

A REVISION OF THE GENUS *PROTOPIOPHILA* DUDA
(DIPTERA : PIOPHILIDAE)

By R. A. HARRISON

(Plant Diseases Division, Department of Scientific and Industrial Research, Private Bag, Auckland,
New Zealand)

THE group of species in the genus *Piophila* Fallén which possess four dorsocentral bristles was first given a taxonomic designation by Duda (1924), when he erected the subgenus *Protopiophila* to contain them. That such a designation is a legitimate and natural one has not been doubted and subsequent authors have accepted it. Séguy (1934) and Harrison (1959) go so far as to give full generic status to the subgenus. The main factors influencing this action are as follows. The number of dorsocentrals in acalypterate families is an important character and is, in fact, frequently the chief character separating two genera, e.g. *Fenwickia* Malloch and *Aneuria* Malloch. The distinction between *Protopiophila* with four dorsocentrals and *Piophila* with one dorsocentral is, therefore, great. Furthermore, one species of *Protopiophila* is distinct from all other known species in possessing prescutellar bristles. This character is subgeneric in other families, e.g. the *Pholadoris* subgenus in *Drosophila*. It is possible that, later, it may be used to designate a subgenus of *Protopiophila*. This action is not proposed here but it does show that a grouping of species can already be recognised within *Protopiophila*. Thus, although at the moment the genus *Piophila* is not a large one, it would appear best to give *Protopiophila* equal status with it.

Three species are already known which can be referred to *Protopiophila* and one of these, *P. australis* Harrison, has only recently been described (Harrison, 1959). Meigen (1838) described what is now the type species of the genus, viz. *Piophila latipes* Meigen. Walker (1860) described *Piophila conlecta* from specimens collected at Makassar in the Celebes. Collin (1910) separated *P. latipes* in his key to the genus *Piophila* by the coloration of the head and legs, but did not intimate that he was aware of the four dorsocentrals. Duda (1924) erected the subgenus *Protopiophila* for *latipes* and *conlecta* and separated them by the number of humeral bristles present. Malloch (1925) recorded a specimen from Sydney, Australia, as *Piophila latipes*, but, after seeing Duda's paper (Duda, 1924), changed the identification to *Piophila (Protopiophila) conlecta* (Malloch, 1927). He also recorded in the same paper a specimen from Wahroonga, Australia, as *Piophila (Protopiophila) conlecta* but this particular specimen is now a paratype of *P. australis*. Malloch (1931) again switched the identification when he reverted to *latipes* for the Australian specimens, after he had examined American and European examples of *latipes*. He could not distinguish between *latipes* and *conlecta* and so recorded the distribution of *latipes* as Europe, America and Australia. Malloch (1930) recorded *Piophila (Protopiophila) conlecta* as occurring in Samoa. These specimens are discussed below. Hennig (1943) discussed the subgenus *Protopiophila* and regarded it as containing only one species, viz. *latipes*. With it he synonymised *conlecta* Walker, *ruficornis* Wulp and *flavifacies* Brunetti. A cotype and six other specimens of *P. flavifacies* are in the British Museum (Natural History). They have yellow cheeks and only one dorsocentral, and the synonymy suggested is not substantiated. *P. conlecta* is distinct and *P. ruficornis* is synonymous with it. Bezzi (1928) gave full notes of specimens from Fiji and recorded them as *Piophila (Protopiophila) conlecta* Walker. He stated that they were near *latipes* as distinguished by Collin (1910), but were

separated by the narrower frons. He had available specimens from the Philippines for comparison, but in his description of the Fijian specimens he erroneously stated that the mesopleuron was bare. These Fijian specimens which are now in the British Museum have the mesopleuron hairy and have been included in the paratype series of *P. australis*.

Protopiophila Duda

Protopiophila Duda, 1924, *Konowia* 3 : 109.

Front with slightly converging sides ; antennal fossae shallow ; 4 dorsocentrals, anterior one presutural ; wings clear, veins light brown.

Type species : *Protopiophila latipes* (Meigen).

Closely related to *Piophila* but readily separated from it by the presence of four dorsocentral bristles.

KEY TO SPECIES

- 1 Prescutellars present **scutellata** sp. n.
- Prescutellars absent 2
- 2 Mesopleuron bare of hairs and dusting **latipes** (Meigen)
- Mesopleuron with dusting and/or hairs 3
- 3 Mesopleuron with dusting and hairs **australis** Harrison
- Mesopleuron with dusting and without hairs **contacta** (Walker)

***Protopiophila scutellata* sp. n.**

A shining dark brown or black species. Body length about 2.75 mm., wing length about 2.5 mm.
Male and female.—*Head* : arista blackish-brown, light brown basally ; bare. Antenna light brown. Front shining black. Fronto-orbital bristle about equal to postvertical but shorter than verticals and ocellar. Few hairs on front and a row of hairs on orbits. Face brown. Cheeks shining dark brown or black. Hairs on ventral half of cheek. Occiput lightly dusted. Eyes with very few short hairs. Vertical diameter of eye about 4.0 times width of cheek in same axis. Proboscis and palpi dark brown.

Thorax : shining dark brown or black. Propleuron, mesopleuron and ventral section of hypopleuron with greyish-white dusting. Prescutellars present and about two-thirds length of posterior dorsocentrals ; basal scutellars parallel and just under half length of cruciate apicals ; scutellum bare ; 2 humerals ; 1 presutural ; 2 notopleurals ; 1 strong supra-alar ; two postalars ; mesopleuron haired ; 2 approximately equal sternopleurals ; propleural strong.

Legs : yellowish-brown ; fore leg all blackish-brown except fore coxa, trochanter, base and apex of femora and base of tarsus. Second segment of fore tarsus about 1.5 times as long as wide. Fore femur with strong posterodorsal and posteroventral bristles ; mid-tibia with strong ventral apical.

Wings : short stout black costal spines extending just beyond apex of second vein. Wing indices : costal about 4.0 ; fourth vein about 2.2 ; 4c about 0.8 ; 5x about 1.0.

Halteres light brown basally, light yellowish-brown apically.

Abdomen : glossy black.

Holotype ♂, NEW HEBRIDES : Esp. Santo, Second Chain, 4.x.1943 (*Jean Laffoon*) in United States National Museum.

Other records.—PACIFIC : intercepted at Hawaii from aircraft from south of Hawaii, 1943–44, 3 ♂, 7 ♀, in United States National Museum.

Distribution.—New Hebrides and probably elsewhere in the Pacific.

Remarks.—Distinguished from other members of the genus by having distinct prescutellar bristles.

Protopiophila latipes (Meigen)

Piophila latipes Meigen, 1838, *Syst. Besch.* 7: 360. Collin, 1910, *Ent. mon. Mag.* 94: 177. Malloch, 1925, *Proc. Linn. Soc. N.S.W.* 50: 316; 1927, *Ibid.* 52: 8; 1931, *Ibid.* 56: 292.

Piophila (*Protopiophila*) *latipes* Meigen: Duda, 1924, *Konowia* 3: 109, 186. Hennig, 1943, *Flieg. Pal. Reg.* 5: 35.

Protopiophila latipes (Meigen): Séguy, 1934, *Faune Fr.* 28: 77.

Mycetarus hornigi Cresson, 1919, *Proc. Acad. Philad.* 71: 193, *syn. nov*

A shining black or reddish-brown species with mainly yellowish-brown legs. Body length 2.0–3.0 mm., wing length about 2.0–3.0 mm.

Male and female.—*Head*: arista shining brown or dark brown; rays of pubescence not greater than diameter of basal segments with strong black dorsal pre-apical bristle and small black hairs. Front shining dark brown or black. Ocellars very strong; single fronto-orbital about two-thirds length of ocellars; verticals very strong; postverticals just shorter than verticals; weak convergent hairs on centre line of front and small reclinate hairs on orbits. Face brown or dark brown. Cheeks brown or dark brown, not shining. Vibrissa strong, strong hairs over most of cheek with 2 or 3 bristles at lower posterior corner. Occiput black with some grey dusting. Eyes with very few short hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis in males and about 5.0 times in females. Proboscis brown; palpi greyish-brown.

Thorax: shining black, blackish-brown or reddish-brown; propleuron and part of hypopleuron with heavy greyish-white dusting; mesopleuron not dusted. No prescutellars; posterior dorsocentral very strong and about twice length of next anterior bristle, latter about 1.3 times length of 2 anterior bristles. Basal scutellars slightly convergent and just over half length of cruciate apicals. Scutellum bare. Two humerals; 1 presutural; 2 notopleurals; 1 supra-alar; 2 postalars; mesopleuron shining and bare of hairs or dusting; 2 sternopleurals; 9 small propleurals.

Legs: yellowish-brown; fore legs with coxa pale yellow, apical half of femur, all tibia and tarsus blackish-brown; second segment of fore tarsus as long as wide. Fore femur with strong posterodorsal and posteroventral bristles, mid-tibia with strong ventral apical.

Wings: short black stout costal spines extending just beyond apex of second vein. Wing indices: costal about 3.8; fourth vein about 2.2; 4c about 0.8; 5x about 0.8.

Halteres light brown.

Abdomen: shining black or dark brown.

Holotype, GERMANY: Aachen.

Previous records.—France.

New records.—(United States National Museum specimens unless otherwise stated.) SAARLAND: St. Wendel, no date, 1 ♂, (*O. Duda*), (det. O. Duda). SWITZERLAND: Basle, 30.v.1946, 1 ♀, (*F. Keiser*), (Natural History Museum, Basle), (det. F. Keiser). SWEDEN: Stockholm, 12.vii.1953, 1 ♂, (*C. Sabrosky*), (det. C. Sabrosky). GREECE: Macedonia, Lahanas Hills, Oak forest, no date, 1 ♂, (*Anon.*). UNITED STATES OF AMERICA: Michigan, Detroit, 4.vii.1943, 1 ♂, (*G. Steyskal*), (det. G. Steyskal as *Mycetarus hornigi* Cresson): District of Columbia, Washington, -.viii.1911, 1 ♀, (*W. Palmer*); on fresh bones, 9.viii.1906, 1 ♂, 2 ♀, (*Anon.*); Chain bridge, 8.v.1928, 1 ♀, (*J. M. Aldrich*): Maryland, Glen Echo, 22.viii.1922, 1 ♂; 10.vi.1923, 1 ♂, (*J. R. Malloch*); Cabin John, 19.ix.1931, 3 ♀, (*J. M. Aldrich*): Virginia, Maywood, Alexandria Co., 8.ix.1932, 1 ♀, (*W. L. McAtee*); Glencarlyn, 12.vi.1925, 1 ♀, (*J. R. Malloch*): Connecticut, Stamford, 20.vii.1938, 1 ♂, 1 ex., (*S. W. Bromley*): Tennessee, U.T. Farm, Knox. Co., 11.vi.1951, 1 ♂, 3 ♀, (*H. B. Read*), (det. C. Sabrosky): Wisconsin, Pewaukee, 15.vi.1951, 1 ♂, (*W. E. Brown*).

Specimens examined: 10 ♂, 13 ♀ and 1 example (not sexed).

Distribution.—Europe, North America.

Remarks.—There is variation in size and colour of specimens in this genus. Most specimens approach 3.0 mm. and are almost black, but some are smaller and some much lighter in colour. Duda (1924) separated *latipes* from *contecta* by the number of humeral bristles, the former species having one and the latter two. This

is an unsatisfactory character and, as all twenty-four specimens of *latipes* examined on the present occasion (including one determined by Duda) have two humerals, the presence of only one must be regarded as a rare aberration. *P. latipes* is most readily separated from all other species in the genus by having the mesopleuron completely bare of hairs and of dusting. It would appear to be closest to *P. contecta* and, besides the bare mesopleuron, differs from that species in having a pubescent arista and the third antennal segment darker than the rest of the antenna. Sabrosky (*private communication*) states that Steyskal considered that *Mycetaulus hornigi* Cresson was synonymous with *P. latipes* although the synonymy has not been published.

Protopiophila australis Harrison

Protopiophila australis Harrison, 1959, *The Acalyptrate Diptera of New Zealand*: 173 (*Bull. N.Z. Dep. Sci. industr. Res.* 128. Wellington. 382 pp.)

Although this species has been recently described, the description is repeated here for the sake of completeness.

Shining blackish-brown, with yellowish-brown mid and hind legs. Body length about 3.0 mm., wing length about 2.75 mm.

Male and female.—*Head*: arista brown; pubescence of a few scattered small hairs much less than diameter of arista. Antenna yellowish-brown; basal segment brown. Front longer than wide, glossy black, slightly raised anteriorly. One fronto-orbital just shorter than the divergent postverticals and shorter than verticals and ocellars; few scattered black hairs over surface except the raised anterior ridge, and row of hairs on orbits. Face whitish-grey with shining darker brown bands on margin of antennal fossae. Cheeks shining dark brown. Vibrissa strong but no clearly differentiated bristles at lower posterior corner of cheek; hairs on ventral half of cheek. Occiput dark brown. Eyes with few very short fine hairs. Vertical diameter of eye about 3.5 times width of cheek in same axis. Proboscis shining dark brown; palpi yellowish-brown, broad and long.

Thorax: shining dark brown; greyish-white tomentum on dorsal margin of mesopleuron, surrounding anterior spiracle and over most of propleuron, and dorsal to hind coxa. No acrostichals; basal scutellars parallel, or divergent and about two-thirds length of convergent apicals; scutellum bare; 2 humerals; 1 presutural; 2 notopleurals; 1 supra-alar; 2 postalars; 2 equal posterior sternopleurals; mesopleuron haired; 1 strong and 1 very weak propleural; prosternum bare.

Legs: fore legs blackish-brown except yellowish-brown coxa, trochanter, base and apex of femur and base of tibia; white pulvilli; other legs all yellowish-brown. Second segment of fore tarsus about 1.5 times as long as wide. Fore femur with posterodorsal and posteroventral bristles; apicals only on mid-tibia.

Wings: short black stout costal spines ending just beyond apex of second vein. Wing indices: costal about 4.3–4.7; fourth vein about 2.2–2.7; 4c about 0.9; 5x about 0.8–1.0.

Halteres light brown basally, light yellowish-brown apically.

Abdomen: glossy blackish-brown; longest hairs and bristles on the posterior segments.

Holotype ♂, NEW ZEALAND: Waitakere Ranges, Titirangi, *ex* light trap, 18.ii.1953, (C. R. Thomas), in Plant Diseases Division, D.S.I.R., Auckland, New Zealand.

Previous records.—New Zealand, Australia, Fiji. (10 ♂, 5 ♀ and 2 paratypes (not sexed).)

Distribution.—New Zealand, Australia and Fiji.

Remarks.—Closest to *P. contecta* and separated from it by having hairs on the mesopleuron.

Protopiophila contecta (Walker)

Piophila contecta Walker, 1860, *J. Linn. Soc. Lond.* 4: 167. Malloch, 1927, *Proc. Linn. Soc. N.S.W.* 52: 8; 1930, *Insects of Samoa*, VI (6): 251; 1931, *Proc. Linn. Soc. N.S.W.* 56: 292.

Piophila (*Protopiophila*) *contecta* Walker : Duda, 1924, *Konowia* 3 : 109 and 197. Bezzi, 1928, *Dipt. Brach. Ath. Fiji Is.* : 119. Hennig, 1943, *Flieg. Pal. Reg.* 5 : 35.

Protopiophila contecta (Walker) : Séguéy, 1934, *Faune Fr.* 28 : 77.

Piophila ruficornis Wulp, 1871, *Dipt. Sumatra Exp.* : 49.

A shining black or blackish-brown species with yellowish-brown legs. Body length about 3.0–3.5 mm., wing length about 3.0–3.5 mm.

Male and female.—*Head* : arista dark brown, bare, or with only minute pubescence. Antenna all light brown ; second segment with small but distinct pre-apical dorsal bristle. Front black. Ocellars strong ; single fronto-orbital about equal to postverticals ; verticals strong. Few fine hairs on front and on orbits. Face mostly black or blackish-brown. Vibrissa strong, fine long bristles at lower posterior angle of cheek. Occiput black. Eyes with very few fine short hairs. Vertical diameter of eye 3 to 4 times width of cheek in same axis. Proboscis dark brown ; palpi light reddish-brown or yellowish-brown.

Thorax : black, mostly shining black but with a very light dusting of pollen over some surfaces, particularly the mesonotum ; propleuron and dorsal section of mesopleuron and ventral portion of hypopleuron with thick distinct matt of grey pollen. No prescutellars ; posterior dorsocentral about 1.5–1.75 times length of the 3 anterior bristles ; basal scutellars parallel and about half length of convergent apicals ; scutellum bare ; 2 humerals ; 1 presutural ; 2 notopleurals ; 1 strong supra-alar ; 2 sternopleurals ; 1 small propleural bristle.

Legs yellowish-brown ; fore coxa not as shining as other coxae ; apical two-thirds of fore femur except extreme apex, all fore tibia and fore tarsus, blackish-brown. Fore femur with posterodorsal and posteroventral bristles and mid-tibia with strong ventral apical.

Wings : small black costal spines extending just beyond apex of second vein. Wing indices : costal about 4.1 ; fourth vein about 2.5 ; 4c about 0.8 ; 5x about 0.9.

Halteres pale yellow.

Abdomen : shining black.

Holotype ♀, CELEBES : Makassar, no date (*A. R. Wallace*), in British Museum (Nat. Hist.).

Previous records.—Samoa, Sumatra, New Guinea, Formosa.

New records.—(All United States National Museum specimens) : OKINAWA : 23.vi.1945, 1 ♂, (*F. N. Young*) ; Chizuka, July to September, 3 ♀, (*G. E. Bohart and C. L. Harnage*). PHILIPPINE ISLANDS : Sama, 7.x.1945, 1 ♀, (*F. F. Bibby*) : Palawan, Puerto Princessa, 1 ♂, (*R. C. McGregor*) : Manila, 1 ♂, (*R. C. McGregor*).

Specimens examined.—Holotype, 3 ♂, 4 ♀ and 6 examples (not sexed).

Distribution.—Samoa, Celebes, Philippines, Okinawa, Sumatra, New Guinea, Formosa.

Remarks.—Usually a larger species than *P. latipes* but most easily separated from it by the presence of dusting on the mesopleuron. Other characters of *P. contecta* which separate the two species are the bare arista and the even coloration of the antenna. Duda (1924) did not mention the dusting on the mesopleuron and by describing it as shining black leads one to suspect the absence of any dusting. However, the holotype and all specimens examined show this dusting, and when searched for it is unmistakable.

DISTRIBUTION

P. latipes can now reasonably be regarded as a Holarctic species as all records of its occurrence outside this region are in error.

P. contecta, as shown above, occurs in the Orient and the Pacific and in future may be found widespread over this area.

P. scutellata is at present known only from the Pacific, while *P. australis* is found in New Zealand, Australia and Fiji.

The occurrence of *P. contecta* in Samoa and not (as yet) in Fiji is hard to explain, but the apparent discontinuity of its distribution may well be due to the paucity of collections.

ACKNOWLEDGMENTS

I am indebted to C. W. Sabrosky of the United States National Museum for indicating to me the need for some revision in *Protopiophila*, and for much valuable assistance during this study. Specimens have been received on loan from the United States National Museum and the Natural History Museum, Basle, Switzerland. The collections of the British Museum (Natural History) were freely available to me during my stay in England.

REFERENCES

- BEZZI, M., 1928, *Diptera, Brachycera and Athericera of the Fiji Islands*. British Museum (Natural History), London. 220 pp.
- COLLIN, J., 1910, Additions and corrections to the British list of Muscidae Acalyptratae. *Ent. mon. Mag.* **46** : 169-78.
- DUDA, O., 1924, Revision der europäischen u. grönländischen sowie einiger südostasiat. Arten der Gattung *Piophila* Fallén (Dipteren). *Konowia* **3** : 97-113, 153-203.
- HARRISON, R. A., 1959, Acalypterate Diptera of New Zealand. *Bull. N.Z. Dep. Sci. industr. Res.* **128**. Wellington, N.Z. 382 pp.
- HENNIG, W., 1943, In Lindner, E. *Die Fliegen der Palaearktischen Region*. (Piophilidae). 52 pp.
- MALLOCH, J. R., 1925, Notes on Australian Diptera, vii. *Proc. Linn. Soc. N.S.W.* **50** : 311-40.
- 1927, Notes on Australian Diptera, x. *Ibid.* **52** : 1-16.
- 1930, Lonchaeidae, Chloropidae, Piophilidae. *Insects of Samoa*, VI (6) : 239-51.
- 1931, Notes on Australian Diptera, 29. *Proc. Linn. Soc. N.S.W.* **56** : 292-8.
- MEIGEN, J. W., 1838, *Syst. Besch.* **7** : xii + 434 pp.
- SÉGUY, E., 1934, *Faune de France* **28**. (*Diptères Brachycères*.) Paris. 832 pp.
- WALKER, F., 1860, Catalogue of the Dipterous Insects collected at Makassar in the Celebes by Mr. A. R. Wallace with descriptions of New Species. *J. Linn. Soc. Lond.* **4** : 90-172.