. 63 (Yoshimoto), 5 ♀♀; Headwaters, Houaïlou R., 26. X. 1958 (C. R. Joyce),

2 ♀♀; 10 km s. of Koh, 31. I. 63 (Yoshimoto), 2 ♀♀; Couli, nr. La Foa, III. 1959 (N. L. H. Krauss), 1 ♀; 25 km from Col des Roussettes, 6. II. 63 (Krauss), 19 ♀♀; Vallee d'Amoa, 7. II. 63 (Yoshimoto), 13 ♀♀.

Remarks. The long series of females available for study shows considerable variation from the original description. Size varies from 9.5 - 11 mm, frontal index 3.0-3.5, black hairs absent on face, mesoscutum with gray or yellowish gray tones, fore tibiae yellowish basally, yellowish brown apically, hind tibial fringe mostly black on some specimens, tergites 1-3 yellow with slightly darkened apices, mid-stripe of yellow hairs very distinct on some specimens, evanescent or absent on others. Otherwise females examined agree with the original description. The genal index is 1.7. The male is unknown. This species is most commonly collected from the central part of the island from late December to March. *C. diasi* closely resembles *Cydistomyia (C.) sol* (Schuurmans Stekhoven) from New Guinea, but is easily distinguished by the broader frons and contrasting yellow basal flagellomere (Mackerras & Rageau, 1958).

17. *Cydistomyia (C.) kraussi*, n. sp. Fig. 7

A relatively small to medium-sized brownish gray species with long antennal flagellum, broadly columnar frontal callus, sharply tapered maxillary palpi, black femora, abdominal tergites with pale posterior margins, and hyaline wings without spur on vein R_4.

Holotype ♀. Length: 10.8 mm. Frons moderately broad (index: 3), slightly diverging below, gray tomentose, paler along eye margins, bearing rather long black hairs; vertex depressed below level of eyes, median and lateral ocelli visible as small spherical shiny dots; frontal callosity black, broadly columnar, gradually and evenly tapered to point about half way to vertex, widely separated from eye margins; subcallus gray tomentose, with yellowish tinges medianly; gena and clypeus light gray tomentose, mixed black and white pilose; genal index 1.8; beard mostly white pilose with some black hairs intermixed anteriorly; scape and pedicel reddish brown; flagellum black except pale reddish at extreme base, remainder black; basal flagellomere elongate, about 2X longer than tall, dorsobasal tooth prominent, dorsal excision deep; terminal flagellomeres subequal in length to basal flagellomere; maxillary palpi pale yellowish gray, apical palpomere stout basally, tapered to sharp point, covered with black hairs; eyes (relaxed) black, without pattern, sparsely but distinctly pilose under low (15X) magnification.

Mesoscutum dark gray tomentose with some brownish tones, faint gray sublateral longitudinal stripes present anterior to transverse suture, paler gray anteriorly, on postpronotal and notopleural lobes, and above wing bases, bearing black and white hairs; scutellum concolorous, posterior margin paler gray tomentose; pleuron gray tomentose, white pilose; coxae gray tomentose, white pilose; femora black overlain by thin gray tomentum, "knees" paler brown; tibiae reddish brown, extreme apices darkened; tarsi blackish; wings hyaline, vein R_4 without spur.

Abdomen brown anteriorly, blackish posteriorly; tergite 1 dark medianly, brownish laterally, tergite 2 brown except for large median black spot, hind margin pale tomentose and pilose, tergites 3-6 blackish with distinct pale tomentose and pilose hind margins, pale hairs on tergites 5-6 indistinct, lateral margins of all tergites pale tomentose and pilose; sternites blackish, with some brown tones intermixed laterally and with pale hind margins, median areas black pilose, lateral areas pale pilose, median area of sternum distinctly

darker, appearing as a broad blackish median stripe.

Type data. Holotype ♀ (BPBM No. 15,131), NEW CALEDONIA: La Crouen, 31. I. 1963 (C. M. Yoshimoto & N. Krauss). Paratypes, 2♀♀ (BPBM), 1 ♀ same data as holotype, 1 ♀ (No Locality), 9. IV. 1970 (S. Keenan & A. M. Gillogly).

Remarks. The paratype females are 12.8 mm and 10.4 mm long. They agree well with the holotype, except the female with no locality stated on the label has the frontal callosity more abruptly narrowed above, and, because it is somewhat greased, shows more strongly brownish tones on the antennae, maxillary palpi, and notopleural lobes. This species is named for one of the collectors, N.L.H. Krauss who has collected many species of Tabanidae from New Caledonia.

This species is closest to *Cydistomyia (C.) risbeci* Mackerras & Rageau, but differs in having a broader frontal callus, more elongate basal flagellomere with a more prominent dorsobasal tooth, paler mesoscutum laterally, paler brown basal tergites, and sternites paler brown laterally, not uniformly blackish with pale hind margins.

18. *Cydistomyia (C.) lifuensis* (Bigot)

Tabanus lifuensis Bigot, 1892. Mém. Soc. Zool. de France 5: 689.

Cydistomyia (C.) massali Mackerras & Rageau, 1958. Ann. Parasitol. Hum. Comp. 33: 719, fig. 12B.

Cydistomyia (C.) lifuensis (Bigot): Mackerras & Rageau, 1958. Ann. Parasitol. Hum. Comp. 33: 728.

Specimens examined. 4♀♀, 4♂♂; BPBM except as noted. NEW CALEDONIA: 10 km S. of Pouébo, 150 m, 17. I. 1964 (R. Straatman), 1 ♂; 400 m, 24. I. 1964 (Straatman), 1 ♀; Pouébo, n.e. Coast, 10 m, 11. I. 1964 (Straatman), 2♂♂; Hienghéne, 0-100 m, I. 1971 (N. L. H. Krauss), 1 ♀; Forêt de la Thy, 100-200 m, 10. III. 1961 (J. Sedlacek), 1 ♀; Sarraméa, 12. II. 1963 (Krauss), 1 ♀; Prony Bay (Baie du Prony), Oct. 22, 1940 (F. X. Williams), 1 ♀ (MCZ).

Remarks. This species was originally described from Isle de Lifou (Loyalty Islands), but was subsequently recorded from several localities (as *Cydistomyia massali*) on New Caledonia by Mackerras and Rageau (1958). Ricardo's (1914) description of Bigot's male is sketchy and does not mention the pale median abdominal triangles. The specimens examined here agree well with the description of *C. massali* by Mackerras & Rageau. The genal index is 1.7. *C. lifuensis* is widely distributed on New Caledonia, and is 1 of only 2 horse flies known from the Loyalty Islands. It has been collected from December to March, except for one specimen collected in late October, an unusual early season record.

19. *Cydistomyia (C.) longicornis*, n. sp. Fig. 8

A small gray-black species with strikingly elongate antennae, black legs, pale apical hair fringes on abdominal tergites and sternites, and hyaline wings without a spur on vein R_4.

Holotype ♀. Length: 10.4 mm. Frons moderately broad (index: 4), parallel-sided, blackish gray tomentose, paler along eye margins; vertex without traces of ocellar tubercle or ocelli; frontal callus black, irregularly triangular below with a narrow dorsal prolongation extending about 2/3 distance to vertex; subcallus concolorous with frons; gena brownish along eye margins, otherwise gena and clypeus dark gray tomentose, black

pilose; genal index 1.6; beard black anteriorly, white posteriorly; scape and pedicel dark reddish brown, overlain by gray tomentum; flagellum black; basal flagellomere slender with very low dorsobasal tooth and shallow dorsal excision, about twice as long as tall; terminal flagellomeres together about 1.6X longer than basal flagellomere; maxillary palpi gray tomentose, apical palpomere relatively slender, about 5X longer than broad, tapering to acute point, bearing semi-erect black hairs; eyes (relaxed) dark green, without pattern, bearing minute scattered hairs visible under high magnification.

Mesoscutum shiny gray-black, paler above wing bases; notopleural lobes and scutellum concolorous, bearing mixed black and pale hairs; pleuron concolorous with mesoscutum, white pilose, except black pilose on posterior half of anepisternum; coxae black, overlain by gray tomentum, mixed black and white pilose; femora black; tibiae blackish, mid- and hind tibiae with traces of brown basally; tarsi black; wings hyaline, vein R_4 without spur.

Abdomen shining black and black pilose; tergites with pale gray tomentose and white pilose posterior margins (pale hairs on posterior margin may be abraded); sternites concolorous with tergites, sternites 2-6 with posterior fringe of white hairs.

Type data. Holotype ♀ (BPBM No. 15,132), NEW CALEDONIA: Couli, nr. La Foa, III. 1959 (N.L.H. Krauss). Paratype ♀, Yahoué, 60-100 m, II. 1980 (Krauss)(Acc. # 1980.128).

Remarks. The paratype ♀ has the tomentum of the frons and face paler (light brownish), beard predominantly white pilose, pleuron wholly white pilose, apices of abdominal tergites with a fringe of white hairs and a few scattered pale hairs medianly on the disc of tergites 3-6. *C. longicornis* resembles *C. longistyla*, but differs in having the apices of abdominal tergites with pale hair fringes, hyaline wings, black legs, and antennae even longer than that of *C. longistyla*. The basal flagellomere of *longicornis* is distinctly longer than that of *longistyla*. The species name is derived from the remarkably elongate antenna.

20. *Cydistomyia (C.) longipennis*, n. sp. Fig. 9

A relatively small, slender brownish species with narrow frons, brown frontal callus and legs, large pale median triangles on abdominal tergites, and long wings with faintly brown costal cell.

Holotype ♀. Length: 10.8 mm. Frons relatively narrow (index: 5.6), parallel-sided, distinctly protuberant in profile on lower half, dark brown tomentose, with some gray tomentum intermixed, bearing short black hairs; vertex depressed below level of eyes, subshining, without traces of ocelli or ocellar tubercle; frontal callus brown, rectangular below, narrowly separated from eye margins, dorsal prolongation gradually tapering above, extending 2/3 distance to vertex; subcallus and upper gena brown tomentose, lower gena and clypeus gray tomentose, except brownish tones present on lower half of clypeus; genal index 2.4; beard white; scape and pedicel yellowish brown; basal flagellomere long and slender, black, with distinct dorsobasal tooth; apical flagellomeres lost; maxillary palpi light brown, apical palpomere relatively slender, black pilose; eyes (relaxed) black, without pattern, bearing scattered microscopic hairs.

Mesoscutum, scutellum, and pleuron brown tomentose; mesoscutum with broad blackish median and sublateral longitudinal stripes, bearing mixed white and black hairs; pleuron white pilose; legs uniformly brown, with mixed black and white hairs; wings rel-

atively long, about as long as total body length, faintly brownish tinged throughout, costal cell slightly darker brown tinged, vein R_4 without spur on right wing, with short spur on left wing.

Abdomen brown, black pilose, tergite 1 entirely dark, tergites 2-5 with conspicuous pale median tomentose and pilose median triangles, triangle on tergite 2 short and broad, those on tergites 3-5 taller and narrower, tergite 6 with pale posterior margin only, lateral margins of tergites 2-5 with triangular pale pilose patches; sternites paler brown, with pale posterior margins, sternites 2-5 with pale hairs posteriorly and laterally.

Type data. Holotype ♀ (BPBM No. 15,133), NEW CALEDONIA: Baie du Prony, W. side, 0-10 m, 14. VIII. 1979, Sweeping (W. C. Gagné), BPBM Acc. 1979.380.

Remarks. This slender brown species with conspicuous median triangles on the abdomen is not likely to be confused with any other species known from New Caledonia or the Pacific islands.

21. *Cydistomyia (C.) longistyla*, n. sp. Fig. 10

A relatively small black and grayish species with conspicuously elongated terminal antennal flagellomeres, relatively broad frons, short, slender maxillary palpi, shining gray-black mesoscutum, shiny black abdomen without pale pattern, and R_4 vein with short spur.

Holotype ♀. Length: 12 mm. Frons relatively broad, parallel-sided (index: 3.3), dark gray tomentose, paler along eye margins below, with scattered black hairs; vertex with no trace of ocellar tubercle or ocelli; frontal callus black with some brownish tones below, elongate-oval and widely separated from eye margins, dorsal prolongation irregularly fusiform, extending slightly more than half way to vertex; subcallus light brown tomentose; gena and clypeus gray tomentose, bearing mixed black and pale hairs; genal index 1.5; beard with pale and black hairs intermixed; scape reddish brown, pedicel and flagellum black; basal flagellomere short, only slightly longer than tall, dorsobasal tooth and dorsal excision barely perceptible; terminal flagellomeres twice as long as basal flagellomere; maxillary palpi yellowish gray tomentose, apical palpomere relatively short and slender, about 4X longer than broad, bearing semi-erect black hairs; eyes (relaxed) dark green, without pattern, bearing microscopic scattered hairs.

Mesoscutum shining gray-black with 2 indistinct gray sublateral stripes anterior to transverse suture, paler gray laterally and on notopleural lobes, bearing erect black hairs, except a tuft of yellow hairs above the wing bases and on postalar ridge; scutellum concolorous with mesoscutum; pleuron gray tomentose, slightly darker on ventral anepisternum, white pilose; coxae gray tomentose, white pilose; mid- and hind femora and tibiae brown, basal half of femora overlain by gray tomentum; fore femora and tibiae dark brown; tarsi blackish; wings with faint brownish tinge; vein R_4 with short spur.

Abdomen shining black and black pilose dorsally, except pale hairs present on lateral margin, without paler pattern; ventral surface gray-black, pale pilose, except black hairs present on sternites 6-7.

Type data. Holotype ♀ (BPBM No 15,134), NEW CALEDONIA: Mt. Koghi, 500-700 m, 1. XII. 1963, Malaise trap (R. Straatman).

Remarks. This species is closest to *Cydistomyia (C.) roubaudi* Mackerras & Rageau, but differs in being more slender and in having a much longer antenna, paler head and thorax with white pilosity on the pleuron, brownish legs, slightly brownish tinted

wings, and pale pilosity ventrally on the abdomen. It is named for the relatively long terminal antennal flagellomeres.

22. *Cydistomyia (C.) matilei* Trojan Fig. 11

1991. Mém. Mus. natn. Hist. nat. (A) 149: 271, fig. 22a-c.

Specimens examined. 1 ♀, 1 ♂. NEW CALEDONIA: Plaine des Lacs, 5 km E. Grand Lac, 300 m, 22° 16' S 166° 58' E, 22-25 January 1984 (M. Pogue & M. Epstein) (FSCA).

Remarks. The female examined here generally agrees with the description by Trojan (1991) except for the following: frontal index 5.2; ocellar remnants clearly visible on vertex; frontal callus somewhat bulging in lateral view; scape and pedicel brown; maxillary palpi dark brown; genal index 2.25; scutellum brown on extreme base; legs dark brown; abdominal tergites 2-4 with equilateral median and lateral gray tomentose triangles; sternites 2-4 with gray tomentose posterior margins. Length of the female 7.2 mm.

The male of *C. matilei*, heretofore undescribed, is similar to the female in general appearance, and differs in the following features: maxillary palpi gray tomentose, apical palpomere slender, short; eyes with upper area of large facets sharply differentiated from smaller facets below, minute scattered ocular hairs visible at high magnification (50X). Length of the male is 8 mm.

23. *Cydistomyia (C.) metallica*, n. sp. Fig. 16

A small, compact metallic blue-green species with a broad frons, orange antennae, beard and hairs on the pleuron golden yellow, blackish brown legs and hyaline wings with no spur on vein R_4.

Holotype ♀. Length: 9.6 mm. Frons broad (index: 2.6), protuberant in lateral view, subshining black and irregularly rugose laterally, distinctly divergent below, brown tomentose above frontal callus and on vertex; vertex lacking ocellar tubercle and ocellar vestiges; frontal callus broadly oval, dark brown, well separated from eye margins, dorsal prolongation broad basally, gradually narrowed toward vertex, not distinctly differentiated from surrounding shiny integument above; subcallus, gena, and clypeus yellow-brown tomentose, gena and clypeus short golden yellow pilose; genal index 1.45; beard golden; antennae orange; basal flagellomere stout basally, with strong dorsobasal tooth, dorsal excavation deep; maxillary palpi pale brown, apical palpomere stout stout basally, tapering to sharp point; eyes (relaxed) black, without pattern, bearing only a few scattered minute hairs when viewed under high magnification.

Mesoscutum and scutellum (abraded) metallic bluish green with faint brownish tones medianly; pleurae concolorous with mesoscutum, golden yellow pilose; coxae and femora dark brown; tibiae and tarsi brown; all legs black pilose; wings hyaline, vein R_4 without spur.

Abdomen metallic blue-green, tergites black pilose; sternites concolorous with tergites, mostly pale yellow pilose, except black on sternite 7.

Type data. Holotype ♀(BPBM No. 15,135), NEW CALEDONIA: 4 km NNE Col de Kuenthio (Col de Nassirah), Rte. 4 at Koua R., 150-200 m, 22. IX. 1979 (W. C. Gagné, G. M. Nishida & G. A. Samuelson).

Remarks. This species superficially resembles species of *Chasmia* in being rather rotund and compact and with a metallic body, but it has a stout apical palpomere, short

proboscis with large labellum and the A_1+CuA_2 veins join well before the wing margin. This species is provisionally placed in *Cydistomyia*. It is easily distinguished from other *Cydistomyia* species known New Caledonia by its bright golden beard and pleural hairs, orange antennae, and greenish metallic color.

24. *Cydistomyia (C.) minuta*, n. sp. Fig. 12

A small, brown species with short, stout antennae, broad pale sublateral stripes on the mesoscutum, black-brown legs and dark brown abdomen with conspicuous gray tomentose posterior margins slightly enlarged laterally and medianly into triangular markings.

Holotype ♀. Length: 6.4 mm. Frons narrow, parallel-sided, index 5, silvery gray tomentose; vertex depressed, with trace of median ocellus; frontal callus reddish brown, broadly triangular below, dorsal prolongation extending 2/3 distance to vertex; subcallus yellowish gray tomentose; gena and clypeus gray tomentose, black pilose; genal index 1.5; beard mostly black haired, with a few white hairs intermixed; scape and pedicel yellowish brown, basal flagellomere dark brown, short and stout, only slightly longer than high, dorsobasal tooth short, dorsal excision shallow, apical flagellomeres black, about as long as basal flagellomere; maxillary palpi dark brown, paler apically, apical palpomere moderately stout basally, blunt apically, bearing black hairs; eyes black, bearing minute scattered hairs visible under high (50X) magnification.

Mesoscutum dark brown, bearing 2 broad sublateral gray tomentose stripes extending nearly 3/4 distance to scutellum and 2 lateral gray tomentose stripes crossing notopleural lobes to postalar calli, integument underlying pale areas yellowish brown; scutellum dark brown with a gray tomentose posterior margin; pleuron dark brown and gray tomentose, darkest on ventral half of anepisternum, black pilose on dark areas, white pilose on pale gray areas; coxae brown, gray tomentose, femora black-brown, fore tibiae yellowish basally, black-brown apically, mid- and hind tibiae yellowish, slightly darker apically, fore tarsi black, mid- and hind tarsi yellowish basally, darker apically; wings hyaline, vein R_4 without spur.

Abdomen dark brown, tergite 1 gray tomentose laterally, tergites 2-7 with gray tomentose and white pilose posterior bands that expand medianly and laterally into short triangles, dark areas black pilose, all sternites dark brown with gray tomentose posterior margins.

Male.- Length: 5.8 - 6.4 mm. Similar to female in general appearance except darker areas of the body are lighter brown. Area of large upper eye facets sharply differentiated from smaller facets below; postocular fringe of hairs long and black, curved forward; scape, pedicel, and basal flagellomere yellow, sharply contrasting with black apical flagellomeres; maxillary palpi yellowish gray tomentose, sharply pointed apically.

Type data. Holotype ♀, NEW CALEDONIA: Mandjélia, 29-31. I. 1984, u.v. light trap (Pogue & Epstein)(FSCA). Paratypes, 2 ♀♀, 5 ♂♂, same data as holotype (FSCA).

Remarks. The paratype series agrees well with the holotype except the basal flagellomere is yellowish brown, strongly contrasting with black apical flagellomeres. Length of the paratype females is 6.0 - 6.4 mm. Since all the specimens have been in preservative fluid, some of the colors may be lighter than in freshly collected specimens. This species is closest in appearance to *C. matilei*, but is easily distinguished by differences in the thoracic and abdominal banding pattern.

25. *Cydistomyia (C.) pinensis*, n. sp. Fig. 13

A relatively small brownish gray species with a short, compact basal flagellomere, long apical flagellomeres, dark grayish thorax contrasting with brownish abdomen, light brown legs, and hyaline wings.

Holotype ♀. Length: 10.4 mm. Frons grayish buff tomentose, lighter gray along eye margins, index 4, slightly divergent below, bearing scattered black hairs; small ocellar tubercle present, bearing a rudimentary median ocellus; frontal callus brown, quadrangular below, well separated from eye margins, dorsal prolongation gradually tapered above, extending about 2/3 distance to vertex; subcallus and upper gena concolorous with frons, lower gena and clypeus gray tomentose, white pilose; genal index 1.55; beard white; scape, pedicel and basal flagellomere orange-brown, apical flagellomeres darker brown; basal flagellomere short, compact, only slightly longer than high; apical flagellomeres elongate, about 2X length of basal flagellomere; maxillary palpi yellowish gray, apical palpomere moderately swollen basally, tapering to sharp point apically, bearing mixed black and pale yellow hairs; eyes (relaxed) dark green, without pattern, essentially bare (scattered microscopic hairs visible under high magnification).

Mesoscutum dark gray tomentose with traces of sublateral pale brown stripes anterior to transverse suture; postpronotal and notopleural lobes reddish; surface of mesoscutum bearing mixed black and yellowish hairs; notopleural lobes densely black pilose laterally; scutellum concolorous with mesoscutum; pleurae gray tomentose, white pilose; coxae gray tomentose; femora and tibiae brown, bearing mostly yellowish hairs and scattered black ones; tarsi blackish brown; wings hyaline, vein R_4 without spur.

Abdomen brown, darker blackish brown on tergites 5-7; tergites 2-5 with small pale haired median spots on posterior margins, otherwise black pilose; ventral surface brownish laterally, dark gray medianly, sternites slightly paler on posterior margins, bearing mostly pale yellowish hairs and scattered black ones medianly.

Male.- Length: 10-12 mm. Frontal triangle yellowish brown tomentose; apical palpomere elongate-oval, about twice as long as than broad; upper eye facets strongly enlarged, occupying upper 2/3 of eyes, bearing microscopic scattered hairs; dark gray mesoscutum contrasting with pale brown abdomen; posterior abdominal tergites variably darkened; otherwise similar to female.

Type data. Holotype ♀ (BPBM No. 15,136), NEW CALEDONIA: Isle of Pines [Île des Pins], III. 1959 (N.L.H. Krauss). Paratypes, 4♂♂, same data as holotype (BPBM).

Remarks. This species is closest to *Cydistomyia (C.) risbeci* Mackerras & Rageau, but is easily distinguished by the lighter colored frons, callus, face, antennae, and light brown abdomen and legs, in contrast to the blackish brown color of *C. risbeci*. This species is named for the island where it was collected, southeast of the main island.

26. *Cydistomyia (C.) quadrimaculata*, n. sp. Fig. 14

A large, stout brown and black species with a brown mesoscutum, a silvery hair patch beneath the wing base, dark brown wings and brown-black abdomen with median and lateral silvery hair patches on tergites 1-4.

Holotype ♀. Length: 19.2 mm. Frons relatively narrow, parallel-sided, index 5, brown tomentose and black pilose; vertex gray tomentose, with traces of 3 ocelli; frontal callus reddish brown, rugose, narrowly triangular with very stout, short dorsal prolonga-

tion; subcallus brown tomentose; genae and clypeus brown tomentose, black pilose; genal index 1.53; beard black; scape and pedicel brown tomentose, flagellum dark brown, basal flagellomere long and narrow, dorsobasal tooth large, dorsal excision deep; maxillary palpi brown tomentose, black pilose; eyes black, bearing minute scattered hairs visible only at high (50X) magnification.

Mesoscutum brown, with slightly paler, indistinct sublateral and lateral stripes, black pilose; scutellum concolorous with mesoscutum, slightly paler on posterior margin; pleuron brown tomentose, densely black pilose, except a conspicuous silvery hair tuft anterior to basalare and on outer edge of upper calypter; legs black-brown, black pilose, fore- and mid tibiae slightly lighter brown; wings dark brown, with slightly paler areas in some cells, R_4 without spur.

Abdomen deep brown-black to black, lighter brown laterally on tergite 1, tergite 1 with small median posterior and lateral silvery hair patch, tergites 2-4 with large silver-haired median triangles and silvery haired tufts on lateral margins; sternite 1 brown tomentose, sternites 2-7 blackish, lateral silvery hair tufts on sternites 2-4.

Male.- Length: 18 - 20 mm. Similar in general appearance to female except for the following characters: eyes with upper area of large facets sharply differentiated from smaller facets below; maxillary palpi slender, pointed apically; beard light brown; wings less heavily infuscated posteriorly.

Type data. Holotype♀ (BPBM No. 15,137), NEW CALEDONIA: Col d'Amieu, 750 m, III. 3. 1960 (J. L. Gressitt). Paratypes, 5♂♂ (BPBM); Mt. Koghi, 26-30. I. 1963 (C. M. Yoshimoto), 1♂; Pouébo, 150 m, 17. I. 1964, light trap (R. Straatman), 1♂; Pouébo, NE Coast, 10 m, 11. I. 1964, light trap (R. Straatman), 2♂♂; 10 km S. of Pouébo, 400 m, 24. I. 1964, light trap (R. Straatman), 1♂.

Remarks. This species is close to *C. caledonica* but can be distinguished by the narrower frons, smaller, shorter frontal callus, longer and more excised basal flagellomere, abdominal tergite 5 without any silvery markings, and abdominal sternites 2-4 with silvery hair tufts only on the lateral margins, without pale apical bands.

27. *Cydistomyia (C.) risbeci* Mackerras & Rageau

1958. Ann. Parasitol. Hum. Comp. 33: 711, figs. 9B, 11A.

Cydistomyia danutae Trojan, 1991. Mém. Mus. natn. Hist. nat. (A) 149: 269, figs. 19 (as *risbeci*), 21a-c, **n. syn.**

Specimens examined. 14♀♀, 2♂♂; BPBM except as noted. NEW CALEDONIA: Anse Vata, 22. XI. 1958 (C. R. Joyce), 1♀; Pondimiè, 26. XI. 1958 (Joyce), 1♀; Mt. Koghi, +600 m, 30. XI. 63 (R. Straatman), 1♀; 1. XII. 63 (Straatman), 1♀; 2. XII. 63 (Straatman), 2♀♀; 3. XII. 63 (Straatman), 1♀; 27. I. 63 (Straatman), 1♀; Hienghène, 25. XI. 1958 (Joyce), 1♀; Pouébo, NE Coast, 10 m, 11. I. 1964, light trap (Straatman), 1♀; 150 m, 17. I. 1964 (Straatman); [no locality], 2. IV. 1970, A. N. Gillogly; Nouméa, Oct. 20, 1940, at light (F. X. Williams), 1♀ (MCZ); Chapeau Gendarme (Yahoué), XII. 5-7. 1954, valley pocket-forest (E. O. Wilson), 1♀(MCZ); Nouméa (Anse Vata), 16. XI. 1954 (J. Rageau), 1♀ (FSCA); Baie Tina (22° 18' S, 166° 27' E), 25 m, 11, 14-15. Feb. 1984 (M. Pogue & M. Epstein), 1♂(FSCA).

Remarks. Mackerras and Rageau (1958) examined 160 specimens of *C. risbeci* and discussed variation seen from different localities. To this variation can be added the following comments: beard with a few black hairs intermixed with white hairs, palpi either

acutely or bluntly pointed, basal flagellomere of antennae sometimes blackened distally, mesoscutum sometimes lighter gray, median pale triangles evanescent on some abdominal tergites, and median pale longitudinal stripe crossing entire length of tergite 2. The genal index is 1.7. *C. risbeci* is widely distributed on New Caledonia. It has been collected from November to February.

Trojan (1991) described *Cydistomyia danutae* from 6 females. The type series was not available for study. Comparison of a topotype female of *danutae* determined by Trojan with specimens of *C. risbeci* revealed that they are conspecific.

28. *Cydistomyia (C.) roubaudi* Mackerras & Rageau
1958. Ann. Parasitol. Hum. Comp. 33: 724, fig. 12F.

Specimens examined.- 30 ♀♀, 1 ♂; all specimens BPBM except as noted. NEW CALEDONIA: Col des Roussettes, 450-550 m, 4-6. II. 63 (J. L. Gressitt), 9 ♀♀; Mt. Koghi [Mont des Koghis], 27. I. 1963 (C. M. Yoshimoto), 1 ♀; 28. I. 1963, light trap (Yoshimoto & N. Krauss), 1 ♂; 350-600 m, 19. III. 1968 (Gressitt & T. C. Maa), 10 ♀♀; summit (Gressitt & Maa), 1♀; Mt. Mou, 1220 m, 7. III. 1972 (Gressitt), 4♀♀; 18. III. 1914 (P. D. Montagne), 1♀ (MCZ); Makoue to Mt. Do to Thio, 150-500 m, 20, 22. III. 1963 (Gressitt), 1♀; Col d'Amieu, 650 m, 21. III. 1968 (Gressitt & Maa), 1♀; Thy River Valley, Nov. 6, 1940 (F. X. Williams), 2♀♀ (MCZ).

Remarks. The male of *C. roubaudi* has not been described previously. Only differences from the female are given. Length: 14.6 mm. Frontal triangle gray tomentose, with blackish tones above; flagellum of antennae entirely black; beard mostly black, with some pale hairs intermixed posteriorly; apical palpomere elongate-oval, pointed apically, about 2.5 times longer than broad; upper eye facets greatly enlarged, occupying upper 2/3 of eyes, bearing minute scattered hairs, sharply demarcated from area of lower small facets; postocular rim with long dark recurved hairs; proepisternal callosity bearing white hairs anteriorly, black hairs posteriorly; fore coxae entirely black pilose; costal cell of wings hyaline, not darker than remainder of wing; otherwise similar to female. The genal index of the female is 1.6.

Specimens of *C. roubaudi* examined agreed well with the original description, except the vertex is subshining and the costal cell of the wings is entirely hyaline, not darker than the remainder of the wing. In addition to the above localities, Mackerras and Rageau (1958) recorded it from the Tchamba River and from Forêt de la Thy (Saint-Louis). *C. roubaudi* is widely distributed on the island, and has been collected from January to March. The stout black body and hyaline wings will easily distinguish this species from others occurring in New Caledonia.

29. *Cydistomyia (C.) toumanoffi* Mackerras & Rageau
1958. Ann. Parasitol. Hum. Comp. 33: 721, fig. 12C.

Specimens examined.- 30♀♀, 6♂♂; BPBM except as noted. NEW CALEDONIA: Mt. Koghi, 26-30. I. 1963 (C. M. Yoshimoto & N. Krauss), 1♂; 27. I. 1963 (Yoshimoto & Krauss), 1♀; 28. I. 1963 (Yoshimoto & Krauss), 2♂♂; 15. II. 1963 (Krauss), 5♀♀; 18. III. 1968 (Krauss), 1♀; 19. III. 1968 (J. L. Gressitt & T. C. Maa), 2♀♀, 1♂; I. 1969 (Krauss), 2♀♀; La Crouen, 12. III. 1961 (J. Sedlacek), 1♀; 16. III. 1961 (Sedlacek), 1♂; 31. I. 1963 (Yoshimoto & Krauss), 1 ♀; Tao, 8-10. II. 1963 (Yoshimoto & Krauss), 1 ♀; Mt. Koghi, Forêt de la Thy, 530 m, 8. III. 61 (Sedlacek), 1 ♀; 10 km S. of Koh, 31. I. 1963

(Yoshimoto), 1 ♀; Col des Roussettes, 450-550 m, 4-6. II. 63 (Yoshimoto & Krauss), 3 ♀♀; 10 km S. of Pouébo, 400 m, 24. I. 1964 (R. Straatman), 3 ♀♀; 10 km S. of Plum, 24. III. 1968 (Gressitt & Maa), 1 ♀; Sarraméa, II. 1970 (Krauss), 1 ♀; Mt. Mou, 180-400 m, 11. XII. 1954 (E. O. Wilson), 1 ♀ (MCZ); St. Louis Valley, April 5, 1945 (H. E. Milliron), 1 ♀(FSCA); Mt. Dumbéa, 15 Feb. 1977 (D. Habeck), 1 ♀ (FSCA); Col de Mouirange, 12 Mar. 1977 (D. Habeck), 1 ♀(FSCA); Rivière des Piroges, 7-9. II. 1984, u.v. light trap (Pogue & Epstein), 1 ♂ (FSCA).

Remarks. The male of *C. toumanoffi* has not been described previously. The following characters differ from those of the female. Length: 13.6 - 14.8 mm. Frontal triangle brownish yellow tomentose; beard pale yellowish white; maxillary palpi mostly yellow pilose, with scattered black hairs, apical palpomere elongate-oval, about 2.5X longer than broad; eyes with area of upper facets moderately enlarged, occupying upper 2/3 of eyes, distinctly pilose, area of small facets below well differentiated from large facets, bearing microscopic hairs; postocular rim bearing long recurved black hairs near vertex; anepisternum yellowish tomentose above, with scattered black hairs intermixed with pale yellowish ones posteriorly; otherwise similar to female.

Specimens examined agree with the original description, except some of them have the costal cell of the wings yellowish tinged and wings variably tinted, eyes with scattered microscopic hairs, and maxillary palpi predominantly yellow pilose. The size of specimens examined was 12-16 mm, and the index of the frons was 4.5-5.0. The genal index is 1.6. *C. toumanoffi* resembles *C. lifuensis* but can be distinguished by the narrower, darker frontal callus, longer, darker basal flagellomere, gray pleuron, and absence of white-haired triangles on the abdominal tergites. *C. toumanoffi* is widely distributed on New Caledonia and has been collected from December to March, Mackerras and Rageau (1958) also recorded it from La Foa.

30. *Dasybasis chazeaui* Trojan

1991. Mém. Mus. natn. Hist. nat. (A) 149: 257, fig. 7a-c.

Remarks. The holotype is labelled "*Cydistomyia chazeaui* sp. n., holotype, P. Trojan det. 1988". The specimen has been in a preservative fluid. The mesoscutum and abdomen are extensively denuded (described as "sparsely pilose" by Trojan), and the blackish color of the mesonotum may not be the same as in fresh specimens. The genal index is 1.25. The yellowish lateral margin of the mesoscutum, including the notopleural lobes, contrast strongly with the black color on the rest of the mesoscutum. The pleuron is dark gray pruinose and white pilose except yellowish and yellow pilose on the upper surface of the mesanepisternum. The abdomen is orange-brown with traces of a median darker stripe. The posterior margins of the tergites are slightly paler, and vestiges of pale hairs on posterior segments suggest that there are narrow, pale-haired hind margins on tergites 2-5 or 6, with the dorsal surface otherwise bearing black hairs. The sternites are gray-brown basally, lighter brown apically with pale-haired posterior margins.

31. *Dasybasis danielae* Trojan

1991. Mém. Mus. natn. Hist. nat. (A) 149: 258, fig. 8a-c.

Remarks. This species is known only from the holotype female. Although it was ultimately to be deposited in the Museum National d'Histoire Naturelle in Paris, it was still in possession of Trojan at the time of this writing, and could not be examined. It is

placed in the key based on the original description.

32. *Dasybasis evenhuisi*, n. sp. Fig. 15

A small grayish and brown species with strongly divergent frons, enlarged antennal scape, slender maxillary palpi, large pale median abdominal triangles, and hyaline wings with dark stigma, brownish costal cell, and vein R_4 without spur.

Holotype ♀. Length: 9.2 mm. Frons relatively broad (index: 3), strongly divergent below, twice as wide at base than at vertex, gray tomentose and black pilose; vertex with no trace of ocellar tubercle or ocelli; frontal callus black, triangular, narrowly separated from eye margins, with narrow dorsal prolongation extending 3/4 distance to vertex; subcallus gray tomentose, densely black pilose laterally and with scattered hairs along median line; genae yellowish gray tomentose, black pilose; clypeus gray tomentose, black pilose; genal index 1.2; beard mostly yellowish, with scattered black hairs anteriorly; scape and pedicel gray tomentose, scape distinctly enlarged dorsally and ventrally; basal flagellomere short and oval, without distinct dorsobasal tooth or dorsal excision, orange except black at extreme apex, about twice as long as tall; apical flagellomeres black; maxillary palpi dark gray tomentose, apical palpomere slender, tapered to rounded apex, bearing mostly black and a few yellowish semi-erect hairs; eyes (relaxed) dark green, without pattern, densely pilose.

Mesoscutum dark brown medianly with broad faint grayish tomentose area anterior to transverse suture and paler gray markings above wing bases and on notopleural lobes, bearing black and yellowish hairs; scutellum concolorous; pleurae gray tomentose and yellowish pilose, slightly darker ventrally on anepisternum and katepisternum; coxae gray tomentose, yellow pilose; femora black; tibiae reddish, slightly darker apically; tarsi blackish; wings hyaline, costal cell light brown, pterostigma very large, dark brown, vein R_4 angular near base but without spur.

Abdomen brownish black on tergites 1-2, black on remaining tergites, tergite 1 with tuft of pale yellowish hairs on median posterior border, tergites 2-7 with pale posterior margins, pale area expanded medianly into prominent narrow median pale triangles on tergites 2-6, triangle on tergite 2 nearly crossing segment, pale and dark areas of tergites pale yellow and black pilose respectively; sternum blackish, sternites with pale posterior margins.

Male.- Length: 9.6 mm. Frontal triangle brown tomentose, bulging in profile, bearing numerous small setae laterally and along median line; flagellum of antennae lost; maxillary palpi elongate-oval, pointed apically, about twice as long as tall; eyes with facets of uniform size, densely long pilose; postocular rim bearing long recurved black hairs near vertex; legs blackish, mostly black pilose, with yellow hairs ventrally on mid- and hind tibiae; abdominal tergites brown laterally, tergites 2-6 with large black areas divided by pale median triangles; otherwise similar to female.

Type data. Holotype ♀ (BPBM No. 15,138), NEW CALEDONIA: Mt. Koghi, 500 m, 2. XII. 1963, Malaise trap (P. Straatman). Paratype ♂, same data as holotype (BPBM).

Remarks. This species can be placed in the *sarpa* group of *Dasybasis* (Mackerras, (1957), known from the north island of New Zealand, but is distinct from any known species in that group. This species is named for Neal Evenhuis of the Bishop Museum, whose outstanding work on the taxonomy of Pacific Diptera and on a catalog of Diptera of the Australian and Oceanian Regions has greatly enhanced our knowledge of the bio-

geography of the Pacific, and whose cooperation has greatly assisted my studies of Pacific Tabanidae.

33. *Dasybasis gracilipalpis*, n. sp. Fig. 17

A medium-sized brown species with rudimentary frontal callus, very slender maxillary palpi, slender reddish orange basal flagellomere and yellowish brown legs.

Holotype ♀. Length: 13.2 mm. Frons relatively broad, parallel-sided, index 3.2, brown tomentose; vertex strongly depressed below level of eyes, with a distinct raised tubercle medianly but without vestiges of ocelli; frontal callus brown, reduced to a narrow, short median bar; subcallus, upper genae and clypeus brown tomentose, lower part of genae gray tomentose, black pilose; genal index 1.15; beard white, sparse; scape and pedicel brown tomentose, scape relatively broad, basal flagellomere slender, with very short dorsobasal tooth, orange tomentose, apical flagellomeres brown; maxillary palpi yellowish brown, apical palpomere unusually slender basally, tapered to sharp point apically, mostly black setose, with a few pale hairs at base; eyes black, bearing distinct short hairs.

Mesoscutum brown (denuded) with darker sublateral markings possibly due to abrasion; scutellum bright yellow-brown, contrasting with dull brown mesoscutum; pleuron light brown and gray tomentose, mostly white pilose except black hairs on anepisternum; legs light brown; wings hyaline, costal cell lightly tinted brown, vein R_4 without spur.

Abdomen uniformly light brown, slightly darker on posterior tergites, black pilose; sternites yellowish brown overlain by thin gray tomentum.

Type data. Holotype ♀ (BPBM No. 15,139), NEW CALEDONIA: Yiambi, NE, 50-500 m, 14. X. 1967, newly cleared forest (J. M. Sedlacek).

Remarks. The dull brown color and slender palpi are unlike any other species of *Dasybasis* known from New Caledonia.

34. *Dasybasis grenieri* (Mackerras & Rageau)

Cydistomyia (C.) grenieri Mackerras & Rageau, 1958. Ann. Parasitol. Hum. Comp. 33: 723, fig. 12E.

Dasybasis (Protodasyommia) grenieri (Mackerras & Rageau): Mackerras, 1962. Pac. Insects 4: 111, fig. 16 (♂).

Cydistomyia norae Trojan, 1991. Mém. Mus. natn. Hist. nat. (A) 149: 272, fig. 23a-c, **n. syn.**

Specimens examined. 4 ♀♀, 1 ♂; BPBM except as noted. NEW CALEDONIA: Mt. Koghi (Mts. des Koghis), 15. II. 1963 (C. M. Yoshimoto), 1 ♀; 19. III. 1968 (J. L. Gressitt & T. C. Maa), 1 ♀ (teneral); 400-600 m, I. 1969 (N.L.H. Krauss), 1 ♀; Rivière des Piroges, 7-9. II. 1984, u.v. light trap (Pogue & Epstein), 1 ♀ (FSCA); Mandjélia, 29-31. I. 1984, u.v. light trap (Pogue & Epstein), 1 ♂ (FSCA).

Remarks. Specimens of *D. grenieri* examined agree well with the original description, differing only in having very few pale hairs on the disc of the abdominal tergites, and wings slightly brownish tinted along the longitudinal veins. The genal index is 1.3. Mackerras and Rageau (1958) also recorded it (as *Cydistomyia*) from Mt. Mou and Canala. Mackerras (1962) described the male from "Montagne des Sources". It is known from the southern half of the island, and has been collected from December to March.

Trojan (1991) described *norae* in the genus *Cydistomyia*, stating that the parafacial

index was 1.7. Examination of the holotype and measurement of the genal [parafacial] index revealed that the index is 1.21. This species should be placed in *Dasybasis*. Comparison of the holotype of *norae* with specimens of *D. grenieri* revealed that they are conspecific.

35. *Dasybasis kuniae* (Mackerras & Rageau), **n. comb.**

Cydistomyia (C.) kuniae Mackerras & Rageau, 1958. Ann. Parasitol. Hum. Comp. 33: 715, fig. 9C.

Chasmiella kuniae (Mackerras & Rageau): Trojan, 1991. Mém. Mus. natn. Hist. nat. (A) 149: 265, fig. 12.

Dasybasis lydiae Trojan, 1991. Mém. Mus. natn. Hist. nat. (A). 149: 259., fig. 9a-c, **n. syn.**

Specimens examined. 23 ♀♀, all BPBM except as noted. NEW CALEDONIA: La Crouen, 16. III. 1961 (J. Sedlacek), 1 ♀; I. 1963 (N. L. H. Krauss), 1 ♀; Mt. Koghi, 500 m, 27. I. 1963 (C. M. Yoshimoto), 1 ♀; 15. II. 1963, 3 ♀♀; 400-600 m, I. 1969 (Krauss), 4 ♀♀; 300-600 m, 19. III. 1968, light trap (J. L. Gressitt & T. C. Maa), 5 ♀♀; Col des Roussettes, 300 m, 5-6. II. 1963 (Yoshimoto & Krauss), 2 ♀♀; 25 km from Col des Roussettes, 6. II. 63 (Krauss), 1 ♀; Rivière Bleue, 200 m, 25-27. III. 1981 (Gressitt), 1 ♀; Makoue to Mt. Do to Thio, 150-500 m, 20, 22. III. 1968 (Maa), 1 ♀; Hienghène, 0-50 m, I. 1969 (Krauss), 1 ♀; nr. Dumbéa, 15 Feb. 1977 (D. Habeck), 2 ♀♀(FSCA).

Remarks. Mackerras and Rageau (1958) described this species in the genus *Cydistomyia*. Trojan (1991) transferred it to *Chasmiella* without explanation. *D. kuniae* has the apical maxillary palpomere relatively stout, the proboscis short with a large labellum and wing vein A_1+CuA_2 joined well before the wing margin. Therefore, I believe this species should not be placed in *Chasmiella*. The genal index is 1.1, and therefore *kuniae* is best placed in *Dasybasis*.

Comparison of the holotype of *Dasybasis lydiae* Trojan with *D. kuniae* revealed that they are conspecific. The integument of *D. lydiae* is slightly darker than in specimens I examined of *D. kuniae*. This may be due to discoloration from immersion of *D. lydiae* in a fluid preservative.

D. kuniae specimens examined agreed well with the original description, except they were slightly larger (average 9.6 mm), the basal flagellomere of the antennae was slightly darkened apically, and the costal cell was concolorous with the hyaline wings. Mackerras and Rageau (1958) recorded *D. kuniae* (as *Cydistomyia*) only from the Isle of Pines, but recent collections show that it is widely distributed on the main island as well. Specimens have been collected from December to March.

36. *Dasybasis ponandouensis*, n. sp. Fig. 18

A medium-sized grayish brown species with very narrow pale yellowish gray apical margins on the abdominal tergites, and lightly brown tinted wings.

Holotype ♀. Length: 13 mm. Frons parallel-sided, yellowish gray tomentose, darker gray above dorsal prolongation of frontal callus, index 4.3; vertex without ocellar remnants; frontal callus oval below and widely separated from ocular margins, dorsal prolongation broad, extending 2/3 distance to vertex, callus narrowly reaching the frontal/subcallar boundary; subcallus yellow-gray tomentose; genae and clypeus gray tomentose, with white and black hairs intermixed; genal index 1.3; beard pale yellow; scape and pedi-

cel yellowish brown, gray tomentose dorsally, basal flagellomere black-brown basally, black apically, bearing a short dorsobasal tooth, apical flagellomeres black; maxillary palpi gray-brown tomentose, apical palpomere entirely black haired; eyes black with scattered short hairs.

Mesoscutum gray-brown tomentose with slightly paler sublateral and lateral stripes, mostly black pilose with yellowish ones intermixed along posterior margin; scutellum dark gray tomentose, posterior margin slightly paler; pleuron gray tomentose, yellowish pilose, some yellowish tones and scattered black hairs present on upper anepisternum; coxae concolorous with pleuron, femora and tibiae yellowish brown with some darker brownish tones dorsally on fore femora, tarsi dark brown; wings lightly brown tinted, vein R_4 without spur.

Abdomen dark brown with some grayish tones intermixed, tergites 2-6 with narrow yellowish gray tomentose posterior margins; sternites 1-2 predominantly gray tomentose laterally, sternites 3-6 yellowish brown laterally, all sternites darkened medianly due to black median hair patches.

Type data. Holotype ♀, NEW CALEDONIA: 5 km S. Touho, Ponandou River, 100 m, 20° 49'S 165° 13'E, 2 Feb. 1984 (M. Pogue & M. Epstein)(FSCA).

Remarks. This species is closest to *D. grenieri* but differs in having a slightly narrower frons, more slender palpi, more brownish mesoscutum, brownish tinted wings and more yellowish gray pleurae.

37. *Dasybasis rageaui* Mackerras

1962. Pac. Insects 4: 112, fig. 17.

Specimens examined.- 2 ♀♀; BPBM. NEW CALEDONIA: Grand Lac, 9-10. VIII. 1971, macquis scrub (J. Holloway), 1 ♀; 30 km NW Col de Mouirange, 175 m, 10. VIII. 1979 (G. M. Nishida), 1 ♀.

Remarks. *D. rageaui* was previously known only from the holotype female described from "Montagne des Sources", east of Nouméa. The 2 females examined here agree well with the original description, except the antennae are entirely blackish brown and the light colored hairs on the body are silvery, not golden. The genal index is 1.37. The *D. rageaui* females recorded here were collected only in the far southern part of New Caledonia in August, during the dry season. The holotype was collected in March.

38. *Dasybasis rubricallosa* (Ricardo)

Tabanus rubricallosus Ricardo, 1914. Ann. Mag. Nat. Hist. (8) 13: 478.

Dasybasis (D.) rubricallosa (Ricardo): Mackerras & Rageau, 1958. Ann. Parasitol. Hum. Comp. 33: 708, figs. 9A, 10.

Specimens examined.- 17 ♀♀, 2 ♂♂. NEW CALEDONIA: Nouméa, V. 1950 (N.L.H. Krauss), 2 ♀♀(BPBM); 8. XII. 56 (J. Rageau), 1 ♂(MCZ); Anse Vata, Nouméa, 25. X. 1958 (C. R. Joyce), 1 ♀(BPBM); 20 Nov. 1954 (Rageau), 1 ♀(MCZ); Yiambi, NE, 50-500 m, 14. X. 1967, in newly cleared forest (J. & M. Sedlacek), 1 ♀(BPBM); 10 km NW of Plum, 24. III. 1968 (J. L. Gressitt & T. C. Maa), 2 ♀♀(BPBM); I. of Mouac, N. of New Caledonia, 19. X. 1958 (Joyce), 3 ♀♀(BPBM); 10 mi. S. of La Foa, 10 Feb. '45 (C. L. Remington), 1 ♀(MCZ); Isle of Pines, Oct. 24, 1940 (F. X. Williams), 5 ♀♀, 1 ♂ (MCZ).

Remarks. The broad frons and large reddish frontal callus will immediately distin-

guish this species from all others known from New Caledonia. Mackerras and Rageau (1958) redescribed *D. rubricallosa* from 200 ♀♀ and 20♂♂. Specimens examined here agree well with the redescription, except some specimens had a few black hairs dorsally intermixed with pale ones on the apical palpomere. The genal index is 1.2. *D. rubricallosa* has been collected from the southern half of New Caledonia, the Isle of Pines, and the Isle of Mouac in the Loyalty Group. It has an extended period of adult activity compared to most Tabanidae on New Caledonia, from October to May. Because it has been collected primarily in coastal locations and on islands, it is possible that this pallid species may inhabit beaches or other sandy locations.

39. *Dasybasis setipalpis*, n. sp. Fig. 19

A small brown species with relatively short bristly palpi, hyaline wings and abdominal tergites with narrow brownish gray tomentose and white pilose posterior margins.

Holotype ♀. Length: 9.6 mm. Frons relatively broad, index 3.2, slightly diverging below, gray tomentose; vertex without ocellar remnants; frontal callus reddish brown, nearly filling width of frons at base, narrowly separated from eye margins, dorsal prolongation narrow, black, extending 3/4 distance to vertex; subcallus light brown tomentose; genae and clypeus yellowish gray tomentose and black pilose; anterior tentorial pits shining brown; genal index 1.3; beard with black and white hairs intermixed; scape and pedicel light brown tomentose, basal flagellomere orange, bearing a short dorsal tooth, apical flagellomeres brown; maxillary palpi gray tomentose, apical palpomere relatively short, about 4X longer than broad, bearing semi-erect black setae; eyes blue with slender green transverse stripe.

Mesoscutum brown-gray tomentose with indistinct median stripe, 2 pairs of sublateral paler stripes and paler lateral margins, mostly black pilose, except white hairs along posterior margin; scutellum yellowish brown with a dark brown median band; pleuron light gray tomentose, white pilose; coxae concolorous with pleurae, femora, tibiae and tarsi light yellowish brown; wings hyaline, vein R_4 without spur.

Abdomen brown, tergites 2-6 with narrow light brownish gray tomentose and white pilose hind margins, tergite 7 entirely dark; sternites predominantly gray tomentose and white pilose, with brown tomentum basally on sternites 3-6, sternite 7 with black hairs.

Male.- Length: 8.8 - 9.6 mm. Similar in general appearance to the female. Eyes with upper area of large facets sharply differentiated from smaller facets below; postocular fringe of hairs long and black, curved forward; maxillary palpi slender, sharply pointed apically; abdominal tergites light brown with pale posterior margins poorly defined and entire surface of tergites pale pilose with scattered black hairs intermixed; sternites gray tomentose and white pilose, except sternite 7 black pilose.

Type data. Holotype ♀, NEW CALEDONIA: Mandjélia, u.v. light trap, 27-31. I. 1984 (Pogue & Epstein)(FSCA). Paratypes: 5 ♀♀ , 5♂♂ (FSCA), same data as holotype.

Remarks. The female paratypes are 8.8 - 10.4 mm long. The paratypes generally agree well with the holotype. There is some variation in the width of the frontal callus and its dorsal prolongation. The maxillary palpi of 2 females have some yellowish tones as well as gray tomentum. This species is closest to *D. ponandouensis* and *D. grenieri*, but the much smaller size, broad frontal callus, short, bristly maxillary palpi and absence of median black hair patches on the sternites will easily distinguish it.

40. *Dasybasis tillierorum* Trojan

1991. Mém. Mus. natn. Hist. nat. (A) 149: 260, fig. 10a-c.

Remarks. The holotype female has been in a preservative fluid; the mesoscutum and abdomen are denuded (described as "sparsely pilose" by Trojan), with only a few hairs remaining, and thus obscuring possible patterns. The frontal callus is shining black. The maxillary palpi are relatively short and slender with semi-erect black setae. The pleurae are concolorous with the black and gray tomentose mesoscutum, and bears white hairs. The wing membrane is light brown along the longitudinal veins, hyaline between the veins. The costal cell is brown. The abdomen is black, except tergite 2 yellowish brown laterally. All tergites have narrow pale posterior margins. The sternites are black with pale posterior margins.

41. *Dasybasis tiwakai* (Trojan), **n. comb.** Fig. 20

Cydistomyia tiwakai Trojan, 1991. Mém. Mus. natn. Hist. nat. (A) 149: 273, fig. 24a-d.

Specimens examined. 6 ♀♀; all BPBM. NEW CALEDONIA: Col des Roussettes, 450-450 m, 4-6. II. 1963, Malaise trap (J. L. Gressitt, C. Yoshimoto, N.L.H. Krauss), 2 ♀♀; Mt. Koghi, II. 1962 (N. L. H. Krauss), 1 ♀; 15. II. 1963 (N.L.H. Krauss), 1 ♀; 350-600 m, 19. III. 1968, light trap (J. L. Gressitt & T. C. Maa), 1 ♀; 10 km S. of Pouébo, 400 m, 24. I. 1964, light trap (R. Straatman), 1 ♀.

Remarks. Trojan (1991) placed this species in *Cydistomyia*, indicating that the genal [parafacial] index was 1.5. Measurement of the holotype's genal index revealed that it was 1.28. The broad gena, pilose eyes and enlarged antennal scape are characteristic of *Dasybasis* to which this species is reassigned.

The females examined here generally agree with the holotype but the abdomen is not quite as dark laterally. The holotype has indistinct slightly paler grayish apices on tergites 2-7; those on specimens examined here are lighter and more conspicuous. Other differences noted are: Length: 16 - 17.6 mm, frons diverging toward the base; frontal callus black; scape broad, gray to yellowish gray tomentose; hairs of apical palpomere black and white intermixed; mesoscutum blackish gray; abdominal tergites 1-3 broadly yellowish brown laterally, hairs of median triangles white, apices of tergites 2-7 yellowish gray tomentose but without pale hairs.

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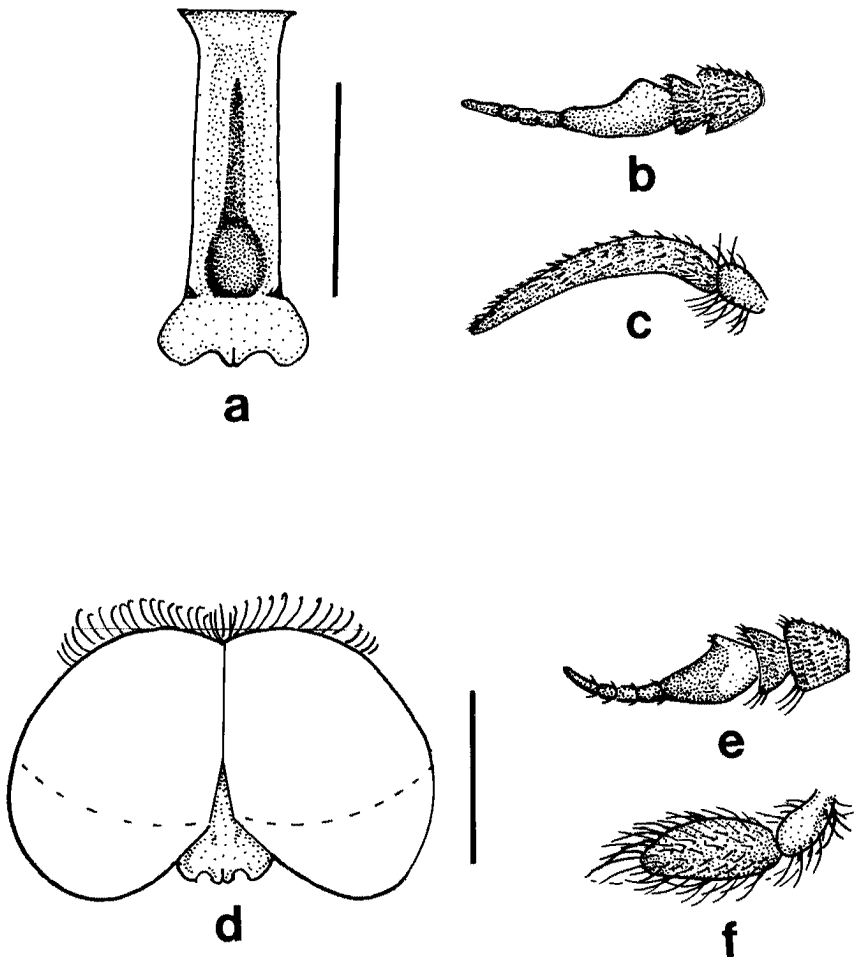


Fig. 1. *Chasmia brunnea*, n. sp., female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.

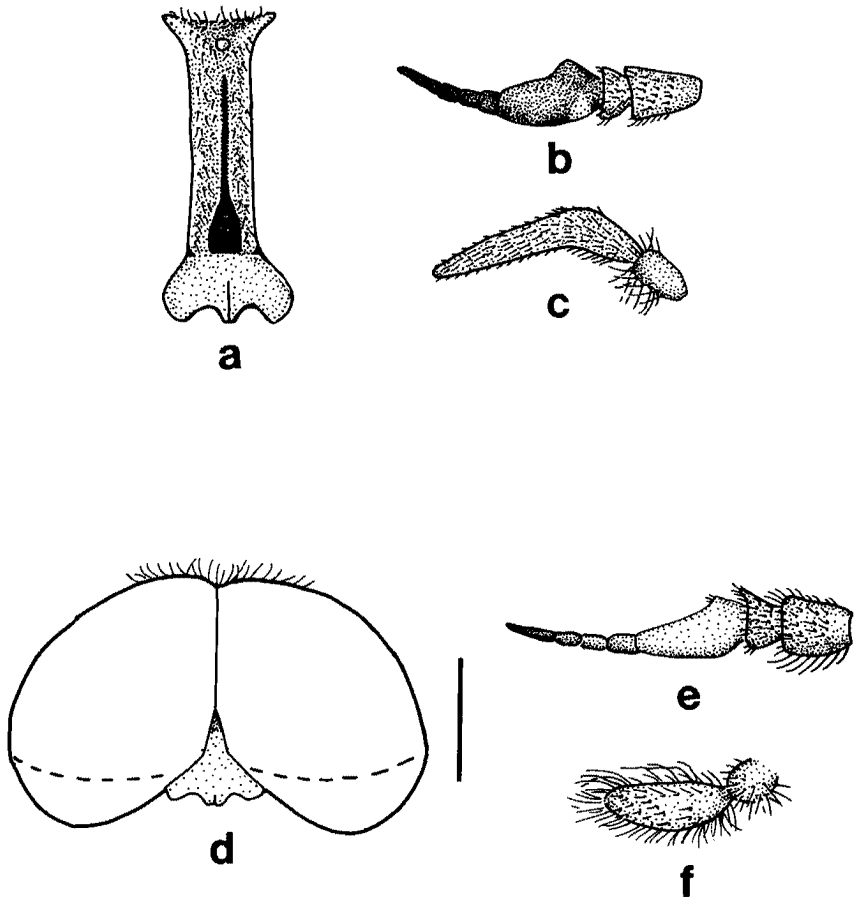


Fig. 2. *Chasmia cohici* (Mackerras & Rageau), female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.

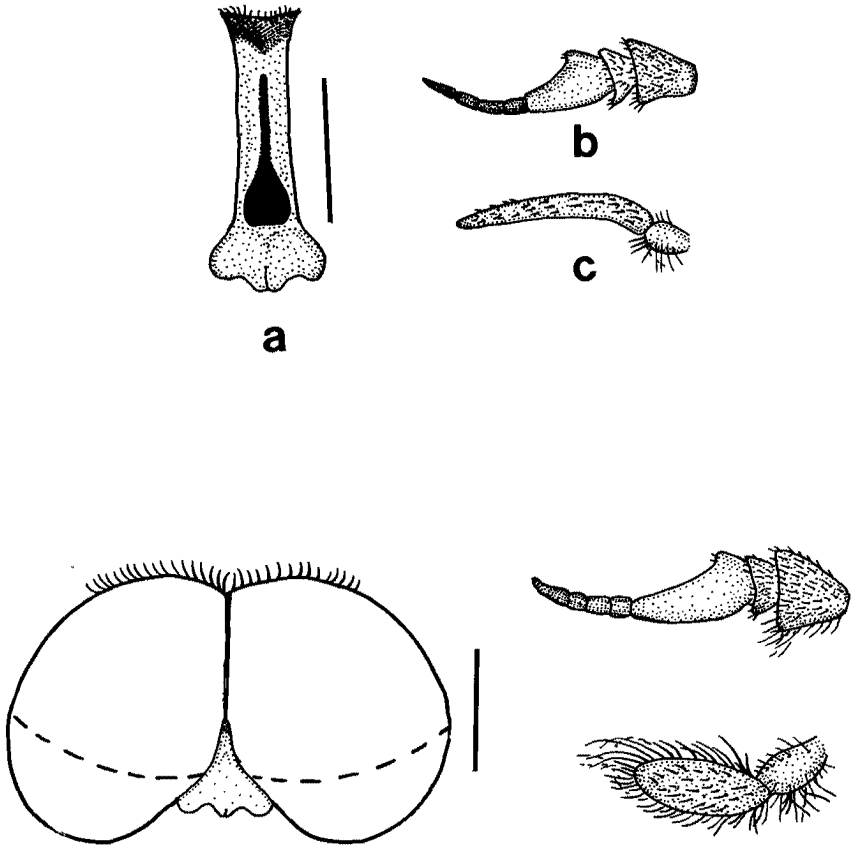


Fig. 3. *Chasmia leszeki* Trojan, female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.

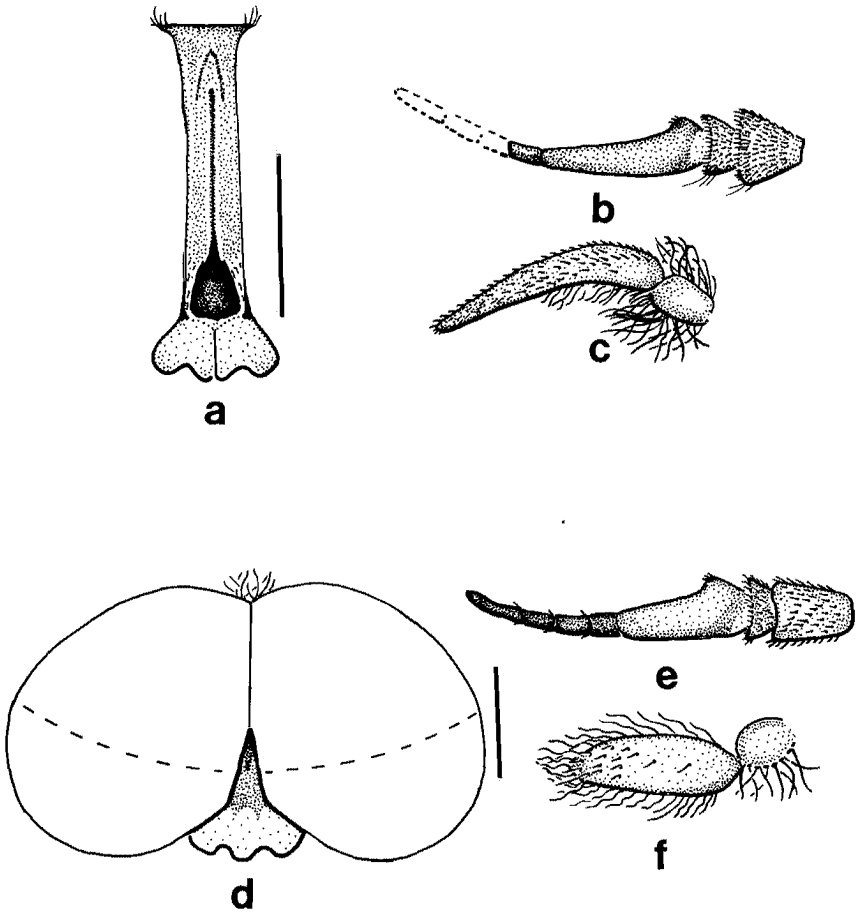
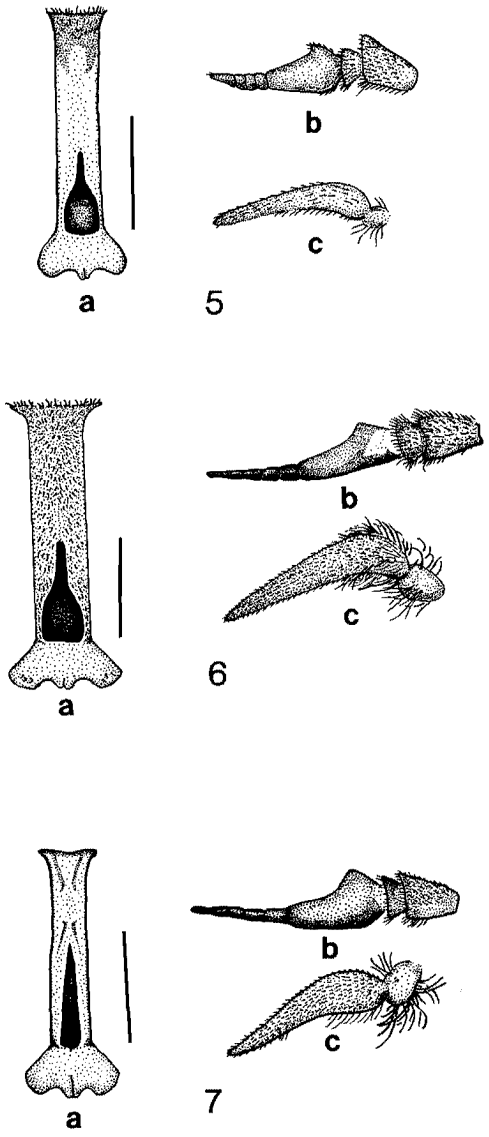
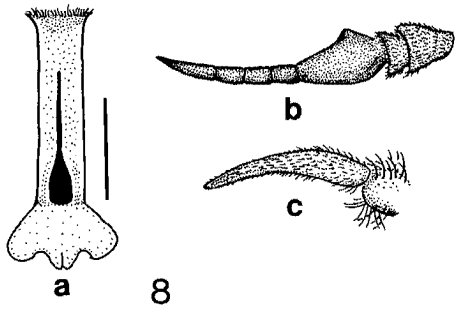
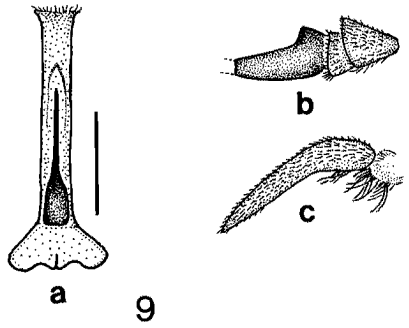


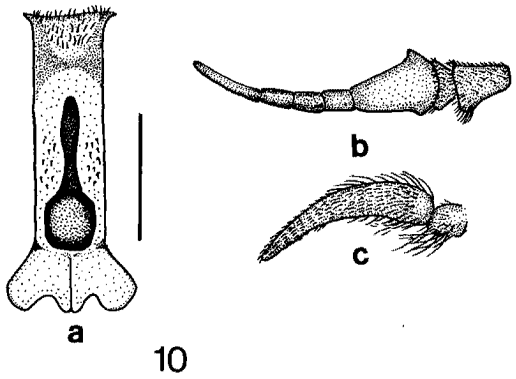
Fig. 4. *Chasmia neocaledonica*, n. sp., female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.



Figs. 5-7. 5.- *Chasmia maculata*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. 6.- *Cydistomyia atrata*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. 7.- *Cydistomyia kraussi*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. Scale bars = 1.0 mm.







Figs. 8-10. 8.- *Cydistomyia longicornis*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. 9.- *Cydistomyia longipennis*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. 10.- *Cydistomyia longistyla*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. Scale bars = 1.0 mm.

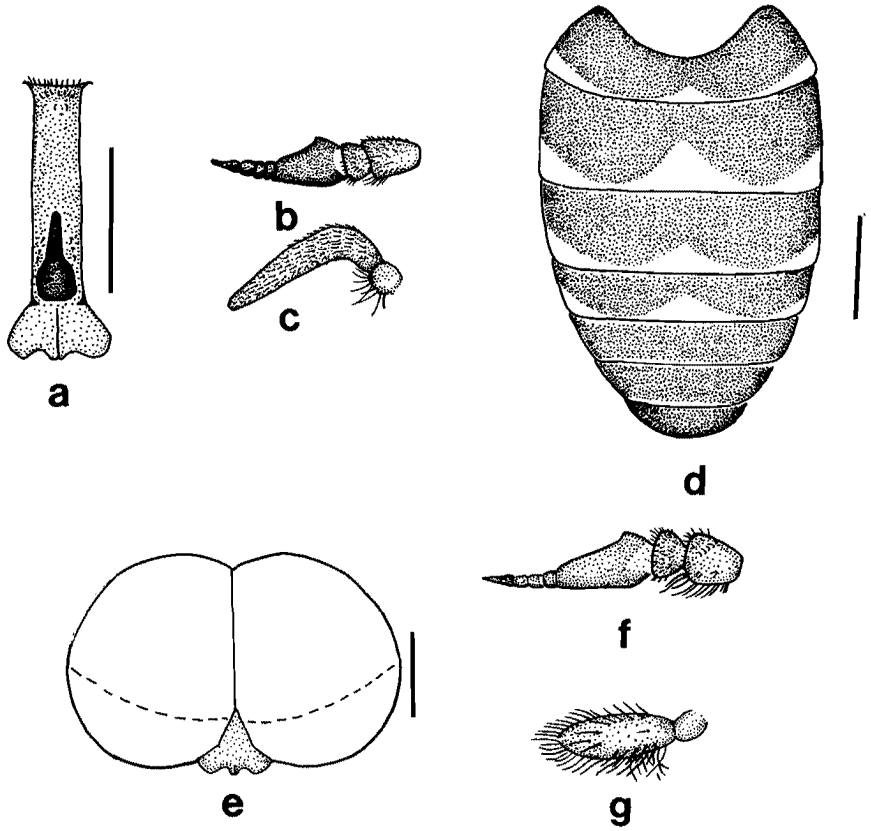


Fig. 11. *Cydistomyia matilei* Trojan, female (a-d), male (e-g). a) frons; b) antenna; c) maxillary palpus; d) abdomen; e) frontal view of head; f) antenna; g) maxillary palpus. Scale bar = 1.0 mm.

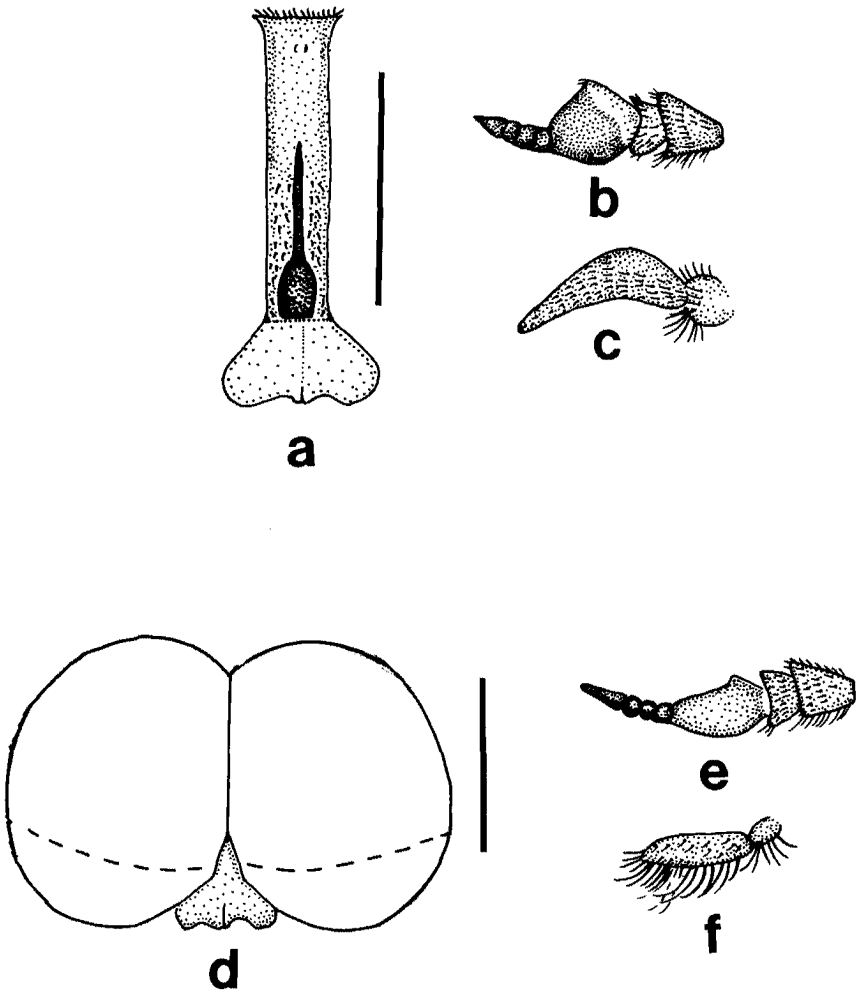


Fig. 12. *Cydistomyia minuta*, n. sp., female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.

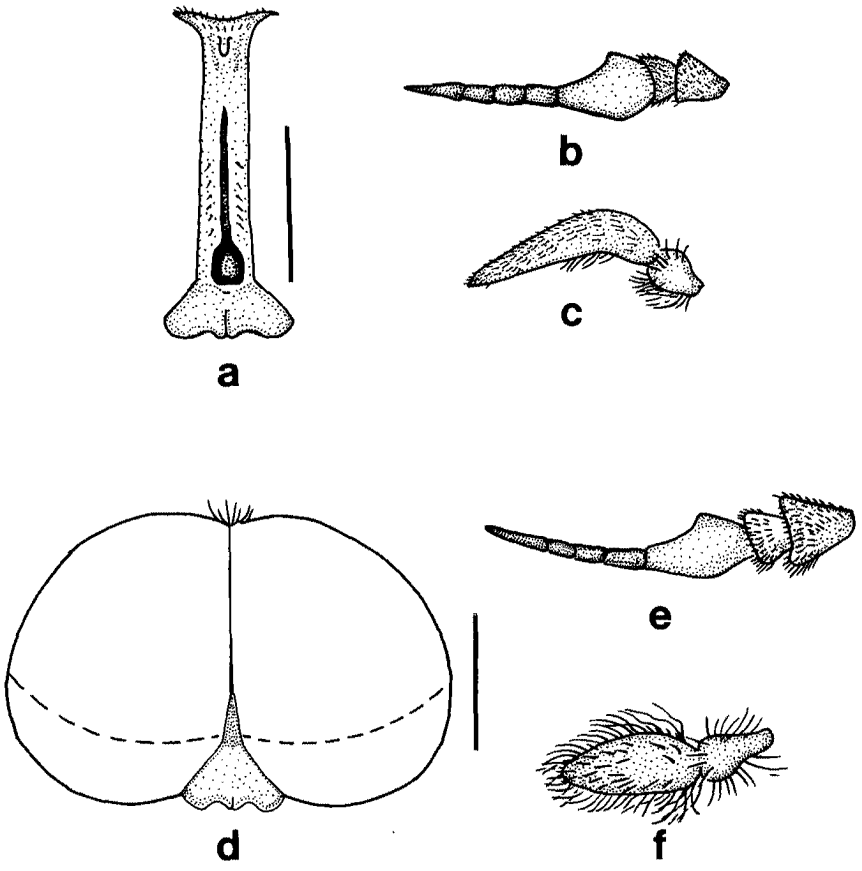


Fig. 13. *Cydistomyia pinensis*, n. sp., female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.

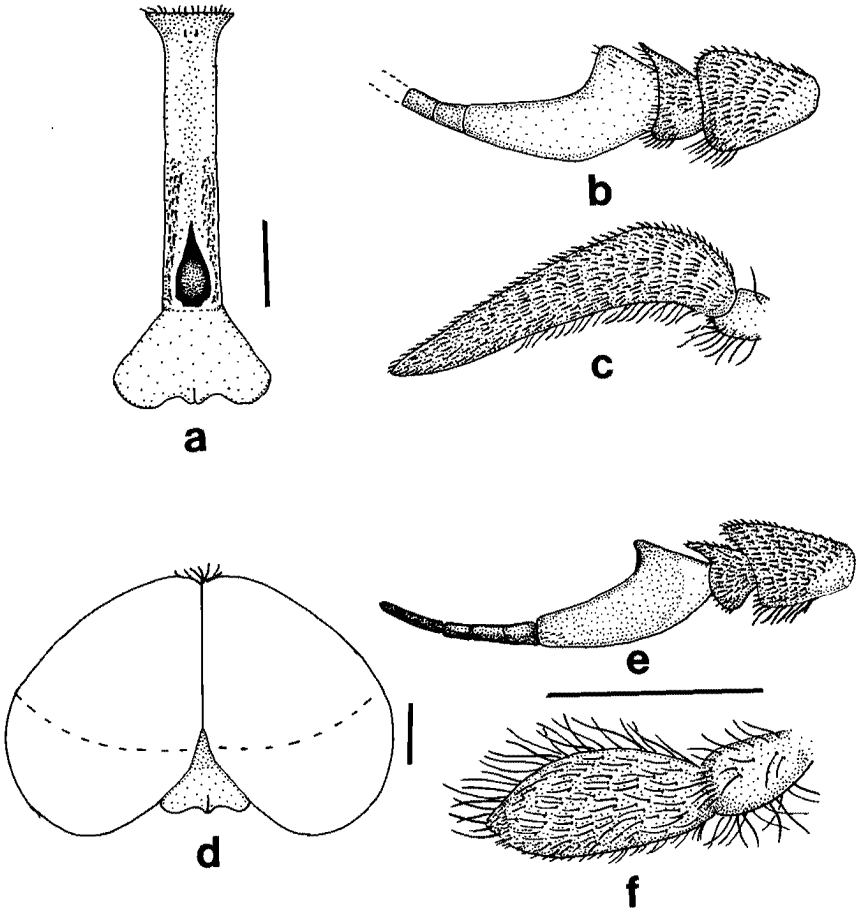


Fig. 14. *Cydistomyia quadrimaculata*, n. sp., female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.

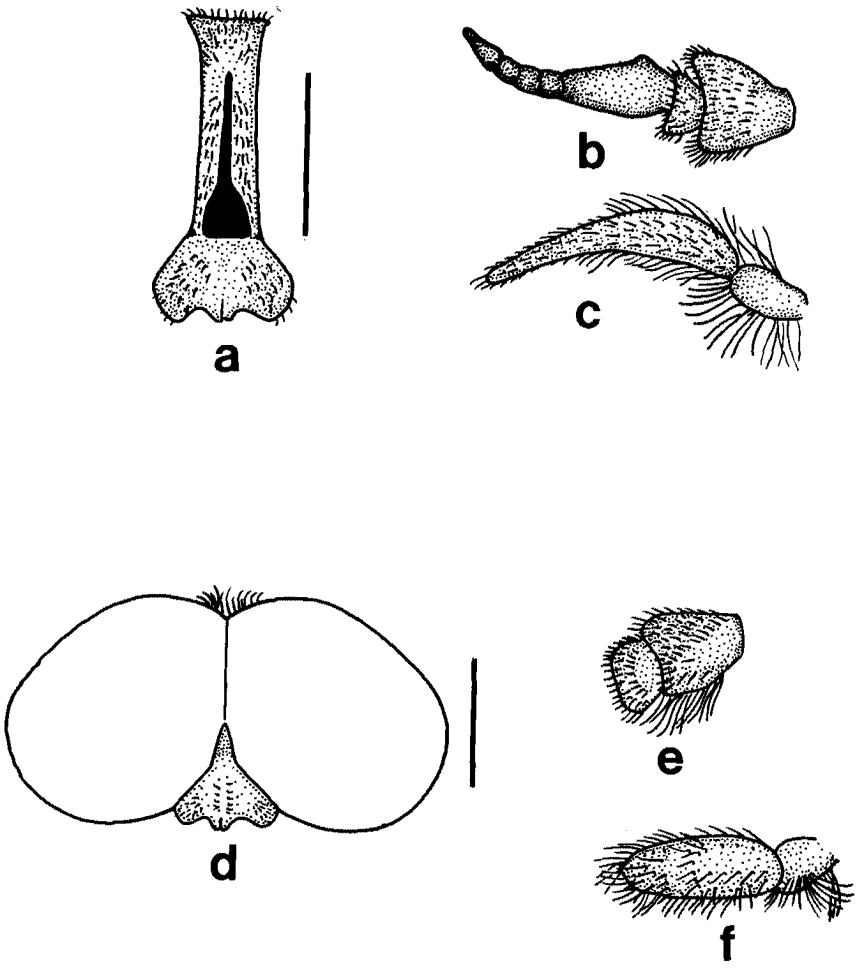
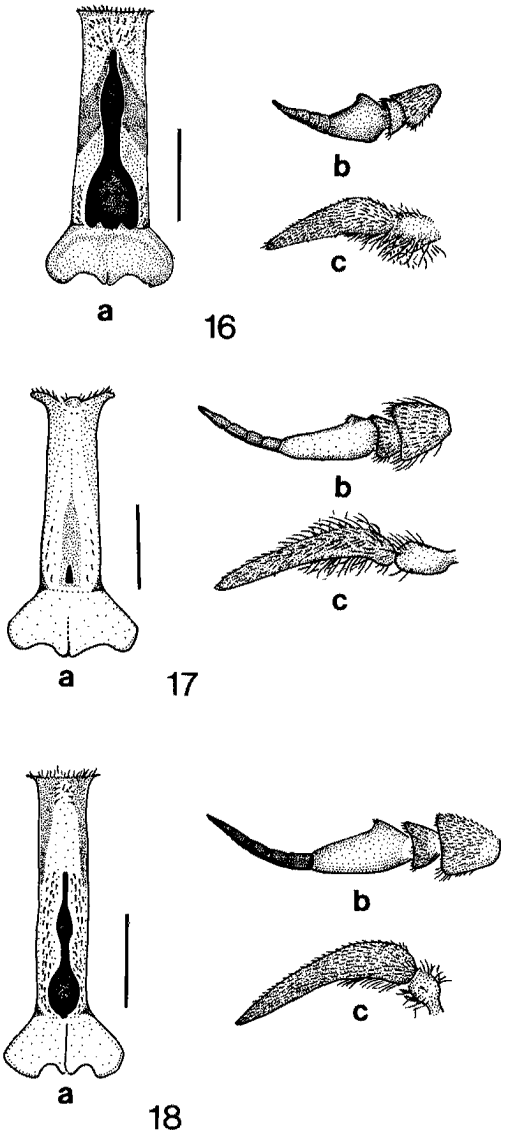


Fig. 15. *Dasybasis evenhuisi*, n. sp., female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.



Figs. 16-18. 16.- *Cydistomyia metallica*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. 17.- *Dasybasis gracilipalpis*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. 18.- *Dasybasis ponandouensis*, n. sp., female. a) frons; b) antenna; c) maxillary palpus. Scale bars = 1.0 mm.

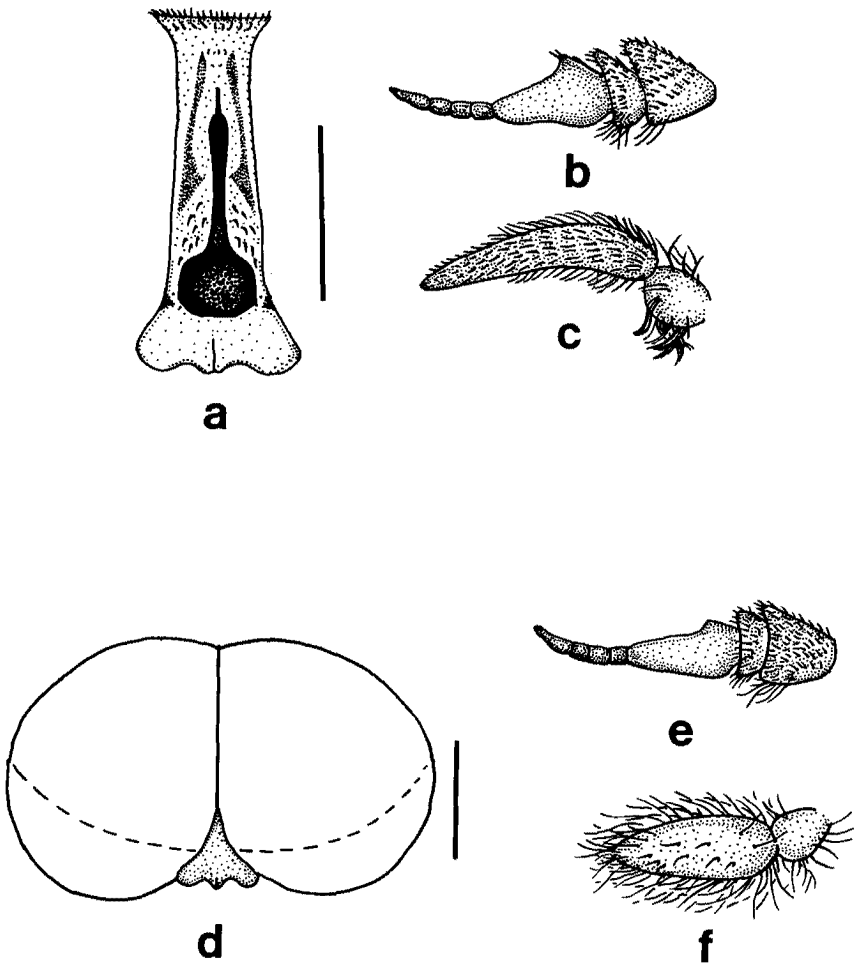


Fig. 19. *Dasybasis setipalpis*, n. sp., female (a-c), male (d-f). a) frons; b) antenna; c) maxillary palpus; d) frontal view of head; e) antenna; f) maxillary palpus. Scale bar = 1.0 mm.

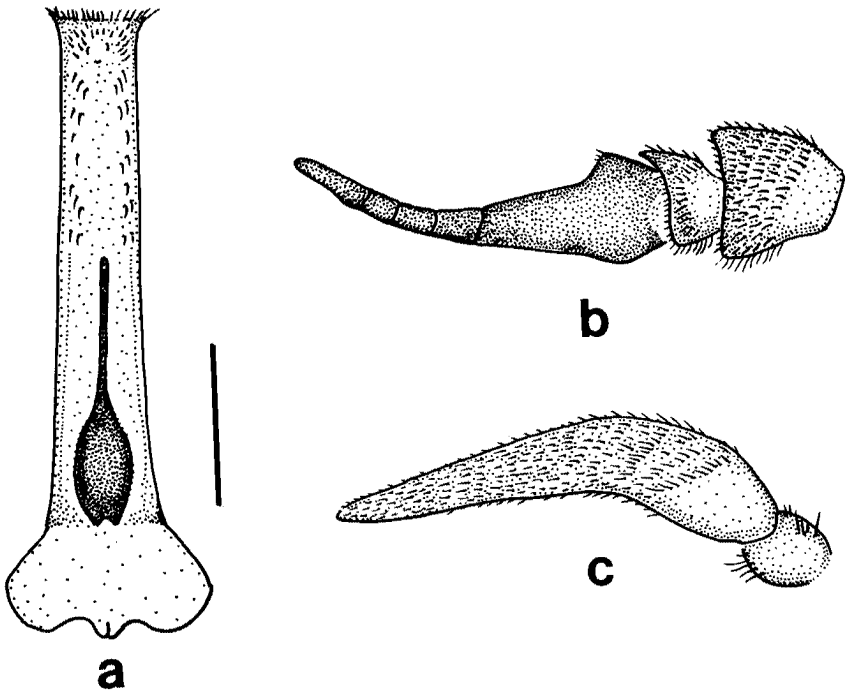


Fig. 20. *Dasybasis tiwakai* (Trojan), female. a) frons; b) antenna; c) maxillary palpus. Scale bar = 1.0 mm.