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A REVIEW OF THE AUSTRALIAN SPECIES OF *ELAPHROSYRON* AND *TELOSTEGUS*, WITH NOTES ON OTHER GENERA (HYMENOPTERA, POMPILIDAE)

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ABSTRACT. The genera *Elaphrosyron* and *Telostegus* are reported from Australia for the first time, and a brief review of the species is presented. The following new species are described: *E. socius*, *T. thomisivorus*, and *T. turneri*; *T. nigrocinerascens* (Turner) is also redescribed. Notes are presented on the genera *Pompilus*, *Ctenostegus*, and *Fabriogenia*, and the following new species described: *P. belardoo*, *C. warragai*, *F. canberra*, and *F. dilga*. Notes on the nesting behavior of these and other species will be presented separately.

During the summer of 1969–1970, Robert Matthews and I made a number of observations on the nesting behavior of Australian spider wasps (Pompilidae). Since the pompilid fauna of that continent has been little studied, we experienced much difficulty in identifying the species we worked on. Study of the types of Smith's and Turner's species in the British Museum has clarified many of our problems, but there remain several previously unnamed species for which we have field data that we consider worth publishing. Some of our most interesting data pertain to the related genera *Elaphrosyron* and *Telostegus* (neither previously reported from Australia), and I present here a review of the Australian members of those genera. Notes and descriptions relating to three other genera are also appended.

The material considered here will be deposited in the following museums, which are abbreviated in the text as follows:

- AMS: The Australian Museum, Sydney
- ANIC: Australian National Insect Collection, Canberra
- BMNH: British Museum (Natural History), London
- MCZ: Museum of Comparative Zoology, Cambridge
- WAMP: Western Australian Museum, Perth

Genus *Elaphrosyron* Haupt

Elaphrosyron Haupt, 1929, Mitt. Zool. Mus. Berlin, 15: 120 (type-species: *E. heinrichi* Haupt).

—Arnold, 1937, Ann. Transvaal Mus., 19: 40–43 (African species).

Protelostegus Priesner, 1955, Bull. Soc. Ent. Egypt, 39: 167 (type-species: *P. arnoldi* Priesner). New synonymy.

Both Haupt and Arnold regarded this genus as closely related to *Episyron*, with which it shares several important features, most notably the bifid claws and the longitudinal folding of the wings along a vena spuria. However, the postnotum is shaped differently and there is no evidence of squamose pubescence on the body. The genus is poorly known but is apparently confined to warmer parts of the eastern hemisphere. The type species was described from the vicinity of the Caspian Sea, and Arnold recognized one species from central Africa and another from southern Africa. The genus has not previously been reported from Australia. There appears to be only one species on that continent, but it is widely distributed and locally common.

Arnold (1937) provided an accurate generic diagnosis, and there seems no need to present one here. The Australian species resembles the African *insidiosus* Smith closely.

Elaphrosyron socius new species

Holotype. ♀, Boundary Bend, Victoria, Australia, 25 Feb. 1970 (H. E. Evans and R. W. Matthews) [ANIC].

Description of type female. Length 10 mm; fore wing 9.7 mm. Body and appendages entirely black. Fore wings lightly infuscated except very narrowly darker at basal vein and broadly darker in marginal and outer two submarginal cells, also with a still darker band broadly margining the wing beyond the cells, but not quite reaching the extreme margin, which is whitish; hind wing very lightly infuscated, darker apically. Body clothed with conspicuous silvery pubescence over much of head, thorax, and leg-bases (but pubescence dark on much of mesoscutum and scutellum, metapleura, and anterior part of propodeum); abdomen with dark pubescence except most of first segment silvery, also posterior margins of sternite 2 and tergites 2–4. Head and thorax covered with pale erect hair which is especially long and dense on the temples, prothorax, mesopleura, and propodeum; coxae with short,

pale hairs, femora weakly hairy; first abdominal tergite with pale hairs, apex of the abdomen with dark setae above and below.

Clypeus $2.4 \times$ as wide as high, somewhat convex, the apical margin weakly concave. Front broad, middle interocular distance $.65 \times$ head width; inner eye margins subparallel below, strongly convergent above, upper interocular distance $.77 \times$ lower interocular distance; ocelli in a broad, flat triangle; postocellar line: ocello-ocular line = 5:4; third antennal segment equal to $.70 \times$ upper interocular distance. Pronotum short, broadly subangulate behind. Postnotum smooth, produced backward medially as an obtuse angle which is rounded at its apex. Front basitarsus with three long, weakly spatulate pecten spines, the apical basitarsal spine $1.6 \times$ length of second segment; basitarsus also with two slender accessory spines nearly as long as the pecten spines, the accessory spines located on the inner margin and alternating with the pecten spines. Fore wing with the second submarginal cell $1.4 \times$ as wide as the third, measured below, but of approximately the same width when measured on the radial vein; hind wing with the anal vein meeting media slightly basad of the cubital fork.

Allotype. ♂, same data as type [ANIC].

Description of allotype male. Length 7 mm; fore wing 5.8 mm. Coloration as in female; pubescence and erect hairs also as described for that sex. Fore wings subhyaline, with a brown band beyond the cells which does not quite reach the apex of wing; hind wings subhyaline, very slightly darkened apically.

Clypeus $2.2 \times$ as wide as high, truncate apically. Middle interocular distance $.64 \times$ head width, $1.15 \times$ lower interocular distance; upper interocular distance $.95 \times$ lower; ocelli rather large, in a flat triangle; postocellar line: ocello-ocular line = 4:3. First four antennal segments in a ratio of 10:4:8:9, segment three twice as long as thick, segments three and four together equal to $.7 \times$ upper interocular distance. Pronotum broadly angulate behind. Postnotum arcuately produced backward medially. Wing venation as described for female except second submarginal cell much larger than third, $1.6 \times$ as wide measured below, $2.5 \times$ as wide measured along the radial vein. Subgenital plate slender, tapering, its midline strongly elevated, surface with numerous strong setae and margin fringed with short, stiff setae. Genitalia as shown in Figure 1.

Paratypes. 13 ♀ ♀, 2 ♂ ♂, same data as type; 1 ♂, Yaapect, Victoria, 18–22 Feb. 1970 (Evans & Matthews); 1 ♂, 5–15 miles south of Rainbow, Victoria, 21–22 Feb. 1970 (Evans & Matthews); 1 ♂, Wyperfeld Nat. Park, 25 miles north of Rainbow, Victoria, 18–23 Feb. 1970 (Evans & Matthews); 1 ♀, Near Adelaide, South Australia, 7 Jan. 1966 (O. W. Richards); 1 ♀, 1 ♂, Dedari, 40 miles west of Coolgardie, Western Australia, 11–21 Jan. 1936 (R. E. Turner); 1 ♀, 5 ♂ ♂, Merredin, Western Australia, 13 Dec. 1935 (Turner); 1 ♀, 2 ♂ ♂, Perth, Western Australia, Jan., Feb. 1914, 1936 (Turner); 1 ♀, 1 ♂, Yanchep, Western Australia, Nov., Dec. 1935 (Turner); 1 ♂, Mundaring Weir, Western Australia, 19–23 Feb. 1936 (Turner); 1 ♀, “New Holland” [ANIC, AMS, BMNH, MCZ, WAMP].

Variation. The females vary in length from 7.5 to 10.5 mm. In some specimens the apical margin of the clypeus is suffused with reddish brown, and the mandibles have a variable amount of this color. Otherwise there is little variation in color except that the female from Yanchep has slightly darker wings than usual and the silvery pubescent bands on the abdomen are reduced. This specimen also has the pecten spines unusually strongly spatulate.

The males vary in length from 5 to 9 mm. In several the second submarginal cell is only slightly larger than the third, and there is some variation in the patterning of silvery pubescence, but otherwise there is no noteworthy variation in this series.

Remarks. The females differ from those of the African species *insidiosus* Smith in the following particulars: clypeus slightly concave apically; third antennal segment considerably shorter; two strong accessory spines present on the front basitarsus in addition to the three pecten spines. I have seen no males of *insidiosus*, but I judge from Arnold's figures that the genitalia bear a close resemblance to those of *socius* but have somewhat differently shaped volsellae and parapenial lobes.

Genus *Telostegus* Costa

Telostegus Costa, 1887, *Prospetto Imenotteri Italiani*, II: 88 (type-species: *T. major* Costa). —Haupt, 1930, *Mitt. Zool. Mus. Berlin*, 16: 703–718 (Palearctic spp.). —Arnold, 1937, *Ann. Transvaal Mus.*, 19: 35 (African spp.). —Priesner, 1955, *Bull. Soc. Ent. Egypt.*, 39: 168–183 (Egyptian spp.).

This genus is very closely related to *Elaphrosyron*, the major difference being that the second transverse cubital vein is absent. In all other respects, including the male genitalia, the two genera are scarcely separable. Our field notes suggest that the two genera are much alike ethologically.

Telostegus is widely distributed in warmer parts of the Eastern Hemisphere, but it has not previously been recorded from Australia. Although the specimens from that continent display little morphological diversity, I believe that they represent three species (one known only from males). The species may be separated by the following key:

Females

- Vertex weakly arched above the eye tops; antennae elongate, third segment at least $.75 \times$ upper interocular distance; known specimens with a wing length of 7-8 mm.....*nigrocinerascens* (Turner)
- Vertex strongly arched above tops of eyes; antennae shorter, third segment $.50$ to $.58 \times$ upper interocular distance; known specimens with a wing length of 4.5 to 6 mm.....*thomisivorus* new species

Males

1. Third antennal segment about $3 \times$ as long as thick, third and fourth together subequal to upper interocular distance; postocellar line barely exceeding ocello-ocular line; vertex little arched above eye tops; genitalia as in Fig. 3.....*nigrocinerascens* (Turner)
- Third antennal segment $2.0-2.7 \times$ as long as thick, third and fourth together equal to from $.65$ to $.80 \times$ upper interocular distance; postocellar line: ocello-ocular line = 14:11; vertex strongly arched above eye tops.....2
2. Clypeus $2.5 \times$ as wide as high; tibial spurs nearly as dark as the legs; volsellae slender, nearly parallel-sided (Fig. 4)...*turneri* new species
- Clypeus $2.8 \times$ as wide as high; tibial spurs stramineous, much lighter than legs; volsellae much expanded, somewhat truncate apically (Fig. 2).....*thomisivorus* new species

Telostegus nigrocinerascens (Turner) new combination

Aporus nigrocinerascens Turner, 1910, Proc. Zool. Soc. London, 1910: 334 (type: ♀, MacKay, Queensland, Australia, summer 1899, Turner Coll. [BMNH]).

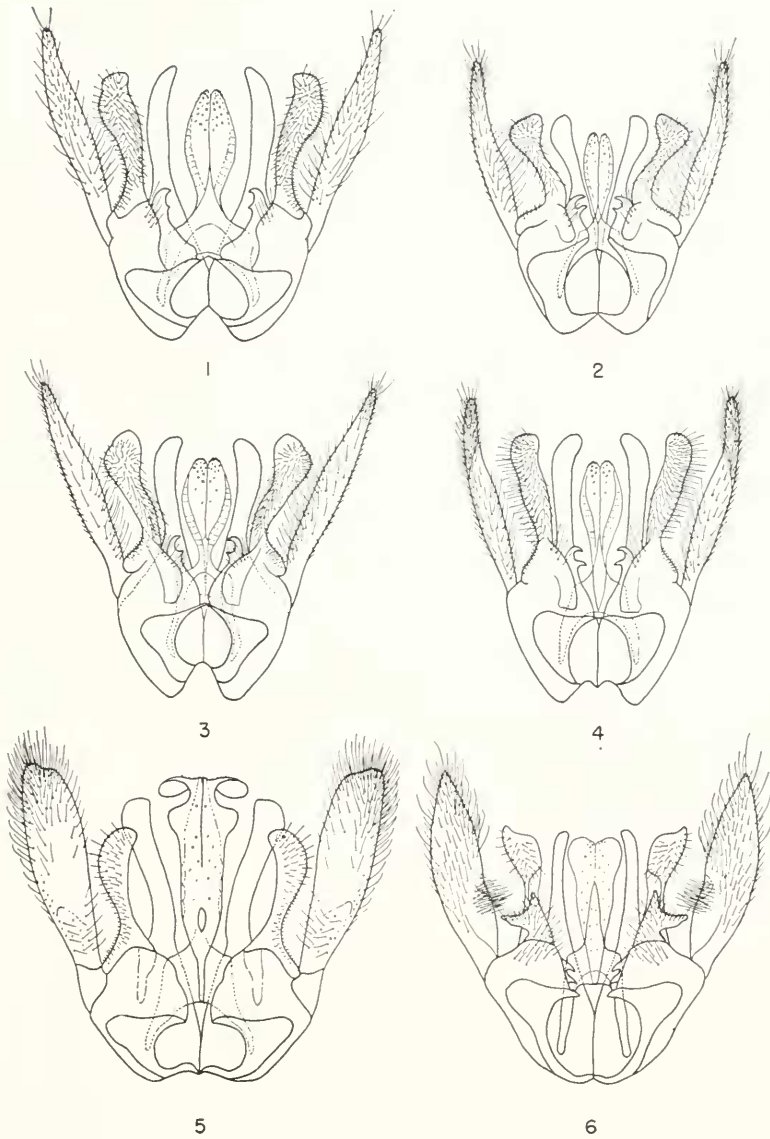
Description of type female. Length 8.6 mm; fore wing 7.5 mm. Black; antennae dark brown; legs black to dark brown, tibial spurs dusky testaceous. Fore wings subhyaline, with a brown cloud in the marginal and second submarginal cells that is partially separated from a brown band along the outer wing margin (not quite reaching the wingtip, which is hyaline); hind wings subhyaline, slightly darker apically. Body clothed with conspicuous silvery pubescence over much of head, thorax, and leg bases (but pubescence dark on much of mesoscutum, scutellum, and base of propodeum); abdomen silvery-pubescent over first segment and second sternite, also in a narrow posterior band on tergite 2, otherwise dark. Head and thorax covered with pale erect hair that is especially long and dense on the temples, prothorax, mesopleura, and propodeum; abdomen with sparse, dark setae ventrally and on the apical two segments dorsally.

Clypeus $2.7 \times$ as wide as high, its apical margin truncate, polished and slightly elevated. Front broad, middle interocular distance $.64 \times$ head width; inner eye margins strongly convergent on the upper half, upper interocular distance $.8 \times$ lower; vertex passing nearly straight across between eye tops; ocelli in a flat triangle, postocellar line: ocello-ocular line = 7:6; third antennal segment equal to $.8 \times$ upper interocular distance. Pronotum short, broadly subangulate behind. Postnotum arcuately produced backward medially. Front basitarsus with three long pecten spines, the apical one $1.2 \times$ the length of segment two; basitarsus also with two accessory spines ventrally, one quite short and the other nearly as long as the pecten spines. Fore wing with the second submarginal cell $2.5 \times$ as wide as high; hind wing with the anal vein meeting media slightly basad of the cubital fork.

Plesiallotype. ♂, same data as type [BMNH].

Description of plesiallotype male. Length 6 mm; fore wing 5 mm. Black; antennae and legs, including tibial spurs, dark brown. Fore wings subhyaline, with a broad brown band along the outer margin; hind wings subhyaline. Body pubescence as described for the female. Head, thorax, and abdominal venter with sparse erect hair, including pale hairs on each side of the propodeum.

Clypeus $2.4 \times$ as wide as high, its apical margin truncate. Front of moderate breadth, middle interocular distance $.66 \times$ head



Figures 1-6. Male genitalia of Pompilidae, ventral aspect (drawn to same scale). Fig. 1, *Elaphrosyron socius* n. sp. Fig. 2, *Telostegus thomisivorus* n. sp. Fig. 3, *T. nigrocinerascens* (Turner). Fig. 4, *T. turneri* n. sp. Fig. 5, *Pompilus belardoo* n. sp. Fig. 6, *Fabriogenia canberra* n. sp.

width; upper interocular distance $.95 \times$ lower; vertex weakly arched above eye tops; postocellar line: ocello-ocular line = 11:10. First four antennal segments in a ratio of 15:8:20:19, segment three $3 \times$ as long as thick, segments three and four together equal to the upper interocular distance. Pronotum angulate behind. Postnotum arcuately produced backward medially. Venational features as in female. Subgenital plate elevated along the midline, pointed apically, the margin beset with strong spines. Genitalia as shown in Figure 3.

Other specimens examined. 4 ♀♀, 5 ♂♂, same data as type [BMNH]; 1 ♀, Yeppoon, Queensland, 3–6 Feb. 1970 (H. E. Evans) [ANIC]; 1 ♀, Ku-ring-gai Chase, 20 miles north of Sydney, New South Wales, 4–8 Jan. 1970 (H. E. Evans) [ANIC].

Variation. The females from Yeppoon and from Ku-ring-gai Chase resemble one another and differ from the MacKay series in the following respects: middle and hind tibial spurs white; abdominal tergites 3–6 with silvery pubescence apically; posterior margin of pronotum rather sharply angular; front basitarsus with both accessory spines rather long. These females resemble those from MacKay in all other particulars, and I feel it probable that all are conspecific.

Telostegus thomisivorus new species

Holotype. ♀, Nilemah Station, 50 miles south of Denham, Western Australia, 8–9 October 1969 (R. W. Matthews, note no. AM22) [ANIC].

Description of type female. Length 7 mm; fore wing 6 mm. Black, except anterior margin of clypeus and much of mandibles dull ferruginous, tibial spurs dusky testaceous. Fore wings lightly infuscated, more heavily clouded at the basal vein and in the marginal and second submarginal cells, also with a brown sub-apical band, the extreme outer wing margin hyaline; hind wings subhyaline, slightly darker apically. Body clothed with silvery pubescence over much of head, thorax, and leg-bases (but pubescence dark on mesoscutum, scutellum, and base of propodeum); abdomen with dark pubescence except silvery on first segment, second sternite, and apical margin of second tergite. Head and thorax covered with pale hair that is especially dense and long on the temples and propodeum; abdomen with sparse,

dark setae ventrally and on the apical two segments dorsally.

Clypeus $2.8 \times$ as wide as high, its apical margin truncate, polished and slightly elevated. Front broad, middle interocular distance $.68 \times$ head width; upper interocular distance $.87 \times$ lower; vertex forming a strong, even arc above tops of eyes; postocellar line: ocello-ocular line = 7:6; antennae rather short, third segment equal to only $.55 \times$ upper interocular distance. Pronotum broadly angulate behind. Postnotum arcuately produced backward medially. Front basitarsus with three slender pecten spines, the apical one $1.3 \times$ the length of segment two; basitarsus also with two slender accessory spines, as described for *nigrocinerascens*. Fore wing with the second submarginal cell $2.5 \times$ as wide as high; hind wing with the anal and cubital veins interstitial.

Allotype. δ , same data as type except taken in a Malaise trap (H. E. Evans & R. W. Matthews) [ANIC].

Description of allotype male. Length 5.5 mm; fore wing 5 mm. Color of body and of tibial spurs as in female; pubescence as in that sex except abdominal dorsum with brownish pubescence beyond segment one. Fore wing lightly infuscated, slightly darker in marginal cell and in a subapical band; hind wing subhyaline, slightly darker apically. Sparse, pale hairs present on head, prothorax, pleura, and propodeum; abdominal venter with a few dark setae, especially toward the apex.

Clypeus $2.8 \times$ as wide as high, its apical margin truncate. Front broad, middle interocular distance $.7 \times$ head width; upper interocular distance $.9 \times$ lower; vertex forming a strong, even arc above eye tops; postocellar line: ocello-ocular line = 14:11. First four antennal segments in a ratio of 8:3:7:7, segment three about twice as long as thick, segments three and four together equal to $.66 \times$ upper interocular distance. Pronotum angulate behind. Postnotum arcuately produced backward medially. Wing venation as in female except anal vein reaching media slightly before the cubital fork. Subgenital plate slender and tapering, its midline strongly elevated, surface with strong setae. Genitalia differing from those of *nigrocinerascens* chiefly in having the volsellae more abruptly truncate apically (Fig. 2).

Paratypes. 1 φ , 1 δ , same data as allotype; 1 φ , 6 $\delta \delta$, 2 miles west of Coorow, Western Australia, 12 Oct. 1969 (Evans & Matthews); 1 φ , 1 δ , 13 miles SW of Carnemah, Western

Australia, 12 Oct. 1969 (Evans & Matthews); 1 ♀, 1 ♂, 27 miles north of Northampton, Western Australia, 10 Oct. 1969 (Evans & Matthews); 1 ♀, Miaboolya Beach, 9 miles north of Carnarvon, Western Australia, 4 Oct. 1969 (Evans & Matthews) [AMS, ANIC, BMNH, MCZ, WAMP].

Variation. The females vary slightly in size but are consistently smaller than the known females of *nigrocinerascens* (length 4.5–7.0 mm). The fore wings vary from hyaline to moderately infuscated basally, and the abdomen often lacks silvery bands beyond the first segment. The middle interocular distance varies from .67 to .70 × the head width, the third antennal segment from .50 to .58 × the upper interocular distance.

The males vary in length from 4 to 6 mm. Some of the smaller specimens have more silvery pubescence on the abdomen than described for the allotype, and in some of these specimens the upper interocular distance exceeds the lower interocular distance slightly.

Telostegus turneri new species

Holotype. ♂, Yallingup, Western Australia, 1–12 Dec. 1913 (R. E. Turner) [BMNH].

Description of type male. Length 7 mm; fore wing 5.3 mm. Body black; antennae and legs dark brown except tibial spurs stramineous. Wings very lightly infuscated except fore wing with a darker band along the outer margin, hind wing slightly darker apically. Pubescence brownish except conspicuously silvery on front, temples, prothorax, coxae, lower pleura, posterior part of propodeum, first abdominal tergite, and first two sternites. Head, thorax, and abdominal venter sparsely setose, the temples, propleura, and propodeum with an abundance of pale hair.

Clypeus 2.5 × as wide as high, truncate apically. Front broad, middle interocular distance .69 × head width; upper interocular distance .95 × lower; vertex forming a strong, even arc above eye tops; postocellar line: ocello-ocular line = 14:11. First four antennal segments in a ratio of 16:7:19:17, segment three 2.7 × as long as thick, three and four together equal to .80 × the upper interocular distance. Pronotum angulate behind. Postnotum subangularly produced backward medially. Fore wing with the second submarginal cell 2.5 × as wide as high; hind wing with

the anal and cubital veins interstitial. Subgenital plate strongly elevated medially, pointed apically, surface with several strong setae and margin with a row of stout spines. Genitalia very similar to those of *nigrocinerascens*, but the volsellae more slender and parallel-sided (Fig. 4).

Paratypes. 2 ♂♂, same data as type except one dated Nov. 1913 [ANIC, BMNH].

Variation. Both paratypes are smaller than the type (fore wing 3.8–4.3 mm). In the smaller specimen, the upper and lower interocular distances are subequal and antennal segments three and four only $.65 \times$ the upper interocular distance. In the larger male these measurements approximate those of the type.

Genus *Pompilus* Fabricius

Pompilus Fabricius, 1798, Suppl. Ent. Syst., p. 212 (type-species: *P. pulcher* Fabricius).

The precise limits of this large, cosmopolitan genus have never been defined. Many generic and subgeneric names are available, but for the most part these are difficult to apply when the genus is considered from a world point-of-view. *Pompilus*-like wasps are abundantly represented in Australia, and they are somewhat diverse morphologically, but there seems little hope of fitting them neatly into accepted subgenera or closely related genera at this time. Hence, I shall use the generic name in its broad sense and when discussing species simply attempt to point out the closest known relatives within the genus.

Pompilus cinereus (Fabricius)

Sphex cinerea Fabricius, 1775, System. Ent., p. 350.

Sphex plumbea Fabricius, 1787, Mant. Insect., 1: 278. New synonymy.

Pompilus pulcher Fabricius, 1798, Suppl. Ent. Syst., p. 249. New synonymy.

This is a very common wasp in eastern Australia, its typical habitat being sea beaches and sand banks along streams. I have studied the Fabricius specimen in the Banks collection at the British Museum, probably the type, and my interpretation of the species is based on that specimen. Australian specimens compare very favorably with specimens of *plumbeus* and *pulcher* from India, Africa, and Europe, even to minor details of the male

genitalia. Evidently this one species ranges in suitable habitats throughout the warmer parts of the eastern hemisphere. Arnold (1937, *Ann. Transvaal Mus.*, 19: 47) recorded it from China, and one assumes that it also occurs in the East Indies.

There is an extensive literature on this species, mainly under the name *Pompilus plumbeus*. Our field observations, so far as they go, agree well with the accounts of various European authors. Arnold (1937) placed three additional species names in synonymy with *plumbeus*.

Pompilus belardoo new species

Holotype. ♀, Rottnest Island, Western Australia, 21–22 Oct. 1969 (H. E. Evans & R. W. Matthews) [ANIC].

Description of type female. Length 14 mm; fore wing 11 mm. Body and appendages entirely black; wings moderately infuscated, broadly darker along outer margins. Pubescence in large part dark, with a blue-green sheen in certain lights, but conspicuously silvery as follows: much of scape, clypeus, front, and temples; anterior third and posterior margin of pronotum; sides of scutellum and sides and central part of metanotum; much of upper surface of tibiae; narrow posterior margins of abdominal segments one to four, these bands narrowly interrupted mid-dorsally and broadly interrupted ventrally. Body clothed with rather long, dark hairs over much of the head and thorax, including the scape, propodeum, coxae, and to some extent the femora; abdomen with dark hairs ventrally and on the apical two tergites.

Clypeus $2.3 \times$ as wide as high, truncate apically; malar space, at its minimum, about half the width of the anterior ocellus. Front rather narrow, middle interocular distance $.56 \times$ head width; upper interocular distance $.82 \times$ lower; vertex passing nearly straight across between eye tops; postocellar line: ocellular line = 6:5; third antennal segment subequal in length to upper interocular distance. Pronotum broadly subangulate behind. Propodeum with a median sulcus anteriorly, posterior third with a flat declivity. Front basitarsus with a strong pecten consisting of five slender spines, the apical one $1.7 \times$ as long as the second segment, the basitarsus also with two accessory spines nearly as long as the pecten spines. Fore wing with the marginal cell removed from the wing tip by approximately its own length,

the radial vein somewhat angled at the third transverse cubital vein; third submarginal cell about as wide below as the second, but more strongly narrowed above.

Allotype. ♂, same data as type [ANIC].

Description of male allotype. Length 11 mm; fore wing 9.7 mm. Color of body and wings as in female, but silvery pubescence less extensive than in that sex, restricted to the base of the mandibles, sides of the clypeus and front, temples, and interrupted apical bands on abdominal tergites 1 and 2 and sternite 2. Head and thorax with an abundance of long, dark hairs, including some on the scape and on the coxae and to some extent the femora; abdomen sparsely setose ventrally.

Clypeus convex, twice as wide as high, its apical margin truncate; malar space rather long, nearly equal to width of anterior ocellus. Middle interocular distance $.58 \times$ head width; upper interocular distance $.97 \times$ lower; vertex passing nearly straight across between eye tops; postocellar line very slightly exceeding ocello-ocular line. Third antennal segment $2.4 \times$ as long as thick, third and fourth together subequal to upper interocular distance. Pronotum subangulate behind. Propodeum rounded, abruptly declivous on posterior fourth. Apical segment of front tarsus symmetrical, unmodified, but the inner claw strongly curved, bifid. Venation as in female. Subgenital plate elevated along the midline, broadly rounded apically. Genitalia with the basal hooklets absent, the aedeagus with an abrupt apical expansion that is turned sharply downward (Fig. 5).

Paratypes. 6 ♀♀, 5 ♂♂, same data as type [AMC, ANIC, BMNH, MCZ, WAMP].

Variation. The females vary in length from 11 to 14 mm. In the majority the third antennal segment is very slightly shorter than the upper interocular distance ($.93$ – $1.00 \times$ this distance) and in three the silvery pubescence on the posterior margin of the pronotum and on abdominal tergite 4 is weakly developed. The males vary in length from 8.5 to 11 mm. Three of them have slightly more silvery pubescence than the allotype, including some on the pronotum and sides of the scutellum; however, the banding of the abdomen is relatively constant.

Remarks. This species is closely related to several other Australian species, such as *semiluctuosus* Smith, but the patterning

of silvery pubescence, the male genitalia, and the nature of the pecten spines of the female are distinctive. Belardoo is an aboriginal word from Western Australia referring to coastal sand dunes.

Genus *Ctenostegus* Haupt

Ctenostegus Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 685 (type-species: *Sphex cingulata* Fabricius).

This is a dominant genus of Pompilidae in Australia and on adjacent islands; in fact it may well be the largest genus of the family in that zoogeographic region. It is closely related to *Pompilus* and probably a derivative of that genus. Only a few of the species have been described. One of the commoner species, for which we have nesting data, is described below and compared with the type species.

Ctenostegus warragai new species

Holotype. ♀, 3 miles west of Wentworth, New South Wales, 27 Nov. 1969 (R. W. Matthews, note no. AM92) [ANIC].

Description of type female. Length 12 mm; fore wing 9.5 mm. Body and appendages entirely black. Wings rather heavily infuscated, broadly darker along outer margin. Pubescence wholly dark, on the abdomen with dark blue-green reflections in certain lights. Body with short, sparse, rather dark hairs as follows: front, vertex, temples, propleura, front coxae, propodeum, and tip of abdomen.

Clypeus $2.4 \times$ as wide as high, apical margin narrowly polished, weakly concave; malar space well developed, at its minimum nearly as long as width of anterior ocellus. Front narrow, middle interocular distance $.55 \times$ head width; upper interocular distance $.92 \times$ lower; postocellar line: ocello-ocular line = 6:5; third antennal segment equal to $.77 \times$ upper interocular distance. Posterior margin of pronotum angulate. Propodeum rounded, with a flat, oblique declivity on the posterior third. Front basitarsus with four rather broad pecten spines, the apical one $1.7 \times$ as long as the second segment. Second submarginal cell of approximately the same width as the marginal cell, measuring $2.2 \times$ as wide as high, narrowed by two-thirds above.

Paratypes. 10 ♀ ♀, same data as type except collected by H. E. Evans & R. W. Matthews; 6 ♀ ♀, 4 miles east of Wilcannia, N.S.W., 1–2, 20–21 Nov. 1969 (Evans & Matthews); 1 ♀, 5 miles west of Wilcannia, N.S.W., 1 Nov. 1969 (Evans & Matthews); 4 ♀ ♀, Packsaddle, 111 miles north of Broken Hill, N.S.W., 31 Oct., 21–26 Nov. 1969 (Evans & Matthews); 1 ♀, Port Germein, South Australia, 28 Oct. 1969 (Evans & Matthews) [AMS, ANIC, BMNH, MCZ].

Variation. The paratypes vary in length from 8 to 14 mm; the middle interocular distance varies from .52 to .57 × the head width, the third antennal segment from .75 to .85 × the upper interocular distance. Several of the specimens have a small amount of silvery pubescence on the sides of the clypeus and/or lower front.

Remarks. This species is closely related to the type species, *cingulatus* Fabricius, but the pubescence is wholly or almost wholly dark, the propodeum more hairy, and the pecten spines longer. I have not been able to associate any males with these females with any certainty.

All specimens were collected in areas of extensive sand dunes or ridges. The species name *warragai* is an aboriginal word from New South Wales meaning "plenty of sand."

Genus *Fabriogenia* Banks

Fabriogenia Banks, 1941, Occ. Papers B.P. Bishop Mus., Honolulu, 16: 240 (type-species: *F. incompta* Banks).

This is the dominant genus of the tribe Auplopodini in Australia. Turner (1910, Proc. Zool. Soc. London, 1910: 310) presented a key to several of the species (under the name *Pseudagenia*), but there are many additional species. Both Banks (1941) and Townes (1957, Bull. U.S. Nat. Mus., 209: 141) pointed out the similarity of *Fabriogenia* to *Phanagenia*, but I regard them as generically distinct. Not all of the species have a well-developed malar space and lateral spines beneath the apical tarsal segments, as described by Banks for the type species, but they agree in having a central polished area on the apical tergite of the female (approaching the condition in *Auplopus*), as well as a group of stout bristles on the mentum. The generic classification of the Auplopodini is in a deplorable state, but for the present

it seems sufficient to assign the majority of the Australian species to *Fabriogenia*.

Fabriogenia canberra new species

Holotype. ♀, Canberra, A.C.T., Feb. 1970 (R. W. Matthews, note no. AM191) [ANIC].

Description of type female. Length 9 mm; fore wing 8 mm. Body and legs black; antennae bright orange except scape and apical segment very weakly infuscated. Wings clear hyaline except fore wings with a narrow brown band at the basal and transverse median veins and a somewhat wider band through the base of the marginal cell, across the second submarginal and base of the third submarginal cell, and into the outer discoidal cell; tip of wing also darkened. Body covered with fine, silvery pubescence which is darker on the vertex and mesoscutum. Pale, erect hairs are present over much of the head, prothorax, front coxae, mesopleura, and propodeum; abdomen sparsely setose ventrally and densely so on the apical tergite.

Clypeus convex, weakly produced medioapically, measuring $1.9 \times$ as wide as high. Middle interocular distance $.64 \times$ head width; upper interocular distance $.95 \times$ lower; postocellar line: ocello-ocular line = 7:9; vertex forming a low, even arc above eye tops. Antennae moderately thick, third segment $3.5 \times$ as long as thick, exceeding the fourth segment as 10:9, equal to $.70 \times$ the upper interocular distance. Pronotum broadly subangulate behind. Postnotum, along the midline, about two-thirds the length of the metanotum. Propodeum evenly rounded in lateral view. Hind tibiae with numerous short spines laterally, smooth above. Second submarginal cell twice as wide as high, receiving the first recurrent vein slightly before the middle; third submarginal cell $1.7 \times$ as wide as second, receiving the second recurrent vein $.3 \times$ the distance from the base.

Allotype. ♂, same data as type [ANIC].

Description of allotype male. Length 7.5 mm; fore wing 6.8 mm. Black, except as follows: mandibles with a cream band about halfway from the base, the tips rufous; clypeus cream laterally and apically; sides of lower front narrowly cream; front legs suffused with light brown on their inner sides; hind tibial spurs white, other spurs more or less infuscated; antennae orange except

basal two segments weakly infuscated, apical four segments strongly infuscated. Wings clear hyaline, unbanded, fore wings slightly darkened at apex. Body clothed with fine, silvery pubescence. Head and thorax extensively covered with pale, erect hairs, including the propodeum and front coxae.

Clypeus $2.2 \times$ as wide as high, truncate apically. Middle interocular distance $.64 \times$ head width; upper interocular distance $1.1 \times$ lower; postocellar line: ocello-ocular line = 3:4; vertex forming a smooth arc above tops of eyes. Antennae elongate, third segment subequal to fourth, $3.4 \times$ as long as thick, $.67 \times$ upper interocular distance. Pronotum broadly subangulate behind. Postnotum medially only slightly shorter than metanotum. Venation as in female. Abdominal sternite 6 with a pair of toothlike elevations bordering a median, flat area. Subgenital plate broad, outer apical margins rounded, extreme apex truncate; surface somewhat concave, margins fringed with setae. Genitalia as shown in Figure 6.

Paratypes. 4 ♀ ♀, same data as type [ANIC, BMNH, MCZ].

Variation. The four paratypes range in size from 7 to 9.5 mm and resemble the type closely in all details; the upper interocular distance varies from $.93$ to $1.0 \times$ the lower, antennal segment three from $.65$ to $.72 \times$ the upper interocular distance.

Remarks. This species runs to the final couplet in the key to *Pseudagenia* provided by Turner (1910, Proc. Zool. Soc. London, 1910: 310). It is a smaller species than *australis* Cameron, and the male lacks banding on the fore wings and has the sixth sternite somewhat differently modified. The size is comparable to that of *fusiformis* Saussure, but the latter species is much less hairy and has a longer pronotum.

Fabriogenia dilga new species

Holotype. ♀, Canberra, A.C.T., 31 January 1970 (H. E. Evans, note no. A118) [ANIC].

Description of type female. Length 9.5 mm; fore wing 8.8 mm. Coloration of body appendages, wings, and pubescence exactly as described for *canberra*. Head and pronotum, including the front coxae, with numerous pale, erect hairs; propodeum with a few pale hairs on each side, but the pleura weakly hairy; abdomen sparsely setose ventrally and densely so on the apical tergite.

Clypeus convex, strongly and subangularly produced apically, measuring $1.6 \times$ as wide as high. Middle interocular distance $.61 \times$ head width; upper and lower interocular distances subequal; postocellar line: ocello-ocular line = 2:3; vertex forming a low, even arc above eye tops. Antennae elongate, third segment $4 \times$ as long as thick, exceeding the fourth segment as 10:8, equal to $.82 \times$ the upper interocular distance. Pronotum very broadly angulate behind. Postnotum along the midline about half the length of the metanotum. Propodeum evenly rounded, with a weak median sulcus. Hind tibiae weakly spinose laterally, almost without spines above. Second submarginal cell $1.7 \times$ as wide as high, receiving the first recurrent vein slightly beyond the middle; third submarginal cell nearly twice as wide as the second, receiving the second recurrent vein $.38 \times$ the distance from the base.

Paratype. ♀, same data as type [ANIC].

Variation. The paratype is smaller (7.5 mm, fore wing 7 mm) and the third antennal segment equal to only $.73 \times$ the upper interocular distance. Otherwise it is very similar to the type.

Remarks. This species is exceedingly similar to the preceding, but differs in the shape of the clypeus, the more elongate antennae, the shorter postnotum, and minor details of wing venation. Only the female is known.

Dilga is an aboriginal word from New South Wales, meaning "a stick of wood." Two females were reared from a trap-nest, so I assume the species typically nests in hollow twigs or other cavities in wood.