

THE "COLLARIS" COMPLEX OF AUSTRALIAN MIMETIC POMPILIDAE (HYMENOPTERA)

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Abstract. Eight species of Pompilidae of diverse groups share a common color pattern, having dark wings and body except that the pronotum and often parts of the head are bright orange. All are sympatric in eastern Australia and occur in similar habitats. Of the 8 species, 3 are here described as new: *Ferreola collarella*, *Ctenostegus frauca*i, and *C. gryphus*.

One of the more common Pompilidae of tropical and subtropical parts of eastern Australia has gone by the name *Ferreola collaris* Fabricius. This is a species armed with a potent sting, possessing dark wings and a body that is blue-black but bright orange over the rather long pronotum and parts of the head. It is evidently the "centerpiece" of a complex of Müllerian mimics involving several other Pompilidae and, I would judge, scoliids such as *Scolia verticalis* Fabricius. In this paper 3 additional Pompilidae of diverse groups are added to this complex of "orange-collared" wasps.

M. C. Day (1979) has pointed out that *Ferreola collaris* Fabricius is a junior homonym and must be called by the next available name, *handschini* Haupt. The name "collaris" nevertheless seems suitable as an informal designation for this complex, and I so use it. The following species of Pompilidae all share a common black to blue-black coloration, with the pronotum and often parts of the head orange. Interestingly, it is the integument that is orange in the 2 species of *Ferreola*, but in all the others the orange coloration is produced by dense, appressed pubescence. The "collaris" complex includes *Ferreola handschini* (Haupt); *Ferreola collarella* Evans, n. sp.; *Paracyphononyx consimilis* (Smith); *Turneromyia frontalis* (Fabricius); *Ctenostegus hilli* (Turner); *Ctenostegus deceptus* (Evans); *Ctenostegus frauca*i Evans, n. sp.; and *Ctenostegus gryphus* Evans, n. sp.

Four species of the complex belong to the genus *Ctenostegus*, which is a large and exceedingly diverse genus, divisible into 10 species groups, some of which would doubtless be given generic rank by some systematists (Evans 1976). Each of the 4 mimetic species belongs to a different species group: *hilli* to the *cingulatus* group, *deceptus* to the *munta* group, *frauca*i to the *cinctus* group, and *gryphus* to the *tenellus* group. It should also be pointed out that *Ferreola handschini* and *F. collarella*, though in my opinion congeneric, are not closely related.

I have collected all but 2 of the species of this complex, and in every case the specimens were found close to the ground where there was sparse to fairly dense vegetation, chiefly in or near open mesophytic woodland. In a study area near Blun-

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der Creek, in the southern part of the city of Brisbane, Queensland, wasps of 4 of these species flew together along a track through woodland, and I found it quite impossible to separate them on the wing. All 8 are of similar size and color, and there is no marked sexual dimorphism (males of 3 of the species are unknown). Descriptions of the 3 new species follow, and the anterior parts of the body are contrasted in Fig. 2-4. The head and prothorax of *Ferreola handschini* are shown in Fig. 1. Terminology employed is that of Evans (1976).

Ctenostegus frauca Evans, new species

Fig. 3

♀. Length 15 mm; forewing 10 mm. Body black, with faint violaceous reflections; frons, occiput, and genae with dense orange pubescence, but vertex broadly black between eye tops; pronotum with dense orange pubescence except extreme lower sides and in a large spot dorso-posteriorly which is subangulate laterally and anteriorly; clypeus, base of mandibles, and propleura silvery pubescent; tergites 1-4 each with small spots of silvery pubescence latero-posteriorly, tergites 5 and 6 also with more indistinct lateral spots and sternites 1-4 also with small lateral silvery spots. Antennae black; legs black but fore and hind coxae and tibiae partly silvery pubescent. Wings fumose, both pairs slightly darker on apical $\frac{1}{4}$ than elsewhere. Frons, genae, and propleura with fairly dense, short, pale hairs; propodeum with sparse, dark hairs; apex of abdomen with strong hairs; legs without hairs except for a few on the coxae.

Clypeus $2.1\times$ as wide as high, slightly concave apically, labrum fully exposed. Malar index 45; frontal index 57; antennal index 70. Postocellar and ocello-ocular lines subequal. Vertex very slightly elevated above tops of eyes, especially just behind ocellar triangle. Pronotum angulate behind; propodeum with a well-defined, rather flat declivity. Front basitarsus with 3 pecten spines which are slightly shorter than width of basitarsus, apical spine $0.37\times$ as long as segment 2; apical tarsal segments with 2-3 rather strong median spines beneath. Second submarginal cell $2.1\times$ as wide as high.

♂. Unknown.

Holotype ♀, AUSTRALIA: QUEENSLAND: Watalgan Range, via Rosedale, 6.IV.1971, H. Frauca (Australian National Insect Collections, CSIRO, Canberra).

Remarks. This is a member of the *cinctus* species group and shares the characteristics of that group as defined by Evans (1976). Because of the short pecten spines, it will run out to the 2nd couplet of the key, but it is smaller than either of the species separated there, and the coloration separates it readily from all other members of this group. I have seen only the type. It is named for its collector, Harry Frauca, Queensland naturalist and writer, whose collecting has added much to knowledge of the insect fauna of central eastern Queensland.

Ctenostegus gryphus Evans, new species

Fig. 4

♀. Length 15 mm; forewing 9.5 mm. Body black, with an extensive pattern of dense pubescence as follows: base of mandibles, clypeus, lower frons, and lower genae silvery, upper genae, occiput, and upper inner orbits orange, a broad median dark streak from antennal sockets to vertex; propleura and extreme lower sides of pronotum silvery, remainder of pronotum orange except black posterolaterally, on anterior slope, and in a diamond-shaped dorsal spot; mesoscutum with posterior orange spots and scutellum with orange lateral spots, metanotum and base of propodeum spotted with silvery pubescence and posterior slope of pro-

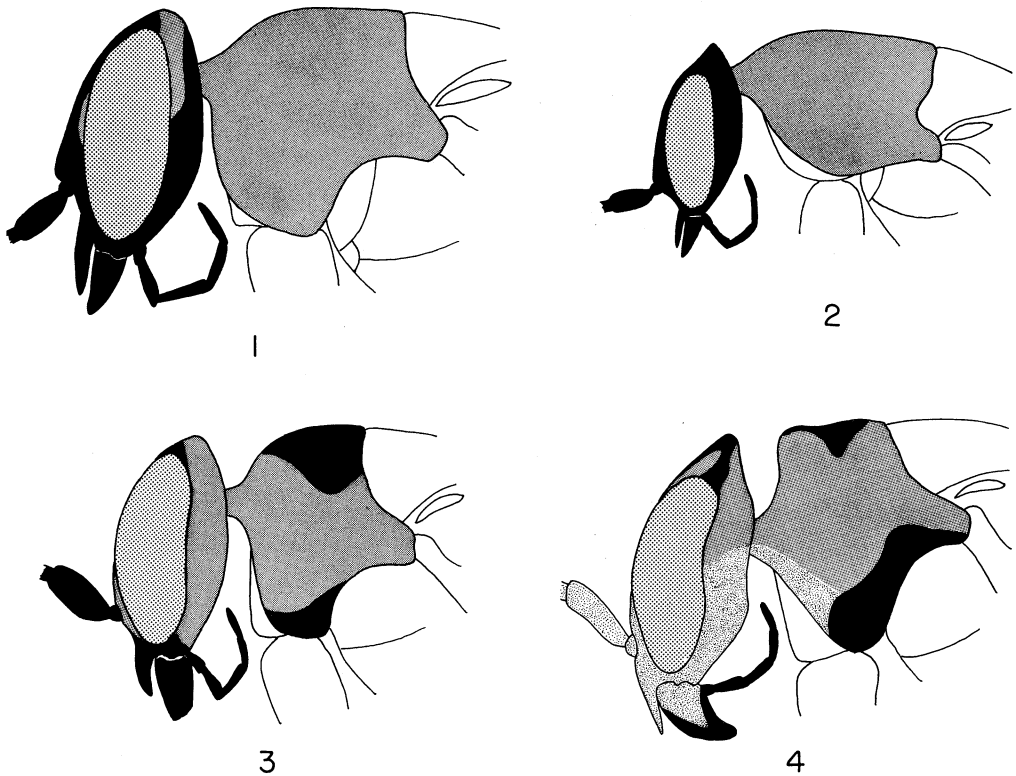


Fig. 1-4. Lateral view of head and pronotum of females of 4 species of Pompilidae. In each case orange coloration is shown by gray shading, silvery pubescence by stippling. In each case the body is elsewhere black, although parts other than the head and pronotum have not been shaded. 1, *Ferreola handschini*; 2, *F. collarella*; 3, *Ctenostegus frauca*; 4, *C. gryphus*.

podeum with U-shaped silvery band, interrupted medially; lower mesopleura silvery; tergite 1 with a basal silvery spot, tergites 1-5 with narrow, apical silvery bands; tergite 6 silvery laterally and sternites mostly silvery. Antennae black, with silvery pubescence on scape; legs black; extensively patterned with pale pubescence. Wings fumose, slightly darkened on apical $\frac{1}{4}$.

Mandibles broad and polished on apical $\frac{2}{3}$, ridged basally and twisted downward to form an angle with clypeus, the latter narrow and rather flat, only $1.6\times$ as wide as high, weakly rounded apically. Clypeofrontal bridge not depressed; lower frons with oblique grooves for reception of scapes. Malar space negligible; frontal index 54, eyes strongly convergent at top; antennal index 45. Ocello-ocular line slightly exceeding postocellar line, distance from posterior ocelli to vertex crest about $2.4\times$ postocellar line, vertex elevated in a sharp crest well above eye tops. Pronotal disc strongly bituberculate anteriorly and deeply grooved between the tubercles; propodeum with a median sulcus and well-defined, slightly concave declivity. Front basitarsus with several pecten spines which are shorter than width of basitarsus, apical spine $0.3\times$ as long as segment 2. Second submarginal cell $1.55\times$ as wide as high.

♂. Unknown.

Holotype ♀, AUSTRALIA: NORTHERN TERRITORY: Elizabeth Riv, 40 km SE of Darwin, 12.IX.1979, H.E. & M.A. Evans (Australian National Insect Collections, CSIRO, Canberra).

Remarks. This unusual species belongs to that section of the *tenellus* group in which the pronotal disc is strongly bituberculate anteriorly. The closest relative appears to be *monstrosus* Evans, a black species with a pattern of pale pubescence, known from arid parts of New South Wales, South Australia, and Western Australia. The type specimen was taken on the ground beneath *Eucalyptus* trees, where there was considerable leaf and bark litter. I would judge from the structure of the head that this species and its close relatives attack some type of trapdoor spider. *Gryphus* is a Latin word for a fabulous creature, a name eminently suitable for this unusual wasp.

Ferreola collarella Evans, new species

Fig. 2

♀. Length 13 mm; forewing 8.5 mm. Body black except pronotum wholly with orange integumental color; head and thorax covered with delicate silvery pubescence; abdomen silvery pubescent ventrally and over basal $\frac{1}{2}$ of tergites 1–3; antennae black; legs black (including tibial spurs), extensively silvery pubescent. Body devoid of erect hairs except for a few on venter and apex of abdomen. Wings strongly suffused with brown except subhyaline over basal $\frac{1}{3}$ of fore wing and basal $\frac{3}{4}$ of hind wing.

Clypeus broadly, evenly rounded apically; malar index 50; frontal index 73; eyes reniform, slightly closer together at bottom than at top; antennal index 42. Postocellar and ocello-ocular lines subequal; posterior ocelli separated from the sharp occipital crest by about $2.5\times$ their own diameters; genae well formed only near tops of eyes. Median length of pronotum very slightly less than its maximum width (between posterior lobes), its posterior margin nearly straight, though weakly emarginate medially. Postnotum concealed; propodeum elongate, its median length $1.1\times$ maximum width (at spiracles); lateroposterior ridges well developed although (in lateral view) not exceeding posterior rim. Apex of abdomen moderately compressed. Fore wing with basal and transverse median veins interstitial; 2nd and 3rd submarginal cells subequal in area; jugal lobe of hind wing unusually long, fully $\frac{3}{4}$ as long as anal cell; transverse median vein of hind wing strongly arched, joining media just basad of origin of cubitus.

♂. Length 8 mm; forewing 5.8 mm. Coloration of body and appendages as well as nature and distribution of pubescence as in ♀; wings lightly tinged with brown, darker along apical margin. Major features of head as described for ♀; frontal index 70; postocellar line exceeding ocello-ocular line as $5:4$; posterior ocelli separated from occipital crest by $1.5\times$ their own diameters; occipital crest closely paralleling posterior margins of eyes. First 4 antennal segments in a ratio of $7:4:5:6$, segment 3 only slightly longer than wide. Pronotum and propodeum as in ♀ but relatively shorter, posterior ridges of propodeum extending well beyond posterior rim. Subgenital plate strongly compressed, its lower margin strongly arched in profile. Wings as in ♀.

Holotype ♀, AUSTRALIA: QUEENSLAND: Brisbane, Blunder Crk, 11.XI.1979, H.E. & M.A. Evans and A. Hook. Allotype ♂, same data except 30.XI.1979. (Both in Queensland Museum, Brisbane.) Paratypes: 3♀, 1♂. QUEENSLAND: 1♀, Brisbane, 27.XI.1959, R. Jones; 1♀, Beenleigh, 20.VI.1965, R. Berndt (University of Queensland, Brisbane); 1♀, 1♂, 5 km S of Gympie, 11.X.1979, H.E. & M.A. Evans and A. Hook (Australian National Insect Collections, CSIRO, Canberra).

Remarks. This species differs from the larger *F. handschini* in head shape and in the appreciably longer pronotum and propodeum, and I would not regard these as closely related species despite the similarity in color. However, the form of the clypeus and mandibles is similar; both share similar wing venation and an unusually long jugal lobe of the hind wing; both have a long 2nd gastral sternite bearing an arching, punctate groove. This is a more slender species than *handschini*, with slightly paler wings and no orange on the head. The species name *collarella* is a diminutive of *collaris*, the original name of *handschini*.

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