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A taxonomic revision of Australian Conopidae (Insecta: Diptera)

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Abstract

A taxonomic revision of the Australian Conopidae is presented. Nineteen genera in four subfamilies are recognised. The Stylogasterinae are represented by the cosmopolitan genus *Stylogaster* Macquart and the Myopinae by *Myopa* Fabricius and *Thecophora* Rondani. A monotypic genus, *Notoconops* gen. nov., is described and placed in a new subfamily, Notoconopinae. The remaining fifteen Australian genera are assigned to the Conopinae. *Australoconops* Camras, *Chrysidiomyia* Kröber, *Conops* Linnaeus, *Delkeskampomyia* Kröber, *Heteroconops* Kröber, *Microconops* Kröber, *Neoconops* Kröber, *Pleurocerina* Macquart, *Physocephala* Schiner, *Smartiomyia* Kröber and *Stenoconops* Kröber are redescribed. Four new conopine genera are described: *Atrichoparia*; *Camrasiconops*; *Setosiconops*; and *Tanyconops*, with the following resultant new combinations: *Atrichoparia curticornis* (Kröber) (from *Heteroconops*); *Camrasiconops ater* (Camras) and *Ca. rufofemoris* (Camras) (from *Microconops*); and *Setosiconops robustus* (Kröber) (from *Neoconops*). *Callosiconops* Kröber and *Paraconops* Kröber are regarded as junior synonyms of *Chrysidiomyia* and *Pleurocerina* respectively with the following resultant new combinations: *Chrysidiomyia hirsuta* (Kröber), *Pleurocerina aristalis* (Camras), *P. longicornis* (Kröber), *P. nigrifacies* (Kröber), *P. similis* (Kröber), *P. turneri* (Camras).

A total of 100 species of Australian Conopidae are now recognised. No new species of Myopinae or Stylogasterinae are described. Representative species only of *Atrichoparia*, *Camrasiconops*, *Heteroconops* and *Microconops* are described. All species of the other 12 genera are described or redescribed. These include the following 45 new species,: *Australoconops aglaos*, *A. aurantius*, *A. balteus*, *A. breviplatus*, *A. brunneus*, *A. camrasi*, *A. cantrelli*, *A. elegans*, *A. fulvitarsus*, *A. furvus*, *A. nebrias*, *A. neuter*, *A. pallorivittus*, *A. phaeomeros*, *A. ruficrus*, *A. vespoides*; *Chrysidiomyia rugifrons*, *C. setosa*; *Conops aureolus*, *C. badius*, *C. chvalai*, *C. sparsus*; *Heteroconops carnarvonensis*; *Neoconops brevistylus*, *N. glaber*; *Notoconops alexanderi*, *Pleurocerina aquila*, *P. brevis*, *P. chrysopyga*, *P. lamellata*, *P. lutea*,

P. luteiceps, P. occidua, P. saxatilis, P. scutellata, P. vespiformis; Setosiconops epixanthus, Se. similis, Smartiomyia arena, Sm. cerina, Sm. danielsi, Sm. macalpinei; *Tanyconops longicaudus, T. luteus, T. ocellatus*. *Australoconops ocellatus* (de Meijere) comb. nov. is resurrected from synonymy with *A. aurosus* (Newman). *Conops demeijerei* Kröber is considered a junior synonym of *C. seminiger* de Meijere. A lectotype and paralectotypes are designated for *Microconops fasciatus* Kröber.

Anatomical features used in descriptions are discussed and illustrated. Special attention has been given to the ultrastructure of spicules on female genital structures. These spicules show differences between genera and species. The high degree of endemism of the Australian fauna is discussed in relation to the world fauna and some preliminary thoughts on phylogenetic relationships are presented.

A catalogue of the Australian Conopidae is included as an Appendix.

Key words: Diptera, Conopidae, Australian, Conopinae, Myopinae, Stylogasterinae, Notoconopinae

1. Introduction

The Conopidae constitute a moderately small family of schizophorous flies including about 800 described species. Conopids are distributed worldwide except for the polar regions and many Pacific islands. The majority of conopids are black with yellow or orange markings and bands and often bear remarkable resemblance to their typical hosts—wasps or bees. Larvae for which biology is known are internal parasites of other insects.

1.1 Diagnosis of the Conopidae

Conopids possess a ptilinum and a combination of apomorphic character states that sharply differentiate them from other Schizophora. The head is large and wider than the thorax; this characteristic indicative of the common name “thick-headed flies” (Hennig 1973). Other apomorphic character states with respect to the groundplan of the Acalyptrata include: occiput and vertex with short setae; antennal pedicel without a dorsal cleft; precoxal bridges absent; basisternum of prosternum with elongated posterolateral corners (Speight 1969); midcoxal prong absent; R_1 bare; R_{4+5} and M strongly convergent apically and usually fused before wing margin (exceptions occur in the Baltic amber species, *Palaeomyopa tertiaria* Meunier and in the new subfamily from Australia described below; these have cell r_{4+5} widely open); vena spuria distinct in many genera; and females usually with highly modified sternites 5 and 6.

Other characters useful in defining many acalyptrate families occur in the plesiomorphic state in Conopidae: cephalic and thoracic bristles usually poorly differentiated; costa without breaks; Sc complete, not fused with R_1; crossvein sc-r present near apex of Sc; vein A_1+CuA_2 long, reaching or nearly reaching wing margin; males with aedeagal apodeme rod-like (J. McAlpine 1989).

1.2 Current status of conopid taxonomy

1.2.1 Subfamily classification

The subfamily classification of Conopidae is relatively stable with four widely-accepted subfamilies: Conopinae, Myopinae, Dalmanniinae and Stylogasterinae. All subfamilies are represented in most geographical regions. Exceptions are discussed in Section 5—Biogeography. Conopinae have a terminal antennal stylus; most have an elongate, strongly sclerotised, anteriorly-projecting haustellum that can reach three times the length of the head and is jointed or geniculate only at the base; labella are short, ovoid and somewhat pointed apically. The other three subfamilies are characterised by an aristate antenna and a second joint near the middle of the haustellum enabling it to fold back under the head at rest. In Stylogasterinae, the haustellum is very

long with setaceous labella; in most Myopinae and Dalmanniinae the haustellum is relatively short with elongate strap-like labella.

A striking characteristic of most conopids is the modification of female sternum 5 and, to a lesser extent, sternum 6. In Conopinae and Myopinae sternum 5 is expanded ventrally into a flattened shield-like projection (the female genital plate). The posterior surface of the plate and the expanded anterior surface of sternum 6 are variously armed with black, flattened spicules and setae of varying lengths. Stylogasterines lack these sternal modifications; dalmanniines, although having modifications to the sterna, lack the genital plate. Both subfamilies have terminal abdominal segments modified into an ovipositor. The ovipositor of Stylogasterinae is very long, tapered and posteriorly directed; the ovipositor of Dalmanniinae is short, strongly sclerotised and anteriorly directed.

Distinguishing features of the four subfamilies are summarised here: Conopinae: antenna with apical stylus; haustellum geniculate at base only; cell cu*p* usually long, acute; female genital plate present; ovipositor not well-developed, terminalia anteroventrally directed. Myopinae: antenna with short dorsal arista; haustellum twice-geniculate (except *Robertsonomyia* Malloch and *Zodion* Latreille); cell cu*p* long, acute; female genital plate present; ovipositor not well-developed, terminalia anteroventrally directed. Dalmanniinae: antenna with short dorsal arista; haustellum twice-geniculate (except *Parazodion* Kröber); cell cu*p* short, acute; female genital plate absent; ovipositor short, recurved, anteriorly directed. Stylogasterinae: antenna with dorsoapical arista; haustellum twice-geniculate; cell cu*p* short, rounded; female genital plate absent; ovipositor long, posteriorly directed.

Acceptance of Conopinae and its limits has long been established. The status of other subfamilies has been debated (Rohdendorf 1964; Smith 1967; Zimina 1960). Rohdendorf (1964) elevated the monogeneric Stylogasterinae to family-level based on the short cell cu*p*, presence of a two-segmented surstylus in the male, elongate ovipositor, absence of antennal foveae, and presence of strong bristles on the vertex. The 1974 translation of Rohdendorf adds to these features the presence of bristles on the apex ‘of the tarsus’ (footnotes p. 108). I assert that this represents an incorrect interpretation of the original Russian text and ‘tarsus’ should read ‘tibia’. The tarsal bristles of *Stylogaster* Macquart are not different from other Conopidae but the tibiae, especially the fore tibia, have short apical spurs not seen in other conopids.

Smith and Cunningham-Van Someren (1985) also supported the concept of a separate family for *Stylogaster* based on differences from other conopids in biology and larval structure. Third instar larvae of Conopidae other than *Stylogaster* are narrowed anteriorly. I agree with Smith and van-Someren that this is an adaptation for feeding upon thoracic contents. The larva develops in the abdomen of the hymenopteran host. By the parasite’s third instar, host abdominal tissue is reduced. Projecting the anterior part of the body through the host’s petiole allows the larva to utilise resources in the thorax, particularly the flight muscles. While this presumably derived condition supports monophyly of the Stylogasterinae, I do not agree that it supports family-level status for the group. In later publications (Smith 1989; Smith and Petersen 1987) Smith reverts to subfamily status for Stylogasterinae. Despite the differences listed above, stylogasterines share the same autapomorphic characters as other conopids. Furthermore, cladistic analysis of the Conopidae shows the Stylogasterinae and another new subfamily described below to be monophyletic sister groups to the rest of the conopids. Given the demonstrated uncertainity of the basal part of the phylogeny (Fig. 347), together with the support of shared apomorphies (J. McAlpine 1989), I would argue that the stylogasterines are more appropriately treated as a subfamily of the Conopidae.

At times, the Dalmanniinae have been included in the Myopinae (Zimina 1960; Hennig 1973). The two groups have several features in common: a short dorsal arista; similar shaped face; antennal foveae deep but with a poorly developed dividing carina; large cheeks; a twice-geniculate haustellum (except as indicated above); and elongate labella (except *Zodion*). However, many differences between the two groups (in addition to those listed above) clearly warrant subfamily status for each. Female Myopinae have four spermathecae; Dalmanniinae have two spermathecae. Male dalmanniines have five abdominal segments before the postab-

domen, not the typical six of other subfamilies. Prosternum shape variants of Dalmanniinae also distinguish them from other conopids (Speight 1969). All workers since Hennig (1973) have considered the two subfamilies as distinct.

Zodion shows several characters that make it distinct from other Myopinae (see tribal characters below). Steyskal (1957: 70) stated 'The postabdomen of *Zodion* is so different from that of *Myopa* that some support is lent to the view that *Zodion* should serve as the type of a subfamily'. However this concept has not been given much credence and *Zodion* is generally accepted as a myopine.

1.2.2 Tribal classification

Zimina (1958, 1960) divided the Conopinae and Myopinae into tribes primarily based on prosternal shape, wing venation, presence of certain pleural bristles, antennal length and number of segments of the stylus. This tribal classification was based on conopids occurring in the USSR. Zimina did not consider the Dalmanniinae a separate subfamily but rather a tribe within the Myopinae. The characters she used to distinguish the Dalmannini are more widely regarded as subfamilial characters. Chvála and Smith (1988) adopted Zimina's classification for their catalogue of the Palaearctic Conopidae but separated Dalmanniinae from Myopinae. Zimina's classification is summarised below together with the Palaearctic genera belonging in each tribe (underlined genera occur in Australia):

Subfamily Conopinae

Pleurocerinellini (*Pleurocerinella* Brunetti): ocelli present.

Tropidomyiini (*Tropidomyia* Williston): antennae longer than head length; face without antennal foveae; stylus two-segmented; veins R1 and R2+3 not approximated at wing margin, almost parallel; R2+3 meeting wing margin about mid way between R1 and R4+5; prosternum with anteriorly directed projections from anterior corners.

Conopini (*Abrachyglossum* Kröber; *Archiconops* Kröber; *Conops* Linnaeus; *Leopoldius* Rondani; *Macroconops* Kröber; *Neobrachyglossum* Kröber; *Physocephala* Schiner; *Siniconops* Chen): antennae longer than head length; face with antennal foveae; stylus three-segmented; veins R1 and R2+3 approximated at wing margin; prosternum more or less quadrangular.

Brachyceraeini (*Brachyceraea* von Röder; *Neobrachyceraea* Szilády): antennae shorter than head length; face with antennal foveae; stylus three-segmented; veins R1 and R2+3 not approximated at wing margin, almost parallel; R2+3 meeting wing margin about mid way between R1 and R4+5; prosternum more or less quadrangular (variable).

Subfamily Myopinae

Zodionini (*Zodion* Latreille): prosternum narrow; haustellum jointed at base only; sc-r crossvein present; cell r4+5 usually closed; lower part of propleuron bare.

Myopini (*Myopa* Fabricius; *Melanosoma* Robineau-Desvoidy; *Myopotta* Zimina; *Thecophora* Rondani): prosternum narrow: Sc and R1 converge and usually fuse before wing margin; R1 fused with costa for a considerable distance; cell r4+5 narrowly open; cell cu*p* much longer than cell bm; lower part of propleuron pilose.

Sicini (*Sicus* Scopoli; *Carbonosicus* Zimina): prosternum as a broad plate; Sc and R1 parallel, not fused apically; cell r4+5 narrowly open; cell cu*p* much longer than cell bm; lower part of propleuron pilose; some long red hairs on side of mesonotum.

Dalmannini (*Dalmannia* Robineau-Desvoidy): prosternum narrow; female with long ovipositor curved beneath; male with band-shaped aedeagus; Sc and R1 converging at wing margin without fusing; cell cu*p* short, about same length as cell bm; lower part of propleuron bare.

The above details are provided because Zimina's work is the only account available on a tribal classification. Other workers have modified the classification based on the fauna of different zoogeographic regions without explanation of characters used to define tribes. Camras (1965) placed *Physocephala* in the tribe Physocephalini. Papavero (1971) followed Camras with regard to Physocephalini and retained Tropidomyiini. Smith (1980) also listed Physocephalini in Conopinae but did not recognise Pleurocerinellini or Tropidomyiini placing *Pleurocerinella* and *Tropidomyia* in Physocephalini. In their key to Nearctic Conopidae, Smith and Peterson (1987) divided the Conopinae into Conopini and Physocephalini on the basis of the following characters: Physocephalini have crossvein r-m distinctly beyond mid length of cell dm, ocelli are absent, proepisternum is bare, and hind femur is irregularly thickened distally. Conopini have crossvein r-m at most slightly beyond mid length of cell dm, ocelli are 'present, vestigial or rarely absent' (see note below), the proepisternum has at least one bristle, and hind femur is not irregularly thickened. Almost all Nearctic Conopini belong in the genus *Physoconops* Szilady. Species of *Physoconops* have ocelli, unlike most other northern hemisphere Conopinae. Most available keys to subfamilies of Conopidae characterise the Conopinae as without ocelli. Hence McAlpine's key should be understood in terms of the Nearctic fauna only. My study of the Australian Conopinae shows that many genera and species also possess ocelli (either two or three). No tribal classification has been proposed for the Australian or Oriental faunas. Clearly a comprehensive review of the higher classification of Conopidae, and particularly Conopinae, is needed to resolve the relationships and limits of the subfamilies and tribes.

1.2.3 Australian conopid taxonomy

The taxonomy of Australian Conopidae has been neglected. Past descriptive work was based on few specimens and, with the exception of the Stylogasterinae (Smith 1979), no comprehensive study of any group has been undertaken. Smith (1989) catalogued the Australian fauna and recognised 56 described species in 15 genera. Fifty-one of these described species belong in 12 genera of Conopinae. Of these genera, ten are endemic, four monotypic and two with just two described species. Smith (1989) listed one species of *Myopa* Fabricius and one species of *Thecophora* Rondani in Myopinae, three species in Stylogasterinae and no Dalmanniinae.

The German dipterist, Otto Kröber contributed significantly to the knowledge of the conopid fauna of the world. During the period 1915 to 1940, he described 32 Australian species and nine genera. The taxonomy of the group is difficult because of the great variability of many of the species, the occurrence of atypical and intermediate specimens and the apparent disjunct distribution of some species. These factors present problems in species delimitation and partially explain the paucity of identified specimens and the many undescribed species discovered at the beginning of my study. Of the many hundreds of specimens borrowed from Australian collections only about ten were correctly identified to genus and none to species. Available keys (Kröber 1915a, 1919b, 1939a,b, 1940) were based on very few specimens and provided little help in identifying material.

My study has revealed that about 90% of species belong in the Conopinae, three in Stylogasterinae and about ten in Myopinae. One species has been placed in a new subfamily (see below). Dalmanniinae remain unrecorded from Australia.

1.3 History of conopid systematics

The family-level name was first proposed by Latreille (1802) as Conopsariae. Accepted limits of the Conopidae have remained reasonably stable over a long period with the main subject for debate concerning whether

Stylogasterinae should be included. The taxonomic position of Conopidae in the higher classification of Diptera has long been a matter for conjecture. Most workers currently place the family in a separate superfamily (Conopoidea) within acalyptrate Schizophora (J. McAlpine 1989; Smith 1989). Rohdendorf (1964) suggested that Conopoidea are near the ancestral form of the Acalyptrata. For an interesting summary of old classifications of Diptera see Williston (1908). More recently J. McAlpine (1989) summarised the many hypotheses about relationships of Conopidae. Some alternate ideas and difficulties associated with understanding the most appropriate position of Conopidae within the Cyclorrhapha are discussed below.

Some workers have considered that features of venation and presence of a terminal antennal stylus in the Conopinae suggest that the family has affinities with Syrphidae and belongs in the Aschiza (Camras 1965). However, the presence of a well-developed ptilinum is considered by most workers to be strong evidence for placement of Conopidae in the Schizophora. Griffiths (1972) placed Conopidae in the Schizophora and regarded the resemblances to Syrphidae as probably secondary.

Hennig (1958) considered evidence for both syrphid and schizophoran affinities. He placed Conopidae in the Schizophora on account of clear evidence of the ptilinum, but placed them as a sister group to the rest of the Schizophora which do not possess the syrphid-like characters seen in some Conopidae. Hennig (1966) considered evidence provided by the Baltic amber fossil Conopidae as support for this hypothesis. Thus Schizophora (following Enderlein 1936) were divided into two groups: Archischiza (Conopidae only); and Muscaria (all other families). Subsequently Hennig (1971) considered evidence for division of the Schizophora into Acalyptratae (possibly including Conopoidea) and Calyptratae as possibly monophyletic groups. In 1973 Hennig, while still expressing doubts about the Conopoidea, adopted these two groups, at least provisionally, as primary subdivisions (Subsektionen) of the Schizophora.

The wing venation of the Conopidae exhibits four syrphid-like characters: (1) presence of the sc-r crossvein; (2) presence of vena spuria in some species; (3) distal approximation or fusion of R_{4+5} and M; and (4) long cell cu*p*. Each of these four characters is restricted or rare in other Schizophora and the four do not occur together in any other family. However, not all conopids show all four characters and the assumption that they are all plesiomorphic states in Conopidae can be disputed. The presence of the sc-r crossvein almost certainly is a plesiomorphic condition and is listed by J. McAlpine (1989: 1438) with the 'most significant plesiomorphic ground-plan characters of the family'.

The vena spuria of conopids is probably not homologous with that of syrphids. In Syrphidae it extends for much of the length of cell br, traverses crossvein r-m and ends in cell r_{4+5}. In Conopidae the vena spuria commences at the r-m crossvein and extends for about half the length of cell r_{4+5}, anterior of the distal part of the discal cell. At least in the Australian conopids, development of an obvious vena spuria correlates well with wasp mimicry and is also commonly stronger in large species. These two points suggest that the vena spuria may serve two purposes: first it makes the venation more Hymenoptera-like by increasing the number of apparent veins and cells; and second, the vena spuria may add strength to the wing. If these hypotheses are valid, then the development of a vena spuria in Conopidae was probably secondary and arose independently of the occurrence of a vena spuria in Syrphidae.

The apical convergence of R_{4+5} and M is listed by J. McAlpine (1989) as apomorphic with respect to the groundplan of the acalyptrates. The widely open cell r_{4+5} in the fossil conopid, *Palaeomyopa tertiaria* adds support to this hypothesis. Hennig (1958) considered the occurrence of a long cell cu*p* in some representatives of a few Schizophoran families (*e.g*. Micropezidae, Pyrgotidae, Conopidae) as suggesting that this feature has evolved secondarily in these families. Griffiths (1972) used this idea to support his argument for conopid affinities with the prefamily Tephritoinea.

Conopids have a prosternum that, although somewhat variable in shape, always has prominent posterolateral angles (Speight 1969). Such a prosternum is characteristic of the superfamily Syrphoidea (both families Syrphidae and Pipunculidae). Speight considered these lobes ('tails') absent in acalyptrates other than Conopidae. However, D. McAlpine (pers. com.) found them in the ropalomerid *Willistoniella* Mik (though omitted

by Hennig 1958: Fig. 104). Speight (Fig. 57f) also shows them for *Ropalomera* Wiedemann. A pair of similarly situated lobes occurs in the pyrgotid genus *Eumorphomyia* Hendel where they form finger-like processes of varying length. D. McAlpine (pers. com.) considers the prosternum of the Ropalomeridae to be a highly apomorphic type with strongly developed precoxal bridges. This suggests that the possession of posterolateral lobes is also secondary. Alternatively Ropalomeridae show some signs of conopid and syrphid wing characters in the apical convergence of R_{4+5} and M and the acute (but not very long) anal cell. These characters are not so remarkably different from those occurring in numerous other acalyptrates as to suggest any relationship of Ropalomeridae to Conopidae or early separation of the former from the schizophoran stem. *Eumorphomyia* is the only pyrgotid known to me with paired processes or lobes of the prosternum, and otherwise it is typical of the more advanced genera of the family. Available evidence therefore indicates that this condition of the prosternum is apomorphic with respect to the groundplan of the Acalyptrata and does not support the hypothesis of an affinity between Conopidae and Syrphoidea.

The mid coxal prong is absent in Conopidae. This process is present in nearly all of the Schizophora and Syrphoidea. However, it is also absent in many genera of Pyrgotidae (Malloch 1929). Malloch considered this characteristic, together with frequent absence of ocelli and lack of a longitudinal dorsal cleft in the antennal pedicle of Pyrgotidae to suggest a close affinity with Conopidae. Current workers give little credence to such an hypothesis and more probably absence of the mid coxal prong in both families is an independently derived character. It is listed by J. McAlpine (1989) as an autapomorphy for Conopidae, supporting the monophyletic status of the family. Hennig (1958) and Griffiths (1972) do not mention this structure in their lists of apomorphic characters for Conopidae.

Hennig (1952), Griffiths (1972) and J. McAlpine (1989) concluded that Conopidae have closest affinities with families of Tephritoidea. Hennig (1952) was influenced by similarities between Conopidae and Pyrgotidae. Although not proposing a sister-group relationship with Pyrgotidae, he suggested the similarities reflect 'a not altogether distant affinity of the Conopidae with the Tephritoidea'.

Griffiths stated 'the Conopidae are probably referable to the Tephritoinea, since some genera show the type of aedeagus which I ascribe to the groundplan of this prefamily' and considered the short aedeagus of the Conopinae may be due to a secondary reduction. The elongate, coiled type of aedeagus occurs widely among acalyptrate families in forms that often show no other evidence of relationship. Clusiidae, Heleomyzidae, Teratomyzidae, and Pyrgotidae include both forms with a long, coiled aedeagus and forms with a short noncoiled aedeagus. In the heleomyzid tribe Allophylopsini great variation in aedeagal structure occurs and considerable variation is sometimes present within the one species group (D. McAlpine 1967). Generally, characters of the copulatory organs are the most plastic of all characters in the Schizophora immediately above the species level, and by far the greatest morphological differences between closely related species are found in these organs in most cases. Such demonstrably unstable characters as are provided by the aedeagus and associated organs should not be ascribed great weight for higher classification.

A further character used by Griffiths (1972), correlated to some extent with the elongate aedeagus of the male, is the elongation of segment 7 of the female abdomen to form an ovipositor. Again this character is unstable within certain families (*e.g*. Lauxaniidae) or genera (*e.g*. *Diplogeomyza* Hendel—Heleomyzidae) (D. McAlpine 1967). In *Diplogeomyza* the species with a long flexible distiphallus are included in the group having an elongate ovipositor sheath, though not all of the latter group have a long distiphallus. In *Commoniella* Paramonov, a pyrgotid with an exceptionally short aedeagus, the ventral length of the ovipositor sheath is much less than in other genera. In Conopidae, the Stylogasterinae and Dalmanniinae have both the aedeagus and ovipositor elongate whereas the Conopinae and Myopinae have both these structures short. Thus elongation of the aedeagus may be an adaptation to elongation of the postabdomen of the female, which in turn may be adapted to particular modes of oviposition. In view of the great diversity of oviposition sites in the Schizophora, plasticity in correlated characters is expected.

Griffiths' prefamily Tephritoinea rests principally on the assumption that the characters in question are of major phylogenetic significance and on other criteria it is highly heterogeneous. According to D. McAlpine (1985) Chiropteromyzidae and Cnemospathidae, families Griffiths included in the Tephritoinea, belong in Heleomyzidae. Alternative locations for other families included by Griffiths are given by Hennig (1958, 1971), and Colless and McAlpine (1970, 1974, 1991). Likewise inclusion of Conopoidea in the prefamily Tephritoinea is based on dubious evidence and necessitates more consideration.

Hennig (1971) discussed the possible monophyletic status of the Acalyptrata, including the Conopidae. He considered the absence of a distinct postclypeus and lack of penetration of the puparium by prothoracic stigmatal processes of the pupa in acalyptrates to support the monophyly of the group. Gouin (1949) states that the postclypeus is distinct in Syrphidae, Conopidae and Calyptrata but not in other acalyptrates. Whether it has been lost in all other acalyptrates (further studies are needed to confirm this), I consider the presence of a distinct postclypeus in Conopidae a plesiomorphic condition. This may be evidence for the early split of the Conopidae from the lineage leading to the rest of the Acalyptrata but does not necessarily invalidate the concept of the monophyly of the Acalyptrata.

The prothoracic pupal spiracles of many calyptrates (numerous exceptions) and syrphids are situated on horns that penetrate the puparium and are thus visible externally. Hennig suggests that the apparent absence of these in all acalyptrates (including Conopidae) could be an apomorphic character of the ground plan of Acalyptrata, providing evidence of its monophyletic nature. However prothoracic spiracular horns resembling those of many calliphorids and tachinids have been observed in a typical acalyptrate, *Tapeigaster annulipes* Macquart (Heleomyzidae) (McAlpine and Kent 1982), Odiniidae, Agromyzidae and other Heleomyzidae (Ferrar 1987). The puparia of many acalyptrate groups remain unstudied and other examples among them of puparia with externally visible prothoracic pupal horns may be found. On the other hand conopid larvae often have reduced prothoracic spiracles (unlike acalyptrates in general) and this may be evidence of a general downgrading of the physiological importance of anterior spiracles in the immature stages of the parasitic Conopidae. An argument could therefore be presented that loss of pupal horns in many calyptrates, in Conopidae, and acalyptrates generally may also be an independently derived character and not necessarily supportive of the monophyly of the acalyptrates.

In conclusion, I find no convincing evidence for inclusion of Conopidae in the Aschiza or for their separation as the sister group (Archischiza) to the Schizophora. Most resemblances to Syrphoidea are almost certainly a result of secondarily acquired features. Available evidence most strongly supports the hypothesis that they represent a monophyletic group of uncertain affinity within the Schizophora. The remarkable parasitic lifestyle of conopids has probably led to many of their diagnostic apomorphic character states. Even if their closest relatives are shown to be in the Tephritoidea, at least some suggested evidence for strong affinities with the Tephritoidea must be considered dubious.

1.4 Fossil history

The fossil record for Conopidae is poor; only one species is positively identified. Meunier (1899) described a new genus *Palaeomyopa* for a species from Tertiary Baltic amber. He later (1912) named the species *P. tertiaria* and placed it in the "Familie Myopina". Later Meunier studied additional specimens from Baltic amber and in 1916 described a second species, from a female specimen, that he called *Palaeosicus loewi*. Hennig (1966) discussed the Meunier species and concluded that they were conspecific.

Palaeomyopa tertiaria was placed in Myopinae because it has an arista-type antennal appendage rather than a stylus and has a female genital plate. Camras (1994) proposed a new subfamily, Palaeomyopinae for *P. tertiaria*. He concluded that the plesiomorphic characters of the species could not justify its placement in any described subfamily. The most significant of these characters is the apparent position of the female genital

plate on segment 4 rather than on segment 5. Both Hennig and Camras studied the single female specimen of *P. tertiaria* (the holotype of *P. loewi*) and both concluded that the genital plate was part of segment 4. I have not been able to study this specimen but have doubts that the conclusion reached by these two workers is correct. Many dried specimens of extant species are preserved with the female genital plate projecting directly below tergite 4 in lateral view, exactly as illustrated for *P. tertiaria* by Hennig (1966, Fig. 20). However when such specimens are relaxed and dissected, the plate is found to be an extension of segment 5. A comment by de Meijere (1904: 192) indicates that some earlier workers had erroneously considered the genital plate of extant species to be on segment 4, perhaps for the same reason. Hennig's hypothesis that the position of the genital plate moved from segment 4 to segment 5 during the evolution of Conopidae is difficult to accept.

The only other possible conopid fossil is *Poliomyia recta* Scudder, 1878 described from Green River shale, Wyoming. This species is listed under Conopidae in Scudder's 1890 catalogue of the North American Tertiary insects and also in Evenhuis (1994). The specimen is not complete and Hennig (1966) concluded that the species could not be identified positively as a conopid.

1.5 Biology

The most comprehensive accounts of the biology of Conopidae are provided by de Meijere (1904, 1912). Other accounts have dealt with regional faunas or individual genera or species. The biology of northern hemisphere conopids has been studied extensively. Freeman (1966) provided a summary of insect hosts and plant associations for Nearctic species. Howell (1967) detailed the biology and life history of *Zodion obliquefasciatum* (Macquart). Maeta and Macfarlane (1993) studied the Japanese fauna. In numerous publications Smith (1959, 1961, 1969a) gave details of the biology and hosts of British species; and more recently P. and R. Schmid-Hempel and their co-workers in Switzerland have published extensively on the relationships between Conopidae and bumble-bees (*e.g.* Schmid-Hempel *et al.* 1990; Schmid-Hempel and Schmid-Hempel 1988, 1990, 1991, 1996a,b).

Little has been published on the biology of the Neotropical and African faunas except for detailed accounts of the behaviour and oviposition sites of *Stylogaster* (Lopes 1937, 1938; Lopes and Monteiro 1959; Rettenmeyer 1961; Smith 1967, 1969b; Smith and Cunningham-Van Someren 1985; Stuckenberg 1963). In Central and South America and in Africa *Stylogaster* spp. have been observed associated with raiding army ants (Hymenoptera: Dorylinae). *Stylogaster* constantly hover above and in front of the column and intermittently dart down to oviposit in cockroaches and Orthoptera flushed out by ants. *Stylogaster* eggs have been located inserted in the intersegmental membrane between abdominal terga of species of the tachinid fly genera *Calodexia* van der Wulp and *Androeuryops* Beneway that likewise were seeking hosts disturbed by ants (Rettenmeyer 1961). Smith and van Someren (1985) recorded *Stylogaster* eggs from Calliphoridae, Muscidae, Heleomyzidae (all Diptera), and from spiders (Lycosidae)—all associated with army ants. *Stylogaster* occurs in geographic areas where army ants do not occur (*e.g*. Australia) and therefore cannot be considered universally dependent on an association with the ants to find hosts, even if such a dependence may exist in some areas. Flies of Syrphidae and Lauxaniidae have also been observed carrying *Stylogaster* eggs (Stuckenberg 1963).

In summary of current knowledge of conopid biology, many species (particularly Conopinae) are excellent mimics of aculeate wasps (especially Vespoidea) and some hover flies (Syrphidae). Adults feed on nectar and are probably effective pollinators. They are usually found among flowers, often accompanying the insects they mimic. Such species have distinctive bright yellow or orange pruinose banding over black or dark brown thoracic and abdominal cuticle and have reduced chaetotaxy. In contrast to this common habitus most endemic genera of Australian Conopinae are primarily blackish and conspicuously setose. They possibly mimic and parasitise groups of native bees and wasps. This hypothesis is supported by many small (2–5 mm

long) black conopines and the correspondingly high number of species of small black bees found in the same habitats as the flies. Adult Stylogasterinae hover as they feed on nectar and their exceptionally long proboscises are adapted for this purpose.

Conopid larvae are solitary internal parasites, usually developing in the abdomens of their hosts. Adults of Conopinae, Myopinae and Dalmanniinae typically oviposit into the abdomens of adult wasps and bees. The abdomen is variously modified apically for oviposition and always has strongly sclerotised components. Chvála and Smith (1988) summarise the behaviour of females of these subfamilies as follows: 'Adults fly very quickly. Ovipositing females wait on nearby vegetation, often close to hymenopteran nests and attack foraging bees and wasps with a very quick strike. The elongate egg with a conspicuous micropyle is laid directly into the host's abdomen'. Howell (1967) presented detailed observations of the oviposition behaviour of *Zodion obliquefasciatum* and its host, *Nomia melanderi* Cockerell (Halictidae).

Stylogasterine adults oviposit in cockroaches, crickets and calyptrate flies, especially Tachinidae and flies associated with animal dung *e.g.* Muscidae and Calliphoridae (Smith 1967). Kotrba (1997) examined evidence available to determine the oviposition technique in *Stylogaster.* This evidence consisted of accounts of observations by workers such as those listed above and conclusions she could make from detailed morphological studies of the female reproductive organs. Kotrba concluded that a 'stabbing' technique of oviposition was most probable for *Stylogaster.*

The Australian conopids are perhaps the most poorly known biologically of any of the world faunas. The only host record is for *Conops (Asiconops) australianus* Camras which was bred from a scoliid wasp collected in 1931 and identified as '*Campsomeris tasmaniensis* or *radula*' (Jarvis 1924). The eggs of the three Australian species of *Stylogaster* have been described (Smith 1979). Smith reports that *S. liepae* Smith from Lord Howe Island was observed hovering over the nest of an undetermined species of 'mutton bird' (Procellariidae). Smith suggests that the fly 'may have been attempting to oviposit on muscids or calliphorids attracted to faecal matter or carrion in or near the nest' (Smith 1979: 305).

Evidence from collection data suggests that the Australian fauna has radiated in more arid areas. Conopinae are frequently collected on species of *Leptospermum* and *Eucalyptus* (Myrtaceae) in areas of sandy soil or sandstone outcrops. In one such location on North Stradbroke Island, south-eastern Queensland female *Camrasiconops* sp. nov. were collected by sweeping the blossoms of mid to low branches of *Leptospermum flavescens* while the males were collected by sweeping the top branches or above the trees. Males were more numerous and less timid than females. These observations suggest a type of male courtship swarming behaviour. Intense collecting in southern Queensland in recent years indicates that specimens of *Stylogaster* and *Thecophora* are more frequently collected in Malaise traps than by net-sweeping blossom.

Phoretic relationships between conopid adults and meloid and rhipiphorid beetle larvae (Cole and Lovett 1921; Freeman 1966) have been observed for north American species of Myopinae and Conopinae: *Thecophora modesta* (Williston) and *Zodion intermedium* Banks with meloid triungulins; *Physoconops fronto* (Williston) with eleven rhipiphorid triungulins around the base of the 'proboscis', and *Zodion fulvifrons* Say with four rhipiphorid triungulins on the female genital plate. I have observed similar phoretic relationships for Australian species. Rhipiphorid triungulins were found around the bases of the haustellum of two specimens of *Conops australianus*. In addition to these new records for beetle triungulin phoresy, I observed early instar thrips nymphs in the subcranial cavity of one specimen of *Conops satanicus* Bigot.

1.6 Aims of this study

The aims of this study are: (i) to complete a taxonomic revision of the Australian subfamilies, genera and species of Conopidae. (This has been achieved except for the completion of descriptions of all new species of the genera *Atrichoparia* gen. nov., *Camrasiconops* gen. nov., *Heteroconops* Kröber, *Microconops* Kröber and the

Myopinae.); (ii) to describe and illustrate anatomical structures unique to, or characteristic of, Conopidae; and (iii) to provide a catalogue of the described species of Australian Conopidae to update that of Smith (1989).

2. Materials and methods

2.1 Methods

Most specimens examined in this study were dry and pinned or point-mounted. Few available specimens were preserved in ethanol; some of those were used for dissection. Dry specimens used for examination of body parts were first relaxed and softened parts removed using iris scissors. Genitalia were cleared in warm lactic acid, washed and either stored in glycerol for later examination or transferred to 80% ethanol before preparation for scanning electron microscopy. Preparation involved dehydration through an ethanol gradient from 80 to 100% and chemical drying with hexamethyldisilazane. Specimens were mounted on aluminium stubs and sputter-coated with gold using a BIORAD SC502 coater before being placed in a desiccator. Scanning electron micrographs were obtained using a JEOL JSM-6400 F scanning electron microscope.

Wings to be photographed were mounted in Euparal on microscope slides. Photographs of wings and whole specimens were taken through a Zeiss Stemi SV11 stereo zoom microscope using a Kodak DCS 420 digital camera.

Dry specimens were examined using the same Zeiss microscope (magnification 6x–66x). Drawings were made using a drawing tube attached to the Zeiss microscope. Measurements were made using an eyepiece micrometer that allowed for accuracy to the nearest 0.1 mm. Ranges for measurement were made using all specimens if less than ten were available. When a series involved more than 10 specimens, all specimens were scanned under the stereomicroscope and five specimens at the two ends of the size range were selected for measurement. Overall size of specimens was measured in terms of body length (= total length) and wing length. Body length was measured from the most anterior point of the head (excluding antenna) to the most posterior point of the pregenital segment (male segment 6; female segment 7). Several consecutive measurements were taken to derive the composite length of specimens that had dried in a curved position. Wing length was measured from the tegula to the apex of the wing.

Other measurements were made to indicate relative sizes of head parts (Figs 1, 2). Shape of the frons is presented as a ratio of median length (from the anterior ocellus or vertex margin to the lunule base) relative to the median width between eye margins. Antennal length is indicated relative to head height. Eye size is presented as vertical height relative to head height. This measurement also provides an indication of the cheek height, the latter being the difference between the other two measurements. Haustellum length is measured relative to head length. Abdominal tergite lengths were measured along the mid line.

The geographic co-ordinates for the collection locality of every specimen examined were recorded using the Gazetteer of Australian Place Names at the following World Wide Web URL: http://www.ga.gov.au/map/names/. These data were used to generate species distribution maps using RangeMapper™ version 2.3.0 (Philip 1995).

2.2 Definitions and terminology

Terminology follows closely that of J. McAlpine (1981). Figures 1–18 illustrate most anatomical features used in descriptions. These features are defined below:

Head (Figs 1, 2)

Antennal foveae: facial cavities formed to receive antennae in resting position.

Cheek: lateral area of face between eye and subcranial cavity.

Face: entire lower anterior area of head below level of antennal bases and bounded by eyes laterally and subcranial cavity ventrally.

Facial carina: median ridge of face separating antennal foveae.

Facial ridge: area of face between ptilinal suture and lateral edge of antennal fovea.

Frons: area between vertex, eyes and dorsal part of ptilinal suture; if fronto-orbital region demarcated, intervening area referred to as the *mesofrons*.

Frontoclypeal tubercle: lower, protruding end of facial carina.

Frontofacial patch: small velvety pruinose area at junction of fronto-orbital region and parafacial.

Fronto-orbital region: lateral area of frons adjacent to eye; usually poorly defined and differentiated from mesofrons; sometimes pruinose; often forming a low, rounded ridge.

Lunule area above bases of antennae, anterior of ptilinal suture.

Median frontal plate: shiny sclerotised area of the mesofrons of a few conopids; extends from around the ocellar tubercle towards the anterior margin of the mesofrons.

Occiput: posterior surface of head surrounding the foramen; the dorsal median occipital sclerite is often differentiated in descriptions, especially if it is a different colour from remainder of occiput.

Palpus: single-segmented maxillary palpus located at apex of rostrum (Fig.3).

Parafacial: usually differentiated, frequently pruinose, lateral part of face adjacent to eye.

Postgena: ventral and lateral area of occiput; often swollen and extending anteriorly below eye.

Proboscis: consists of two parts, a basal, cone-shaped rostrum and a sub-cylindrical haustellum terminating in the labella.

Vertex: posterodorsal area bounded by median occipital sclerite, eyes and frons; may be raised, cushion-like and clearly demarcated or narrow and ill-defined; usually bears the ocellar tubercle and ocelli, if present.

Thorax (Figs 8, 9)

Bristles: setae that are differentiated from surrounding setae by greater length and/or thickness.

Colour: the base cuticular colour of the thorax and abdomen of most conopids is blackish to dark brown, sometimes orange-tan. The conspicuous yellow or gold bands and patches of many Conopinae result from minute cuticular outgrowths so densely associated that the dark cuticle cannot be seen. This cuticular vestiture is discussed in the Section 3.2.3.

Legs:

- *Microsetae*: extremely short setae densely covering anteroventral surfaces of fore tibia and tarsus and posterior surfaces of hind tibia and tarsus in some genera.
- *Mid coxal prong*: narrow process on lateral surface of mid coxa; absent in Conopidae.
- *Pruinose patch*: apical, oval, densely pruinose patch on distal end of tibiae of both males and females of many genera; on posterior surface of fore tibia, both anterior and posterior surfaces of mid tibia, and anterior surface of hind tibia; shines silver or silvery yellow at some angles.

Postnotum: area posterior and ventral of the scutellum; divided into mediotergite and two laterotergites; laterotergite divided into dorsal anatergite, ventral katatergite.

Postpronotal lobe: humeral callus of many authors.

Proepisternum: anteroventral part of propleuron immediately dorsal of fore coxa.

Prosternum: sclerotised plate between and anterior of fore coxae; divisible into anterior presternum (vestigial, except in Conopinae) and posterior basisternum; the latter usually deeply bifurcate posteriorly, with posterior corners narrowed and flange-like (basisternal 'tails' of Speight, 1969).

Pruinose: adjective used to describe the matt appearance and colour of the cuticle resulting from the cuticular vestiture.

Wing (Fig. 7)

Cells: lower case is used for cell names, *e.g.* cell sc = subcostal cell; posterior cubital cell (= anal cell of most dipterists) is abbreviated to cell cu*p*, the italised 'p' being used to avoid confusion with the word 'cup'.

Crossvein sc-r: some authors consider this to represent an apical branch of Sc.

Petiole: fused section of veins R4+5 and M.

Vena spuria: vein-like fold or thickening of wing membrane originating at the r-m crossvein, and extending towards wing margin in posterior basal part of cell r4+5.

Veins: names are abbreviated with a capital letter, *e.g.* Sc = subcostal vein.

Abdomen

Male (Fig. 13)

Protandrium: apparent segment 6; pregenital segment.

S8: demarcated, usually narrow section along the posterior margin of the protandrium.

Epandrium: tergite 9; surrounds the usually short, rounded cerci.

Female (Fig. 14)

Female genital plate: ventral shield-like expansion of segment 5.

Posteromedial projection of T6: Some genera have a small rounded posterior projection of tergite 6 dorsomedially; this is usually accompanied by a notch in the anterior margin of tergite 7; rarely the latter is present without the projection of tergite 6.

Spicules: extremely short, strong black socketed spines often arranged in rows on posterior surface of female genital plate and sternites 6 and 9; also often on posterior margin of male sternite 5. Ultrastructure of these spicules is discussed in Section 3.

2.3 Abbreviations

Bristles and anatomical features: anepm—anepimeral; anepst—anepisternal; dc—dorsocentral; ial—intra-alar; ipal—intrapostalar; kepst—katepisternal; npl—notopleural; pal—postalar; pprn—postpronotal; prepst—proepisternal; sctl—scutellar; spal—supra-alar; S—sternite; T—tergite

Collection names: AM—Australian Museum, Sydney; ANIC—Australian National Insect Collection, CSIRO, Canberra; CC—Collection of Dr Sidney Camras, Chicago; DEI—Deutsches Entomologisches Institut, Eberswalde; HNM—Hungarian Natural History Museum, Budapest; INHS—Illinois Natural History Survey Insect Collection, Champaign Urbana; MVMA—Museum of Victoria, Melbourne; MAGD—Northern Territory Museum of Arts and Sciences, Darwin; MNHN—Muséum National d'Histoire Naturelle, Paris; NHM—Natural History Museum, London; QDPI—Department of Primary Industries, Brisbane; QM—Queensland Museum, Brisbane; SAM—South Australian Museum, Adelaide; UQIC—University of Queensland Insect Collection, Brisbane; USNM—United States National Museum, Washington; WADA—Western Australia Department of Agriculture, Perth; WAM—Western Australian Museum, Perth

2.4 Format of descriptions

Species descriptions conform to the following format:

Name	Current valid name, author, reference and figure(s).
Synonymy	Synonyms are listed with author and reference.

Material examined	*Holotype*: Whether I examined the holotype (of a described species), the sex, and Australian state in which the holotype was collected are stated. Label details are recorded verbatim. For previously described species that have multiple labels, information on each label is given, starting with the top one and moving down the pin; labels are numbered from the top as **L1**, **L2**, etc. If I did not examine the holotype, label details are quoted as presented in the original description. The current deposition collection is given in parentheses. Label details of type specimens of synonyms are recorded as above. *Paratypes*: The Australian state and the number of specimens of each sex from each locality are given. Label data are recorded in full. Labels on paratypes of previously described species are treated as above. *Additional material*: Material is listed in order of Australian state and from north to south within each state. Numbers of each sex from each locality are given. Geographic coordinates are included only if on the label; collectors names are not included. The deposition collections are given in parentheses at the end of each locality and may be grouped if specimens from a single locality are lodged in more than one collection, *e.g.* (AM, ANIC, UQIC). Conversely the collection is indicated only at the end of a list of localities if all specimens are lodged in one collection, *e.g.* (all UQIC).
Diagnosis	A summary of character states that distinguish the species from other species of the genus.
Description	Males and females are described or redescribed together under the subsections: Head, Thorax, Abdomen. 'Abdomen' in this context includes segments one to four. The postabdomen (from segment five to the terminal segment) is described separately under subsections 'Female' and 'Male'. The description of a new species is based on character states observed in the holotype. Subsection 'Variation' is included to accommodate variations in states observed in paratypes or other included material.
Measurements	Total body length and wing length are presented. Absolute measurements for the holotype and the size range for other specimens are given.
Distribution	A brief summary according to state is given. A distribution map for most species is provided.
Comments	Remaining points of interest are noted together with notes on closely related species if applicable.
Etymology	The derivation of a new name is provided.

Generic descriptions follow a similar format to the above with omission of the 'Material examined' section. The type species is given immediately following the reference to the original generic description.

The style of the Catalogue in the Appendix conforms to that of Evenhuis (1989).

3. Anatomy

A comprehensive account of the anatomy of Conopidae was provided by de Meijere (1904); Hennig (1966) compared many anatomical features of all subfamilies; and Streiff (1906) provided a detailed study of the internal anatomy of the abdomen with special reference to the female genital plate and musculature of male and female genital segments. The most recent general account of conopid anatomy is found in Smith and Peterson (1987).

3.1 Head

The conopid head is large and broader than the thorax. Shape is variable and is commonly diagnostic at the generic level. The lower lateral margin (epistomal margin) may be horizontal and long, giving the head a cuboid shape; or the margin may project upwards from the postgenal corner to give the head a triangular shape in lateral view. Ocelli are present or absent. Subfamilies other than Conopinae have three ocelli. Ocelli are almost always absent in Conopinae in other world regions but many Australian Conopinae possess ocelli. They provide significant characters at the generic level and to a lesser extent at the species level. Two or three may be present but in some genera the number of ocelli is sometimes difficult to determine because they are weakly developed. Shape of the lateral ocellus varies from round to narrow, elongate oval. The ocellar tubercle likewise varies in definition and size.

Eyes of most conopids are dichoptic and not sexually dimorphic. Only in the new subfamily, Notoconopinae, described below, do the eyes of males approach the holoptic condition. Ommatidia of *Stylogaster* are enlarged anteriorly, especially in females. Stuckenberg (1963) hypothesised that enlarged ommatidia would advantage the female in host location and oviposition.

The frons is typically broad and may be transversely rugose or smooth, sloping or horizontal, and protruding on either side of the antennae or with a more or less straight anterior margin. Most conopids do not have well-differentiated cephalic bristles, the marked exception being Stylogasterinae that possess long strong vertical bristles.

Anatomical features of the head used in descriptions are shown in Figs 1 and 2. Ways in which measurements of various structures were made are also shown.

3.1.1 Antennae

Antennae provide many characters for identifying conopids at all taxonomic levels. Presence of a terminal stylus in the Conopinae while all other subfamilies possess an arista is strong evidence (in my opinion) for the monophyly of the Conopinae (see Section 5). The stylus may be two- or three-segmented, long and finely tapered or extremely short and broad. Aristae have one or two short basal segments and a variably long apical segment.

Hennig (1966) discussed the significance of antennal length. He suggested a correlation between the strongly porrect nature of antennae of many Conopinae and their length; porrect antennae can be kept out of the way of the elongate proboscis that projects anterodorsally at rest. Hennig's hypothesis may be true for some groups (*e.g. Physocephala*) but certainly in many Australian Conopinae with a long proboscis the antennal foveae are deep and long and the antennae are fully accommodated in them at rest. Such groups tend to have a very short scape and pedicel that allow the elongate first flagellomere to fold down into the foveae.

3.1.2 Mouthparts

The proboscis consists of two parts, a basal rostrum and a cylindrical haustellum that terminates in the labella (Snodgrass 1935). Hennig (1973) separated the labella as a third part, the distiproboscis. The *rostrum* is funnel-shaped, broad basally and tapered distally. It is usually almost entirely membranous and may be extensive and protrusible, contributing significantly to overall proboscis length. Elements incorporated into the rostrum are difficult to determine. The account of the morphology of the muscoid proboscis by Snodgrass is useful for comparison with Conopidae. The clypeus is typically represented by a small plate that lies in the proximal anterior wall of the rostrum. Dilator muscles of the sucking pump arise from this plate (Snodgrass, 1935).

Strickland (1953) studied ptilinal scales of 150 species of Schizophora in 40 families. He found that scales also occur on the proboscis (and especially on the rostrum) of many Schizophora and hypothesised that the proboscis plays a subsidiary role to the ptilinum in emergence of the adult fly from the puparium. Strickland made the remarkable discovery that nearly all of the extreme variation of ptilinal scales types can be corre-

lated with similar structures on the proboscis of conopids. Eight scale types are illustrated on the proboscis of *Physocephala furcillata* (Williston); six of the scale types are on the rostral membrane that in Conopidae (according to Strickland) is entirely clothed with scales. Such extensive armature of the rostrum may be related to the requirement of most emerging conopid adults to push their way through not only a puparium but also the abdomen of their dead host (Ferrar 1987).

Maxillary palpi (Fig. 3), if present, arise anterodistally on the rostrum near the haustellum base. They are typically small or absent in Conopinae, larger in Myopinae and Dalmanniinae and absent in Stylogasterinae. Occasionally palpi are represented by slight swellings bearing a few setae (*e.g. Chrysidiomyia*, *Neoconops*). In the absence of labial palpi, 'maxillary' is understood and omitted. Presence or absence and size of palpi are useful diagnostic characters for genera of Conopinae.

The *haustellum* is usually elongate and sclerotised but may be short and fleshy as in many *Heteroconops*. At rest the haustellum, or at least the base of it, is retracted into the subcranial cavity and folded against the anterior surface of the rostrum. Most Conopinae and the non-Australian *Neozodion* Szilády, *Robertsonomyia* Malloch and *Zodion* Latreille (Myopinae) and *Parazodion* Kröber (Dalmanniinae) have an elongate, sclerotised, anteriorly-projecting haustellum that can reach three times the length of the head and is jointed or geniculate only at the junction with the rostrum (Fig. 1). Stylogasterinae, and most Myopinae and Dalmanniinae, are characterised by a second joint about mid-length of the haustellum. At rest the distal section is folded back ventrally so that the posterior surfaces of the two sections are approximated. In Stylogasterinae (Figs 23, 24) the haustellum is very long; in Myopinae and Dalmanniinae, it is typically shorter (Fig. 22).

Most of the haustellum consists of the elongate prementum of the *labium*. The sides of the prementum are folded anteriorly and apparently fused, except basally, to form the food channel. The *labrum*, arising from the anterodistal end of the rostrum, is tapered, narrow and covers the anterobasal area of the food channel. The *labella* vary in form in different subfamilies. In most Conopinae (Fig. 4) they are sclerotised laterally and resemble slightly cupped hands held together, with the pseudotracheae extending longitudinally on the medial surface. In Myopinae (Fig. 5) labella are often relatively longer than in Conopinae and somewhat strap-like. In Stylogasterinae, labella are long, cylindrical and setaceous (Fig. 6). Scanning electron microscopy shows marked variation in the form of labellar pseudotracheae.

3.2 Thorax

The thorax is typically subquadrate with distinct postpronotal lobes, relatively small, semicircular scutellum and large postnotum. Lateral (Fig. 7) and dorsal (Fig. 8) views of the thorax illustrate anatomical features, including bristles, used in descriptions. Zimina (1960) described characters of the thorax (particularly distribution of bristles and shape of prosternum) in support of her tribal classification.

3.2.1 Chaetotaxy

The dorsum of the thorax is typically covered with short setae. Sometimes the setae are strong and extremely short; sometimes fine and moderately long. In contrast the pleura are almost always bare except for bristles. Dorsal bristles are not strong or well-differentiated from other setae in most conopids. However postpronotal, notopleural, post-alar, marginal scutellar, and katepisternal bristles are present in most genera. Supra-alar, intrapostalar, proepisternal, anepisternal and anepimeral bristles occur less frequently. Dorsocentral bristles occur in only Stylogasterinae and the new subfamily described below. The presence or absence of these bristles is a useful diagnostic character at the subfamily and generic levels. Number and size of each type of bristle are frequently useful to assist in species delimitation.

Anepimeral bristles are present in Stylogasterinae, the new subfamily and in one genus of Conopinae (*Physocephala*). Well-developed proepisternal bristles are present in *Stylogaster* and Conopini according to

Smith and Petersen (1987). This statement must be modified when the tribal classification of the Conopidae is reviewed. These bristles occur in all Australian Conopinae except *Physocephala* but I do not believe that all the Australian genera other than *Physocephala* belong in the Conopini. Anepisternal bristles are rare but do occur in *Carbonosicus carbonarius* Kröber (Myopinae); I have found them in two new Australian genera of Conopinae.

3.2.2 Wing

The only synapomorphic wing character state for the Conopidae is the bare R1. Several other characters are almost universal for the family: R4+5 and M strongly convergent apically and usually fused before wing margin (except the fossil, *Palaeomyopa tertiaria* and new subfamily); Sc complete, not fused with R1 (except some Myopinae); cell cu*p* long, acute; and crossvein sc-r present near the apex of Sc (exceptions in most subfamilies).

In descriptions of species of Conopinae I have attempted to indicate relative lengths of the petiole, dm-cu crossvein and CuA2+A1 by comparing the latter two with the petiole. The length of Sc varies; the point along the wing at which it terminates sometimes is a useful diagnostic character. In descriptions Sc length is expressed as a proportion of total wing length. Most frequently it terminates about mid wing length.

The vena spuria of Australian conopines is not often well-developed as a 'vein'. Typically it is represented by a thickening or folding of the wing membrane or by an increased density of microtrichia; it is absent in six endemic genera. Microtrichia cover the entire wing surface and therefore do not provide diagnostic characters of pattern.

Invariably definitions of conopid subfamilies include the relative length of cell cu*p*. Until this study, Conopinae have without exception been characterised by a long cell cu*p* that extends far towards the wing margin and is much longer than cell bm. Several species of *Heteroconops sensu lato*, especially small ones, have a short cell cu*p* that may or may not be accompanied by a loss of crossvein bm-cu (*e.g.* Figs 187, 188). In this group, cell r4+5 is sometimes unusually short and not markedly acute (*e.g.* Figs 184–186).

3.2.3 Vestiture

The cuticle of conopids is usually mainly or entirely dull or matt with a 'dusted' appearance. I have used the term 'pruinose' to describe the surface vestiture that produces this appearance. Species in many genera are characterised by dense golden, yellow or silvery white bands. I used scanning electron microscopy to observe the vestiture in these dense bands compared with the general pruinose areas. Figure 10 shows the contrast between the two types of cuticular vestiture. The right side of the micrograph shows a general covering of finer, sparser cuticular processes than on the left side which is the edge of a dense pruinose band. Two magnifications (Figs 11, 12) of the ultrastructure of processes from the band show their grooved nature which explains the way the vestiture 'shines' at different angles.

3.2.4 Legs

Cuticular colour and extent, density and colour of pruinose areas are the most useful diagnostic features of legs. Many conopine genera, especially in the Conopini, have an apical, oval, densely pruinose patch on the posterior surface of the fore tibia, both anterior and posterior surfaces of the mid tibia, and anterior surface of the hind tibia. The ultrastructure of the vestiture of these patches is similar to that described above (Section 3.2.3). The colour is typically silvery white or yellow and 'shines' at certain angles. The patches occur in both sexes but their function is unknown; perhaps they have a role in courtship behaviour or mate recognition.

A feature common to Australian Conopidae and presumably to the family is the presence of dense microsetae on the anteroventral surface of the fore tibia and tarsus and posterior surface of the hind tibia and tarsus. Colour of these microsetae is usually brown but may be bronze or golden and sometimes diagnostic of species.

Differentiated bristles are the exception rather than the rule in Conopidae; legs are usually entirely short setose. Fore femora may have short stout setae that tend to be diagnostic at the generic level. Short preapical dorsal tibial bristles occur in a few genera *e.g*. *Physocephala*. Short tibial spurs occur in *Stylogaster.* Seven Australian genera of Conopinae have a well-defined row of long bristles on the posterodorsal surface of the mid femur.

3.3 Male postabdomen

3.3.1 External anatomy

Main anatomical features of the male postabdomen are illustrated in Fig. 13. As with many higher Diptera, homology of the sclerites in Conopidae is unclear and the terminology unstable. Brief descriptions of male terminalia of selected members of conopid subfamilies are given by de Meijere (1904), Cole (1927), Steyskal (1957), Griffiths (1972) and Smith and Peterson (1987). The sixth abdominal segment is the protandrium. This is the syntergosternite of Smith and Peterson (1987) and bears spiracles 6 and 7 laterally. The composition of this segment is not clear; Smith and Peterson (1987) regard the main part to represent T7; Griffiths (1972) considers it composed of S7 and S8, with T6, T7 and T8 completely lost; Steyskal (1957) suggests that T6 is the main component. Most authors agree that the narrow, weakly demarcated section across the posterior margin represents S8 (Fig. 13). This sclerite may be demarcated by a groove, may be convex in a different plane to the anterior part of the protandrium and/or may be distinguished by colour or pruinose covering. Sternite 6 is represented by a narrow ventral sclerite fused to the anterior margin of the protandrium on each side. The epandrium (T9) is large and usually expanded laterally. It may bear one or two pairs of surstyli but these are typically not particularly large or conspicuous. The cerci are small and lobe-like except in *Stylogaster* where they are much longer and broader.

Sternite 5 is relatively long and wide and usually much larger than S3–4. The presence or absence of spicules and their distribution on the posterior margin of S5 are useful diagnostic features.

Preliminary studies of external male genitalia of Australian Conopinae have indicated that comparison of gross structure is of limited value diagnostically at the species and generic levels. External and internal genitalic structures are extremely complex and would constitute a complete study in themselves. Such a study was not possible at this time, especially as a consequence of the attention given to characters of the female genitalia (see below). I believe that hypotheses about taxon limits and phylogeny based on an incomplete study of male genitalia is inappropriate. For this reason I have not described male genitalic features in any detail and have not used them extensively in defining genera or species.

3.3.2 Internal anatomy

Internal skeletal structures of Australian Conopinae show limited variation. In all genera the hypandrium is Y-shaped and the aedeagal apodeme elongate and rod-like. The ejaculatory apodeme varies in detail of form but invariably has a flattened circular to ovoid ‘head’ with a rod-like projection at 90°. I have used the term ‘mushroom-shaped’ to describe this form.

3.4 Female postabdomen

3.4.1 External anatomy

The external anatomy of *Stylogaster* has been discussed by several workers including Kotrba (1997), Smith and Peterson (1987) and Stuckenberg (1963); Kotrba and Stuckenberg made special reference to structural modification for oviposition. Segment 5 shows important evolutionary differences between subfamilies. Myopinae, Conopinae and the new subfamily have sternum 5 modified into the female genital plate. In Myopinae the sternite and tergite are separated (Fig. 27); in the other two subfamilies the two sclerites are confluent (Fig. 15) thus forming a ring sclerite with a ventral projection. Sternite 6 is divided into a broad plate that bears

spicules and a posterior, weakly sclerotised section that is typically folded under the anterior plate in dry specimens. Sternite 7 is unmodified, quadrate to rectangular and not visible in dry specimens as it is folded in between S6 and the large anteroventrally-directed T7. Tergite 8 is relatively short and narrow, strongly sclerotised and bears a large black, strongly sclerotised spine on each side. Sternite 8 is short and apparently continuous with T8 laterally. Sternite 9 is bilobed (except anteriorly); each lobe is pad-like and bears short black spicules on and long, strong setae along the posterior and medial margins. Cerci are fused and flattened.

The main external anatomical features of the female postabdomen of Conopinae are illustrated in Fig. 14. Features that have proved useful in diagnosing species include relative lengths and form of segments 5, 6 and 7 (Figs 17, 18a). The female genital plate is remarkably diagnostic especially at the species level. Form, length and colour of the plate, arrangement and numbers of rows of spicules on the female genital plate and S6 (Figs 18b,c), and ultrastructure of spicules have all provided valuable distinguishing characters between species that are sometimes otherwise very similar.

3.4.2 Ultrastructure of spicules

The ultrastructure of the spicules of most species of Conopinae was studied using scanning electron microscopy. Each spicule usually articulates with a raised pedestal that may bear microtrichia and may have a ridge or 'collar' at its distal end below the spicule (Figs 79, 80). Each spicule has a unique pattern of ridges; each may extend to the spicule base or ridges may merge medially to a smooth area. The amount of space between spicules and the microtrichia of the surrounding cuticle also varies between species. Some spicules have a small notch in the basal margin; presence of this may be constant in a genus and is of some value in defining generic characters.

At the beginning of this study I anticipated that ultrastructure of spicules would provide clear evidence of generic limits for Conopinae but found that such evidence was limited. However, the features mentioned above have proved so useful in confirming species limits that I have used ultrastructure of spicules of the female genital plate and S6 in this study as an alternative to detailed study of male genitalia for providing support for species delimitation based on external anatomy.

3.4.3 Internal skeletal structures

Segments 5–7 of the female abdomen have much of the internal space occupied by muscle tissue. At the junction of the anterior edge of the tergite and intersegmental membrane, T5 and T6 each has an internal cuticular flange (phragma) to which muscles attach. The phragma of T5 (Fig. 15) is relatively narrow dorsally, wide laterally, and narrow ventrally. In T6 (Fig. 16) the phragma is not developed dorsally and not fused medially; it is narrow dorsolaterally and widest ventromedially, ending in a narrow flange that projects anteriorly into segment 5. The function of the phragmata is presumably for reinforcement of the genital segments and for providing increased surface area for attachment of muscles associated with reproductive behaviour. Tergite 7 has a large posterior surface from which muscles arise and are inserted on the posterior surface of the T6 phragma. Likewise muscles arising from the anterior surface of the T6 phragma are inserted on the posterior surface of the T5 phragma. In this way maximum strength of genitalic embrace in copulation and ovipositional thrust while grasping a host is achieved. An excellent, detailed account of these muscles and their function is found in Streiff (1906).

3.4.4 Spermathecae

Most conopids have four spermathecae; two on each side with ducts of each pair fusing very close to the spermathecae to form a long, narrow, lateral duct. The exceptions are found in *Stylogaster* and the new Australian conopine genus, *Tanyconops* (Section 4.5.18). These two genera have only a single spermatheca on each side but each is markedly larger than those found in groups that have four spermathecae. Conopine spermathecae show some variation is size, colour and form but most are small, brown and subspherical. In some *Australo-*

conops spp. they are elongate-globular; in some species pale yellow; and in some species of *Pleurocerina* they are ovoid. The spermathecae are usually found between muscles in segment 7 but sometime have very long ducts and are located in segment 6. They enter the common oviduct in the distal part of segment 7.

3.5 Intraspecific variation

Intraspecific variation is one of the most important problems in delineating species. The degree of morphological plasticity inherent in a single species is not understood but many factors are known to influence phenotypic variation, some genetic and others environmental. Characters with large environmental components of variation are generally regarded as less reliable than those with large genetic components. For example, size is known to be largely influenced by environmental factors, whereas shape is thought to be under stricter genetic control and less likely to vary, making it a preferred character (Daly 1985).

Knowledge of the degree to which environmental factors can influence phenotype is useful in understanding limits of variation of species. Nothing is known of the effect of environmental factors on Conopidae but because they are parasitoids they are probably influenced by similar factors as those inducing intraspecific variation in hymenopterous parasitoids. Many studies suggest that non-genetic factors can contribute to a large amount of phenotypic variation (Grissell and Schauff 1990). Some forms of variation know to occur in Hymenoptera (and therefore perhaps in Conopidae) are:

i. colour changes induced by difference in temperature of host locality;
ii. seasonal dimorphism;
iii. host-induced variation; different hosts, or different sizes of the same host species may cause the progeny of the same female or species to vary morphologically.

Müller *et al.* (1996) found evidence that conopid-parasitised bumble bees are on average larger in body size than unparasitised bees. This differential parasitism suggests active host choice by conopids and supports independent evidence that conopids develop more successfully in larger, rather than smaller, individuals of a host species. Induced morphological differences in the parasite may include changes in colour, cuticular vestiture, body size and relative sizes of parts of a structure, e.g. antennal segments.

Establishing the limits of morphological variation for species of Conopinae was made especially difficult because of the frequent absence of series of specimens from single localities or regions. Sometimes a few specimens from disparate localities were very similar and probably conspecific. However, with no available specimens from intermediate localities, slight differences in character states led to difficulty in determining what constituted individual variation versus species-delineating differences.

Sexual dimorphism is a form of intraspecific variation. Unlike hymenopteran parasitoids, Conopidae rarely show sexual dimorphism and even when it is present, it is not marked. This means that associating sexes of Conopidae is usually not difficult.

4. Alpha taxonomy

The taxonomy of Australian Conopidae has been only sporadically studied and no comprehensive work is available. Smith (1989) lists 56 species in 15 genera. Many of the nine genera and 32 species described by Kröber (1915a,b; 1916; 1919a; 1939b; 1940) were based on a single specimen or very few specimens. However my studies have found that with few exceptions his genera and species are valid and have formed an excellent foundation for a revision of the Australian fauna. Of the previously described taxa I recognise 54 species and 14 genera.

The Australian fauna belongs in four subfamilies: Conopinae, Myopinae, Stylogasterinae, and a new subfamily, Notoconopinae. Dalmanniinae do not occur in Australia. This subfamily is included in the key below but will not be discussed further.

The taxonomic revision that follows has a heavy focus on the Conopinae that comprise by far the largest component of the Australian conopid fauna. Even so a complete revision of the Conopinae has not been achieved at this time with some species in four genera still awaiting description. In addition, seven new species in the two genera of Myopinae also await description.

4.1 Key to subfamilies of extant Conopidae

1. Antenna with terminal stylus (Fig. 1) ..... **Conopinae**
-. Antenna with arista (Figs 33, 34) ..... 2.
2. Arista subapical; face with prominent median keel, antennal foveae absent (Fig. 27); haustellum very long and thin, geniculate about mid-length; labella setaceous; crossvein sc-r present (Fig. 21); cell cu*p* rounded apically; female with posteriorly directed, elongate ovipositor (Fig. 24) ..... **Stylogasterinae**
-. Arista dorsal; face without prominent median keel, usually with antennal foveae separated by a variably developed carina; mouthparts otherwise, labella never setaceous; crossvein sc-r absent; cell cu*p* acute apically; female with relatively short, anteroventrally directed ovipositor ..... 3.
3. Veins R4+5 and M convergent apically (Fig. 20); haustellum long, usually geniculate about mid length ..... 4.
-. Veins R4+5 and M not convergent apically (Fig. 31); haustellum absent; oral cavity without trace of mouthparts ..... **Notoconopinae** subfam. nov.
4. Cell cu*p* usually not much longer than cell bm; male with 5 unmodified abdominal segments; female with an elongate, blade-like ovipositor, genital plate almost always absent ..... **Dalmanniinae**
-. Cell cu*p* usually much longer than cell bm (Fig. 19); male with 6 unmodified abdominal segments; female with a short, stout ovipositor, usually with well-developed genital plate (Figs 28, 30) ..... **Myopinae**

4.2 Myopinae

4.2.1 Introduction

The Myopinae have not radiated to any great extent in Australia. Only two genera, *Myopa* Fabricius and *Thecophora* Rondani, are represented and each has one described and several undescribed species. Both genera belong in the Myopini as defined by Zimina (1960). Diagnoses of the subfamily, *Myopa* and *Thecophora*, and the described species are provided below. Five new species of *Myopa* and two new species of *Thecophora* have been determined and will be described at a later date.

4.2.2 Subfamily diagnosis

Three ocelli present. Vertical bristles present but relatively weak. Eyes slightly protruding posterodorsally. First flagellomere of antenna short with a two-segmented arista arising at about middle of dorsal surface. Palpus present; haustellum geniculate at about mid length (except *Neozodion*, *Robertsonomyia* and *Zodion*) and at base; labella usually strap-like (Fig. 5). Mesonotum with differentiated bristles but these not markedly long and strong. Prosternum usually narrow, bilobed posteriorly. Crossvein sc-r usually absent; Sc usually joined to R_1 apically by intervening sclerotisation; R_1 fused with costa along a considerable distance; cell r_{4+5} typically narrowly open; vena spuria absent; cell cu*p* elongate, much longer than cell bm. Abdomen not noticeably constricted basally; T2 longest tergite; T6 only longer than T5. Female with T7 large and coniform; T8 much reduced; ovipositor short; S5 modified into female genital plate; T5 separated from S5 by pleural membrane (Fig. 30); 4 small, subspherical spermathecae present. Male with sixth apparent abdominal segment large, not markedly smaller than preceding segment; hypandrium Y-shaped; surstyli present; ejaculatory apodeme small, mushroom-shaped; plate-like process present posterodorsal of hypandrium (possible vestige of S10).

4.2.3 *Myopa* Fabricius

Introduction
Myopa spp. are distinctive at the generic level but often difficult to distinguish at the species level. They have a general appearance very different from *Conops* spp. but nevertheless the apomorphies *Myopa* shares with *Conops* were recognised by Linnaeus who described *C. buccatus*, the type species of *Myopa*, in the same paper as he described *Conops* (Linnaeus 1758).

Genus *MYOPA* Fabricius (Figs 19, 22, 28, 29)

MYOPA Fabricius, 1775: 798. Type species: *Conops buccatus* Linnaeus, 1758, des. Curtis, 1838.

Diagnosis
Predominantly yellow-brown to reddish brown species with silvery pruinose markings. Eyes relatively small; vertex not demarcated from occiput and frons; antenna shorter than frons length; first flagellomere short, rounded; arista short; face without antennal foveae and median carina; frontoclypeal tubercle broad, obtuse; cheek with ridges, retuse, height usually at least as high as eye height; palpus comparatively long; filiform. Mesonotum setose, without well-differentiated bristles; proepisternum bare above prepst bristles; katepisternum setose; all femora robust, with antero- and posteroventral row of short, black spicules on distal half; fore and mid tibiae with posteroventral row of short, black spicule-like setae on basal half; wing (Figs 19, 22) relatively broad and longer than abdomen; cell r4+5 narrowly open. Abdomen concave ventrally; more or less dorsoventrally flattened; T2 and T3 each broader than long; female genital plate often small (Fig. 28); epandrium short, cone-shaped; ejaculatory apodeme small, mushroom-shaped; two pairs of surstyli present, without strong bristles on margin.

***Myopa ornata* Kröber**

Myopa ornata Kröber 1940: 80.

Diagnosis
Reddish brown, densely setose species; length about 6.5 mm. Head with whitish, very fine, moderately long setae; antenna short, about half head length, mainly reddish brown, scape as long as wide; first flagellomere black with orange basomedial patch; arista black; palpus tan, about 2x diameter of haustellum base; haustellum short, each segment about as long as head length. Mesonotum with four longitudinal shiny bands separated by narrow yellowish brown pruinose bands; legs mainly reddish brown with apices of femora and tibiae blackish; wing hyaline. Abdomen with fine, dense, black setae; T2–4 white pruinose posteriorly and laterally.

4.2.4 *Thecophora* Rondani

Introduction
The name *Occemya* Robineau-Desvoidy 1853, with various emendations and errors in spelling, was widely used for this genus until about 1960. However *Occemya* is a junior synonym of *Thecophora* Rondani 1845. This synonomy was overlooked previously but *Thecophora* is now accepted as the valid name for this genus.

Genus *THECOPHORA* Rondani (Figs 5, 20, 23, 30)

THECOPHORA Rondani 1845: 15. Type species: *Myopa atra* Fabricius, 1781, monotypy.

OCCEMYA Robineau-Desvoidy, 1853: 130 (*Occemyia*, *Oncomyia*: emendations; *Eccemyia*: error). Type species: *Myopa atra* Fabricius, 1781, original designation.

Diagnosis

Mainly black or blackish grey, setose species. Head relatively thin; setae of head mainly long, erect and not dense; antenna usually as long as frons; antennal foveae weakly developed; facial carina absent or weak; cheek height usually distinctly less than half eye height; palpus narrowly elongate; haustellum long, geniculate about mid length. Prothorax densely pruinose; proepisternum setose above prepst bristles; legs, especially femora robust; with antero- and posteroventral row of short, black spicules on distal half; wing (Fig. 20) with cell r4+5 narrowly open. Abdomen usually slender, club-shaped, ventrally concave; female genital plate usually relatively small and broadly rounded apically (Fig. 30); epandrium short, cone-shaped; ejaculatory apodeme small, mushroom-shaped; one pair of surstyli present, with short strong bristles on anteroventral margin.

***Thecophora australiana* (Camras)**

Occemyia australiana Camras, 1955: 124.
Thecophora australiana (Camras)—Camras 1961: 76.

Diagnosis

Occiput black dorsally, becoming yellowish ventrally, entirely white pruinose; vertex and frons posteriorly blackish brown; frons yellowish orange anteriorly; antennae blackish brown apically on scape, dorsally on pedicel, dorsally and apically on first flagellomere, otherwise yellow; first flagellomere and pedicel equal length, 2x scape length; arista blackish brown; palpus longer than diameter of base of haustellum; clavate. Thorax and abdomen black except for partially yellow legs, including yellow fore coxa; extensively white pruinose. Abdomen with distinct white pruinose posterolateral bands on T2–4. Female genital plate as long as wide.

4.3 Notoconopinae subfam. nov.

Type genus: *Notoconops* gen. nov.

4.3.1 Introduction

Two specimens (a male and a female) of a remarkable new species of Conopidae were discovered in material examined in this study. The female is pinned, somewhat damaged and missing a wing; the male is preserved in ethanol. Nevertheless I am convinced they are conspecific. Their general appearance is somewhat reminiscent of that of the Baltic amber *Palaeomyopa tertiaria* and very different from any extant Conopidae. The species possesses the following character states apomorphic for the Conopidae (autapomorphies are marked *):

- pedicel of antenna without dorsal notch;
- *prosternum bilobed and slightly expanded posterolaterally;
- anepisternum bare;
- R_1 bare;
- *mid coxal prong absent;
- *female with segments 5–8 highly modified, anteroventrally directed;
- female genital plate present.

Other character states typical of Conopidae include:

- vibrissae absent;
- C without humeral or subcostal breaks;
- Sc separate from R_1;
- Cell cu*p* acute;
- A_1 complete to wing margin.

Based on the possession of the above character states, I believe the species belongs in the Conopidae. However it cannot be placed in any currently recognised subfamily and is assigned to a new subfamily described below.

4.3.2 Subfamily diagnosis

Vertex not demarcated from frons; with strong inner and outer vertical and postvertical bristles. Ocellar triangle with three ocelli and differentiated ocellar bristles. Eyes large, elongate-oval; distinctly dimorphic, male eyes approaching holoptic condition. Frons of female (Fig. 33) with large shiny median plate expanding laterally and anteriorly from ocellar tubercle; frons otherwise velvety; frons of male (Fig. 32) velvety, narrow; mesofrons deeply emarginate anteriorly in both sexes. Antenna short, aristate; arista very fine, long, apparently two-segmented. Mesofacial concave for reception of antennae but carina poorly developed. Subcranial cavity large, membranous, with small lightly sclerotised median sclerite that may represent clypeus; mouthparts otherwise entirely absent. Thorax with strong differentiated bristles; otherwise bare. Prosternum bifurcate posteriorly, posterolateral corner somewhat projecting. Wing (Fig. 31) with sc-r crossvein absent; vena spuria absent; cell r4+5 widely open; cell cu*p* slightly acute, about as long as cell bm; CuA2+A1 long, discernible to wing margin. Abdomen relatively short and broad. T2 the longest but not especially longer than other tergites. S1–4 well-developed. Female with S5 modified into genital plate; T5 separated from S5 by pleural membrane. T7 short, broad. Four spermathecae present. Male with sixth apparent abdominal segment large. Surstyli absent. Hypandrium broadly Y-shaped with short fused section. Cerci and aedeagus small.

4.3.3 *Notoconops* gen. nov.

Introduction

The choice of characters assigned to the generic level as distinct from the species level is based on characters used to define genera in Conopinae. With only one species known in this subfamily and genus the selected characters could need modification should more species of Notoconopinae be found.

Genus *NOTOCONOPS*, gen. nov. (Figs 31–33)

NOTOCONOPS gen. nov. Type species: *Notoconops alexanderi* sp. nov.

Diagnosis

Occiput concave dorsally, convex ventrally; antenna short, with broadly conical pedicle, subspherical first flagellomere, and arista arising mid-dorsally; frontoclypeal tubercle high on face so that subcranial cavity inverted-V shaped anteriorly. Thorax strongly convex dorsally with well-differentiated bristles; otherwise bare; haltere large. Abdomen relatively compact; tergites with long erect bristles; male S5 without spicules.

Description

Head. Occiput concave dorsally, convex ventrally; with a row of moderately long and strong postocular setae dorsally. Median occipital sclerite confluent with frons dorsolaterally. Vertex with ocellar tubercle prom-

inent; occupying median third in female (Fig. 33); about half width in male (Fig. 32). Ocellar tubercle with three large round ocelli and three pairs ocellar bristles. Frons of female about as wide as eye. Fronto-orbital region not demarcated; with differentiated fronto-orbital setae. Lunule not protruding anteriorly. Eyes with facets of both sexes uniform size. Antennal scape very short, not easily visible in available specimens; pedicle broadly conical; first flagellomere subspherical; arista arising mid-dorsally. Mesofacial dark brown. Face not conspicuously setose. Parafacial and facial ridge poorly defined, velvety. Parafacial narrow but projecting at about 90° to anterior eye margin. Facial ridge short, extending about half length of parafacial. Frontoclypeal tubercle high on face so that subcranial cavity inverted-V shaped anteriorly.

Thorax. Strongly convex dorsally. Mesonotum with npl, spal, pal, dc, marginal sctl bristles as well as several short setae in region of transverse suture. Scutellum small, semicircular. Subscutellum concave. Pleural bristles present: proepisternal, katepisternal, anepimeral. Legs long, relatively thin. Mid femur without defined row of longer setae on posterodorsal margin. Fore and mid tibiae without apical, oval pruinose patch. Preapical, dorsal tibial bristles absent. Anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus with moderately dense microsetae. Wing (Fig. 31) hyaline. Sc ending a little proximal of mid length of wing. R_1 ending far beyond apex of Sc; not extending along costa to end a little before R_{2+3}. Haltere long; capitellum large.

Abdomen. Tergites without distinct pruinose bands. Female with long erect bristles on all tergites; most bristles of male broken or missing but generally shorter than those of female. T1 without lateral lobes, narrower than T2; lateral bristles no longer or stronger than those of other tergites. Tergites broader than long. S1–4 relatively large.

Female. T5 and T6 short, broad. T7 rounded posteriorly. Posterior margin of T6 straight. Cerci small, possibly not fused but this difficult to see clearly.

Male. T5 longer than protandrium. S8 demarcated from anterior part of protandrium by faint suture. Epandrium short, flat. Cerci small, rounded. Aedeagus short. S5 without spicules.

Etymology. The generic name is masculine and is derived from the Greek *notos* (= south), referring to the apparent restricted Australian distribution of the genus.

Notoconops alexanderi, sp. nov. (Figs 31–35)

Type material. Holotype. ♀, **New South Wales**: Clyde Mtn, East slope, 12.i.1961, D. H. Colless (ANIC). Paratype. 1♂, **New South Wales**: Barren Grounds Fauna Res. nr. Jamberoo, 11–12.i.1986, G. A. Holloway, Malaise trap (AM).

Diagnosis

Almost entirely brown; about 3 mm long. Ocellar tubercle and median frontal plate (female only) brown; frons otherwise dark velvety brown; antennae short, compact; arista long, bare. Mid and hind tibiae expanded distally; wing broadly rounded; haltere about as long as T1+2.

Description

Head (Figs 32, 33). Occiput dark brown with short, moderately fine, dark brown setae laterally; otherwise bare. Median occipital sclerite slightly more convex than surrounding surface of occiput. Vertex and setae dark brown. Ocellar tubercle raised above plane of vertex; smooth, shiny; ocellar bristles of uneven length. Ocellar tubercle and median frontal plate of female brown; frons otherwise dark brown, velvety. Fronto-orbital region with about 5 fronto-orbital setae, posterior one long, moderately strong; mesofrons with numerous short setae anteriorly in both sexes. Eyes about 0.9x head height. Antenna (Fig. 34) brown, about 0.25x head height; ratio of segment lengths about 1:3:3. Arista bare, basal segment very small. Mesofacial dark

brown. Parafacial and facial ridge pale brown; parafacial slightly wider than facial ridge. Epistomal margin with moderately long, dark brown, fine setae. Cheek dark brown, very narrow. Postgena brown, with short setae.

Thorax. Brown, finely pale brown pruinose. Postpronotal lobe with 1 long strong bristle and several shorter weaker setae. Mesonotal bristles present: 2 npl, 1 longer and stronger than the other; 1 spal; 2 pal; 3 dc; and 2 marginal sctl as well as several short setae in region of transverse suture (Fig. 35). Proepisternum with 1 moderately long, strong, dorsally-directed bristle. Katepisternum with 1 long and 1 or 2 short bristles. Anepimeron with 1 long and 1 or 2 shorter bristles. Legs with bases and apices of femora and tibiae and most of tarsi pale brown; otherwise brown. Setae of coxae and trochanters moderately long; all femora long setose ventrally. Microsetae of fore and hind tibia and tarsus golden brown. Mid and hind tibiae expanded distally. Wing (Fig. 31) broadly rounded; almost as long as entire fly. Haltere pale yellow, as long as T1+2.

Abdomen. Medium brown. T1–5 pale brown pruinose; without distinct pruinose bands. S3,4 with several long bristles.

Female. T6 very broad, extending below level of lower margin of T7. T6 and T7 shiny brown. Female genital plate apparently relatively weak, thin anteroposteriorly, apical half broadly triangular, not much longer than wide; spicules large, only on apex. S6 covered with large spicules.

Male (Fig. 31). T5 and protandrium finely pruinose. S8 shiny, short, about same width as epandrium. Epandrium shiny, pale brown; lower lateral margin with minute setae. S5 large, short setose.

Measurements. Total length = 2.8 mm (3.3 mm); wing length = 2.8 mm (3 mm).

Distribution. Eastern New South Wales.

Comments. The apparent difference in body length:wing length ratio between the male and female may be a result of the differences in preservation of the two specimens. Abdominal tergites, especially T4–6, of the pinned female appear to have folded into one another to a considerable extent thus causing the total length of the dry specimen to be less than it would be in a live specimen.

Etymology. The specific epithet honours Alexander Gordh, son of Gordon Gordh whose on-going encouragement and support played a significant role in the completion of this revision.

4.4 Stylogasterinae

4.4.1 Introduction

The taxonomic status of the Stylogasterinae has been a matter of some uncertainty because in general appearance and behaviour they are distinctive from other Conopidae. Some authors have insisted that the taxon represents a separate family (*e.g.* Rohdendorf 1964) but currently it is generally accepted as a subfamily of Conopidae. Studies of the prosternum of representatives of all conopid subfamilies by Speight (1969) found the greatest difference between Conopinae and the other three subfamilies. He commented that the degree of similarity between the prosternal shape of Myopinae, Dalmanniinae and Stylogasterinae suggests a good monophyletic group and that the character does not support family status for Stylogasterinae. Five autapomorphies for the Conopidae were listed by J. McAlpine (1989); Stylogasterinae possess all five. Stylogasterines are surprisingly uniform in their external morphology and only one genus is recognised despite the subfamily's distribution in all zoogeographic regions except the Palaearctic.

4.4.2 Subfamily diagnosis

Vertex usually defined as an narrow ovoid plate with one pair of long, strong postocellar bristles. Three ocelli present; frontal plate typically large, shiny, surrounded laterally and anteriorly by matt, velvety frons. Eye large, height about equal to head height. First flagellomere of antenna usually short with dorsoapical arista. Face with a prominent median keel and antennal foveae lacking. Cheek narrow. Palpus absent. Haustellum

geniculate at base and about middle; with long, setaceous, multi-segmented labella. Thorax with distinct long, strong bristles. Legs, including coxae, long and thin; tibiae with short spurs; pulvilli weakly developed. Wing with sc-r crossvein present; cell r4+5 closed; vena spuria absent; cell cu*p* shorter than cell bm. Abdomen elongate, narrow; S1–4 absent. Female without genital plate; ovipositor (Figs 24–26) long, posteriorly-directed, three-segmented with short T6 forming base of ovipositor; sometimes suture between T6 and T7 indistinct; 2 spermathecae present; cerci large, elongate, not fused, forming claspers in male. Male with sixth apparent abdominal segment large; one pair of surstyli present; ejaculatory apodeme very large, longer than surstylus; hypandrium Y-shaped.

4.4.3 *Stylogaster* Macquart

Introduction

Smith (1979) presented the first and only review of Australian *Stylogaster*. He described two species, *S. macalpini* and *S. frauci* from mainland Australia and one, *S. liepae* from Lord Howe Island. I have examined *Stylogaster* specimens from numerous Australian collections and have been unable to determine additional species. The genus is restricted to eastern Australia. Available collection data indicate that *S. macalpini* is widely distributed from northern Queensland to Tasmania while *S. frauci* is confined to eastern Queensland. A new species has recently been collected in New Caledonia. This is the second record for Conopidae from the Pacific islands. The species from New Caledonia is different from *S. liepae* and will be described in the near future. A diagnosis only for the genus is provided but species are not redescribed because I consider Smith's descriptions adequate. A key to the Australian species is provided.

Genus STYLOGASTER Macquart (Figs 6, 21, 24–27)

STYLOGASTER Macquart 1835: 38. Type species: *Conops stylatus* Fabricius, 1805, monotypy.

Diagnosis

Lateral ocelli round; frontal plate usually rounded anteriorly and long, sometimes reaching to ptilinal suture, clearly demarcated from surrounding surface of vertex; ocellar bristles present or absent; frons smooth, without transverse grooves; fronto-orbital bristles short but usually well-differentiated; eyes with anterior ommatidia enlarged, especially in female (Fig. 27); pedicel of antenna with anteromedial flange that articulates with medial surface of first flagellomere; first flagellomere with arista arising much closer to apex than to middle of dorsal surface; facial keel silvery pruinose; haustellum jointed distal of mid length. Mesonotum with long, strong black npl, spal, pal, prescutellar dc and marginal sctl bristles; proepisternum with 1 white bristle; anepimeron with 1 long, strong black bristle and 1 to 3 very short black setae near base of bristle; pleura otherwise bare; mid femur with posterodorsal row of long fine setae; wing (Fig. 21) with Sc ending at most about one-third along wing length; M and R4+5 fusing at or just before wing margin; r-m crossvein far beyond mid length of cell dm. Abdomen entirely narrow, not markedly constricted basally.

Key to Australian species of *Stylogaster*

1. Abdominal T2–4 yellowish with blackish brown band across posterior margins; proepisternal seta short and fine; one pair of fine short ocellar setae present . . . . . 2.
-. Abdominal T2–4 mainly dark yellow, without blackish band across posterior margins; proepisternal seta long, relatively strong; ocellar setae absent; eastern Queensland (Figs 24, 25) . . . . . ***frauci*** Smith
2. Frons yellowish brown anteriorly; Lord Howe Island . . . . . ***liepae*** Smith
-. Frons entirely blackish brown; eastern Australian mainland and Tasmania (Fig. 26) . . . . . ***macalpini*** Smith

4.5 Conopinae

4.5.1 Introduction

The Australian Conopinae comprise approximately 90% of the estimated 150 species of Conopidae in this country. The subfamily has radiated dramatically in Australia. Fifteen genera are now recognised but only two occur in other world regions. Four new genera (*Atrichoparia*, *Camrasiconops*, *Setosiconops* and *Tanyconops*) and 44 new species are described below. A total of 94 species are described or redescribed. I estimate an additional 40 species of *Atrichoparia*, *Camrasiconops*, *Heteroconops* and *Microconops* await description; the majority are *Heteroconops*.

Incorporating the synonymies and additions presented below, Conopinae worldwide now consist of 34 genera. The most obvious autapomorphy is the presence of an antennal stylus rather than an arista. The diversity of character states demonstrated by the Australian genera has made diagnosis of the subfamily difficult. Exceptions to many character states previously attributed to the Conopinae are found in one or more Australian genera. This point is illustrated in Table 1.

Many conopine genera from other regions have been examined in conjunction with this study. However similar exceptions to those indicated in Table 1 may be characteristic of some non-Australian genera and are here overlooked.

TABLE 1. Conopine character states and Australian exceptions.

Typical character state	Australian exception
ocelli absent	ocelli present in 11 genera
stylus three-segmented	stylus two-segmented in 9 genera
cell cu*p* elongate	cell cu*p* short (some *Heteroconops*)
cell r4+5 long, pointed apically	cell r4+5 short, broad apically (*Heteroconops* and *Atrichoparia*)
vena spuria distinct	vena spuria almost indiscernible in 6 genera
cells bm and dm separated by crossvein	cells bm and dm confluent (some *Heteroconops*)
anepisternal bristles absent	anepisternal bristles present (*Setosiconops* and *Tanyconops*)
female T7 robust, coniform	female T7 dorsoventrally flattened (*Tanyconops*)
4 small spermathecae	2 large spermathecae (*Tanyconops*)

4.5.2 Subfamily diagnosis

Head without well-defined bristles. Vertex usually clearly demarcated from frons. Antenna longer than frons, with two- or three-segmented stylus. Eyes not dimorphic. Antennal foveae and facial carina often well-developed; frontoclypeal tubercle prominent, more or less pointed. Palpus small or absent. Haustellum geniculate only at base, usually as long as or longer than head; labella short, ovoid. Mesonotum covered with short setae and usually with differentiated bristles (some or all of npl, spal, ial, pal, ipal and marginal sctl) but these never very strong and long. Proepisternum with or without prepst bristle(s) but otherwise bare; anepisternum and anepimeron usually bare; katepisternum usually with one or more bristles; pleura otherwise bare. Wing with cell r4+5 long, pointed apically; vena spuria usually distinct; cell cu*p* elongate, much longer than cell bm; sc-r crossvein present, almost always a little before apex of Sc. Abdominal T1 usually with lateral lobes bearing long, dense bristles. Female T5 confluent with S5 which is modified into genital plate bearing black spicules; S6 partially covered with spicules; T7 usually robust, coniform; cerci small, fused; usually 4 small sclerotised spermathecae present. Male with sixth apparent abdominal segment large, not markedly smaller than preceding segment; epandrium relatively broad and flattened; cerci small, rounded; surstyli absent; hypandrium Y-shaped; ejaculatory apodeme small, mushroom-shaped.

4.5.3 Key to genera of Australian Conopinae

1. Occiput pale yellow ventrally, dark brown to black dorsally; wing completely hyaline (*e.g.* Figs 316–320); setae of mesoscutum not extremely short (Fig. 321) . . . . . 2.
-. Occiput not distinctly pale ventrally and dark dorsally; wing with dark brown areas (rarely only faintly brown anteriorly or hyaline) (*e.g.* Figs 69–72); setae of mesoscutum extremely short (Fig. 258). . . . . 12.
2. Costa weakened and bare for a short distance before apex of petiole (Fig. 320); female T7 dorsoventrally flattened, very elongate (Fig. 321); female genital plate expanded, membranous apically (Fig. 327); male epandrium longer than wide (Fig. 326) . . . . . ***Tanyconops*** gen. nov.
-. Costa complete, with strong microsetae as far as apex of petiole (Figs 316–319); female T7 stout, length similar to height of T6 (Fig. 14); female genital plate not membranous apically (Fig. 14); male epandrium usually wider than long (Fig. 13) . . . . . 3.
3. Petiole of cell r4+5 longer than length of discal crossvein (Figs 317–319); vein M meeting R4+5 at about 90° (Figs 317–319) . . . . . 4.
-. Petiole of cell r4+5 shorter than, or at most as long as, length of discal crossvein (Figs 152–154); vein M meeting R4+5 at an acute angle (Figs 152–154) . . . . . 6.
4. Haustellum long, at least 1.5 times as long as head length (Fig. 309) . . . . . ***Smartiomyia*** Kröber
-. Haustellum short, at most as long as head length (Fig. 194) . . . . . 5.
5. Antenna distinctly shorter than head height; first flagellomere broad and markedly convex ventrally, narrowly tapered distally (figs 36, 37); female postabdomen bulbous, broader than preceding segments; female genital plate broad basally, narrowly pointed apically (Fig. 77); male S5 without spicules . . . . . ***Atrichoparia*** gen. nov.
-. Antenna about as long as head height; first flagellomere spatulate, at least 3x length of pedicel (Figs 193–195); female postabdomen not especially broader than preceding segments; female genital plate broadly rounded apically; male S5 with posterior band of spicules (Figs 196, 197) . . . . . ***Heteroconops*** Kröber
6. Ocelli absent; frons distinctly setose. . . . . ***Setosiconops*** gen. nov.
-. Ocelli present; frons bare or with few scattered minute setae . . . . . 7.
7. Three ocelli present. . . . . 8.
-. Two ocelli present . . . . . 10.
8. Palpus present (Fig. 134); parafacial not strongly projecting, sloping medially from eye margin; facial ridge short, narrow; mesoscutum with very short setae. . . . . ***Camrasiconops*** gen. nov. (part)
-. Palpus represented by small setose swelling (Fig. 202); parafacial projecting at 90° to anterior eye margin; facial ridge long, broad, flat, with many narrow grooves (Fig. 144); mesoscutum with moderately short to moderately long setae. 9
9. Clypeus bare; antennal stylus three-segmented (Figs 146, 149); thorax densely pubescent; female T7 with anteromedial notch. . . . . ***Chrysidiomyia*** Kröber
-. Clypeus usually setose (Fig. 202); antennal stylus two-segmented (Fig. 201); thorax at most partially pruinose; female T7 with anterior margin straight . . . . . ***Neoconops*** Kröber
10. Stylus two-segmented; petiole of cell r4+5 longer than length of discal crossvein . . . . . ***Delkeskampomyia*** Kröber
-. Stylus three-segmented; petiole of cell r4+5 shorter than, or at most as long as, length of discal crossvein (Fig. 307) . . . . . 11.
11. Frons smooth (Fig. 198); 1 prepst bristle present (Fig. 8); fore and mid tibiae with shiny pruinose patch; T1 distinctly wider than T2 . . . . . ***Microconops*** Kröber
-. Frons transversely grooved; 2 prepst bristles present; fore and mid tibiae without shiny pruinose patch; T1 about same width as T2 . . . . . ***Stenoconops*** Kröber
12. Anepimeral bristles present (Fig. 8); hind femur and tibia of irregular shape, bent along length (Fig. 223); cell r4+5 broad apically, M meeting R4+5 at about 90° (Figs 230–232). . . . . ***Physocephala*** Schiner
-. Anepimeron bare; hind femur and tibia not bent along length; cell r4+5 tapered apically, M meeting R4+5 at an acute angle1 . . . . . 3.
13. Antenna with first flagellomere usually shorter (never longer) than pedicel (Fig. 150); fore and mid tibiae with shiny pruinose patch1 . . . . . 4.
-. Antenna with first flagellomere longer than pedicel (Fig. 134); fore and mid tibiae without shiny pruinose patch 15.
14. Two ocelli present; palpus present (Fig. 39). . . . . ***Australoconops*** Camras
-. Ocelli absent; palpus absent (Fig. 150) (rarely vestigial) . . . . . ***Conops*** Linnaeus

15. Palpus absent; frons flat, grooved (Fig. 250); mid femur with defined posterodorsal row of long setae . . . . . ***Pleurocerina*** Macquart
-. Palpus present; frons tuberculate anteriorly (Fig. 136); mid femur without defined posterodorsal row of long setae . . . . . ***Camrasiconops*** gen. nov. (part)

4.5.4 *Atrichoparia* gen. nov.

Introduction

The type species of this genus was described in *Heteroconops*. Even though revision of *Heteroconops* is not complete in this paper, all species previously described as *Heteroconops* have been studied. *Heteroconops curticornis* differs significantly from all other species of the genus *sensu stricto*, especially in the antennal and female genital plate shapes, presence of a bulbous female postabdomen and absence of setae on the cheek and postgena. Several additional species of this genus await description.

Genus ATRICHOPARIA, gen. nov. (Figs 37, 77)

ATRICHOPARIA, gen. nov. Type species: *Heteroconops curticornis* Kröber, 1940

Diagnosis

Occiput brownish black dorsally, whitish ventrally; three ocelli present; frons transversely grooved; first flagellomere markedly convex ventrally, narrowly tapered distally; stylus two-segmented, apical segment spike-like; cheek and postgena bare or only minutely setose; palpus absent. Mesonotal setae erect, moderately long. Abdomen slender; female postabdomen broader than preceding segments; female genital plate narrowly pointed.

Redescription

Head. Occiput brownish black dorsally, pale whitish yellow ventrally; setae sparse, very short, fine, brown, on dorsal half, white on ventral half, appressed. Median occipital sclerite brownish black, extending laterally to eye margin; setae moderately long, strong. Vertex bare, not raised above plane of frons, much shorter than frons, margins difficult to define. Ocellar bristles absent; three ocelli present, median round, lateral ovoid. Frons (Fig. 37) strongly rugose, transverse ridges extending on to anterior projection; width about 2x median length; extending anteriorly lateral of antenna; fronto-orbital region forming a narrow rounded, smooth ridge, without differentiated setae; frons bare or with few fine, short setae. Eye elongate oval. Antenna distinctly shorter than head height. First flagellomere length less than 2x combined length of scape and pedicle; stout basally, strongly pointed apically. Stylus two-segmented; basal segment plump, broadly projecting medially; apical segment spike-like. Face relatively narrow, more or less bare. Parafacial projecting anteriorly. Anterior extension of frons reaching down face to about half eye height. Facial ridge long, grooved. Antennal foveae deep, narrow, parallel. Facial carina shallow, height less than half depth of foveae. Frontoclypeal tubercle large but only slightly projecting beyond margins of foveae. Cheek relatively broad, concave, lower margin horizontal, meeting ventral end of facial ridge at about 90°. Postgena markedly projecting down below level of cheek. Cheek and postgena bare or at most minutely setose. Palpus absent. Haustellum sclerotised, about same length as head length, fitting into narrow subcranial cavity when retracted. Labellum lobe-like, not broader than haustellum.

Thorax. Dull blackish brown, with some silvery pruinose areas and moderately long, strong, erect setae over entire surface. Differentiated mesonotal bristles: npl, pal, ipal and scutellar. One prepst bristle and 1 or 2 kepst bristles. Mid femur without distinct row of longer setae on posterodorsal margin. Tibiae without apical, pruinose patches. Wing completely hyaline; R_1 extending along costa to end a little before R_{2+3}; vena spuria absent; cell r_{4+5} short; petiole much longer than dm-cu.

Abdomen. Blackish brown, finely brown pruinose. Sender, more or less parallel sided, cylindrical, segments longer than wide; segments 5 and 6 of female broader than preceding segments, at least in dry specimens, giving appearance of apically bulbous abdomen. Pruinose bands diffuse, not distinct. T1 slightly wider than T2, relatively long; with numerous long, curved bristles laterally. S1–4 elongate, well developed.

Female. Posterior margin of T6 straight, not produced posteriorly; T6 shorter than T4. T7 height slightly greater than that of T6. T8 shiny dark brown. Female genital plate broad basally, strongly tapered apically (Fig. 77); spicules short, conical; spicules on female genital plate and S6 not arranged in defined rows.

Male. Protandrium short, broadly rounded; dorsal length much less than length of T5. S8 short, narrower than epandrium; clearly demarcated from anterior part of protandrium. Epandrium wider than long. S5 without spicules.

Measurements. Total length = 3.0–6.2 mm; wing length = 1.9–3.9 mm.

Etymology. The name is neuter. It is derived from the Greek words *a* (= not, without), *trichos* (= hair) and *pareion* (= cheek) and refers to the bare, or almost so, cheek and postgena of all species in this genus.

Atrichoparia curticornis (Kröber), comb. nov. (Figs 36, 37, 57, 78)

Heteroconops curticornis Kröber 1940: 69.

Type material. Holotype (examined) ♀, **L1**: Type; **L2**: Heteroconops curticornis, Kröb. examined & det. O. Kröber, 1938.; **L3**: Heteroconops curticornis Krb [hand written pencil]; **L4**: Yanchep. 32 mls. N. of Perth. 3–19.xii.1935; **L5**: TYPE; **L6**: W. AUSTRALIA: R. E. Turner. B.M.1936-28. (NHM).

Additional material. **Western Australia**: 1♂, 1♀, Dongarra, 26.ix–3.x.1933 (NHM); 1♂, 16 km NW Eneabba, 29°49'S 115°16'E, 9–12.ix.1987 (WAM); 1♂, 30 W of Coolgardie, 29.x.1958; 2♂, 2♀, 25 S Coolgardie, 28.x.1958 (all ANIC); 5♂, 1♀, Wembley, 21.x;2.xi.1961 (WAM); 1♂, Capel Dist., 18 mi [29 km] S Bunbury, 7.vii.1957 (AM); 1♀, Porongurup NP, 11.x.1970 (ANIC).

Diagnosis

Frons dark brown to black posteriorly, yellowish brown anteriorly; first flagellomere of antenna yellowish brown ventrobasally; face entirely yellow. Femora mainly yellowish; dorsum distally usually infuscated brown, hind femur often extensively dark brown distally; tibiae mainly yellow; hind tibia diffusely brown apically; wing with M meeting R_{4+5} at about a 90° angle; petiole about 2x length of dm-cu.

Redescription

Head. Occipital setae sparse, very short, fine, brown, on dorsal half, white on ventral half, appressed. Median occipital sclerite brownish black. Vertex blackish brown, smooth, bare. Ocellar tubercle small, smooth, black, not much raised above plane of vertex. Frons (Fig. 37) dark brown to black posteriorly, yellowish brown anteriorly; width about 2x median length; row of fine short setae along inner margin of frontoorbital region, otherwise bare or with a few scattered short setae. Lunule black, variable, usually about 1.5x diameter of base of antenna. Eye about 0.7x head height. Antenna (Fig. 36) about 0.65x head height; mainly blackish brown, first flagellomere yellowish brown ventrobasally; ratio of segment lengths: 1:1.8:4.9; stylus brownish black, 0.2x length of first flagellomere. Face bare, entirely yellow. Parafacial finely silvery pruinose; projecting anteriorly, widest about mid eye height where about same width as facial ridge. Facial ridge grooved. Antennal foveae shiny. Facial carina height less than half depth of foveae. Cheek and postgena pale yellow. Setae of postgena sparse, minute, whitish. Haustellum blackish brown; labellar setae shorter than those of haustellum.

Thorax. Blackish brown, finely bronze-pruinose dorsally. Postpronotal lobe silvery pruinose posteriorly; with about 5 moderately long, strong black setae. Mesoscutum entirely blackish brown, finely silvery pruin-

ose adjacent to postpronotal lobe; setae moderately long, strong; mesoscutal bristles present: 2 npl, 1 pal, 1 ipal. Scutellum with scattered moderately long and strong setae; one pair of long, erect convergent marginal bristles. Postnotum finely white pruinose. Pleura white pruinose, more densely on anepisternum and katepisternum. One moderately strong, posteriorly-directed prepst bristle. One dorsal kepst bristle, upwardly directed, moderately strong. Prosternum yellowish to dark brown. Fore coxa yellow; mid coxa yellowish brown; hind coxa mainly dark brown, white pruinose; fore coxa with conspicuous short, dark brown setae. Trochanters yellowish; hind trochanter infuscated with brown. Femora mainly yellowish; dorsum distally usually infuscated brown, hind femur often extensively dark brown distally. Tibiae mainly yellow; hind tibia diffusely brown apically. Tarsi yellowish brown; darker apically, with golden-yellow microsetae. Wing (Fig. 57) with Sc ending slightly before mid length of wing; R_{2+3} ending at about half distance between apices of Sc and petiole; M meeting R_{4+5} at about a 90° angle; petiole 2.1x length of dm-cu; CuA_2+A_1 about 0.6x length of petiole. Haltere pale yellow, base dark brown.

Abdomen. Blackish brown, bronze-pruinose; narrowly and finely white pruinose across posterior margins of T1–4. T1 with numerous long, curved bristles laterally. T2 without especially long lateral bristles; about 1.8x length of T1 in male and 2x length in female. T3 with setae about same length as on T2; slightly longer than T2, about 2x as long as wide. T4 slightly shorter than T3; female with several longer, stronger setae posterolaterally.

Female. T5 about half length of T4. T6 posterior margin straight, without posteromedial projection; shorter than T4. T7 height slightly greater than that of T6. T8 shiny dark brown. Female genital plate yellowish brown anteriorly; with minute setae on anterior surface and long, fine marginal setae; spicules (Fig. 78) on about distal third; ridges not merging medially. S6 with plate of closely arranged spicules.

Male. T5 about same length as T4, moderately long setose. Protandrium short; dorsal length about 0.6 length of T5; broadly rounded. S8 blackish brown, brown pruinose; short, convex in same plane as anterior part of protandrium. Epandrium dark yellowish brown.

Measurements. Total length = 5.3 mm; wing length = 3.2 mm.

Distribution. Western Australia.

Comments. The wings of the holotype are unusual in both having a symmetrical hook-like vein appendage on the petiole (Kröber 1940: 70, Fig. 17).

4.5.5 *Australoconops* Camras

Introduction

This endemic genus consists of species that frequently resemble those of *Conops* in general habitus. All have dense pruinose banding and the first flagellomere of the antenna is shorter than the pedicel. Camras (1961) proposed the genus to accommodate *Conops*-like species that possess a distinct ocellar tubercle and two ocelli. He transferred nine previously described species of *Conops* to *Australoconops* and described four new species. Below I describe an additional 16 species and resurrect *Conops ocellatus* de Meijere from synonymy with *Australoconops aurosus* (Newman). The genus now has 30 species and is the most diverse of all Australian genera.

Genus AUSTRALOCONOPS Camras (Figs 38–41)

AUSTRALOCONOPS Camras 1961: 64. Type species: *Conops splendidus* Kröber, 1916, by original designation.

Diagnosis

Predominantly dark brown or black, occasionally with some paler coloured sclerites; with yellow or gold dense pruinose markings on thorax and abdominal tergites. Two ocelli present on distinct ocellar tubercle;

frons smooth or grooved; antenna longer than head height, scape elongate, pedicel usually distinctly longer than first flagellomere, never shorter; stylus three-segmented; palpus present. Abdominal segment 2 relatively short and narrow; in male, about half greatest width of abdomen; T2 as long as T4; shorter or as long as T3; female T6 without median posterior projection.

Redescription

Head (Figs 38,39). Occiput blackish, dark reddish black or dark brown and usually silvery pruinose, especially at eye margin; occipital setae fine, moderately dense, dark brown or black, at most moderately long. Vertex smooth, much shorter than frons, usually slightly raised above plane of frons and demarcated from it by a ridge around the anterior margin to eye margin posterolaterally; setae of vertex moderately dense and strong, dark brown or black. Head without differentiated setae. Ocellar tubercle raised above plane of vertex, usually blackish brown. Two ovoid, always conspicuous ocelli present. Frons either smooth or rugose (never conspicuously setose), usually wider than long (never longer than wide). Fronto-orbital region either undifferentiated or poorly defined from mesofrons. Lunule blackish brown. Eye elongate-oval. Antenna distinctly longer than head height; scape elongate, with a row of short strong setae along anterior margin. Pedicel with transverse dorsal keel close to base and strong short setae on entire surface; usually distinctly longer than first flagellomere, never shorter. First flagellomere tapered distally. Stylus three-segmented; almost always with segment 1 disc-shaped, segment 2 projecting ventrally, segment 3 long, finely tapered; 0.3–0.6x length of first flagellomere. Frontofacial patch absent. Face not conspicuously setose. Parafacial silver or yellow pruinose, about as wide as or wider than facial ridge; not strongly projecting. Antennal fovea developed throughout length. Facial carina poorly developed. Cheek slightly concave or flat; setae of cheek absent or inconspicuous, fine, brown or black. Setae of postgena fine, brown or black. Palpus present, narrowly clavate, length less than half diameter of base of haustellum. Haustellum blackish brown, occasionally with some paler areas; at least 1.5x head length.

Thorax (Figs 40,41). Dorsum with short, strong, black setae over entire surface. Mesoscutum always with npl and pal bristles, sometimes with short ial and ipal bristles. Pleural bristles present: 1 to several prepst and 1 to numerous katepst. Setae of coxae strong, black, longer on mid and hind coxae than on fore coxa. Mid femur almost always with defined row of longer setae on posterodorsal margin. Posterior surface of fore and mid tibiae with apical, oval densely silvery pruinose patch; preapical, dorsal tibial bristles absent. Anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus with dense golden or golden brown microsetae. Claws almost always yellow or orange with black apices; pulvilli almost always yellowish. Wing almost always with brown anterior band; Sc ending a little beyond mid length of wing; R_1 running along costa to end a little before R_{2+3}; vena spuria present; cell r_{4+5} long, acute apically; petiole length 0.5–0.9x length of dm-cu; CuA_2+A_1 rarely longer than petiole.

Abdomen. Dense pruinose bands always present on some tergites, never on T1. Tergites with scattered short black setae which may be longer and denser laterally, especially on posterior tergites of female. T1 with numerous long black setae laterally. S1–4 present; with long black setae.

Female. T6 0.5–0.7x combined length of T3–5; T6 without median posterior projection. Female genital plate usually large, broadly rounded, distinctly longer than wide; with long, fine setae and more than 200 spicules arranged in distinct rows (*e.g.* Fig. 81). Each spicule on basal pedestal; pedestal usually with 2 or 3 microtrichia on wall; ridges on spicules almost always confluent with triangular or elongate median smooth area. S6 with large area of close spicules arranged in rows.

Male. Protandrium not much longer than T2 or T3; S8 usually about same width as epandrium, clearly demarcated from anterior part of protandrium. S5 with posteromedial patch or band of spicules.

Measurements. Total length = 5.1–14.5 mm; wing length = 3.6–9.9 mm.

Key to Australian species of *Australoconops*

1. Femora, tibiae, all or most tarsomeres, and claws black; antenna black . . . . . 2.
-. Legs at most only partially black; claws black only apically; antenna usually not entirely black . . . . . 4.
2. Postpronotal lobe, postnotum, pleural stripe and legs densely whitish pruinose; cheek orange with a dark brown band; haltere mainly yellow . . . . . ***aptatus*** (Walker)
-. Postpronotal lobe, postnotum, pleura and legs not densely pruinose; cheek reddish or blackish brown; haltere entirely blackish . . . . . 3.
3. First tarsomeres and bases of second yellowish brown; T1 and T2 of abdomen black, all other tergites deep golden pruinose (Fig. 75) . . . . . ***fulvitarsus*** sp. nov.
-. All tarsomeres black; T1 and T2 of abdomen black, all other tergites pale silvery yellow pruinose . . ***furvus*** sp. nov.
4. Thorax deep-golden pruinose on postpronotal lobe, mesonotum anterior and posterior of lobe, anterior of scutellum, and on scutellum, on mediotergite, laterotergite and pleura; abdomen with broad deep-golden pruinose bands on all tergites except T1 and T4; T1 with narrow golden pruinose band across medial part of posterior margin; male T4 with indistinct golden pruinose patch . . . . . ***aglaos*** sp. nov.
-. Thorax and abdomen not as extensively pruinose and usually with paler pruinose markings . . . . . 5.
5. Frons transversely grooved (Fig. 39) . . . . . 6.
-. Frons smooth, not transversely grooved (Fig. 51) . . . . . 22.
6. Frons with brown to black median and posterior bands, usually in distinct T shape (occasionally with only a median longitudinal band); frons otherwise yellow to orange; frontoclypeal tubercle usually yellow; vertex with setae only posteriorly or posteromedially . . . . . 7.
-. Frons without distinct dark bands, usually entirely dark coloured; frontoclypeal tubercle dark brown to black; vertex with setae over all surface except around anterior margin (Fig. 39). . . . . 13.
7. Frons with broad brown median longitudinal band; frons otherwise yellow to orange; frontoclypeal tubercle dark brown . . . . . ***aurosus*** (Newman)
-. Frons with brown to black median and posterior bands, usually in distinct T shape; frons otherwise yellow to orange; frontoclypeal tubercle yellow . . . . . 8.
8. Postpronotal lobe, laterotergite, anepisternum posterodorsally, and abdominal segment 2 all orange, silvery yellow pruinose; male S8 bright orange; legs mainly orange, femora with ventrobasal dark brown patch. ***aurantius*** sp. nov.
-. Postpronotal lobe, laterotergite, anepisternum, abdominal segment 2, and male S8 brown or blackish brown; legs otherwise coloured . . . . . 9.
9. Mesoscutum with large golden pruinose patch anterior of scutellum and pleural stripe . . . . . 10.
-. Mesoscutum without pruinose patch anterior of scutellum and without pleural stripe; other pruinose areas yellow12.
10. Postnotum with mediotergite and laterotergite golden pruinose; abdominal T4 and T5 without pruinose bands . . . . . ***ocellatus*** (de Meijere)
-. Postnotum with laterotergite only golden pruinose; abdomen with either T4 and T5 or only T5 golden pruinose . 11.
11. All abdominal tergites, except T1, golden pruinose; parafacial brown laterally, yellow medially; male S8 dull brown . . . . . ***pulcher*** Camras
-. Abdominal T1 and T4 without pruinose bands; parafacial entirely brown; male S8 shiny dark brown . . . . . ***elegans*** sp. nov.
12. Thorax with only postpronotal lobe yellow pruinose; abdominal T1 and T2 without pruinose bands . . . . . ***pseudocellifer*** (Kröber)
-. Thorax with postpronotal lobe, mesoscutum medial and posterior of lobe, and laterotergite yellow pruinose; abdominal T2 with yellow pruinose band . . . . . ***balteus*** sp. nov.
13. Abdominal T3 without pruinose band in both sexes; male T5 with distinct pruinose area . . . . . 14.
-. Abdominal T3 with complete pruinose band in male and short lateral band in female; male T5 without pruinose area (occasionally with indistinct patch) . . . . . 18.
14. Dense yellow pubescence of fronto-orbital region separated from similar pubescence on parafacial by small, non-pubescent patch at anterior margin of frons; parafacial golden brown; facial carina usually yellow; antennal fovea entirely dark brown, lower half silver pruinose . . . . . ***bridwelli*** Camras
-. Pubescence of fronto-orbital region continuous with pubescence on parafacial; parafacial dark brown; facial carina dark brown; antennal fovea with lower half yellow and silver pruinose1 . . . . . 5.
15. Pleural pruinose stripe on anepisternum and katepisternum (sometimes not well defined); pruinose markings deep reddish golden; patch anterior of scutellum large1. . . . . 6.

-. Pleural pruinose stripe absent; pruinose markings yellow or silvery yellow; patch anterior of scutellum narrow . 17.
16. Pleural stripe golden, dense, well-defined; female genital plate short, much wider than long. . . . ***breviplatus*** sp. nov.
-. Anepisternum posteriorly and katepisternum medially with a poorly defined pruinose band which is yellow on dorsal part of each sclerite and otherwise white; female genital plate large, longer than wide (Fig. 83) ***camrasi*** sp. nov.
17. Femora blackish brown on basal two-thirds; legs otherwise reddish brown; pruinose markings silvery yellow; female genital plate longer than wide . . . . . ***picus*** (Macquart)
-. Femora mainly blackish brown, apices and ventrolateral one-third to one-half, orange-brown; pruinose markings yellow; female genital plate short, wider than long . . . . . ***inglorior*** (Walker)
18. Mesoscutum with yellow pruinose transverse band anterior of scutellum; yellow pruinose bands on abdominal T2 and T3 narrow, across posterior one-third to half . . . . . 19.
-. Mesoscutum without pruinose band anterior of scutellum; pruinose bands on abdominal T2 and T3 wide, across posterior half or more . . . . . 20.
19. Parafacial dark brown laterally, dark yellow medially; antennae extensively reddish orange; yellow pruinose bands on T2 and T3 slightly produced anteriorly in mid line; female genital plate longer than wide (Fig. 96). . . . . ***similis*** Camras
-. Parafacial entirely dark blackish brown; antennae dark reddish brown and black; yellow pruinose bands on T2 and T3 not produced anteriorly in mid line; female genital plate short, wider than long (Fig. 103). . . . ***vespoides*** sp. nov.
20. Laterotergite finely white pruinose; male T5 with indistinct yellow pruinose patch . . . . . ***sydneyi*** Camras
-. Laterotergite densely yellow or golden pruinose; male T5 without pruinose patch . . . . . 21.
21. Pleura with dense pale yellow pruinose band; other pruinose markings whitish yellow to golden yellow . . . . . ***aequatus*** (Walker)
-. Pleura without pruinose band; other pruinose markings golden yellow to reddish golden . . . . . ***perbellum*** (Kröber)
22. Parafacial and facial ridge brown; facial carina and antennal fovea blackish brown; pleural stripe absent. . . . . ***brunneus*** sp. nov.
-. Parafacial and facial ridge yellow; antennal fovea not entirely blackish brown; white pruinose pleural stripe usually present . . . . . 23.
23. Femora almost entirely dark brown; legs otherwise yellowish except for brown apical tarsomeres . . . . . ***phaeomeros*** sp. nov.
-. Femora with dark brown areas either absent or only basally . . . . . 24.
24. Mediotergite densely silvery yellow pruinose; abdominal T3 without pruinose bands; frons with some distinct fine setae posterolaterally. . . . . 25.
-. Mediotergite not densely pruinose; abdominal T3 with pruinose bands; frons without distinct setae posterolaterally (Fig. 51). . . . . 26.
25. Frontoclypeal tubercle and cheek yellow; with yellow pruinose patch anterior of scutellum and white pruinose pleural stripe; haltere capitellum yellow . . . . . ***neuter*** sp. nov.
-. Frontoclypeal tubercle and cheek brown to dark brown; without pruinose patch anterior of scutellum and pleural stripe; haltere capitellum reddish . . . . . ***unicinctus*** (Kröber)
26. Frontoclypeal tubercle, facial carina and cheek dark brown to blackish; all femora with blackish brown band on basal half; mesoscutum with a narrow transverse yellow pruinose band anterior of scutellum. . ***splendidus*** (Kröber)
-. If frontoclypeal tubercle, facial carina and cheek dark brown to blackish, then not all femora with blackish brown band on basal half; mesoscutum either with broad pruinose patch anterior of scutellum or not pruinose anterior of scutellum . . . . . 27.
27. Wing dark brown anteriorly (Fig. 71) . . . . . 28.
-. Wing either entirely hyaline or only very pale brown anteriorly (Fig. 64). . . . . 29.
28. Femora entirely reddish orange; abdominal T2, T3 and T6 yellow pruinose. . . . . ***ruficrus*** sp. nov.
-. Fore femora with dark brown basal band; male with all abdominal tergites (female unknown) except T1 yellow pruinose . . . . . ***nebrias*** sp. nov.
29. Cheek blackish brown; antenna mainly dark brown; fore femur with dark brown basal band . . ***pallorivittus*** sp. nov.
-. Cheek yellow; antenna mainly orange-brown; all femora without distinct basal brown bands . . . . . ***cantrelli*** sp. nov.

Australoconops aequatus (Walker) (Figs 38–41, 58, 79, 105)

Conops aequata Walker 1849: 675
Conops aequatus—Kröber 1939b: 604

Conops piceus Bigot 1887: 43
Australoconops aequatus—Camras 1961: 69

Type material. Holotype (examined) ♀, **L1**: W. Australia [underside 47.109]; **L2**: Type; **L3**: Conops æquata Walk. [underside: identified as the type by E.A. Waterhouse.] (NHM). Type of Synonym (examined), ♂, **L1**: Type [underside: Conops piceus, Bigot. Type.]; **L2**: C. Piceus. ♂. Australie J. Bigot (NHM).

Additional material. **Queensland**: 1♂, no data (AM). **New South Wales**: 1♀, 10 km S Central Mangrove, Sydney, 26.ix.1987 (AM). **Victoria**: 1♀, Wyperfeld Nat. Pk, 5.xi.1966 (ANIC). **Western Australia**: 1♂, 13 km SE Dongara, 30.xii.1975, on Eucalyptus (UQIC); 1♀, 12 km S Cataby, 26.ix.1988 (WADA); 1♀, Mimmegarra Stn, 23.x.1941 (ANIC); 1♂, Clackline, 28.ix.1979, on flowers of *Chamelaucium uncinatum* (WAM); 1♀, Kelmscott, 26.ix.1981 (UQIC); 1♂, Gleneagle, 10.x.1972 (WADA); 1♂, Bejoording Pool, no date (WAM); 1♀, National Park, no date (WAM); 1♀, 20 km SE Pinjarra, 32°43'S 115°57'E, 15.xi.1989, on *Eucalyptus* (MVMA); 1♂, 2 km NNW Crossman, 32°45'S 116°34'E, 24.ix.1981 (ANIC); 4♂, 4♀, Yallingup, nr Cape Naturaliste, 14.ix–31.x.1913 (NHM, CC); 2♂, 3 km N Hopetoun, 33°55'S 120°08'E, 4.i.1986, 13.i.1987; 1♀, Cape Le Grand Nat. Pk, 33°58'S 122°08'E, 11.i.1987 (all UQIC); 1♀, 17.5 km NW Mt Arid, 35°29'S 141°56'E, 13–14.i.1982 (WAM).

Diagnosis

Frons grooved, dark, reddish black; parafacial dark brown, with yellow pubescence. Thorax yellow pruinose on postpronotal lobe and mesoscutum medial and posterior of postpronotal lobe, on anepisternum and katepisternum and on laterotergite. Abdomen with yellow transverse bands on T2 and T3 and yellow patch on protandrium in male; yellow on T2 as transverse band, on T3 as lateral patch and as large dorsal patch on T6 in female.

Redescription

Head (Figs 38, 39). Occiput black with narrow silvery pruinose band around eye margin, broader and denser at lower posterior corner of eye; occipital setae short. Median occipital sclerite black. Vertex blackish brown; setae over entire surface except around anterior margin. Ocellar tubercle blackish brown with shallow, median longitudinal groove. Frons blackish brown, transversely rugose, slightly wider than long; with minute, sparse setae. Fronto-orbital region black, sparsely silvery pruinose along eye margin; forming a rounded, smooth ridge. Lunule length about 2x diameter of base of antenna. Eye height 0.8x head height. Antenna mainly black, first flagellomere dark brown basally and ventrally; ratio of segment lengths: 1:2.2:1.7; stylus black, about 0.3x length of first flagellomere. Face almost bare. Parafacial silvery yellow pubescent, cuticle blackish brown under pubescence. Facial ridge more or less smooth, mainly yellow, brown below towards cheek. Antennal foveae dark brown, with upper half shiny, lower half white pruinose. Facial carina dark brown. Frontoclypeal tubercle dark brown. Cheek blackish brown, slightly concave, with short setae. Postgena blackish brown, silvery pruinose; setae moderately long. Haustellum about 1.5x head length.

Thorax (Figs 40, 41). Postpronotal lobe blackish brown; pale yellow pruinose on posterior half with a few setae anteromedially. Mesoscutum blackish brown, pale yellow pruinose medial and posterior of postpronotal lobe, with moderately dense setae over entire surface; mesoscutal bristles present: numerous npl and pal. Scutellum blackish brown with short, strong setae over entire surface and 2 pairs marginal bristles, one pair convergent, posterior and second pair shorter, more lateral and dorsal. Postnotum blackish brown, finely white pruinose on mediotergite, pale yellow pruinose on laterotergites. Pleura blackish brown, finely white pruinose with pale yellow pruinose stripe on anepisternum posteriorly and katepisternum medially. Two close prepst bristles (occasionally several). Numerous kepst bristles, most strong, varying lengths. Prosternum dark brown, finely silver pruinose. Coxae dark reddish brown, white pruinose. Trochanters dark brown. Femora very dark reddish brown to black. Tibiae mainly reddish brown, paler basally; at least hind tibia dark reddish black on distal half; fore and mid tibia entirely whitish yellow pruinose on posterior, lateral and basal half of anterior

surfaces; hind tibia whitish yellow pruinose on basal half of posterior and lateral surfaces; apical, oval, densely pruinose patch on posterior surface of fore and mid tibiae. Tarsi dark reddish brown; dense microsetae on fore and hind tibiae and tarsi golden brown. Wing (Fig. 58) dark brown in cells sc, r_1, r_{2+3}, br, bm, basal and anterior apical parts of r_{4+5}, basal part and along distal section of vein CuA_1 of dm, anterior basal half of cu*p*; cells bc and c paler brown than other brown areas. Petiole about 0.7x length of dm-cu. CuA_2+A_1 about same length as petiole. Haltere yellow, base dark brown.

Abdomen. Pruinose areas yellow. T1 to T4 brownish black. T1 and T2 narrower than T3 especially in males. T1 slightly wider than T2. T2 with pruinose band on posterior half to two-thirds; setae sparse in pruinose area. T3 with pruinose band across posterior half in male; present as lateral patch only in female; with scattered short black setae, sparse in pruinose area; about same length as T2. T4 with scattered, short black setae over entire surface; in female, setae longer and arranged in transverse row. S1–4 dark brown, finely silver pruinose.

Female. T5, T6 and T7 brownish black. T5 with moderately long, black setae arranged in transverse row. T6 with large dorsal pruinose patch and moderately long black setae over surface. T7 with moderately long black setae anteriorly and laterally; about same length as T6. T8 shiny blackish brown. Female genital plate dark brown, large, broadly rounded, distinctly longer than wide, with about 13 rows of closely arranged spicules and long, fine setae. Spicules (Fig. 79) with fine ridges; pedestal with 2 or 3 short basal microtrichia and groove below distal end forming a distinct rim. S6 with about 13 rows of very closely arranged spicules.

Male. T5, S5, protandrium and epandrium brownish black. Protandrium with large round pruinose mark. S8 shiny blackish brown, large, slightly longer than epandrium. S5 with posteromedial patch of spicules; brownish black.

Measurements. Total length = 10.8 mm (7.5–13.5 mm); wing length = 7.3 mm (5.2–8 mm).

Distribution. Queensland (no location), central coastal New South Wales, western Victoria, south-western Western Australia (Fig. 105).

Comments. The type of *C. piceus* is damaged: the right wing and all legs, except the left foreleg, are missing; the abdomen is glued to card. Sufficient of the specimen remains for me to be confident that *C. piceus* is a synonym of *A. aequatus*. Kröber (1939b) wrote that *C. picus* Macquart is a synonym and *C. piceus* Bigot is distinct; this is not correct. Kröber (1939b) described two males in NHM and called them *C. piceus* but these may not be the same species as the one specimen from which Bigot described the species. *A. aequatus* is most similar to *A. perbellum*.

Australoconops aglaos, sp. nov. (Figs 45, 106)

Type material. Holotype ♀, **New South Wales**: approx, 3 km W Crowdy Head, 1.i.1987, G. Williams, on *Leptospermum* (AM). Paratypes, **Queensland**: 1♀, North Stradbroke Is., 5.ii.1979 (UQIC); 1♂, Amiens, 18.xii.1966, C. F. Ashby (ANIC).

Diagnosis

Median occipital sclerite with golden pruinose patch; frons smooth except posterior of lunule, brown medially and posteriorly, otherwise orange; face orange, golden pruinose. Thorax golden pruinose on postpronotal lobe, medial and posterior of lobe, anterior of scutellum, on scutellum, postnotum and pleura; legs mainly orange, femora partially reddish black. Abdomen golden pruinose on T2, T3, T4, T5 and protandrium in male; on T2, T3, T6 and T7 in female.

Description

Head. Occiput blackish brown with narrow orange-brown, silvery pruinose band around eye margin and elongate, golden pruinose patch adjacent to median occipital sclerite; occipital setae moderately long. Median occipital sclerite orange-brown with golden pruinose dorsal match extending onto posterior part of vertex. Vertex orange brown, dark reddish brown anteromedially; setae long, on posterior surface. Frons blackish brown and rugose posterior of lunule, otherwise smooth; brown posteriorly and posteromedially; otherwise orange; slightly wider than long; setae sparse, minute, brown. Fronto-orbital region forming a rounded, smooth ridge. Lunule length about 1.5x diameter of base of antenna. Eye height 0.78x head height. Antenna mainly reddish black, scape and first flagellomere basally and ventrally orange; ratio of segment lengths: 1:1.8:1.5; stylus (Fig. 45) black, about 0.5x length of first flagellomere. Face with minute, sparse setulae. Parafacial orange, golden pruinose. Facial ridge orange. Antennal fovea shiny black medially on upper half, otherwise orange, white pruinose on lower half. Facial carina and frontoclypeal tubercle black. Cheek brownish black; with scattered moderately long setae, especially around epistomal margin. Postgena silvery pruinose, orange-brown anteriorly, reddish black posteriorly; setae long. Haustellum 1.8x head length.

Thorax. Postpronotal lobe orange brown, densely golden pruinose; setae sparse. Mesoscutum mainly blackish brown; orange-brown and golden pruinose medial and posterior of postpronotal lobe as far as transverse suture, and broadly anterior of scutellum; brown laterally posterior of transverse suture; with dense, fine setae over entire surface; mesoscutal bristles present: numerous npl and pal (2 long and strong). Scutellum brown, golden pruinose with short, strong setae over entire surface; one pair convergent bristles. Postnotum golden pruinose; mediotergite dark brown, laterotergite orange brown. Pleura dark brown, with golden pruinose band posteriorly on anepisternum and horizontally on posterodorsal part of katepisternum; silver pruinose patch below gold on katepisternum. One prepst and 4 kepst bristles. Prosternum dark brown. Coxae brown, densely silvery pruinose. Trochanters orange. Femora mainly reddish orange, most of fore femur posteriorly dark reddish black; mid and hind femora less extensively darkened. Tibiae orange; basal half golden pruinose, otherwise silvery pruinose. Tarsi mainly yellowish orange; apical 2 segments brown; dense microsetae on fore and hind tibiae and tarsi golden. Wing brown in cells c, sc, r_1, r_{2+3}, anteriorly in br and r_{4+5}, posteriorly in bm, anterior of CuA_1 in dm, anterior basal half of cu*p*; wing otherwise extensively infuscated pale brown; petiole length about 0.6x length of dm-cu. CuA_2+A_1 about 1.3x length of petiole. Haltere pedicel yellow, base and capitellum dark brown.

Abdomen. T1 and T2 about equal length and width; distinctly narrower than T3 in male only. T1 mainly blackish brown, brown posterolaterally; narrowly golden pruinose across posterodorsal margin. S1–4 dark brown; S2 and S3 golden pruinose posteriorly.

Female. T2 dark reddish brown; golden pruinose over almost all surface except for narrow anterior and lateral areas; about 0.6x length of T3. T3 black with broad crescent-shaped golden pruinose band, incomplete dorsomedially; T3 slightly longer than T2. T4 and T5 blackish brown. T6 and T7 mainly orange-brown, dark brown laterally; T6 almost entirely golden pruinose, less densely laterally; T7 golden pruinose on anterior half. T8 shiny brown. Female genital plate brown; large, broadly rounded, distinctly longer than wide; with approximately 20 rows of closely arranged spicules and numerous long, fine setae. S6 with at least 15 rows of closely arranged spicules.

Male. T2 blackish brown; golden pruinose across posterior two-thirds; about 0.7x length of T3. T3 black anteriorly; posterior two-thirds dorsally, tapering to posterior one third laterally orange, golden pruinose. T4 black with indistinct golden pruinose patch dorsally; about same length as T3. T5 black, broadly golden pruinose dorsally. Protandrium entirely golden pruinose. S8 dark brown with two posterodorsal orange patches; finely yellow pruinose except dorsally; convex in continuous line with anterior part of protandrium; about same width as epandrium. Epandrium dark brown, finely yellow pruinose except dorsally. S5 blackish brown with posteromedial band of spicules.

Variation. Male paratype not as extensively or deeply golden pruinose as holotype; only indistinctly pruinose on median occipital sclerite, scutellum, postnotum and pleura. Ratio of antennal segment lengths: 1:2:1.4; stylus about 0.4x length of first flagellomere. Wing with petiole length about 0.7x length of dm-cu; CuA_2+A_1 about 0.9x length of petiole.

Measurements. Total length = 12.0 mm (10.0 mm); wing length = 8.7 mm (7.3 mm).

Distribution. South-eastern Queensland and north-eastern New South Wales (Fig. 106).

Etymology. The specific name is the Greek word *aglaos* (= splendid, bright, beautiful) and is chosen because this species bears more golden markings than any other species in the genus.

Australoconops aptatus (Walker) (Figs 59, 107)

Conops aptata Walker 1849: 675
Conops aptatus Walker—Kröber 1939b: 600
Australoconops aptatus (Walker)—Camras 1961: 69

Type material. Holotype (examined) ♀, Western Australia: **L1**: W. Australia [underside 47.109]; **L2**: Type; **L3**: Conops aptata Walk. [underside: identified as the type by E. A. Waterhouse.]; **L4**: aptata (NHM).

Additional material. **Western Australia**: 1♀, same data as holotype (CC); 1♀, Arrowsmith Rd, North Eneabba, 29.viii.1978 (WADA); 1♂, 1♀, Wembley, 21.x.1961 (WAM); 1♀, no data (AM); 1? (abdomen missing), Swanbourne, 24.x.1953 (WAM); 1♀, Yallingup, nr Cape Naturaliste, 14.ix.–31.x.1913 (NHM).

Diagnosis

Frons smooth, brown posteriorly and medially, otherwise mainly velvety orange; cheek orange with broad blackish brown band. Postpronotal lobe and pleura with confluent silvery yellow pruinose band; legs black, densely white pruinose. Abdomen with silvery yellow transverse bands on T2 and T3 and large golden pruinose patch on protandrium in male; female with yellow transverse band on T2, silvery yellow lateral patch on T3 and large dorsal golden pruinose patch on T6.

Redescription

Head. Occiput brownish black with narrow yellowish brown, silvery pruinose band around eye margin. Median occipital sclerite brownish black. Vertex blackish brown, lighter brown laterally, cushion-like, raised above plane of frons; setae over entire surface except around anterior margin. Ocellar tubercle brownish black, without median longitudinal groove, at anterior margin of vertex. Frons brown medially and posteriorly, velvety orange laterally except anterior edge which is smooth, dark yellow and raised, perpendicular to plane of eye; smooth, without transverse grooves, slightly wider than long; with some moderately short setae posterolaterally. Fronto-orbital region not demarcated from mesofrons, narrowly silvery pruinose posteriorly. Lunule length about twice diameter of base of antenna. Eye height 0.68x head height. Antenna mainly black, finely silver pruinose, first flagellomere dark brown ventrally; ratio of segment lengths: 1:1.4:1.3; stylus black; about 0.4x length of first flagellomere. Face almost bare. Parafacial orange, black narrowly down eye margin, much wider than facial ridge; laterally projecting forward at almost 90° from eye. Facial ridge extending at most to level of frontoclypeal tubercle; dark brown dorsally, orange below. Antennal fovea shiny, blackish brown except for pale yellow lower one quarter, white pruinescence on lower one-third to half. Facial carina blackish brown. Frontoclypeal tubercle dark brown. Cheek with broad anterior blackish brown band between epistomal margin and eye, otherwise orange; concave, almost bare. Postgena yellow anteriorly, black posteriorly, silvery pruinose. Haustellum 1.8x head length.

Thorax. Postpronotal lobe blackish brown, pale silvery yellow pruinose posteriorly; setae moderately dense over entire lobe except pruinose area; moderately short, longer ventrolaterally. Mesoscutum brownish black, pale silvery yellow pruinose medial of postpronotal lobe and along notopleuron; with numerous npl and

pal. Scutellum brownish black, with moderately short, strong setae over entire surface and several pairs of marginal bristles, median longest. Postnotum brownish black, finely white pruinose on mediotergite, densely silvery yellow pruinose on laterotergite. Pleura blackish brown, finely white pruinose; dense silvery yellow pruinose band on anepisternum posteriorly and katepisternum medially, continuous with pruinose areas on mesoscutum and mid coxa. Two or 3 prepst and numerous kepst bristles present. Prosternum dark brown, posterior narrowed corner shiny brown. Coxae blackish brown, silvery pruinose. Trochanters blackish brown. Femora black, silvery pruinose on dorsal and posterior surfaces of fore and mid femora and all hind femur, except anteroventrally near apex. Tibiae black, silvery pruinose on posterior and dorsal surfaces of fore tibia and all of mid and hind tibiae. Tarsi black; dense microsetae on fore and hind tibiae and tarsi golden brown. Wing (Fig. 59) dark brown in cells bc, c, sc, r_1, r_{2+3}, anteriorly and along vena spuria of r_{4+5}; petiole length about 0.7x length of dm-cu; CuA_2+A_1 length about 0.8x length of petiole. Haltere yellow, base dark brown.

Abdomen. T1 and T2 only slightly narrower than T3. T1 to T4 brownish black. T1 slightly wider than T2; with numerous long black setae laterally. T2 with yellow pruinose band on posterior half, narrower, silvery ventrolaterally; with scattered, short, black setae, more sparse in pruinose area. T3 with pruinose band silvery yellow; complete in male, covering posterior half; present as lateral patch only in female; T3 slightly longer than T2. S1–4 black, silver pruinose.

Female. T5 brownish black with moderately long, black setae arranged in transverse row. T6 blackish brown, almost entirely golden pruinose dorsally. T7 dark brown, with scattered short black setae over entire surface. T8 shiny blackish brown. Female genital plate brown, white pruinose; large, broadly rounded, distinctly longer than wide; with about 15 rows of closely arranged spicules and with long, fine setae. S6 with about 20 rows of closely arranged spicules.

Male. T5, S5, protandrium and epandrium brownish black. Protandrium with large round golden pruinose mark. S8 shiny blackish brown slightly more convex anteriorly than posteriorly; slightly shorter than epandrium. S5 with broad band of spicules.

Measurements. Total length = 14.4 mm (12.0–13.5 mm); wing length = 9.6 mm (7.5–9.0 mm).

Distribution. South-western Western Australia (Fig. 107).

Australoconops aurantius, sp. nov. (Fig. 108)

Type Material. Holotype ♂, **New South Wales**, Mt Kaputar NP, Bullawa Ck, 30°14'S 150°06'E, 16–19.i.1994, M. E. Irwin & D. K. Yeates (AM).

Diagnosis

Frons grooved, with blackish brown T-shaped mark, otherwise yellow; face, lower third of antennal fovea and frontoclypeal tubercle yellow; cheek and upper two-thirds of antennal fovea blackish brown. Thorax orange on postpronotal lobe, medial and posterior of lobe, tip of scutellum, laterotergite, propleuron and anepisternum; all these areas silvery yellow pruinose. Abdominal segment 2, S3 and S8 orange; silvery yellow pruinose on T2, T5 and protandrium.

Description

Head. Occiput brownish black with narrow orange brown, silvery pruinose band around eye margin; setae short. Median occipital sclerite blackish brown. Vertex orange posteromedially, dark brown across anterior margin, otherwise yellowish brown; setae across posterior surface, absent anteriorly. Ocellar tubercle black, wider than long, distinctly posterior of anterior margin of vertex. Frons brownish black medially and posteriorly in T shape, otherwise yellow; transversely rugose; width 1.6x length; with scattered minute setae. Frontoorbital region not demarcated from mesofrons but with a narrowly rounded, finely silver pruinose ridge.

Lunule length about twice diameter of base of antenna. Eye height 0.82x head height. Antennal scape dark orange; pedicel dark reddish brown except apex and most of medial surface orange; first flagellomere mainly dark brown, orange basally; ratio of segment lengths: 1:2:1.6; stylus dark brown, about 0.4x length of first flagellomere. Face with minute fine setae. Parafacial yellow, silver pruinose laterally. Facial ridge yellow. Antennal fovea shiny, dark brown except for pale yellow, white pruinose lower one quarter. Facial carina dark brown. Frontoclypeal tubercle yellow. Cheek blackish brown, slightly concave, with minute setae. Postgena narrowly yellowish brown and silver pruinose anteriorly; blackish brown posteriorly; setae short. Haustellum about 2x head length.

Thorax. Postpronotal lobe orange brown; mostly pale yellow pruinose, with 1 or 2 short setae. Mesonotum mainly blackish brown, with brown pruinose sheen especially when viewed from in front; orange brown, silvery yellow pruinose patches medial and posterior of postpronotal lobe; with very short setae over entire surface; mesoscutal bristles present: numerous npl and pal (2 longer and stronger), 1 short ipal. Scutellum apex orange brown; with one pair marginal bristles (broken in holotype). Postnotum with mediotergite blackish brown, finely white pruinose; laterotergite orange, silvery yellow pruinose. Pleura mainly blackish brown, finely white pruinose; propleuron adjacent to postpronotal lobe and posterodorsal part of anepisternum orange brown; yellowish white pruinose on propleuron, anepisternum posteriorly and katepisternum medially; bristles present: 1 prepst, 3 kepst. Prosternum black. Coxae orange brown anterolaterally, otherwise blackish brown, silver pruinose. Trochanters orange. Femora orange-tan, with ventrobasal dark brown patch. Tibiae mainly deep yellow, silver pruinose; distal half of ventral surface reddish orange. Tarsi deep yellow, silver pruinose; dense microsetae on fore and hind tibiae and tarsi golden. Wing dark brown in cells sc, r_1, r_{2+3}; cells bc, c and anteriorly in r_{4+5} pale brown; petiole length about 0.6x length of dm-cu; CuA_2+A_1 1.4x length of petiole. Haltere pale yellow, base dark brown.

Abdomen. T1 and T2 markedly narrower than T3; T1 mainly blackish brown; orange brown on lateral tubercle and narrowly across posterior margin. T2 orange, pale yellow pruinose, with scattered short black setae over entire surface. T3 and T4 brownish black; pruinose bands absent; about same length as T2, 1.4x length of T1. S1 and S4 blackish brown; S2 and S3 orange-brown.

Female. Unknown.

Male. T5 and protandrium brownish black. T5 silvery yellow pruinose except narrow anterior band and laterally. Protandrium entirely silvery yellow pruinose dorsally. S8 orange; slightly more convex anteriorly than posteriorly; distinctly shorter than epandrium. Epandrium blackish brown. S5 with posteromedial patch of spicules.

Measurements. Total length = 8.7 mm; wing length = 5.5 mm.

Distribution. North-eastern highlands of New South Wales (Fig. 108).

Comments. The single specimen from which this species is described is distinguished from all other species by the number of orange sclerites.

Etymology. The specific name is from the Latin word *aurantium* (= orange) and refers to the orange sclerites of this species.

Australoconops aurosus (Newman) (Figs 60, 80, 109)

Conops aurosus Newman 1841: 222
Conops bulbimus Walker 1849: 674
Conops aureorufa Macquart 1851: 162
Conops claviventris Thomson 1869: 514
Conops aurosus—Kröber 1916: 59
Australoconops aurosus—Camras 1961: 65

Type material. Holotype (examined) ♀, **L1**: ? Type aurosa Newm.; **L2**: aurosa Newm.; **L3**: Dre[?] [?]20 [?] T (NHM); types of synonyms (examined): *Conops bulbimus* Walker ♂, **L1**: New Holland [underside 47 '73]; **L2**: Type; **L3**: Conops bulbimus Walk. [underside: identified as the type by E. A. Waterhouse.]; **L4**: Bulbimus, Walker. (NHM); *Conops aureorufa* Macquart ♂, **L1**: 1220; **L2**: pink above; underside [date]: 4 46; **L3**: Conops aureorufa Macq. n.sp. Tasm. (MNHN).

Additional material. **Queensland**: 1♀, Amiens, 16.xii.1967 (ANIC); 3♂, 3♀, Stanthorpe, 4.i.1920, 9,28.xii.1929, ii.1953 (QDPI, UQIC). **New South Wales**: 1♂, Wylie Ck, 15.xii.1959; 1♂, Woodford, 29.xii.1927 (all ANIC); 1♂, Fraser Pk, xii.1947 (AM).

Diagnosis

Frons with median dark brown to black longitudinal band; face dark brown with dense yellow pubescence; antennal foveae dark brown, white pruinose on lower half. Thorax golden pruinose on postpronotal lobe, mesoscutum medial and posterior of postpronotal lobe as far as transverse suture, and broadly anterior of scutellum and on laterotergite; pleura without defined pruinose band on anepisternum and katepisternum. Abdomen golden pruinose on T2, T5 and protandrium in male; on T2, T6 and T7 in female (Kröber 1919c, Fig. 39).

Redescription

Head. Occiput blackish brown with narrow silvery pruinose band around eye margin; occipital setae moderately long. Median occipital sclerite yellowish brown. Vertex yellowish brown, cushion-like, raised above plane of frons; setae of vertex over entire surface except around anterior margin. Ocellar tubercle sometimes with median longitudinal groove, blackish brown. Frons broadly blackish brown medially, yellow laterally, transversely rugose, slightly wider than long; setae sparse, minute. Fronto-orbital region forming a rounded, smooth ridge; golden yellow with yellow pruinose on posterolateral margin only. Lunule length about 3x diameter of base of antenna. Eye height 0.75x head height. Antenna mainly dark brown, dorsal surface of first flagellomere black; ratio of segment lengths: 1:1.8:1.2; stylus black, about 0.4x length of first flagellomere. Face with very fine, short, sparse, pale yellow setulae. Parafacial pale yellow pubescent, cuticle dark brown under and around margins of pubescence. Facial ridge mainly yellow, brown below towards cheek. Antennal fovea dark brown, shiny on upper part, white pruinose on lower part. Facial carina dark brown. Frontoclypeal tubercle dark brown. Cheek blackish brown, setae short. Postgena blackish brown, silvery pruinose; setae long. Haustellum 1.3–1.5x head length.

Thorax. Dorsum and pleura blackish brown. Postpronotal lobe densely golden pruinose; setae sparse, very short. Mesoscutum golden pruinose medial and posterior of postpronotal lobe as far as transverse suture, and broadly anterior of scutellum; with dense, short, fine setae over entire surface; mesoscutal bristles present: numerous npl and pal. Scutellum with short, strong setae over entire surface; one pair marginal bristles (missing in type). Postnotum blackish brown, finely white pruinose on mediotergite, golden pruinose on laterotergite. Pleura finely white pruinose. Three or 4 long, curved prepst bristles. Numerous black kepst bristles, varying lengths, most strong. Prosternum dark brown, posterior narrowed corner shiny brown. Coxae yellowish brown, white pruinose. Trochanters yellow. Femora mainly yellowish, basal half of fore and mid femora at least partially dark brown, hind femur with only small patch of dark brown; finely white pruinose. Tibiae yellowish; silvery yellow pruinose; apical, oval, densely pruinose patch which shines silver at some angles on posterior surfaces of fore and mid tibiae. Tarsi yellowish; finely silvery yellow pruinose; dense microsetae on fore and hind tibiae and tarsi golden. Wing (Fig. 60) brown in cells c, sc, anteriorly and distally in br, r_1, r_{2+3}, basal and anterior apical parts of r_{4+5}, posteriorly in bm and dm, anterior basal half of cu*p*. Petiole length about 0.8x length of dm-cu. CuA_2+A_1 about 0.7x length of petiole. Haltere yellow, base and capitellum dark brown.

Abdomen. T1 to T4 blackish brown. Golden pruinose bands present. T1 and T2 usually distinctly narrower than T3. T1 not wider than T2; with numerous long bristles laterally. T2 with pruinose band covering

almost all surface except for narrow anterior and lateral bands; setae sparse and minute in pruinose area. T3 with scattered short black setae over entire surface; about same length as T2. T4 with scattered, very short black setae over entire surface. S1–4 dark brown, finely silver pruinose.

Female. T5 blackish brown; setae moderately long, especially laterally. T6 mainly brown, blackish brown laterally and across anterior and posterior margins; golden pruinose except for narrow anterior and lateral bands; about 0.7x length of T3–5 together; with scattered short black setae over entire surface, longer and denser laterally. T7 brown, blackish around margins; finely golden pruinose over most of surface; with scattered short black setae over entire surface. T8 shiny blackish brown, paler brown posteriorly and ventrally. Female genital plate mid to dark brown; large, broadly rounded, distinctly longer than wide; with approximately 15–17 not very well defined rows of closely arranged spicules. Spicules (Fig. 80) with fine ridges. Pedestal of spicule broad basally; narrower, rounded below spicule. S6 with 12–13 rows of closely arranged rows of spicules and long fine setae.

Male. T5, S5, protandrium and epandrium blackish brown. T5 golden pruinose except narrow anterior and posterior bands and on lower lateral part. Protandrium golden pruinose except for narrow anterior and lateral bands. S8 shiny brown. S5 with posteromedial patch of spicules.

Measurements. Total length = 14.2 mm (12.5–13.9 mm); wing length = 9.7 mm (7.7–9.7 mm).

Distribution. South-eastern Queensland and eastern New South Wales (Fig. 109).

Comments. The type of *C. aureorufa* in the Museum in Paris is extensively damaged by *Anthrenus* sp. (Dermestidae). The parts remaining are: antennae, wings, 4 legs (one foreleg, probably one mid and hind legs), some of the mesonotum, parts of T2–8; the head is totally destroyed. I observed no difference from *A. aurosus* in the remaining fragments except that the mid or hind femur has more dark on the basal half, the gold mark on the mesoscutum extends little behind the postpronotal lobe and the gold on T5 does not much extend ventrolaterally. The type of *C. claviventris* was studied by Paramonov (ms notes on Conopidae housed at UQIC); one specimen I have studied is identified by him as '*Conops claviventris'* and labelled 'compared with type'; this specimen is conspecific with *A. aurosus*.

Australoconops balteus, sp. nov. (Fig. 110)

Type material. Holotype ♂, **Queensland**: Cooktown, 12.xi.1978, E. M. Exley and K. Walker, on *Eucalyptus papuana* (QM). Paratypes. **Queensland**: 1♀, 3 km E Lockerbie, C. York, 30.i.–4.ii.1975, G. B. Monteith, coll. at M.V. Light; 1♀, same data as holotype (all UQIC); 1♂, Davies Creek Nat. Pk, 15 km E Mareeba, 17°00'S 145°32'E, 15.x.1988, K. Walker, ex. *Lophostemon suaveolens*; 1♀, Charters Towers, 20°05'S 146°16'E, 20.xi.1988, K. Walker, on *Eucalyptus* sp. (all MVMA).

Diagnosis

Frons with T-shaped brown mark; yellow anterolaterally; grooved, mainly in brown area. Antennae mainly orange. Face mainly yellow; brown ventrally and laterally, with dense silvery yellow pubescence. Antennal foveae dark brown on upper part, pale yellow, silvery pruinose on lower half. Frontoclypeal tubercle yellow. Thorax yellow pruinose on postpronotal lobe, mesoscutum medial and posterior of postpronotal lobe, and on laterotergite. Abdomen yellow pruinose on T2, T3 and protandrium in male; on T2, T3, T6 and T7 in female.

Description

Similar to *A. ocellatus*; character states not mentioned are as for that species.

Head. Eye height 0.8x head height. Antenna mainly orange; first flagellomere apically and stylus, brown. Cheek yellowish brown. Haustellum yellowish brown except dark brown base and labellum; 1.8x head length.

Thorax. Postpronotal lobe and mesoscutum medial and posterior of lobe to transverse suture, yellow pruinose. Pruinose patch anterior of scutellum absent. Laterotergite with yellow pruinose patch. Mediotergite and pleura without pruinose bands. Three npl and 2 pal are longer and stronger than other npl and pal. One prepst and 3 kepst bristles. Wing dark brown in cells sc, r_1, r_{2+3} and anteriorly in r_{4+5}; paler brown in cell c. Legs as for *A. ocellatus*: femora mainly reddish orange with some darker reddish brown areas especially on posterior surface of fore femur; tibiae and tarsi yellow, silver pruinose.

Abdomen. Pruinose bands as for *A. ocellatus* but yellow rather than golden; on T2, T3, T5 posteriorly and protandrium in holotype; male paratype with broad yellow band on T5; yellow bands on T2, T3, T6 and T7 in female.

Measurements. Total length = 10.7 mm (10.0–13.5 mm); wing length = 7.0 mm (6.4–9.0 mm).

Distribution. Northern Queensland (Fig. 110).

Etymology. The specific name is the Latin noun *balteus* (= border, edge) and refers to the narrow brown band on the anterior half of the wing.

Australoconops breviplatus, sp. nov. (Fig. 111)

Type material. Holotype ♀, **New South Wales**: approx. 2 km SW Crowdy Head, 20.x.1988, G. Williams, ex heathland (AM).

Diagnosis

Frons grooved, mainly dark mustard brown; fronto-orbital region differentiated from mesofrons, yellow pubescent; parafacial dark brown, yellow pubescent; frontoclypeal tubercle and cheek blackish brown. Thorax golden pruinose on postpronotal lobe, mesoscutum medial and posterior of postpronotal lobe, broadly anterior of scutellum, on anepisternum and katepisternum and on laterotergite. Female with broad golden transverse band on T2 and most of T6 golden pruinose; female genital plate short.

Description

Similar to *A. inglorior*; differing from the description given for that species as follows:

Head. Occiput black, entirely finely white pruinose, more intensely around eye margin. Median occipital sclerite brownish black. Vertex slightly raised above plane of frons. Ocellar tubercle dark brown; with shallow median longitudinal groove. Frons width 1.6x length. Lunule length about 4x diameter of base of antenna. Eye height 0.76x head height. Ratio of antennal segment lengths: 1:2.3:1.6. Stylus about 0.5x length of first flagellomere. Face with very fine, short, sparse, pale yellow setulae. Postgena black, white pruinose, more densely anteriorly. Haustellum pale brown at extreme base.

Thorax. Entirely blackish brown. Postpronotal lobe densely golden pruinose. Mesoscutum golden pruinose medial and posterior of postpronotal lobe and broadly anterior of scutellum. Mediotergite finely white pruinose; laterotergite white pruinose with golden median patch. Pleura finely white pruinose, golden pruinose band on anepisternum posteriorly and katepisternum dorsally. Two prepst bristles present. Coxae blackish brown, densely silver pruinose. Trochanters orange. Femora mainly reddish brown; basal half to two-thirds of fore femur blackish brown; mid and hind femora with less extensive dark areas; mid femur with longer setae on posterodorsal margin but not in a defined row. Tibiae dark yellow to reddish; finely white pruinose with basal half of lateral surface golden pruinose. Tarsi yellowish brown; dense microsetae on fore and hind tibiae and tarsi golden. Wing with CuA_2+A_1 about 0.7x length of petiole.

Abdomen. More or less parallel sided, widening slightly posteriorly. S1–4 blackish brown, S2 golden pruinose, other sternites finely silver pruinose.

Female. T6 about 0.6x length of segments 3–5 together. T7 brown, blackish around margins. Female genital plate short and broadly rounded with about 14 very closely arranged rows of spicules.

Male. Unknown.

Measurements. Total length = 12.3 mm; wing length = 9 mm.

Distribution. Central coastal New South Wales (Fig. 111).

Etymology. The specific name is from the Latin *brevis* (= short) and *platus* (= plate) and refers to the short female genital plate of this species.

Australoconops bridwelli Camras (Figs 42, 49, 61, 81, 82, 112)

Australoconops bridwelli Camras 1961: 65

Type material. Holotype (examined) ♂, Queensland: **L1:** Stradbroke Is, Qld, 20.ix.1915, J. C. Bridwell; **L2**: Bridwell collection; **L3**: Australoconops bridwelli CAMRAS Holotype ♂ (USNM 64917). Paratypes (examined). **Queensland**: 1♂, 1♀, same data as holotype; 1♂, Stradbroke Island, 10.ii.1911, H. Hacker (SCC, USNM). **New South Wales**: 1♀, Sydney (SCC).

Additional material. **Queensland**: 1♂, Dunwich, 10.x.1947 (ANIC); 1♂, 1♀, Stradbroke Is., 2.x.1911 (QM); 4♂, The Blunder, Brisbane, 2.x.1966, 1.x.1967; 1♂, Paschendaele, 4.xi.1965 (all ANIC); 3♂, 1♀, Stanthorpe, 14.xii.1969; 16,18.xii.1967, 14.xii.1969 (ANIC, UQIC); 1♀, 2 km E Stanthorpe, 26.xi.1976; 2♂, Girraween Nat. Pk, 1–2.xii.1981, 8.xii.1983 (all UQIC). **New South Wales**: 1♀, Wilson's Downfall, 15–19.xii.1969 (QM); 1♂, Liston, 23.xii.1969 (UQIC); 1♂, Mittagong, 17.xii.1927 (ANIC). **Victoria**: 1♂, Warburton, 28.v.1919 (MVMA).

Diagnosis

Frons tan, grooved; dense yellow pubescence of fronto-orbital region separated from similar pubescence on parafacial by small, non-pubescent patch at anterior margin of frons; parafacial dark yellow to brown; frontoclypeal tubercle blackish brown. Densely golden pruinose on postpronotal lobe, mesoscutum medial of lobe, transverse band anterior of scutellum, small patch on lower part of laterotergite and on T2; no pruinose stripe on pleura. In male golden-pruinose on T5 and T6; in female golden-pruinose on T6 and less densely on T7.

Redescription

As given in Camras (1961) with additional information as follows:

Head. Median occipital sclerite blackish brown. Vertex brown, usually darker brown around anterior margin; with long, moderately strong setae on entire surface except narrowly anteriorly. Frons width 1.25x length. Fronto-orbital region flat, yellow pubescent, demarcated from rugose frons. Lunule length about 3x diameter of base of antenna. Eye height 0.8x head height. Ratio of antennal segment lengths: 1:2.2:1.5. Stylus (Fig. 42) about 0.5x length of first flagellomere. Parafacial dark yellow to brown; yellow pubescent. Facial ridge dull yellow. Antennal foveae sometimes entirely blackish brown, not dark yellow below. Frontoclypeal tubercle blackish brown. Cheek almost bare. Postgena brownish black with long, moderately strong setae. Haustellum mainly black, usually just labellum tan; about 1.7x head length.

Thorax. Mesonotum with short strong setae over entire surface. Numerous npl and pal bristles present (sometimes one differentiated ial). Marginal bristles of scutellum short or not differentiated. Pleural bristles present: one prepst, 6 to 8 kepst. Prosternum mid to blackish brown. Trochanters yellow-tan. Femora diffusely blackish brown basally; legs otherwise yellowish. Dense microsetae on fore and hind tibiae and tarsi golden. Wing (Fig. 61) dark brown in cells sc, r_1, r_{2+3}, br, bm, and r_{4+5} and dm except for a patch in each apical half; lighter brown in cell c. Petiole about 0.4x length of dm-cu. CuA_2+A_1 slightly longer than petiole.

Abdomen. T1 to T4 black. T1 slightly wider than T2; with long lateral setae. T2 with yellow-gold pruinose band on distal two-thirds to half. T3 slightly longer than T2 in male; about 1.4x longer in female.

Female. T5 blackish brown; female genital plate large, broadly rounded, longer than wide. Female genital plate (Fig. 81) and S6 both with 16–18 rows of closely arranged spicules. Spicules (Fig. 82) with well defined ridges that arise independently from broad smooth triangular basal area. T6 with gold crescent-shaped pruinose band. T7 with round gold pruinose mark, usually not as intense as mark on T6. T8 shiny, dark brown.

Male (Fig. 49). T5 with broad yellow-gold pruinose band. Protandrium with large round yellow-gold mark projecting to a point anteriorly. S8 dark blackish brown, shiny medially, finely whitish pruinose laterally; more convex than anterior part of protandrium; posterior margin less convex. Epandrium blackish. S5 blackish brown with spicules broadly across posteromedial margin.

Measurements. Total length = 8.0–11.0 mm; wing length = 5.1–6.3 mm.

Distribution. South-eastern Queensland, eastern New South Wales and southern Victoria (Fig. 112).

Comments. This species resembles *A. inglorior*; the most consistent differences are that *A. bridwelli* is a smaller species, is more extensively brown in the discal cell, the male has the base of the fore femur markedly thinner than the apical half and the female has a much longer genital plate.

Australoconops brunneus, sp. nov. (Figs 62, 113)

Type material. Holotype ♂, **Western Australia**: Lake Bryde, 16.xii.1974, K. T. Richards (WADA). Paratypes. **Western Australia**: 1♂, Moorine Rock, 31°08'S 119°08'E, 7.i.1978, R. P. McMillan (UQIC); 1♂, Hatter Hill, 40 km NE Lake King PO, 29.xii.1979, A. M. and M. J. Douglas, on mallee flowers (WAM); 1♀, same data as holotype (WADA).

Diagnosis

Frons smooth, mainly deep yellow with narrow median brown band; face and cheek brown. Thorax golden pruinose on postpronotal lobe, medial and posterior of lobe to transverse suture and anterior of scutellum; legs entirely deep yellow. Abdomen golden pruinose on T2, T3 and protandrium in male; on T2 and T6 in female.

Description

Head. Occiput blackish brown with narrow brown silver pruinose lateral band on lower two-thirds; setae moderately long. Median occipital sclerite brown. Vertex brown, slightly raised above plane of frons, setae about same length as occipital setae, concentrated posteromedially with some across posterior margin. Ocellar tubercle dark brown, distinctly posterior of anterior margin of vertex. Frons mainly deep yellow, with narrow median longitudinal brown band and brown patch posterior of lunule; smooth, bare, width about 1.5x length. Fronto-orbital region not demarcated from mesofrons. Lunule length about twice diameter of base of antenna. Eye height 0.78x head height. Antenna mainly blackish brown; pedicel apically and first flagellomere ventrally and basally orange brown; ratio of segment lengths: 1:1.7:1.5; stylus dark brown, about 0.5x length of first flagellomere. Face almost bare. Parafacial brown, silver pruinose. Facial ridge extending to level of frontoclypeal tubercle; brown. Antennal fovea dark brown, shiny on upper part, white pruinose on lower part. Facial carina and frontoclypeal tubercle blackish brown. Cheek brown, setae minute. Postgena narrowly yellowish brown anteriorly and silver pruinose; blackish brown posteriorly; setae moderately long. Haustellum 1.8x head length.

Thorax. Postpronotal lobe brown, golden pruinose; setae sparse, very short. Mesoscutum mainly black, postalar callus dark brown; golden pruinose medial and posterior of postpronotal lobe to transverse suture; large golden pruinose patch anterior of scutellum; mesoscutal bristles present: numerous npl and pal (usually 2 longer and stronger), one short ipal. Scutellum black with short, strong setae over entire surface and one pair marginal bristles (broken in holotype). Mediotergite blackish brown, finely white pruinose; laterotergite

brown, densely golden pruinose. Pleura blackish brown, finely white pruinose; 1 prepst (2 specimens with 3 or 4) and 4 to 6 kepst bristles. Prosternum mid to dark brown, silver pruinose. Coxae dark brown, silver pruinose. Legs entirely deep yellow. Tibiae silver pruinose; apical, oval pruinose patch on posterior surface of fore and mid tibiae not particularly more dense than remainder of tibiae. Dense microsetae golden on fore tibia and tarsus, golden brown on hind tibia and tarsus. Wing (Fig. 62) dark brown in cells sc, r_1, r_{2+3}, and anteriorly in r_{4+5}; cells bc and c paler brown. Petiole about 0.6x length of dm-cu. CuA_2+A_1 about 0.6x length of petiole. Haltere yellow, base dark brown.

Abdomen. T1 and T2 narrower than T3 in male; only slightly narrower in female. T1 slightly wider than T2; blackish brown. T2 narrowly blackish brown anteriorly, otherwise densely golden pruinose; with scattered short black setae over entire surface. T3 brownish black with scattered short black setae over entire surface; male with broad crescent-shaped golden pruinose band on posterior half; band absent in female; T3 slightly longer than T2 in male; about 1.4x longer in female. T4 and S1–4 blackish brown, S2 densely silver pruinose.

Female. T5 and T6 blackish brown, setae moderately long. T6 with moderately large mid-dorsal golden pruinose patch. T7 dark brown with moderately long black setae over entire surface; height slightly greater than that of T6 in lateral view. T8 shiny dark tan. Female genital plate reddish brown, finely white pruinose; large, relatively narrow, distinctly longer than wide; with about 13 rows of closely arranged spicules. S6 with numerous rows of closely arranged spicules.

Male. T5 blackish brown, with fine pruinose sheen. Protandrium blackish brown with large round pruinose mark projecting to a point posteriorly. S8 shiny dark brown; slightly saddle-shaped, slightly shorter than epandrium. Epandrium and S5 dark brown; S5 with broad band of spicules.

Variation. The following variations in the character states of the holotype were observed in some specimens: narrow median longitudinal brown band on the frons varies from well defined to diffuse; female specimen has frons width about 1.2x length and ratio of segment lengths is 1:1.8:1.7.

Measurements. Total length = 9.0 mm (8.0–8.5 mm); wing length = 5.4 mm (5.3–5.5 mm).

Distribution. South-western Western Australia (Fig. 113).

Etymology. The specific name means brown and refers to the colour of the face and cheeks.

Australoconops camrasi, sp. nov. (Figs 63, 83, 84, 114)

Type material. Holotype ♂, **New South Wales**: Boonoo Boonoo River, 29.xi.1981, G. Daniels and M. A. Schneider (AM). Paratypes. **New South Wales**: 1♂, 6 km NE Bilpin, nr Kurrajong, 2.xi.1980; 1♂, 2♀, Bilpin, Blue Mtns, 9, 16.x., 14.xi.1978, all N. W. Rodd (AM, UQIC); 1♂, 1♀, Mittagong, 17.xii.1927 (ANIC).

Diagnosis

Frons grooved, blackish mustard brown; fronto-orbital region differentiated from mesofrons, silvery yellow pubescent; parafacial blackish brown, silvery yellow pubescent. Thorax golden pruinose on postpronotal lobe, mesoscutum broadly medial and narrowly posterior of postpronotal lobe and broadly anterior of scutellum and with spot on laterotergite; pleura with a poorly defined pruinose band. Abdomen golden pruinose on T2, T5 and protandrium in male; on T2 and T6 in female.

Description

Similar to *A. inglorior*; character states not mentioned are as for that species.

Head. Median occipital sclerite brownish black. Vertex blackish brown. Frons blackish mustard brown; setae very fine, moderately long, scattered over mesofrons and fronto-orbital region. Eye height 0.78x head height. Antenna blackish brown, lighter brown at apex of scape and ventral surface of first flagellomere; ratio of segment lengths: 1:1.8:1.6; stylus about 0.3x length of first flagellomere. Face with very fine, short, sparse,

pale brown setulae. Parafacial blackish brown, with silvery yellow pubescence which appears brown at some angles. Antennal foveae shiny, dark brown on upper half, except yellow immediately below base of antenna; lighter brown, white-pruinose on lower half. Cheek blackish brown.

Thorax. Postpronotal lobe blackish brown; golden pruinose on posterior three-quarters; setae distributed anterolaterally, moderately dense and short, longer ventrolaterally. Mesonotum and pleura brownish black. Mesoscutum with brown pruinose sheen especially when viewed from in front; densely golden pruinose broadly medial and narrowly posterior of postpronotal lobe and broadly anterior of scutellum. Postnotum finely brown pruinose especially on mediotergite; with golden pruinose spot on laterotergite. Pleura finely white pruinose; anepisternum posteriorly and katepisternum medially with a poorly defined pruinose band which is yellow on dorsal part of each sclerite and otherwise white. Two close prepst and numerous kepst bristles present. Coxae blackish brown, densely silver pruinose. Trochanters orange. Femora with basal two-thirds, except extreme bases, mainly dark reddish brown to black; otherwise reddish orange, hind femur more extensively than fore and mid femora. Tibiae dark yellow to reddish; finely white pruinose with lateral surface of basal half golden pruinose. Tarsi orange-brown; finely white pruinose; segments 3 to 5 darker brown; dense microsetae on fore and hind tibiae and tarsi golden. Wing (Fig. 63) dark brown in cells bc, c, sc, br, bm, r_1, r_{2+3}, basal and anterior apical parts of r_{4+5}, basal part and along distal sections of veins M and CuA_1 of dm, anterior basal half of cell cu*p*, narrowly anterior of free section of CuA_2. CuA_2+A_1 about same length as petiole.

Abdomen. T1 blackish brown with a narrow posterolateral white pruinose strip and a small posteromedial reddish gold pruinose strip. T2 brownish black with large golden pruinose area on posterior two-thirds dorsomedially, tapering to posterior one-third laterally. S1–4 black, silver pruinose.

Female. T5 brownish black. T6 mainly mid to light brown, blackish brown laterally and around posterior margin; golden pruinose except ventrolaterally and across posterior margin. T7 mid to light brown, very finely golden pruinose. Female genital plate (Fig. 83) large, distinctly longer than wide, mid to light brown with approximately 16 rows of spicules, rows not very densely arranged. Pedestal of spicule (Fig. 84) with 1 or 2 relatively long microtrichia arising near base; without distinct ridge below spicule. S6 with about 20 rows of very closely arranged spicules.

Male. T5 brownish black with large crescent shaped golden pruinose mark covering almost entire dorsal surface. Protandrium brownish black ventrolaterally, orange brown and almost entirely golden pruinose dorsally. S8 shiny blackish brown. Epandrium brownish black.

Variation. The following variations in the character states of the holotype were observed in some specimens: vertex significantly paler than median occipital sclerite; frons lighter mustard brown; first flagellomere of antenna not as close to length of pedicel and stylus correspondingly larger in relation to length of first flagellomere; cheek dark brown; postpronotal lobe brown, golden pruinose on posterior half only; laterotergite lighter brown than mediotergite; one or 3 prepst setae; T1 partially dark reddish especially across posterior half; T2 variably orange brown beneath golden pruinose area; one male specimen with golden pruinose patch on S2; S8 of male variably shiny mid to orange brown.

Measurements. Total length = 12.0 mm (10.0–13.0 mm); wing length = 8.8 mm (7.0–9.9 mm).

Distribution. Eastern highlands of New South Wales (Fig. 114).

Comments. This species is similar to *A. inglorior* and *A. breviplatus*. It differs from them in having a large, longer than wide, female genital plate and lacks the well defined pleural stripe of *A. breviplatus*.

Etymology. The specific epithet honours Dr Sidney Camras of Chicago, USA who described the genus *Australoconops*.

***Australoconops cantrelli*, sp. nov. (Figs 43, 64, 115)**

Type material. Holotype ♂, **Northern Territory**: Horn Islet, Sir Edward Pellew Group, 8–14.ii.1968, B. Cantrell (QM). Paratypes. **Northern Territory**: 1♂, 1♀, same data as holotype (UQIC).

Diagnosis

Frons smooth, mainly yellow with narrow median brown band; face and cheek yellow. Thorax pale yellow pruinose on postpronotal lobe, medial and posterior of lobe and anterior of scutellum; laterotergite with white or pale yellow pruinose patch and pleura with dense broad white pruinose band; legs reddish orange and yellow; wings hyaline or almost so. Abdomen silvery yellow pruinose on T2, T3, T5 and protandrium in male, on T2, T3, T6 and T7 in female.

Description

Similar to *A. splendidus*; character states not mentioned are as for that species.

Head. Occiput dark brown with distinct silver band around eye margin. Median occipital sclerite dark brown ventrally, paler brown dorsally. Vertex yellowish brown, dark brown anteriorly; setae concentrated posteromedially with a few across posterior margin. Frons mainly yellow, with some narrow medial longitudinal brown not forming a distinct band and small brown patch on each side of midline anterior of vertex; smooth except for some short, shallow longitudinal grooves anteriorly; slightly wider than long; bare. Fronto-orbital region not demarcated from mesofrons. Lunule length about twice diameter of base of antenna. Eye height 0.82x head height. Antenna (Fig. 43) mainly dark orange brown; pedicel apically and first flagellomere ventrally and basally orange; ratio of segment lengths: 1:1.9:1.4; stylus about 0.3x length of first flagellomere. Parafacial yellow, silver pruinose. Facial ridge extending to level of frontoclypeal tubercle; grooved; yellow. Antennal fovea shiny whitish yellow, brown on either side of carina, white-pruinose on lower half. Facial carina light brown with dark line along ridge. Frontoclypeal tubercle pale brown, dark brown line around margin of tubercle and epistoma. Cheek yellow, small brown patch adjacent to anteroventral corner of eye; bare. Postgena yellow and silvery pruinose anteriorly; brown posteriorly.

Thorax. Postpronotal lobe brown; mostly pale yellow pruinose; setae sparse, about 8, moderately short. Mesoscutum blackish brown, postalar callus paler brown; pale yellow pruinose medial and posterior of postpronotal lobe to transverse suture; large pale yellow pruinose patch anterior of scutellum; mesoscutal bristles present: numerous npl and pal (usually 2 longer and stronger), one short ial, one short ipal. Scutellum with one pair of moderately long convergent posterior bristles. Postnotum blackish brown, finely white pruinose on mediotergite, densely white pruinose on laterotergite. Pleura dark brown; entirely finely brownish pruinose with dense broad white pruinose band on anepisternum and katepisternum. One prepst and one kepst bristle present. Prosternum brown. Trochanters yellowish brown. Femora mainly reddish orange; finely white pruinose. Tibiae yellowish brown, silver pruinose. Tarsi yellowish brown. Wing (Fig. 64) hyaline; Sc, most of M bordering cell br, and base of CuA2 yellow, other veins dark brown. Petiole about 0.7x length of dm-cu; CuA2+A1 about same length as petiole.

Abdomen. T1 and T2 markedly narrower than T3. T2 with silvery yellow pruinose band on posterior two-thirds, tapering to posterior one third dorsomedially. Pruinose band on T3 silvery yellow, in male on posterior half, tapering to posterior one third dorsomedially; present as lateral patch only in female. T4 without pruinose band.

Female. T2 with pruinose band of uniform width across posterior half; T3 with posterolateral short band. T5 dark brown. T6 almost entirely silvery yellow pruinose dorsally; about 0.7x length of segments 3–5 together. T7 reddish brown, silvery yellow pruinose on anterior half; height slightly greater than that of T6 in lateral view. T8 shiny mid tan. Female genital plate brown, white pruinose, broadly rounded, distinctly longer than wide with about 13 rows of closely arranged spicules. S6 with many rows of closely arranged spicules.

Male. T5 silvery yellow pruinose except narrow anterior and lateral band. Protandrium silvery yellow pruinose, less densely posterolaterally. S8 brown, shiny medially, very finely pruinose laterally, convex in continuous curve with anterior part of protandrium; slightly shorter than epandrium. Epandrium brownish black, shiny mid dorsally.

Variation. The following variations in the character states of the holotype were observed in the paratypes: median occipital sclerite almost entirely yellowish brown; frons with defined median longitudinal brown band; ratio of segment lengths: male 1:2.1:1.5, female 1:2:2; maxillary palpus pale brown; laterotergite of female yellow pruinose; paratypes with an additional one or 2 short kepst setae; female with diffuse dark brown dorsal patch on basal half of femora; wings indistinctly pale brown in cells r_1, r_{2+3} and anterior half of r_{4+5}.

Measurements. Total length = 6 mm (7–7.1 mm); wing length = 4 mm (4.5–4.6 mm).

Distribution. Gulf of Carpentaria, eastern Northern Territory (Fig. 115).

Comments. This species is most similar to *A. pallorivittus* and differs from it most distinctly in the colour of the antenna and cheek and the ratio of lengths of antennal segments.

Etymology. The specific epithet honours my friend and colleague, Dr Bryan Cantrell, who collected the only specimens known.

Australoconops elegans, sp. nov. (Figs 46, 50, 116)

Type material. Holotype ♂, **New South Wales**: Biniguy, 13.xi.1924 (ANIC). Paratype. **New South Wales**: 1♀, Mt Boppy, nr Cobar, 25.xi.1949, S. J. Paramonov (UQIC).

Additional material. **Western Australia**: 2♂, Broomehill, 33°51'S 117°38'E, 12.ii.1985, i.1987 (UQIC, WAM).

Diagnosis

Frons grooved, at least partially, brown medially and posteriorly, otherwise yellow; face brown, silvery pruinose laterally, yellow medially. Frontoclypeal tubercle yellow. Thorax golden pruinose on postpronotal lobe, medial and posterior of lobe, anterior of scutellum, laterotergite and pleura; legs mainly dark yellow, femora extensively reddish black. Abdomen golden pruinose on T2, T3, T5 and protandrium in male; on T2, T3, T6 and T7 in female.

Description

Head. Median occipital sclerite dark brown. Vertex yellowish brown, dark reddish brown posteromedially. Frons rugose; brown posteriorly and medially; otherwise dark yellow; width 1.8x length. Lunule length about 3x diameter of base of antenna. Eye height 0.75x head height. Antenna mainly reddish black; ratio of segment lengths: 1:1.9:1.1; stylus (Fig. 46) slender, black, about 0.5x length of first flagellomere. Parafacial brown, silvery pruinose on lower lateral part; yellow dorsally and medially. Facial ridge yellow. Antennal fovea shiny brown medially on upper half and narrowly at base of tubercle; otherwise pale yellow; white pruinose on lower half. Facial carina and frontoclypeal tubercle yellow. Cheek brown. Haustellum about 2x head length.

Thorax. Entirely blackish brown. Postpronotal lobe densely golden pruinose. Mesoscutum golden pruinose medial and posterior of postpronotal lobe as far as transverse suture, and broadly anterior of scutellum; mesoscutal bristles present: numerous npl and pal, one ial and one ipal. Scutellum brown pruinose; one pair convergent marginal bristles. Laterotergite golden pruinose. Pleura with golden pruinose band posteriorly on anepisternum and horizontally on posterodorsal part of katepisternum. One prepst and about 6 kepst bristles. Prosternum dark brown. Coxae dark brown, densely silvery pruinose. Trochanters dark brown. Femora

mainly dark reddish black; base and apex reddish orange. Tibiae orange; silvery pruinose. Fore and mid tarsi yellow; hind tarsus orange. Wing dark brown in cells sc, r_1, r_{2+3}, and anteriorly in r_{4+5}; petiole length about 0.8x length of dm-cu. CuA_2+A_1 about 0.5x length of petiole. Haltere pedicel and capitellum yellow, base brown.

Abdomen. T1 to T3 blackish brown. T2 golden pruinose across posterior two-thirds to three-quarters; silvery pruinose laterally. T3 with broad crescent-shaped golden pruinose band almost covering all dorsal surface, not reaching lateral margin. T4 black (dark brown in female). S1–4 dark brown, finely silver pruinose.

Female. T5 dark brown. T6 and T7 mainly brown, dark brown laterally. T6 golden pruinose except laterally; with many long fine lateral setae. T7 golden pruinose on anterior half. T8 shiny brown. Female genital plate brown, large, broadly rounded, distinctly longer than wide; with approximately 20 rows of closely arranged spicules and numerous long, fine setae. S6 with at least 15 rows of closely arranged spicules.

Male (Fig. 50). T5 blackish brown, with broad crescent-shaped golden pruinose band almost covering all dorsal surface, not reaching lateral margin. Protandrium entirely golden pruinose except small lateral area. S8 dark brown; very finely white pruinose; convex in continuous line with anterior part of protandrium; about same width as epandrium. Epandrium dark brown. S5 blackish brown with posteromedial band of spicules.

Variation. Frons rugose only posteriorly in Western Australian (WA) specimens. Ratio of antennal segment lengths in female: 1:1.6:1.2; stylus of female 0.4x length of first flagellomere. Cheek dark brown in one WA specimen. Female without golden patch anterior of scutellum; one WA specimen golden pruinose on mediotergite as well as laterotergite; two specimens with only a faint indication of gold on katepisternum. Wing with petiole length about 0.7x length of dm-cu; CuA_2+A_1 about 0.8x length of petiole.

Measurements. Total length = 12.0 mm (10.0 mm); wing length = 8.7 mm (7.3 mm).

Distribution. Northern central New South Wales and south-western Western Australia (Fig. 116).

Comments. The wide geographic separation of the specimens studied and the variation in the character states suggests the presence of two species. However I do not consider the differences significant, especially based on so few specimens for comparison and prefer to regard all specimens as conspecific.

Etymology. The specific name is from the Latin word *elegantis* (= tasteful, fine).

Australoconops fulvitarsus, sp. nov. (Figs 75, 85, 86, 117)

Type material. Holotype ♂, **Queensland**: Carnarvon Nat. Pk, Mt Moffatt Section, 740 m, 3 km SE Ranger Station, 25°04’39”S 148°00’30”E, 20.xi.1995, D. K. Yeates (QM). Paratypes. **Queensland**: 1♀, Rangers HQ, Mt Moffatt Nat. Pk, 25°01’S 147°57’E, 3.xii.1997, S. Evans, C. Lambkin, J. Skevington (QM); 1♀, 10 km N Tansey, 9.iii.1976, on *Eucalyptus* sp. (UQIC).

Diagnosis

Frons grooved medially and posteriorly in T-shaped brownish black mark; yellow anterolaterally; face mainly yellow, silvery pruinose; cheek and lower part of face dark brown; antennal fovea dark shiny brown on upper half, pale yellow, silvery pruinose on lower half. Thorax black, without golden or yellow pruinose markings; legs black except first segment and base of second pale brown; claws black. Abdomen golden yellow pruinose on T3 to T5 in both sexes, on protandrium in male and on T6 and anterior half of T7 in female.

Description

Habitus (Fig. 75); similar to *A. furvus*; differing as follows:

Head. Occiput black with narrow brown band around eye margin. Median occipital sclerite, vertex and ocellar tubercle black. Frons brownish black medially and posteriorly in T shape, otherwise yellow; transversely rugose in area of T-shaped mark; yellow areas smooth; width 1.5x length. Eye height 0.81x head

height. Antenna black; ratio of segment lengths: 1:1.9:1.4. Parafacial yellow, brown ventrally and adjacent to eye margin, silver pruinose. Cheek blackish brown. Postgena blackish brown, silvery pruinose. Haustellum about 2x head length.

Thorax. Postpronotal lobe blackish brown, finely white pruinose. Scutellum with 2 pairs marginal bristles; one pair convergent, posterior; second pair shorter, more lateral and dorsal. Postnotum and pleura blackish brown, finely white pruinose. Three kepst bristles; 2 just below upper margin, dorsally directed, posterior one about twice as long as the more anterior one; third bristle more anterior and ventral of upper two, posteriorly directed. Prosternum blackish brown, silvery pruinose. Mid femur with long setae on posterodorsal margin longer but not in a defined row. Tarsi mainly black; first segment and base of second pale brown. Wing dark brown in cells bc, c, sc, br, bm, r_1, r_{2+3}, basal and anterior apical parts of r_{4+5}, basal part and along distal section of vein CuA_1 of dm, anterior basal half of cell cu*p*, narrowly anterior of free section of CuA_2. Petiole length about 0.7x length of dm-cu. CuA_2+A_1 about half length of petiole.

Abdomen. T1 and T2 narrower than T3 in male; abdomen more or less parallel sided, widening slightly posteriorly in female. T1 black. T2 to T4 brownish black. T2 finely white pruinose. T3 with golden yellow pruinose band complete in both male and female, covering posterior three-quarters dorsally, narrower posterolaterally. T4 entirely golden yellow pruinose except for narrow lateral area; with scattered, short black setae over entire surface; setae longer ventrolaterally in female. S1–4 black, silver pruinose.

Female. T5 brown, almost entirely golden yellow pruinose. T6 brown, entirely golden yellow pruinose except for narrow lateral area. T7 reddish brown, golden pruinose on anterior half. T8 shiny dark tan. Female genital plate (Fig. 85) mid to dark brown; narrower and more rectangular than that of *A. furvus*; surface of apex sculptured with slits and punctures as in *A. furvus*. Spicules (Fig. 86) without microtrichia arising from the pedestal.

Male. T5 black, golden pruinose except narrow lateral band. Protandrium entirely golden pruinose. S8 shiny brownish black; flat dorsally; shorter than epandrium. Epandrium brownish black. S5 brownish black with broad band of spicules.

Variation. The female paratype is smaller and generally paler coloured than the holotype; areas that are black in the holotype are brown or dark brown in the paratype. The frons width is 1.7x length. The ratio of antennal segment lengths is 1:1.7:1.5. CuA_2+A_1 is slightly shorter than the petiole. The abdominal tergites are reddish brown rather than black.

Measurements. Total length = 11.5 mm (10.0 mm); wing length = 8.5 mm (7.0 mm).

Distribution. South-eastern Queensland (Fig. 117).

Comments. The holotype has malformed wing venation so that CuA1 does not extend beyond discal cell in either wing and dm-cu is not complete in right wing. This species is similar to *A. furvus* and *A. pseudocellifer* in having the first and second abdominal segments without pruinose bands. The abdomen is dark golden pruinose rather than pale silvery yellow as in *A. furvus*.

Etymology. The specific name is from the Latin adjective *fulvus* (= tawny) and the Greek noun *tarsos* (= flat of the foot). The name refers to the colour of the first and second tarsomeres, the only parts of the leg not black.

Australoconops furvus, sp. nov. (Figs 87, 88, 118)

Type material. Holotype ♀, **Queensland**: sandstone ridge, 26 km W 'Fairview', 15°35'S 144°03'E, 24.iv.1989, G. & A. Daniels (QM). Paratype. **Queensland**: 1♀, 30 km S Mt Garnet, 17°45'S 144°58'E, 19.xi.1988, K. Walker, on *Eucalyptus* sp. (MVMA).

Diagnosis

Frons grooved medially or only posterior of lunule, with T-shaped dark reddish black mark, yellow anterolaterally; face mainly yellow, silvery yellow pubescence; cheek and lower part of face dark brown; antennal fovea dark shiny brown on upper half, pale yellow, silvery pruinose on lower half. Thorax black, without golden or yellow pruinose markings; legs black. Female abdomen pale yellow pruinose on T3 to T6. T7 finely pale yellow pruinose.

Description

Head. Occiput dark reddish black, entirely finely white pruinose, more intensely around eye margin; setae short. Median occipital sclerite dark reddish black. Vertex dark reddish brown; slightly raised above plane of frons; setae moderately long, in a broad triangle posteromedially. Ocellar tubercle distinctly posterior of anterior margin of vertex, dark reddish brown. Frons reddish brown medially and posteriorly in T shape, otherwise yellow; mainly smooth but with some shallow transverse grooves medially; nearly twice as wide as long; almost bare, setae minute, yellowish. Fronto-orbital region forming a rounded, smooth ridge. Lunule length about 2x diameter of base of antenna. Eye height 0.79x head height. Antenna mainly black, first flagellomere brownish black ventrally; ratio of segment lengths: 1:2:1.6; stylus about 0.4x length of first flagellomere. Face with very fine, short, sparse, pale yellow setulae. Parafacial yellow, silver pruinose, wider than facial ridge. Facial ridge extending to level of frontoclypeal tubercle, more or less smooth, yellow. Antennal fovea shiny, dark brown on upper half, yellow, silvery white pruinose on lower half. Facial carina blackish brown. Frontoclypeal tubercle dark brown. Cheek dark reddish brown; with some moderately long setae, especially around epistoma. Postgena dark reddish brown, silvery pruinose; setae moderately long. Haustellum 1.8x head length.

Thorax. Dorsum with very short, strong setae over entire surface. Postpronotal lobe dark reddish black, setae sparse. Mesoscutum brownish black with silvery brown pruinose sheen especially when viewed from front; with numerous npl and pal. Scutellum black; with one pair marginal bristles. Mediotergite black; laterotergite reddish black. Pleura reddish black, finely white pruinose; one prepst and several kepst bristles, one long dorsally directed. Prosternum reddish brown; setae restricted to base. Coxae black, densely silver pruinose. Trochanters blackish brown. Femora black, silvery pruinose; mid femur with defined row of longer setae on posterodorsal margin. Tibiae black, silvery pruinose; narrowly brown at bases; apical, oval, silver patch on posterior surface of fore and mid tibiae. Tarsi mainly black; silvery pruinose; first segment brownish black; dense microsetae on fore and hind tibiae and tarsi golden brown. Claws and pulvilli black. Wing dark brown in cells sc, r_1, r_{2+3}, anterior half of br and r_{4+5} and posterior half of bm; cells bc, c, basal part and along distal section of vein CuA_1 of dm and anterior basal half of cu*p* paler brown than other brown areas; petiole length about 0.7x length of dm-cu; CuA_2+A_1 about same length as petiole. Haltere dark brown.

Abdomen. Parallel sided in female, widening slightly posteriorly. T1 slightly wider than T2 with numerous long black setae laterally. T1 to T3 reddish black, finely white pruinose; with scattered, very short setae. T3 with pale silvery yellow pruinose band covering posterior three-quarters dorsally, narrower posterolaterally; T3 length slightly greater than length of T2. T4 reddish black, almost entirely pale silvery yellow pruinose with scattered, short setae over entire surface; longer ventrolaterally. S1–4 reddish black, silver pruinose.

Female. T5 reddish black, almost entirely silvery yellow pruinose dorsally; with transverse row of moderately long setae posteriorly. T6 reddish black, finely white pruinose laterally, almost entirely silvery yellow pruinose dorsally; length about 0.6x length of segments 3–5 together; with scattered short setae over entire surface, longer and denser laterally. T7 reddish brown, finely pale yellow pruinose with scattered short setae over entire surface. T8 shiny blackish brown. Female genital plate reddish brown, finely white pruinose; large, broadly rounded, distinctly longer than wide with about 20 rows of spicules, increasingly more closely arranged apically; cuticle of apex (Fig. 88) sculptured with pits and slits. Pedestals of spicules (Fig. 87) with narrowed rim below base of each spicule; 3 or more microtrichia arising from side of pedestal. S6 with about 20 rows of closely arranged spicules.

Male. Unknown.

Variation. The female paratype is smaller and more extensively black rather than reddish black, especially on T1–3. The ratio of antennal segment lengths is 1:1.7:1.3.

Measurements. Total length = 14.0 mm (10.0 mm); wing length = 9.7 mm (7.8 mm).

Distribution. Northern Queensland (Fig. 118).

Comments. This species resembles *A. pseudocellifer* and *A. fulvitarsus* in having abdominal segments 1 and 2 entirely black. The abdomen is silvery yellow pruinose rather than golden pruinose as in *A. fulvitarsus*.

Etymology. The specific name is the Latin adjective *furvus* (= dark, dusky, black) and refers to the overall colour of the species and the dull, rather than bright, pruinose areas on the abdomen.

Australoconops inglorior (Walker). (Figs 65, 119)

Conops inglorior Walker 1849: 676
Conops inglorior Walker—Kröber 1939b: 605
Australoconops inglorior (Walker)—Camras 1961: 65

Type material. Holotype (examined) ♀, **L1**: Austr [underside: 45 79]; **L2**: Type; **L3**: Conops inglorior Walk. [underside: identified as the type by E. A. Waterhouse.] (NHM).

Additional material. **Victoria**: 1♀, Wyperfeld Nat. Pk, Flagstaff Hill, 28.ix.1997 (UQIC). **South Australia**: 1♂, 1♀, Mt Gambier, 8.xi.1950 (ANIC).

Diagnosis

Frons grooved, mustard brown, dark brown anteromedially; fronto-orbital region differentiated from mesofrons, silvery yellow pubescent; parafacial dark brown, silvery yellow pubescent; frontoclypeal tubercle dark brown; cheek dark reddish brown to tan. Thorax yellow pruinose on postpronotal lobe, mesoscutum medial of postpronotal lobe, and narrowly anterior of scutellum. Abdomen golden pruinose on T2, T5 and protandrium in male; on T2 and most of T6 in female; female genital plate short.

Redescription

Head. Occiput blackish brown with narrow silvery pruinose band around eye margin; setae moderately long. Median occipital sclerite dark brown. Vertex dark brown; setae moderately long, over entire surface except around anterior margin. Ocellar tubercle blackish brown; at anterior margin of vertex, projecting on to frons. Frons mustard brown, dark brown anteromedially; transversely rugose; width at least 1.5x length; setae fine, moderately short, mainly on fronto-orbital region with a few scattered setulae on mesofrons. Fronto-orbital region flat, more or less demarcated from mesofrons, with silvery yellow pubescence which appears brown at some angles. Lunule length about 3x diameter of base of antenna. Eye height 0.74x head height. Antenna mainly black, dark brown at apex of scape and ventral surface of first flagellomere; ratio of segment lengths: 1:2.2:1.4; stylus black, about 0.6x length of first flagellomere. Face almost bare. Parafacial dark brown, with silvery yellow pubescence which appears brown at some angles. Facial ridge long, extending below level of frontoclypeal tubercle, mainly yellow, brown below towards cheek. Antennal fovea shiny, dark brown on upper half, except yellow immediately below base of antenna; yellow, white-pruinose on lower half. Facial carina and frontoclypeal tubercle dark brown. Cheek dark reddish brown (male specimen tan); setae short. Postgena blackish brown, silvery pruinose, more densely anteriorly; setae moderately long. Haustellum silvery pruinose ventrobasally, 1.6x head length.

Thorax. Postpronotal lobe blackish brown; golden pruinose posteriorly with moderately dense and short setae over entire lobe except pruinose area. Mesonotum brownish black, finely brown pruinose; densely golden pruinose medial of humeral callus and narrowly anterior of scutellum; with moderately short, strong

and dense setae over entire surface; mesoscutal bristles present: numerous long npl and pal which are not well differentiated from other mesoscutal setae. Scutellum with 2 pairs of dorsally directed marginal bristles that are longer and finer than other scutellar setae. Postnotum and pleura blackish brown, finely white pruinose. One prepst and numerous kepst bristles present. Prosternum dark brown, finely silver pruinose, with numerous long setae. Coxae dark brown, finely white pruinose. Trochanters mid to dark brown. Femora mainly blackish brown; finely white pruinose; apices and ventrolateral one third to one half, orange-brown. Mid femur with setae on posterodorsal margin longer but not in a defined row. Tibiae orange-tan; finely white pruinose; apical, oval silver pruinose patch present on posterior surface of fore and mid tibiae. Tarsi mainly orange-brown; finely white pruinose; segments 3 to 5 dark brown; dense microsetae on fore and hind tibiae and tarsi golden brown. Wing (Fig. 65) dark brown in cells bc, c, sc, br, bm, r_1, r_{2+3}, basal and anterior apical parts of r_{4+5}, basal part and along distal section of vein CuA_1 of dm, anterior basal half of cell cu*p*, anterior to free section of CuA_2. Petiole about 0.7x length of dm-cu. CuA_2+A_1 about same length as petiole. Haltere yellow, base dark brown.

Abdomen. T1 and T2 narrower than T3 especially in male. T1 only slightly wider than T2. T1 to T4 brownish black. T2 with golden-yellow pruinose band on posterior half; with setae more sparse in pruinose area. T3 and T4 without pruinose bands; T3 about same length as T2. S1–4 dark brown, finely silver pruinose.

Female. T5 to T7 blackish brown. T5 with moderately long setae, especially laterally. T6 golden pruinose except ventrolaterally and across posterior margin; about 0.7x length of segments 3–5 together; with scattered short setae over entire surface, longer and denser laterally. T7 without pruinose mark; long, about same length as segment 6. T8 shiny dark tan. Female genital plate brown, broadly rounded, distinctly wider than longer with about 13 rows of closely arranged spicules and with long, fine setae. S6 with at least 15 rows of closely arranged spicules.

Male. T5 and protandrium brownish black with scattered short setae over entire surface. T5 with large crescent-shaped golden pruinose mark. Protandrium with large round golden pruinose mark. S8 shiny brown, slightly more convex anteriorly than posteriorly; slightly shorter than epandrium. Epandrium brownish black. S5 with posteromedial patch of spicules.

Variation. The frons width is about 1.5x the length in the holotype and the male specimen. The frons of the female specimen from Mt Gambier is nearly 2x as wide as long. The two specimens from Mt Gambier have some dark brown on the apical half of the tibiae. The type has a vague indication of a darker mark on the fore tibia; the mid and hind tibiae are without dark bands. The type has the pruinose mark on T6 extending further laterally than the mark on the female from Mt Gambier.

Measurements. Total length = 12.3 mm (11.5–12.5 mm); wing length = 9.0 mm (8.2–9.0 mm).

Distribution. The type locality is unknown; the other known specimens are from southern Australia (Fig. 119).

Comments. Specimens from Mt Gambier are very similar to type and allotype of *A. picus* in Paris except the bands are more yellow and dark markings on femora extend closer to apex than in *A. picus*.

Australoconops nebrias, sp. nov. (Figs 66, 120)

Type material. Holotype ♂, **Australian Capital Territory**: Canberra, 22.xii.1954, Paramonov leg. (ANIC). Paratypes. **Australian Capital Territory**: 1♂, Black Mountain, 15.i.1934, F. J. Gay; 2♂, Canberra, 5.ii,19.iii.1948 (all ANIC).

Additional material. **Queensland**: 1♂, Carnarvon Nat. Pk, Mt Moffatt Section, 3 km SE Ranger Station, 740 m, 25°04’39”S 148°00’30”E, 20.xi.1995 (UQIC).

Diagnosis

Frons smooth, mainly deep yellow, brown medially and posteriorly; face yellow; cheek and frontoclypeal tubercle blackish brown. Thorax yellow pruinose on postpronotal lobe, medial and posterior of lobe and sometimes anterior of scutellum; white pruinose on laterotergite; pleura with dense white pruinose band; legs mainly reddish orange. Abdomen yellow pruinose on all tergites except first.

Description

Similar to *A. splendidus*; character states not mentioned are as for that species.

Head. Median occipital sclerite dark brown. Vertex dark brown except for yellowish brown patch on each side of ocellar tubercle. Setae in a broad triangle posteromedially. Ocellar tubercle distinctly posterior of anterior margin of vertex. Frons mainly deep yellow, with narrow posterior transverse and median longitudinal brown bands and brown patch posterior of lunule; frons bare, smooth except for some shallow longitudinal grooves anterolaterally, as long as wide. Lunule length about twice diameter of base of antenna. Eye height 0.78x head height. Antenna dark brown, pedicel apically and first flagellomere basally, lighter brown; ratio of segment lengths: 1:2:1.5; stylus about 0.4x length of first flagellomere. Parafacial yellow, silver pruinose laterally. Facial ridge yellow. Antennal fovea with upper half shiny, dark brown, lower half whitish, white pruinose. Frontoclypeal tubercle dark brown. Cheek blackish brown. Postgena narrowly yellowish brown anteriorly; blackish brown, silvery pruinose posteriorly.

Thorax. Postpronotal lobe brown; posterior half yellow pruinose. Mesoscutum blackish brown, postalar callus paler brown; golden yellow pruinose medial and posterior of postpronotal lobe almost to transverse suture; faintly yellow pruinose narrowly anterior of scutellum; bristles present: numerous npl and pal (some long), one short ial and one short ipal; one pair of short, slightly convergent marginal bristles on scutellum. Postnotum and pleura blackish brown, finely white pruinose. Laterotergite densely white pruinose. Pleura with dense white pruinose band on anepisternum and katepisternum; one prepst and 2 kepst bristles present. Femora mainly reddish orange; band on basal half of fore femur dark brown; mid femur with vague posterobasal dark brown patch; finely white pruinose. Tibiae mainly reddish orange; silvery yellow pruinose. Tarsi orange-tan. Wing (Fig. 66) dark brown in cells bc, c, sc, r_1, r_{2+3}, anterior half of r_{4+5}. Petiole about 0.9x length of dm-cu; CuA_2+A_1 slightly shorter than petiole.

Abdomen. Brownish black. T2 with yellow pruinose band on posterior two thirds, slightly produced anteriorly in midline; narrower, silvery yellow ventrolaterally. T3 yellow pruinose band on posterior half, slightly produced anteriorly in midline, narrower, silvery yellow ventrolaterally. T4 with yellow pruinose posterior band, produced anteriorly in midline, wider laterally than medially. S1–4 dark brown, finely silver pruinose; S1 and S2 more densely pruinose than other sternites.

Female. Unknown.

Male. T5 yellow pruinose except narrow anterior and lateral band. Protandrium yellow pruinose except for ventrolateral area. S8 shiny dark brown; convex in continuous curve with anterior part of protandrium; slightly shorter than epandrium. Epandrium brownish black.

Variation. The specimen from Carnarvon Gorge has a dark yellow pruinose patch anterior of scutellum.

Measurements. Total length = 10.7 mm (11.5–13.5 mm); wing length = 7.0 mm (8.2–9.0 mm).

Distribution. Central- western Queensland and ACT (Fig. 120).

Comments. The Canberra specimens have only a trace of yellow anterior of the scutellum. They are much older than the Queensland specimen which is generally darker and in better condition. The spot may have been present in the Canberra specimens when newly eclosed. This species and *A. pulcher* are distinguished by having all tergites except the first yellow or golden pruinose.

Etymology. The specific name is the Greek noun *nebrias* (= spotted like a fawn) and refers to the two pale brown spots on the vertex.

***Australoconops neuter*, sp. nov. (Fig. 121)**

Type material. Holotype ♂, **Western Australia**: 7 km E Kununurra, 12–13.xii.1975, E. Exley & R. Storey, on *Eucalyptus* sp. (QM).

Diagnosis

Median occipital sclerite with large yellow pruinose patch; frons smooth, mainly yellow, diffusely brown medially and posteriorly; face, cheek, antennal fovea and postfrons yellow. Thorax yellow pruinose on postpronotal lobe, medial and posterior of lobe, anterior of scutellum, and on postnotum; pleura with dense broad white pruinose band; legs mainly yellow, silvery pruinose; femora with light brown band on basal half; tibiae light brown on distal half. Abdomen silvery yellow pruinose on T2, T5 and protandrium.

Description

Similar to *A. unicinctus*; character states not mentioned are as for that species.

Head. Occiput brown, broadly silvery pruinose around eye margin. Median occipital sclerite yellowish brown with large yellow pruinose patch. Vertex yellowish brown. Ocellar tubercle blackish brown anteriorly, yellow posteriorly. Frons mainly yellow, diffusely brown posteriorly and medially, with some shallow longitudinal grooves anterolaterally; slightly wider than long; with some fine, moderately long setae posterolaterally. Lunule length about 2x diameter of base of antenna. Eye height 0.85x head height. Antenna reddish brown, dark brown apically including stylus; ratio of segment lengths: 1:1.9:1.2; stylus black, about 0.3x length of first flagellomere. Parafacial yellow, silver pruinose. Facial ridge, antennal fovea, facial carina and frontoclypeal tubercle yellow. Cheek yellow, with some moderately long setae, especially around epistoma. Postgena yellowish, silver pruinose. Haustellum yellow and silver pruinose at extreme base; about 2x head length.

Thorax. Postpronotal lobe yellowish brown; yellow pruinose, with a few very short setae. Mesoscutum brownish black, yellow pruinose medial and posterior of postpronotal lobe to transverse suture and anterior of scutellum; mesoscutal setae present: numerous npl (one markedly longer and stronger than others), numerous pal (2 long and strong), one ial, one ipal. Scutellum densely brownish pruinose with one pair of convergent marginal bristles. Postnotum dark brown, yellow pruinose. Pleura dark brown with white pruinose band; one prepst and 2 kepst bristles present. Prosternum pale brown, silver pruinose. Coxae yellowish brown, silvery pruinose. Trochanters yellow. Femora mainly yellow; fore femur with brown patch on posterior surface of basal half; mid and hind femora with brown band on basal half. Tibiae with basal half yellow, distal half brown; finely white pruinose. Tarsi mainly yellow, distal half of segment 3 and all segment 4 brown. Wing dark brown in cells c, sc, r_1 and r_{2+3}; faintly brown anteriorly and along vena spuria of r_{4+5}. Petiole length about 0.6x length of dm-cu. CuA_2+A_1 1.4x length of petiole. Haltere base dark brown, otherwise pale yellow.

Abdomen. T1 slightly wider than T2; T1 dark brown with a narrow posterolateral white pruinose strip. Anterior third of T2 dark brown, posterior two-thirds yellow and silvery yellow pruinose. T3 and T4 brownish black, pruinose bands absent. S1–4 dark brown, finely silver pruinose; S2 with pale yellow band and more densely pruinose posteriorly in line with dorsal pruinose band.

Female. Unknown.

Male. T5 brown, pale yellow pruinose except laterally. Protandrium brown, pale yellow pruinose except for ventrolateral area. S8 shiny light brown; convex in continuous curve with anterior part of protandrium; slightly shorter than epandrium. Epandrium and S5 brown.

Measurements. Total length = 6.9 mm; wing length = 5.0 mm.

Distribution. Northern Australia (Fig. 121).

Comments. The holotype shows character states of *A. splendidus* and *A. unicinctus* but differs from both sufficiently for me to regard the species as distinct. Eye height of both *A. unicinctus* and *A. neuter* is 0.85x head height, the highest ratio for the genus; eye height of *A. splendidus* is 0.76x head height.

Etymology. The specific name is from the Latin word *neutrum* (= neither one nor the other) and refers to the similarity to both *A. splendidus* and *A. unicinctus*.

Australoconops ocellatus (de Meijere), comb. nov. (Figs 67, 73, 74, 89, 90, 122)

Conops ocellata de Meijere 1910: 163

Type material. Holotype (not examined) ♂, **New South Wales** (HNM).

Additional material. **Queensland**: 1♀, 3 km NW Archer R. x-ing, 13°24'S 142°55'E, 10.i.1994 (UQIC); 1♂, Cooktown, 12.xi.1978, on *Eucalyptus papuana* (UQIC); 1♀, 19 km S Bundaberg, xi.1972 (ANIC); 1♀, Burrum Heads, 14.xii.1986 (UQIC); 1♂, Cooloola, 10.ii.1983 (UQIC); 3♂, 2♀, Brisbane, 20.x.1914, 24.x.1916, 9.i.1918, 5.x.1913 3.I.1966 (ANIC, QM); 1♂, Jamboree Heights nr Brisbane, 14.xii.1980, on *Leptospermum petersonii* (UQIC). **New South Wales**: 1♂, Wylie Ck, 22.xii.1968 (ANIC); 1♂, Wardell 25 km SE Lismore, 20.i.1985, on *Leptospermum* blossom (UQIC); 1♂, Iluka, 25.x.1981 (AM); 1♂, Berkshire Park, Sydney, 23.xi.1986 (AM). **South Australia**: 1♀, 32 km NNE Cowell, 33°26'S 137°03'E, 28.xi.1992 (ANIC). **Western Australia**: 1♀, Merredin, 25.i.1973, on *Eucalyptus* sp. (UQIC); 1♂, 28 km E Lake Grace P.O., 27.xii.1979, on mallee flowers (WAM); 1♀, Busselton, 22.iii.1983 (WAM).

Diagnosis

Frons grooved, with T-shaped dark brown to black mark across posterior third and down anterior median region to ptilinal fissure; yellow anterolaterally. Face yellow with dense silvery yellow pubescence; antennal foveae dark brown on upper part, pale yellow, silvery pruinose on lower half. Thorax golden pruinose on postpronotal lobe, mesoscutum medial and posterior of postpronotal lobe as far as transverse suture, and broadly anterior of scutellum, on laterotergite and across mediotergite of postnotum and as a defined band on anepisternum and katepisternum. Abdomen golden pruinose on T2, T3 and protandrium in male; on T2, T3, T6 and T7 in female.

Redescription

Habitus (Figs 73, 74); similar to *A. aurosus*; differing as follows:

Head. Vertex with erect, short setae posteriorly; anteriorly smooth, bare. Frons with blackish brown mark transverse posterior band as well as median longitudinal band. Fronto-orbital region not pruinose. Eye height 0.73x head height. Antennae usually mainly black with scape ventrally and first flagellomere medially reddish brown (some specimens with antennae almost entirely brown to reddish brown). Parafacial mainly yellow, brown on lower lateral part. Antennal foveae pale yellow on lower half, not entirely dark brown. Frontoclypeal tubercle yellow.

Thorax. Postpronotal lobe almost entirely golden pruinose. Postnotum with mediotergite gold pruinose but not usually as densely gold as laterotergites. Golden pruinose band on pleura continuous with gold of notopleuron. One prepst bristle. Legs almost entirely reddish yellow. Coxae densely silver pruinose. Fore femur blackish brown posteriorly; mid and hind femora usually partly blackish brown. Wing (Fig. 67) brown in cells sc, r_1, r_{2+3}, anteriorly in r_{4+5}; pale brown in cell c. Haltere yellow, only base partially brown.

Abdomen. T2 entirely golden pruinose except for narrow anterior band. T3 in males markedly wider than T2 and almost entirely golden pruinose. T3 in females not much wider than T2; with broad crescent-shaped golden pruinose mark so that anterolateral and posteromedial areas are black. T1, T4 and T5 blackish brown.

Female. T6 extensively golden pruinose dorsally, otherwise brown to blackish brown. T7 brown, golden pruinose anteriorly. Female genital plate very large, brown, with about 20 rows of spicules; rows with some space obvious between them. Pedestals of spicules without ridge below spicule and with 6 microtrichia arising from base (Fig. 89). S6 with about 15 closely arranged rows of spicules (Fig. 90).

Male. Protandrium densely golden pruinose except posteriorly and ventrolaterally. S8 shiny brown. Epandrium blackish brown.

Measurements. Total length = 10–14.5 mm; wing length = 7.0–9.2 mm.

Distribution. Eastern and southern Australia (Fig. 122).

Comments. Kröber (1916: 59) listed this species (incorrectly as *ocellifer*) as a synonym of *Conops aurosus* but later (1939b: 597, 601) apparently changed his mind indicating that it was distinct. I have not been able to locate the type. Paramonov (ms notes on Conopidae housed at UQIC) apparently looked for it and wrote that the type was probably destroyed in the 1950 Hungarian revolution. Camras (1961) did not include this species in his key to species of *Australoconops*. Smith (1989) listed this species as a synonym of *A. aurosus*. From details in the original description I concur with Kröber (1939b) that the two species are distinct.

Australoconops pallorivittus, sp. nov. (Figs 44, 68, 123)

Type material. Holotype ♂, **Northern Territory**: 30 km WNW Alice Springs, 7.x.1978, D. H. Colless (ANIC). Paratype. **Northern Territory**: 1♂, 53 km NE Alice Springs, 6.x.1978, D. H. Colless (ANIC).

Diagnosis

Frons smooth, mainly yellow with narrow median brown band which expands laterally anterior of vertex; face yellow; cheek blackish brown. Thorax whitish to pale yellow pruinose on postpronotal lobe, medial and posterior of lobe, anterior of scutellum, and on laterotergite; pleura with dense broad white pruinose band; legs reddish orange and yellow; wings faintly brown anteriorly. Abdomen whitish to pale yellow pruinose on T2, T3, T5 and protandrium.

Description

Similar to *A. cantrelli*; character states not mentioned are as for that species.

Head. Vertex dark brown around margins, yellowish brown on each side of ocellar tubercle. Frons mainly yellow, with narrow median longitudinal brown band expanding laterally to posterior corner in V-shape anterior of vertex; smooth except for some short, shallow longitudinal grooves anteriorly. Lunule length about equal to diameter of base of antenna. Eye height 0.8x head height. Antenna (Fig. 44) mainly dark reddish black; pedicel medially and first flagellomere ventrally and basally reddish brown; ratio of segment lengths: 1:1.8:1.7; stylus about 0.3x length of first flagellomere. Parafacial yellow, silver pruinose. Facial ridge yellow. Antennal fovea shiny whitish yellow, transparent, brown on either side of carina, finely white-pruinose on lower three-quarters. Facial carina light brown with dark line along ridge. Frontoclypeal tubercle brown, dark brown line around margin of tubercle extending to epistoma. Cheek blackish brown. Postgena brown, silvery pruinose anteriorly.

Thorax. Postpronotal lobe dark brown; mostly whitish pruinose. Mesoscutum black, postalar callus blackish brown; white pruinose medial and posterior of postpronotal lobe to transverse suture; white pruinose patch anterior of scutellum; mesoscutal bristles present: 3 npl and 2 pal (in addition to numerous short setae), one short ipal. Scutellum with one pair of short, medial, dorsally-directed marginal bristles. Postnotum densely white pruinose on laterotergite. Pleura with dense broad white pruinose band on anepisternum and katepisternum. Trochanters yellowish brown. Femora reddish orange; fore femur with small posterobasal dark brown patch. Tibiae orange ventrally, yellow dorsally, silver pruinose. Tarsi yellow basally; apical 3 segments brown. Wing (Fig. 68) very pale brown in cells bc, c, sc, r1, r2+3; otherwise hyaline. Petiole about 0.7x length of dm-cu; CuA2+A1 about same length as petiole.

Abdomen. Pruinose areas whitish. T1 and T2 markedly narrower than T3. T2 with pruinose band on posterior two-thirds, tapering to posterior half dorsomedially. T3 with pruinose band on posterior half, tapering to posterior one third dorsomedially, not extending to lateral margin.

Female. Unknown.

Male. T5 pruinose except narrow anterior and lateral bands. Protandrium pruinose, less densely posterolaterally. S8 brown, shiny medially, very finely pruinose laterally, convex in continuous curve with anterior part of protandrium; slightly shorter than epandrium. Epandrium brownish black, shiny mid dorsally, otherwise pruinose.

Variation. Paratype with dorsal thoracic and abdominal pruinose markings pale yellow rather than whitish.

Measurements. Total length = 6 mm (7.3 mm); wing length = 3.9 mm (5 mm).

Distribution. Central Australia (Fig. 123).

Comments. This species varies markedly from *A. cantrelli* in proportion of lengths of the antennal segments and colour of the cheek. On the basis of these and the other lesser differences I regard the species as distinct.

Etymology. The specific name is a noun from the Latin words *pallor* (= paleness) and *vitta* (= band, stripe) and refers to the white and pale yellow pruinose bands of the thorax and abdomen.

Australoconops perbellum (Kröber) (Figs 47, 91, 92, 124)

Conops perbellum Kröber 1939b: 601
Australoconops perbellum (Kröber)—Camras 1961: 65

Type material. Holotype (not examined) ♂, **Western Australia**, Marloo Station, Wurarga, vii. (? Berlin).

Additional material. **Western Australia**: 1♀, 30 km N Carnarvon, Blow Holes Rd, 21.vii.1978 (AM); 1♂, 13 km S Wannoo, 26°49'S 114°37'E, 31.vii.1985; 1♀, 24 km NW Meeberrie HS, 26°58'S 115°58'E, 28.viii.1988, on flowers of *Grevillea didymobotrya* (all WAM); 1♀, 28 km W Yalgoo, 2.ix.1981 (AM); 1♂, 11 km SW Mt Singleton, 29°29'S 117°11'E, 28.ix.1981 (ANIC); 1♂, 2 km N Evanston, 29°43'S 119°29'E, on flowers of *Thryptomene tuberculata* (WAM); 1♀, Wongan Hills, 20.ix.1951 (ANIC); 1♂, 1♀, Boorabbin Rock, 31°12'S 120°17'E, 4–9.x.1981, on flowers of *Thryptomene tuberculata* (WAM); 1♀, 2 km WSW Noongar, 31°21'S 118°57E, 9.x.1981; 1♂, Dewars Pool, Bush Creek, 1.x.1965; 1♂, Dumbleyung, ix.1938 (all ANIC).

Diagnosis

Frons grooved, brownish black. Face and cheek brownish black except for yellow facial ridge; parafacial silvery pubescence. Thorax golden pruinose on postpronotal lobe, mesoscutum medial and posterior of postpronotal lobe and on laterotergite. Male with broad golden transverse bands on T2 and T3 and golden patch on protandrium; female with broad golden transverse band on T2, lateral patch on T3 and large dorsal patch on T6.

Redescription

Similar to *A. aequatus*; character states not mentioned below are as for that species.

Head. Median occipital sclerite black ventrally, reddish black dorsally. Vertex dark brown, slightly raised above plane of frons. Ocellar tubercle black, without median longitudinal groove. Frons brownish black, usually with a small, paler brown area immediately anterior to ocellar tubercle. Stylus as in Fig. 47. Parafacial brownish black, silvery pubescent.

Thorax. Postpronotal lobe blackish brown; golden pruinose on posterior half. Mesoscutum brownish black, golden pruinose medial and posterior of postpronotal lobe. Postnotum blackish brown, finely white

pruinose on mediotergite, golden pruinose on laterotergite. Pleura blackish brown, finely white pruinose. About 7 kepst bristles present. Coxae blackish brown, silvery pruinose. Femora mainly dark reddish brown to black; basally and ventroapically distinctly paler brown, hind femur more extensively than fore and mid femora. Tibiae orange-tan; whitish pruinose but not as intensely as *A. aequatus*; hind tibia not distinctly darker distally; apical, oval pruinose patch not distinct. Tarsi orange-tan, apical segments usually dark brown. Wing dark brown in cells sc, r_1, r_{2+3}, br and basal and anterior apical parts of r_{4+5}; cells bc, c, posterior half of bm, basal part of dm and anterior basal half of cu*p* paler brown than other brown areas. Petiole about 0.7x length of dm-cu. CuA_2+A_1 about same length as petiole.

Abdomen. Pruinose areas golden. T2 with pruinose band on posterior half to two-thirds, slightly produced anteriorly in midline; with scattered, short setae, more sparse in pruinose area. T3 with pruinose band on posterior half to two-thirds in male; as elongate lateral patches in female.

*Female***.** T6 with large golden dorsal pruinose patch. T8 shiny blackish brown. Female genital plate (Fig. 91) with about 12 rows of spicules. Spicules (Fig. 92) with fine ridges; pedestal with a distinct rim below base of spicule and 2 or 3 short microtrichia below rim. S6 with about 16 rows of closely arranged spicules.

Male. S8 shiny brownish black, large, bulbous and expanded above plane of anterior part of protandrium.

Measurements. Total length = 9.5 mm (6.8–10.2 mm); wing length = 6 mm (5.5–6.8 mm).

Distribution. Western Australia (Fig. 124).

Comments. Kröber (1939b) states that the ocellar tubercle is very weakly developed. In all specimens I examined the ocellar tubercle was well developed and raised above the plane of the vertex. In all other characters the specimens matched the original description. This species is most similar to *A. aequatus*; *A. perbellum* lacks a pleural stripe, the pruinose areas are deep golden, not pale yellow as in most specimens of *A. aequatus*, the legs are much less extensively black, the female genital plate is narrower and the spicules smaller than those of *A. aequatus*.

Australoconops phaeomeros, sp. nov. (Figs 48, 69, 125)

Type material. Holotype. ♂, **Queensland**: North Stradbroke Is., 5.ii.1979, E. M. Exley (QM). Paratypes. **Queensland**: 1♀, Yeppoon, 18.xii.1979, H. E. & M. A. Evans & A. Hook; 1♀, Peregian, 24.x.1965, J. C. Cardale; 1♂, Caloundra, 24.x.1965, J. C. Cardale (all UQIC); 1♂, Brisbane, 28.xi.1917, H. Hacker; 1♂, Acacia Ridge, Brisbane, 9.ix.1962, E. C. Dahms (all QM); 2♂, 1♀, same data as holotype (UQIC); 1♀, Toowoomba, 7–8.xii.1985, D. Bickel & G. Cassis (AM). **New South Wales**: 1♂, Ebor, 1.i.1916 (QM); 1♀, Sandy Ck, W Ebor, 3.i.1978, G. Daniels (UQIC).

Additional material. **Queensland**: 1♂, Carnarvon Nat. Pk, Mt Moffatt Section, 2 km N West Branch Campground, 24°52’18”S 148°00’50”E, 820 m, 24.xi.1995 (UQIC); 1♂, Carnarvon Nat Pk, Mt Moffatt Section, Lots Wife to Kookaburra Cave, 19.xi.1995; 3♂, Chimneys, Mt Moffatt Nat. Pk, 25°06’S 147°52’E, sweeping *Leptospermum* (all QM); 1♂, Carnarvon Nat. Pk, Mt Moffatt Section, Base of The Chimneys, 25°06’08”S 147°52’01”E, 680 m, 21.xi.1995 (UQIC). **Australian Capital Territory**: 1♂, 1♀, 1?, Blundells, 19.i.1936, 21.i.1931 (ANIC). **Victoria**: 1♀, Bacchus Marsh, 2.i.1906; 1♂, Wilsons Promontory, 19.i.1987, on *Eucalyptus* (all MVMA). **South Australia**: 1♂, Torrens Gorge, i.1940; 1♂, Adelaide, xii.1939; 3♂, Mt Gambier, -.1941 (all SAM).

Diagnosis

Frons smooth, extensively brown, yellow anterolaterally; face yellow; cheek yellowish brown. Thorax pale yellow pruinose on postpronotal lobe, medial and posterior of lobe, anterior of scutellum and on postnotum; pleura with white pruinose band which has yellowish sheen anteriorly; femora mainly dark brown; tibiae and tarsi mainly dark yellow. Abdomen yellow pruinose on T2, T3 and protandrium in male, on T2, T3, T6 and T7 in female.

Description

Similar to *A. splendidus*; character states not mentioned are as for that species.

Head. Occiput blackish brown with narrow silvery pruinose band around eye margin. Median occipital sclerite brownish black. Vertex dark brown posteromedially and around anterior margin, yellowish brown lateral of ocellar tubercle; setae moderately long, about same length as occipital setae. Ocellar tubercle distinctly posterior of anterior margin of vertex which curves forward slightly anterior of tubercle. Frons extensively dark brown posteriorly and medially, dark yellow anterolaterally; as long as wide; bare. Lunule length about 1.5x diameter of base of antenna. Eye height 0.83x head height. Antenna mainly orange brown; first flagellomere dark brown apically; ratio of segment lengths: 1:1.9:1.5. Stylus (Fig. 48) dark brown; segment one disc-shaped, segment 2 projecting ventrally, segment 3 globular with fine projection; about 0.3x length of first flagellomere. Face with minute fine setae. Parafacial yellow, silver pruinose. Facial ridge grooved, yellow. Antennal fovea whitish yellow, transparent laterally, brown on either side of carina, white-pruinose on lower half. Facial carina light brown with dark line along ridge. Frontoclypeal tubercle yellowish, dark brown line around margin of epistoma not extending around edge of tubercle as in *A. cantrelli*. Cheek pale yellowish brown, slightly concave with minute setae. Postgena dark brown, finely white pruinose, more densely anteriorly. Haustellum about 2x head length; labellum with yellowish area basolaterally.

Thorax. Dorsum and pleura blackish brown. Postpronotal lobe yellow pruinose on posterior half; setae moderately short, sparse. Mesoscutum yellow pruinose medial and posterior of postpronotal lobe as far as transverse suture, and broadly anterior of scutellum; with moderately short, strong setae over entire surface; mesoscutal bristles present: numerous npl and pal (some long), 2 ial and one ipal. Scutellum brown pruinose with one pair of long convergent posterior bristles. Postnotum extensively yellow pruinose. Pleura with pruinose band on anepisternum posteriorly and katepisternum medially mainly white but with yellow sheen anteriorly; one prepst and one kepst bristle. Prosternum, coxae and trochanters brown. Coxae white pruinose. Femora dark brown except for deep yellow bases and apices. Tibiae deep yellow, indistinctly brownish apically; finely white pruinose with lateral surface of basal half golden pruinose. Tarsi yellowish brown, darker apically; dense microsetae on fore and hind tibiae and tarsi golden brown. Wing (Fig. 69) dark brown in cells bc, c, sc, r_1, r_{2+3}, and anteriorly in r_{4+5}. Petiole length about 0.6x length of dm-cu. $CuA_{2}+A_1$ about same length as petiole.

Abdomen. Narrow, T1 and T2 markedly narrower than posterior part of T3; T2 and T3 long, about equal length, each more than 2x length of T1. T2 with yellow pruinose band on posterior two-thirds, tapering to posterior one third dorsomedially. T3 with yellow pruinose band on posterior half, tapering to posterior one quarter dorsomedially in male; present as elongate lateral patch only in female. S1–4 dark brown, finely silver pruinose; S2 of female and S2 and S3 of male posteriorly yellowish and more densely pruinose, in line with dorsal pruinose bands.

Female. T5 and T6 dark brown. T6 with large dorsal yellow pruinose patch; about 0.6x length of segments 3–5 together. T7 reddish to dark brown, with pale yellow posteromedial patch; pale yellow pruinose on anterior half; about same height as T6 in lateral view. T8 shiny mid tan. Female genital plate broad, mid to dark brown, with about 13 rows of closely arranged spicules. S6 with about 14 well defined rows of closely arranged small spicules, rows extending for about same length as on S5.

Male. T5 without pruinose band. Protandrium entirely yellow pruinose dorsally. S8 brown, shiny medially, very finely pruinose laterally; slightly more convex than anterior part of protandrium, slightly shorter than epandrium. Epandrium dark brown, shiny mid dorsally. S5 with posteromedial tubercle covered in black spicules.

Variation. The following variations in the character states of the holotype were observed in some specimens: the extent of brown on the frons can vary from almost entirely brown to broadly T-shaped; the ratio of antennal segment lengths in females is usually about 1:2:2; some specimens have an additional one or 2 short kepst setae; the prosternum colour varies from pale brown to blackish; trochanters vary in colour from pale to dark brown; T2 and T3 in females are less than 2x the length of T1.

Measurements. Total length = 6.8 mm (5.1–7.5 mm); wing length = 4.5 mm (3.6–5.7 mm).

Distribution. Eastern Australia and southern South Australia (Fig. 125).

Comments. This species is distinguished from *A. splendidus* and *A. unicinctus* by the almost entirely brown femora and the more extensively brown frons. The spicules of *A. unicinctus* are markedly different from those of the other two species.

Etymology. The specific name is a noun formed from the Greek words *phaios* (= dusky, brown) and *meros* (= thigh, femur) and refers to the almost entirely dark brown femora.

Australoconops picus (Macquart) (Fig. 52)

Conops picus Macquart 1851: 161
Australoconops picus (Macquart)—Camras 1961: 65

Type material. Holotype (examined). ♂, **Tasmania**: **L1**: pink above; underside: 4 46; **L2**: Conops pica. ♂. Macq. n.sp. Tasm. (MNHN).

Additional material. ♀, **L1**: pink above; underside: 4 46 (MNHN).

Diagnosis

Frons grooved, mainly blackish brown. Fronto-orbital region and parafacial densely silvery yellow pubescent. Femora blackish brown on basal two-thirds; legs otherwise reddish brown. Whitish yellow pruinose areas on postpronotal lobe, mesoscutum medial of lobe and anterior of scutellum, on laterotergite, on T2, T5 and protandrium in male and on T2 and T6 in female.

Redescription

Head. Occiput blackish brown with narrow silvery pruinose band around eye margin; setae short. Vertex dark brown, cushion-like; setae across width. Ocellar tubercle blackish brown. Frons mainly blackish brown, unevenly lighter brown medially, transversely rugose, slightly wider than long; setae short on fronto-orbital region with a few scattered on mesofrons. Lunule length about 3x diameter of base of antenna. Antenna mainly black, brown at apex of scape and ventral surface of first flagellomere; ratio of segment lengths: 1:2.3:1.4; stylus (Fig. 52) black, about 0.4x length of first flagellomere. Parafacial dark brown, with silvery yellow pubescence which appears brown at some angles. Facial ridge dark yellow on upper part, becoming brown below towards cheek. Antennal foveae shiny, dark brown on upper half, except yellow immediately below base of antenna; yellow, white-pruinose on lower half. Facial carina and frontoclypeal tubercle black. Cheek blackish brown. Postgena blackish brown, silvery pruinose. Haustellum about 1.5x head length.

Thorax. Entirely blackish brown. Dorsum with moderately short, strong setae over entire surface. Postpronotal lobe silvery yellow pruinose posteriorly. Mesoscutum silvery yellow pruinose medial of postpronotal lobe and narrowly anterior of scutellum; with numerous npl and pal which are not well differentiated from other mesoscutal setae. Scutellum with one pair of bristles slightly longer than other scutellar setae. Postnotum finely white pruinose on mediotergite, silvery yellow pruinose on laterotergite. Pleura finely white pruinose; one prepst and numerous kepst bristles present. Coxae blackish brown, silvery pruinose. Femora blackish brown except reddish brown apex and ventrolateral one third; finely white pruinose; mid femur with setae on posterodorsal margin longer but not in a defined row. Tibiae reddish brown, finely white pruinose; apical, oval silver pruinose patch on posterior surface of fore and mid tibiae. Tarsi reddish brown; finely white pruinose; dense microsetae on fore and hind tibiae and tarsi golden. Wing dark brown in cells bc, c, sc, br, bm, r_1, r_{2+3}, basal and anterior apical parts of r_{4+5}, basal part and along distal section of vein CuA_1 of dm, anterior basal half of cell cu*p*. Haltere yellow, base dark brown.

Abdomen. T1 to T4 brownish black. T2 with transverse silvery yellow pruinose band on posterior half; setae more sparse in pruinose area. T3 and T4 without pruinose bands.

Female. T5 and T6 blackish brown. T6 with large round pruinose mark projecting to a point anteriorly; setae longer and denser laterally. Female genital plate with about 11 rows of closely arranged spicules. S6 with closely arranged spicules, number of rows not able to be counted on allotype but extending for about same length as on S5.

Male. T5 and protandrium brownish black. T5 with large crescent-shaped silvery yellow mark. Protandrium with large round pruinose mark projecting to a point anteriorly. S8 shiny blackish brown.

Measurements. Total length = 11.5 mm.

Distribution. ? Tasmania.

Comments. Specimens in the Paris museum (♂ type and one ♀) are covered with mould; they are very similar to *A. inglorior* and differ most obviously in the colour of the pruinose markings. Other differences are subtle and lead to some doubt concerning the validity of *A. picus*. However until more specimens become available, I prefer to let the two remain as distinct. The ♀ specimen from 'Port Philipp' described by Kröber (1916) as *C. pica* was almost certainly a different species. Kröber (1939b) considered *A. picus* a junior synonym of *A. aequatus*. The specimen of '*picus*' to which he referred was missing the abdomen; this specimen was probably the type of *C. piceus* which has the abdomen glued to a card; *C. piceus*, and not *A. picus*, is a junior synonym of *A. aequatus*.

Australoconops pseudocellifer (Kröber) (Figs 70, 93, 94, 126)

Conops pseudocellifer Kröber 1939b: 601
Australoconops pseudocellifer (Kröber)—Camras 1961: 65

Type material. Holotype (not examined). ♀, "**Neuholland**" (? Berlin).

Additional material. **Queensland**: 1♀, 46 km E Charleville, 23.xi.1979, on *Eucalyptus populnea* (UQIC). **New South Wales**: 1♂, 20 km E Narrabri, 2.xii.1976, on *Atalaya hemiglauca* (UQIC); 2♂, 2♀, Bogan R., no dates (AM, ANIC); 1♀, Wilcannia—Mt Boppy, 24.xi.1949; 1♂, Mt Boppy, nr Cobar, 25.xi.1949; 2♂, 25 mls [40 km] E Tibooburra, 1.xi.1949 (all ANIC). **South Australia:** 1♂, Kinchina, 1.i.1941; 1♀, Murray Bridge, i.1940 (all SAM).

Diagnosis

Translation of original description (Kröber 1939b) using current terminology:

Head bright yellow. Face shining white. Cheek brown. Frons with brown T-shaped mark as for *ocellifer* [*A. ocellatus*]. The stripe widening to the width of the antennal tubercle. Grooves on frons very shallow. Ocellar tubercle with two ocelli. Vertex yellow. Facial grooves blackish brown above. Facial carina yellow. Occiput black, silvery around eyes. On the thorax, only the postpronotal lobe is golden red. Laterotergites might be golden red. Legs yellow brown as usual. Wings with light brown band between veins 1 and 2 and to the vena spuria. T3 with narrow crescent shaped golden red band that does not reach the sides. T5 and T6 entirely reddish yellow, golden red pruinose. T5 black laterally. Female genital plate rusty brown, black underneath. The specimen appears bleached.

Redescription

Character states as for *A. furvus* if not mentioned below.

Head. Occiput black with narrow brown band around eye margin. Median occipital sclerite dark reddish brown ventrally, yellowish brown dorsally. Vertex yellow to dark yellowish brown. Ocellar tubercle shallowly rugose posteriorly; distinctly posterior of anterior margin of vertex; dark reddish brown. Frons reddish brown medially and posteriorly in T shape, otherwise yellow, transversely rugose in area of T-shaped mark; yellow areas very shallowly rugose. Lunule length about 3x diameter of base of antenna. Eye height 0.75x head height. Antenna mainly black or dark reddish brown; scape usually paler than other segments; ratio of seg-

ment lengths: average approximately 1:1.8:1.3; stylus about 0.6x length of first flagellomere. Parafacial mainly light brown, yellow adjacent to facial ridge, silver pruinose. Facial ridge yellow. Antennal fovea shiny, dark brown on upper half, yellow, white-pruinose on lower half. Facial carina and frontoclypeal tubercle yellow. Cheek reddish brown; setae short, brown. Postgena blackish brown, silvery pruinose. Haustellum blackish brown.

Thorax. Postpronotal lobe brown; posterior part usually yellow pruinose, sometimes indistinctly; with a few setae anteriorly. Mesonotum mainly blackish brown, paler brown around margins; entirely finely whitish pruinose, often more densely around postpronotal lobe or some specimens narrowly golden pruinose around lobe; some specimens with a fine posteromedial short, longitudinal golden yellow strip; with numerous npl and pal, usually 3 longer and stronger, one ial. Scutellum with one pair marginal bristles. Postnotum finely white pruinose; laterotergite often paler brown, sometimes with golden pruinose patch. Pleura blackish brown, finely white pruinose. One prepst and usually 4 dorsally directed kepst bristles present. Prosternum dark reddish brown to black. Coxae dark reddish brown to black, densely silver pruinose. Trochanters dark reddish brown to black. Femora mainly dark reddish brown to black; extreme bases and variable length distally dark yellow; mid femur with defined row of longer setae on posterodorsal margin. Tibiae and tarsi yellow, silver pruinose; dense microsetae on fore and hind tibiae and tarsi golden. Wing (Fig. 70) dark brown in cells sc, r1, r2+3, anteriorly in r4+5. CuA2+A1 about same length as petiole. Haltere yellow, base dark brown.

Abdomen. T1 and T2 narrower than T3 in male, about same width in female; T1 to T3 reddish black, finely white pruinose. T3 with golden-yellow pruinose band complete in both male and female; covering posterior three-quarters dorsally, narrower posterolaterally in male; crescent shaped in female. T4 reddish black, almost entirely golden-yellow pruinose in male; dark reddish brown, without pruinose band in female. S1–4 dark brown, finely silver pruinose.

Female. T5 dark reddish black. T6 mid to dark reddish brown, entirely golden-yellow pruinose except for narrow anterior and lateral areas. T7 reddish brown, with pale yellow posteromedial patch; golden pruinose on anterior half. T8 shiny dark tan. Female genital plate (Fig. 93) relatively elongate and narrow, with about 18 rows of spicules, increasingly more closely arranged apically. Spicules (Fig. 94) larger than those of *A. furvus*; pedestals of spicules with 5 or 6 fine microtrichia. S6 with about 16 rows of spicules.

Male. T5 reddish black to black, golden pruinose except narrow anterior and lateral band. Protandrium entirely golden pruinose. S8 dark reddish brown, slightly more convex than anterior part of protandrium, slightly shorter than epandrium. Epandrium dark brown. S5 with posteromedial patch of spicules.

Measurements. Total length = 8.7–13.5 mm; wing length = 6.5–9.5 mm.

Distribution. Inland arid areas of Queensland, New South Wales and South Australia (Fig. 126).

Comments. The type of this species is not listed in Rohlfien and Ewald (1975) as being present in the Deutsches Entomologisches Institut. I was unable to determine its location.

Australoconops pulcher Camras (Figs 95, 127)

Australoconops pulcher Camras 1961: 67

Type material. Holotype (examined). ♂, **New South Wales**: **L1**: Sydney NSW; **L2**: Bridwell collection; **L3**: Australoconops pulcher CAMRAS Holotype ♂ (USNM 64918).

Additional material. **New South Wales**: 1♂, Sydney, -.1890-91 (ANIC); **Western Australia**: 1♂, Dedari, no date (WAM).

Diagnosis

Frons grooved, dark brown medially and posteriorly in T shape, yellowish brown anterolaterally; parafacial yellow-brown, densely silvery yellow pruinose; facial ridge, facial carina and frontoclypeal tubercle yellow;

cheek dark brown. Thorax golden pruinose on postpronotal lobe, medial and posterior of lobe as far as transverse suture, broadly anterior of scutellum, on laterotergite and on pleura. Abdomen golden pruinose on all tergites except first.

Redescription

Head. Occiput blackish brown with narrow silvery pruinose band around eye margin; setae short. Median occipital sclerite dark brown. Vertex yellowish brown to dark brown, distinctly higher than frons; setae moderately long, concentrated posteromedially, few setae anteriorly. Ocellar tubercle shallowly rugose posteriorly, blackish brown. Frons dark brown medially and posteriorly in T shape, yellowish brown anterolaterally; transversely rugose; width 1.6x length; setae sparse, short, very fine, yellowish. Fronto-orbital region forming a rounded, smooth ridge. Lunule length about 3x diameter of base of antenna. Eye height 0.77x head height. Antenna dark reddish brown; ratio of segment lengths: 1:1.5:1; stylus dark reddish brown; length about 0.5x length of first flagellomere. Face with very fine, short, sparse, pale yellow setulae. Parafacial yellow-brown, densely silvery yellow pruinose. Facial ridge extending to level of frontoclypeal tubercle, grooved, yellow. Antennal fovea shiny, dark brown on upper half, yellow, white-pruinose on lower half. Facial carina yellow. Frontoclypeal tubercle yellow. Cheek dark brown; setae short. Postgena blackish brown with silvery pruinose anteriorly; setae moderately long. Haustellum length about 2x head length.

Thorax. Entirely blackish brown. Dorsum with short, strong setae over entire surface. Postpronotal lobe densely golden pruinose with few very short setae. Mesoscutum golden pruinose medial and posterior of postpronotal lobe as far as transverse suture, and broadly anterior of scutellum; several npl and pal present. Scutellum perhaps with one pair of marginal bristles (specimens damaged). Postnotum finely yellow pruinose on mediotergite, golden pruinose on laterotergite. Pleura finely white pruinose; golden-pruinose band on anepisternum posteriorly and katepisternum dorsally. One curved prepst bristle and 7, mostly strong katepisternum bristles of varying lengths present. Prosternum blackish brown, silvery pruinose. Coxae blackish brown, silvery pruinose. Trochanters dark brown. Femora orange-tan, diffusely blackish brown basally. Tibiae orange-tan, finely white-pruinose. Tarsi orange-brown; finely white-pruinose; dense microsetae on fore and hind tibiae and tarsi golden. Wing dark brown in cells sc, r1, r2+3, anteriorly in r4+5; lighter brown in bc, c, anterior half of br, posterior half of bm, along CuA1 in dm, anterior basal half of cu*p*, and anterior to free section of CuA2. Vena spuria only faintly indicated. Petiole about 0.9x length of dm-cu. CuA2+A1 about 0.7x length of petiole. Haltere yellow, base dark brown.

Abdomen. T1 and T2 same width, narrower than T3. Pruinose bands golden. T1 blackish brown. T2 to T4 black, with scattered short setae over entire surface. T2 with pruinose band on posterior half to two-thirds. T3 with pruinose band complete in both male and female, covering almost all surface except for narrow anterior and lateral bands. T4 with pruinose band incomplete in holotype, covering almost entire segment in other specimens. S1–4 dark brown, finely silver pruinose.

*Female***.** T5 blackish brown, golden pruinose; setae moderately long. T6 blackish brown; golden pruinose except for narrow anterior and lateral bands; about 0.7x length of segments 3–5 together. T7 dark brown, golden pruinose dorsally; about same length as T6. T8 shiny dark tan. Female genital plate dark brown, large, broadly rounded, distinctly longer than wide; with more than 20 rows of very closely arranged spicules. Spicules (Fig. 95) small, with broad, tiered ridges; pedestals with 3 or 4 short microtrichia. S6 with about 20 rows of closely arranged spicules.

Male. T5 and protandrium blackish brown. T5 golden pruinose except narrow anterior and posterior bands and on lower lateral part. Protandrium golden pruinose except for ventrolateral area. S8 shiny brown. S5 blackish brown; with posteromedial patch of spicules.

Measurements. Total length = 11.2 mm (10.2–13 mm); wing length = 7.1 mm (7.0–9.5 mm).

Distribution. Central coastal New South Wales; southern Western Australia (Fig. 127).

Comments. This species and *A. nebrias* are distinguished by having all abdominal tergites except the first yellow or golden pruinose.

Australoconops ruficrus, sp. nov. (Figs 51, 71, 128)

Type material. Holotype. ♂, **Western Australia**: 1 km W Lake King, 33°05'S 119°40'E, 2.xi.1989, K. L. Walker, on *Eucalyptus* (MVMA). Paratypes. **Western Australia**: 1♂, 62 km E Norseman, 32°12'S 122°18'E, 30.x.1989, K. L. Walker, on *Eucalyptus* (UQIC).

Additional material. **South Australia**: 1♀, 6 mls [9.6 km] NW Keith, 27.xii.1955 (SAM). **Western Australia**: 1♂, Denmark, 26.i.1977, on *Leptospermum* (WAM); 1♀, 57 km ENE Carnarvon, 29.viii.1980, on flowers of *Eremophila obtusifolia* (WAM).

Diagnosis

Frons smooth, mainly deep yellow, with median longitudinal narrow dark brown band; antennae mainly black; face yellow, silvery pruinose laterally; antennal foveae dark brown medially, pale yellow laterally, silvery pruinose on lower half; frontoclypeal tubercle dark brown; cheek brownish black. Thorax golden pruinose on postpronotal lobe and mesoscutum medial and posterior of postpronotal lobe; silvery yellow on laterotergite; silver band on pleura. Legs reddish orange and yellow. Abdomen golden pruinose on T2, T3 and protandrium in male; on T2, T6 and indistinctly on T3 in female.

Description

Similar to *A. brunneus*; character states not mentioned are as for that species.

Head (Fig. 51). Occiput black, entirely finely white pruinose, more intensely around eye margin; occipital setae short. Median occipital sclerite brownish black. Vertex brown; setae concentrated posteromedially. Ocellar tubercle blackish brown. Frons mainly deep yellow, with median longitudinal narrow dark brown band expanding anteriorly behind lunule; narrowly brown anterior of vertex; slightly wider than long. Lunule length about 1.5x diameter of base of antenna. Eye height 0.81x head height. Antenna mainly black, extreme apex of pedicel and first flagellomere basally and ventrally dark brown; ratio of segment lengths: 1:2:1.5; stylus about 0.5x length of first flagellomere. Face with minute fine setae. Parafacial yellow, silver pruinose laterally. Facial ridge yellow. Antennal fovea whitish yellow laterally, dark brown on either side of carina, white-pruinose on lower half. Facial carina blackish brown. Frontoclypeal tubercle blackish brown. Cheek brownish black, flat. Postgena black, finely white pruinose, more densely anteriorly. Haustellum about 2x head length.

Thorax. Postpronotal lobe blackish brown; golden pruinose on posterior half. Dorsum and pleura brownish black. Mesoscutum golden pruinose medial and posterior of postpronotal lobe; with numerous npl (3 longer and stronger) and pal (2 longer and stronger), one short ial, one short ipal. Scutellum with one pair marginal bristles, broken in holotype. Postnotum finely white pruinose on mediotergite, densely silvery yellow pruinose on laterotergite. Pleura finely white pruinose; anepisternum posteriorly and katepisternum medially with white pruinose band; bristles present: one long and a second, close, shorter prepst; 5 kepst, most strong, varying lengths. Prosternum blackish brown, silvery pruinose. Coxae and trochanters blackish brown, coxae silver pruinose. Femora mainly reddish orange; fore femur with a vague posterobasal diffuse dark brown patch. Tibiae mainly dark yellow, reddish orange distally; finely white pruinose. Tarsi dark yellow; segments 3 to 5 brown. Wing (Fig. 71) dark brown in cells c, sc, r_1, r_{2+3}, and anteriorly in r_{4+5}. Petiole length about 0.9x length of dm-cu. CuA_2+A_1 about same length as petiole.

Abdomen. All tergites and sternites brownish black in male, reddish black in female; T2 golden pruinose on posterior two-thirds dorsally, dorsolaterally gold area tapered back sharply so that narrow at posterolateral corner. T3 slightly longer than T2; male with golden pruinose band on posterior one third dorsally, band not

reaching lateral margin; female with indistinct narrow pruinose band posteriorly. S2 densely silver pruinose posteriorly.

Female. T6 golden pruinose dorsally. Female genital plate about as wide as long, with 12 or 13 rows of spicules. S6 with about 10 rows of spicules.

Male. Protandrium with large round dorsal golden pruinose mark on anterior half. S8 shiny, convex in continuous curve with anterior part of protandrium; slightly shorter than epandrium. S5 with broad posterior band of spicules.

Variation. The paratype differs from the holotype in having an incomplete, poorly defined mid-brown band on the frons rather than a well defined blackish brown band. The female first flagellomere is about the same length as the pedicel. One male specimen differs in having a small golden pruinose patch on T5. Cell c sometimes dark brown only close to Sc as in Fig. 71.

Measurements. Total length = 7 mm (7.5–8 mm); wing length = 4.1 mm (4.9–5.1 mm).

Distribution. South-eastern South Australia; Western Australia (Fig. 128).

Comments. This species has similar markings to *A. brunneus* except that it lacks the pruinose mark anterior of the scutellum and has a pleural stripe; the pruinose areas in *A. brunneus* are deep golden. The cheeks and face of *A. brunneus* are brown and the legs bright deep yellow.

Etymology. The specific name is from the Latin adjective *rufus* (= red) and the Latin noun *crus* (= leg, shank) and refers to the predominant colour of the legs.

Australoconops similis Camras (Figs 53, 96, 97, 129)

Australoconops similis Camras 1961: 67

Type material. Holotype (examined). ♂, **Queensland**: **L1**: Stradbroke Is. Queens. Australia ix.20.15; **L2**: J. C. Bridwell Collector; **L3**: HOLOTYPE Australoconops similis CAMRAS (USNM 64919). Paratypes (examined). **New South Wales:** Allotype ♀, **L1**: Sydney NSW. **L2**: Bridwell collection; **L3**: ALLOTYPE Australoconops similis CAMRAS; 1♂, 1♀, same data as allotype (SCC).

Additional material. **Queensland**: 1♂, Bribie Is, 12.ix.1918; 4♂, 2♀, North Stradbroke Is., 17.ix.1915 (all QM); 3♂, 4♀, Brown Lk., North Stradbroke Is., 16,19.ix,1981, 21–24.ix.1984 (UQIC); 14♂, 6♀, Brisbane, 18.ix.1911, 18.ix.1914, 5–26.ix.1916, 2,7,10.ix.1927, 3.ix.1929, 18.viii.1938, 7.ix.1941, 16.ii.1962, 11.ix.1966, 21–24.ix.1984 (ANIC, QDPI, QM, UQIC); 5♂, 1♀, Sunnybank, 18.viii.1927, 24.ix.1939, ix.1940, 18.ix.1949, 28.viii.1950, 9.ix.1950 (ANIC, QDPI); 1♀, Greenbank, nr Brisbane, 27.ix.1953 (UQIC); 7♂, 3♀, The Blunder, Brisbane, 26.ix.1966, 29,30.ix.1968, 13,20.ix.1969 (ANIC). **New South Wales**: 1♀, Bald Rock Nat. Pk, 25 km SE Stanthorpe, 1.xii.1983 (UQIC).

Diagnosis

Frons grooved, dark, reddish black. Parafacial dark yellow medially, dark brown adjacent to eye. Thorax yellow pruinose on postpronotal lobe, mesoscutum medial and posterior to postpronotal lobe and narrowly anterior of scutellum, on anepisternum and katepisternum and on laterotergite. Abdomen with yellow transverse bands on T2 and T3 and a large dorsal patch on protandrium in male; yellow on T2 as transverse band, on T3 as lateral patch and as large dorsal patch on T6 in female.

Redescription

Similar to *A. aequatus* and differing from the description given for that species as follows:

Head. Ocellar tubercle black; with small orange-brown spot immediately in front, without shallow median longitudinal groove. Antenna not as dark as that of *A. aequatus*; scape dark reddish to blackish brown; pedicel dark orange to reddish brown; first flagellomere yellowish brown basally, blackish brown apically;

stylus as in Fig. 53. Parafacial silvery yellow pubescent, cuticle dark yellow, becoming blackish brown adjacent to eye margin. Antennal fovea not entirely shiny, dark brown, usually yellowish immediately below base of antenna and at lower extremity; white-pruinose on lower half.

Thorax. Mesoscutum blackish brown, yellow pruinose medial and posterior of postpronotal lobe and as a narrow, transverse band anterior of scutellum. One prepst bristle. Trochanters yellowish brown. Femora dark reddish brown to black; ventroapical area more distinctly paler brown. Tibiae yellowish brown; yellowish pruinose as for *A. aequatus* except hind tibia not as densely pruinose and not distinctly darker distally. Tarsi yellowish brown.

Abdomen. Pruinose bands on posterior halves of T2 and T3 slightly produced anteriorly in midline.

Female. Female genital plate (Fig. 96) with about 17 rows of very closely arranged spicules. Spicules (Fig. 97) with fine ridges; pedestals with 2 or 3 moderately long microtrichia and lacking defined rim below base of spicule. S6 with about 20 row of spicules.

Measurements. Total length = 8.5–11.0 mm; wing length = 4.5–7.8 mm.

Distribution. South-eastern Queensland, north-eastern New South Wales and ?Sydney (Fig. 129).

Comments. All specimens except those from the Bridwell Collection are from the same general area. Since almost all specimens of all species recorded from the Bridwell Collection have 'Sydney' as the collection site, I question the accuracy of these locality data.

Australoconops splendidus (Kröber) (Figs 54, 98, 130)

Conops splendidus Kröber 1916: 63
Australoconops splendidus (Kröber)—Camras 1961: 68

Type material. Holotype (examined). ♂, **Queensland**: **L1:** Herberton, Dodd, i.1911, 3700 ft; **L2**: coll. Lichtwardt; **L3**: Holotype; **L4**: Conops ♂ splendidus Kröb. O. Kröber det. 1914 (DEI). Paratypes. **Queensland:** 1♂, Queensland: **L1:** Herberton, Dodd, i.1911, 3700 ft; **L2**: coll. Lichtwardt; **L3**: Paratype; **L4**: Conops ♂ splendidus Kröb. O. Kröber det. 1914 (DEI); 1♂: **L1:** Co-Type; **L2:** Herberton Dodd, J. 12.1910; **L3:** CoType No.24295 U.S.N.M.; **L4:** Conops splendidus Krb Kröber det. 1914 (USNM).

Additional material. Queensland: 1♀, upper Jardine R, Cape York Pen., 11°13'S 142°39'E, 15.x.1979 (AM); 2♂, Carnarvon Nat. Pk, Mt Moffatt Section, 3 km SE Ranger Station, 25°04'39"S 148°00'30"E, 18.xi.1995, 740m; 1♂, Carnarvon Nat. Pk, Mt Moffatt Section, Marlong Arch summit, 820m, 24°59'28"S 147°53' 48"E, 26.xi.1995; 1♂, 1♀, Chimneys, Mt Moffatt Nat. Pk, 25°06'S 147°52'E, 1,2.xii.1997 (QM, UQIC); 1♂, Carnarvon Nat. Pk, Mt Moffatt Section, 680 m, Base of The Chimneys, 25°06'08"S 147°52'01"E, 21.xi.1995 (UQIC); 1♂, Mt Moffatt Nat. Pk, 3 km SE Park Headquarters, 25°04'39"S 148°00'30"E, 18.xi.1995 (QM); 1♂, 24 km NE Eidsvold, 25°09'S 151°11'E, 11.x.1984, on *Eucalyptus* flowers (ANIC); 1♀, 15 km W Biggenden, 26.x.1977, on *Eucalyptus tereticornis* (UQIC); 1♀, 1 km N Memerambi via Kingaroy, 8.xi.1981 (UQIC); 2♂, 2♀, North Stradbroke Is., 17.ix.1915 (QDPI, QM); 5♂, 5♀, Brown Lk., North Stradbroke Is., 21–24.ix.1984, on *Leptospermum flavescens* blossom (UQIC); 1♂, 7.6 km N Dunwich, Nth Stradbroke Is, 27°27'S 153°26'E, 21.x.1996, on *Leptospermum*; 2♂, Dunwich, ix.1926, 17.ix.1955 (ANIC, UQIC); 2♂, 1?, Brisbane, 20.x., 24.ix.1914, 17.x.1916 (QM); 1♂, 4 km W Inglewood, 28.xi.1976, on *Eucalyptus populnea* (UQIC); 1♀, Cottonvale, 31.xii.1970, netted from *Lomatia* sp. (QDPI); 1♂, Girraween Nat. Pk, 27.xi.1981 (UQIC). **New South Wales**: 2♀, Gilgal, xii.1911 (ANIC); 1♀, Pilliga scrub, 48 km N Coonabarabran, 4.xii.1976, on *Leptospermum* (UQIC); 1♀, Dunns Swamp, nr Kandos, 12.xi.1982; 3♂, 5♀, Clarence, 2.i.1981, 30.xii.1982, 8.i.1983, 24.xii.1983, 20.i.1984, 23.i.1985; 1♂, Blue Mtns, i.1934 (all AM); 1♂, Leura, 20.i.1943 (ANIC); 1♂, Sydney, no date (NHM); 5♂, 1♀, 1? (no abdomen) Sydney, Bridwell collection, no date (SCC, USNM); 1♂, Mittagong, 14.xii.1900, 17.xii.1927 (ANIC, USNM); 1♂, Goulburn, 4.iii.1948; 1♂, Braidwood, 17.i.1934; 1♂, Angle Bend, 8.i.1938; 1♂, Mt Gladstone,

nr Cooma, 1073 m, 30.i.1974 (all ANIC). **Australian Capital Territory**: 1♀, Molonglo R., 35°22'S 149°21'E, 27.xii.1994 (UQIC); 1♂, Black Mountain, 15.i.1934; 7♂, 1♀, Canberra, 30.xii.1947, 10.i.1948, 1.ii.1948, 17.xii.1954, 11.xii.1959; 2♂, Blundells, 19.i.1936, i.1937 (all ANIC). **Victoria**: 1♂, Mallee, 5.x.1922 (MVMA); 1♂, Bacchus Marsh, 2.i.1906 (MVMA); 1♀, 10 mls NW Lindenow, 11.xii.1949 (ANIC).

Diagnosis

Frons smooth, black medially and posteriorly, yellow-orange anterolaterally; antenna mainly orange brown; face yellow; cheek and frontoclypeal tubercle blackish brown. Thorax yellow pruinose on postpronotal lobe, medial and posterior of postpronotal lobe to transverse suture, narrowly anterior of scutellum and on laterotergite; white pruinose band on anepisternum and katepisternum, often band yellow dorsally; femora mainly reddish orange; band on basal half dark brown; tibiae orange-tan. Abdomen yellow pruinose on T2, T3, T5 and protandrium in male; on T2, T3 laterally, T6 and T7 in female.

Redescription

Head. Occiput blackish brown with narrow silvery pruinose band around eye margin; occipital setae short. Median occipital sclerite dark brown to blackish brown. Vertex yellowish brown, sometimes dark brown; setae quite long, longer than occipital setae; across posterior surface. Ocellar tubercle blackish brown; anterior median edge of vertex curving posteriorly almost to level of ocellar tubercle. Frons black to dark brown posteriorly and medially, yellow-orange anterolaterally, bare, usually entirely smooth but sometimes with some shallow longitudinal grooves anterolaterally, as long as wide. Fronto-orbital region not demarcated from mesofrons. Lunule length about 3x diameter of base of antenna. Eye height 0.76x head height. Antenna mainly orange brown; first flagellomere dark brown apically; ratio of segment lengths: 1:2:1.8; stylus (Fig. 54) dark brown, about 0.3x length of first flagellomere. Face bare. Parafacial yellow, silver pruinose. Facial ridge long, extending below level of frontoclypeal tubercle, yellow. Antennal fovea upper half shiny, dark brown, lower half yellow, white pruinose. Facial carina light brown with dark line along ridge. Frontoclypeal tubercle brown. Cheek blackish brown, flat, setae minute. Postgena narrowly yellowish brown anteriorly; blackish brown, silvery pruinose posteriorly, setae short. Haustellum 1.6x head length.

Thorax. Postpronotal lobe brown; at least posterior part yellow pruinose; setae sparse, about 12, very short. Mesoscutum blackish brown, paler brown around margins; golden pruinose medial and posterior of postpronotal lobe as far as transverse suture, and narrowly anterior of scutellum; several npl (3 long and strong), several pal (2 long and strong). Scutellum brownish black, with short, strong setae over entire surface and one pair of short, slightly convergent marginal bristles. Postnotum blackish brown, finely yellow pruinose on mediotergite, golden pruinose on laterotergite. Pleura blackish brown; entirely finely white pruinose with dense white pruinose band on anepisternum and katepisternum, often band yellow dorsally. One prepst bristle (occasionally an additional shorter one) and 2 kepst bristles present. Prosternum mid to dark brown, silver pruinose. Coxae dark brown, finely white pruinose; fore coxae yellowish anterolaterally. Trochanters yellowish brown. Femora mainly reddish orange; band on basal half dark brown; finely white pruinose; mid femur with defined row of longer setae on posterodorsal margin. Tibiae orange-tan; finely white pruinose. Tarsi orange-tan; dense microsetae on fore and hind tibiae and tarsi golden. Wing dark brown in cells bc, c, sc, r1, r2+3, anterior half of r4+5. Petiole length about 0.6x length of dm-cu. CuA2+A1 about 0.7x length of petiole. Haltere yellow, base dark brown.

Abdomen. T1, T3 and T4 blackish brown. T1 and T2 narrower than T3 especially in males. T1 distinctly wider than T2 in male; slightly wider in female. T1 with a narrow posterolateral white pruinose strip, more distinct in male. T2 brownish black anteriorly, yellowish-brown posteriorly; pruinose band golden yellow dorsally, silvery yellow laterally, on posterior half to two-thirds; with scattered short black setae over entire surface. T3 with pruinose band yellow, complete in male; present as lateral elongate patch only in female; on posterior one third in male; T3 slightly longer than T2. T4 of female with transverse, posterior row of longer

setae; pruinose band absent. S1–4 dark brown, finely silver pruinose; S2 and S3 yellowish and more densely pruinose posteriorly in line with dorsal pruinose bands.

Female. T5 blackish brown with scattered short black setae anteriorly and moderately long setae arranged in transverse row posteriorly. T6 blackish brown, almost entirely pale yellow pruinose dorsally; about half length of segments 3–5 together. T7 dark brown, pale yellow pruinose on anterior half; with moderately long black setae over surface. T8 shiny dark tan. Female genital plate dark brown, large, broadly rounded, distinctly longer than wide, with 12–15 defined rows of closely arranged, relatively large spicules. Spicules (Fig. 98) not merging medially; with small medial basal notch; pedestals with 3 short microtrichia arising from base. S6 with at least 15 rows of closely arranged spicules.

Male. All sclerites except S8, brownish black. T5 with large yellow crescent shaped mark covering almost entire dorsal surface. Protandrium yellow pruinose, less densely posterolaterally; not much longer than T2 or T3. S8 shiny dark brown; convex in continuous curve with anterior part of protandrium; slightly shorter than epandrium. S5 with posteromedial patch of spicules.

Measurements. Total length = 9.0 mm (6.7–11.0 mm); wing length = 6.0 mm (4.8–6.8 mm).

Distribution. Throughout eastern mainland Australia (Fig. 130).

Australoconops sydneyi Camras (Figs 55, 99, 100, 131)

Australoconops sydneyi Camras 1961: 69

Type material. Holotype (examined). ♂, **New South Wales**: **L1**: Sydney NSW; **L2**: Bridwell collection; **L3**: HOLOTYPE Australoconops sydneyi CAMRAS (USNM 64920).

Additional material. **New South Wales**: 1♂, Woodford, 15.xi.1925 (ANIC). **Victoria**: 1♀, Little Desert, 1.xi.1949 (MVMA).

Diagnosis

Frons blackish brown, grooved; dense narrow yellow pubescence of anterior fronto-orbital region continuous with similarly coloured, wider pubescence on parafacial; face and cheek blackish brown except for yellow facial ridge. Thorax yellow-gold pruinose on posterior half of postpronotal lobe and on mesoscutum medial and posterior of lobe; white pruinose stripe on anepisternum and katepisternum in line with gold of mesoscutum. Finely white pruinose on laterotergite. Tibiae yellow pruinose. Abdomen yellow-gold pruinose on T2, T3, T5 (diffusely) and epandrium in male; on T2, T3 laterally and T6 in female.

Redescription

As given in Camras (1961) with additional information as follows:

Head. Occiput brownish black, silver pruinose especially ventrally and at eye margin. Median occipital sclerite and vertex dark brown, with long, moderately strong, dark brown setae; setae more dense behind ocellar tubercle, absent from around anterior margin of vertex; vertex about half as long as frons. Ocelli ovoid. Frons slightly wider than long, dark blackish brown with narrow yellow pubescent band along eye margin, tapering posteriorly. Lunule about 3x diameter of base of antenna. Eye height 0.81x head height. Antenna blackish brown; first flagellomere reddish orange basally; ratio of segment lengths: 1:2:1.5. Stylus (Fig. 55) slightly less than half length of first flagellomere. Parafacial blackish brown, densely yellow pubescent. Facial ridge yellow. Facial carina, frontoclypeal tubercle and antennal fovea blackish brown; foveae silver pruinose on lower half. Cheek blackish brown, almost flat, with few scattered, short, fine dark brown setae.

Thorax. Postpronotal lobe dark brown, golden pruinose posteriorly; with scattered short, strong black setae. Mesoscutum mainly blackish brown; postalar callus dark brown; golden-yellow pruinose medial and posterior of postpronotal lobe; with numerous npl and pal setae. Scutellum blackish brown with 2 pairs mar-

ginal bristles. Pleura blackish brown, finely white pruinose with more or less defined white stripe down posterior of anepisternum and middle of katepisternum. One long, strong prepst and 6 or 7 kepst bristles present. Femora dark brown; fore and mid femora with bare, shiny patch on posteroapical one third. Tibiae yellowish basally, dark brown distally, yellow pruinose. Apical pruinose patch on tibiae not differentiated. Wings dark brown in cells bc, c, sc, r_1, r_{2+3}, br, anterior half of r_{4+5}, anterior to CuP; lighter brown in posterior half of bm, basal half of dm. Sc ending a little beyond mid-length of wing. Petiole equal to length of dm-cu. CuA_2+A_1 0.7x length of petiole.

Abdomen. Brownish black with golden-yellow pruinose bands. T1 with long lateral setae; slightly wider than T2. T2 extensively pruinose. T3 in male pruinose except for anterolateral triangle; female with posterolateral pruinose patch. T3 about same length as T2 in male; slightly longer than T2 in female.

Female. T5 blackish brown with moderately long, dark brown setae across width. T6 with large pruinose patch covering entire dorsal surface except for anterior and posterior margins; about 0.7x length of T3–T5 together. T7 dark brown, somewhat rounded posteriorly, with moderately long dark brown setae anteriorly and laterally. T8 shiny, dark brown. Female genital plate (Fig. 100) large, with about 18 rows of very closely arranged spicules. Spicules (Fig. 99) with fine ridges arising from basomedial smooth triangular area; pedestals with broad rim below spicule base; microtrichia not arising from side of pedestals. S6 long and broad, with more than 20 rows of tightly arranged spicules.

Male. T5 with indistinct dorsal band. Protandrium entirely pruinose except for lower lateral area. S8 shiny dark brown. S5 long, blackish brown, with band of spicules posteromedially.

Variation. In the female specimen, frons brown; ratio of antennal segments 1:2.1:2; stylus about 0.4x length of first flagellomere; the white pruinose band on the pleura is more defined on the anepisternum and more diffuse on the katepisternum than in the holotype.

Measurements. Total length = 8.0 mm (9.0–11.5); wing length = 5.4 mm (6.0–7.2).

Distribution. Central eastern NSW and western Victoria (Fig. 131).

Comments. The female described above shows subtle differences from the male specimens, the most striking being in the length of the first flagellomere which is almost as long as the pedicel. This species is similar to *A. aequatus* and *A. similis* but the yellow bands on T2 and T3 are much wider, the pleural stripe is white and the laterotergite lacks the yellow patch; the posteroapical femoral shiny area is dark brown and not yellowish as in *A. similis.* The spicules of the three species show distinct differences.

Australoconops unicinctus (Kröber) (Figs 101, 102, 132)

Conops unicinctus Kröber 1939b: 603
Australoconops unicinctus—Camras 1961: 66

Type material. Holotype (examined). ♂, **Western Australia**: **L1**: Type; **L2**: Conops unicinctus, Krb. examined & det. O. Kröber, 1938.; **L3**: Conops unicinctus ♂ [hand written pencil]; **L4**: S.W. Australia. Kalamunda. 9–28 Feb. 1914. R. E. Turner. 1914-258.; **L5**: TYPE (NHM). Paratypes (examined). **Western Australia**: ♀, **L1**: Type; **L2**: Conops unicinctus, Krb. examined & det. O. Kröber, 1938.; **L3**: Conops unicinctus ♀ [hand written pencil]; **L4**: S.W. Australia. Kalamunda. 9–28 Feb. 1914. R. E. Turner. 1914-258.; **L5**: TYPE (NHM).

Additional material. **Queensland**: 1♂, Lockerbie Scrub, Cape York, 10.iv.1975 (AM); 4♂, 3 km NE Mt Webb, 15°03'S 145°09'E, 2,3.x.1980 (ANIC); 1♂, 12 km W Fairview via Laura, 26.vi.1975 (ANIC); 1♂, 45 km S Collinsville, 16.i.1987 (AM); 1♂, 1♀, Funnel Ck, 21°47S' 148°55E', 12.xii.1968, at light, (ANIC); 1♂, 21 km NE Emerald, 31.x.1977, on *Parsonia eucalyptophylla* (UQIC); 3♂, Blackdown Tableland, Expedition Ra., 12.v.1981, 17.i.1987 (AM); 1♂, 2♀, Mt Moffatt Nat. Pk, Top Moffatt Camp, 13,15.xii.1987, on *Bursaria* flowers, MV light; 3♂, Carnarvon Nat. Pk, Mt Moffatt Section, 3 km SE Ranger Station, 25°04'39"S 148°00'30"E, 740 m, 18–20.xi.1995; 1♂, Carnarvon Nat. Pk, Mt Moffatt Section, Chimneys, 25°06'01"S

147°52’01”E, 1.xii.1997 (all UQIC); 1♀, Bin Bin Ra. via Didcot W Biggenden, 5.xii.1974 (ANIC); 1♂, Bluff Ra., Biggenden, c. 3100 ft [1000 m], x.1972 (ANIC); 1♂, 7 km E Charleville, 23.xi.1979, on *Eucalyptus populnea*; 1♀, Amby, 22,27.xi.1979; 1♂, Brock Ck, Burnside, 2.iv.1929 (ANIC); 1♂, Miles, 16.i.1972; 1♂, Chinchilla, 4.iv.1929 (all UQIC); 1♀, 20 mls [32 km] E Chinchilla, 28.iii.1957 (ANIC); 1?, Durham Downs—Nokandra, 13.xi.1949 (ANIC); 7♂, 4♀, Brisbane, 28.i,24.iv.1912, 3.iii.1914, 8,15.ii.1916, 28.xi.1917, 17.i.1927, 8.x.1939 (ANIC, QDPI, QM); 4♀, The Blunder, Brisbane, 30.ix.1968, 1,7.xi.1979, 9.i.1980, 16.ii.1980 (ANIC, UQIC); 1♂, Nappamerrie, 7.xi.1949 (ANIC); 2♂, 5 km N Leyburn, 29.iii.1991, 7.xi.1993 450 m; 1♀, Cunnamulla, 27,29.x.1979; 1♂, Yelarbon, 1.i.1959 (all UQIC); 1♀, Stanthorpe, 6.xii.1927 (QDPI). **New South Wales**: 1♂, 1♀, 60 mls [96 km] W Wanaaring, 30.x.1949 (ANIC); 1♂, Bogan River, -.1934 (AM); 1♀, nr Bourke, 26.x.1949 (ANIC); 1♀, Coonabarabran, 29.xi.1984 (ANIC); 4♂, 10 km S Coonabarabran, 13,17.i.1980 (UQIC); 2♀, Warrumbungle Nat. Pk, 20.xi.1984, 24–26.xii.1992 (ANIC, INHC); 3♂, 1♀, 1?, Wilcannia—Mt Boppy, 24.xi.1949 (ANIC); 2♀, Goonoo State Forest, 12–14.i.1994, malaise trap (UQIC); 4♂, Tibooburra, Cobham Lake, 17.xi.1949 (ANIC); 11♂, 3♀, 3–7 km NE Bilpin, 28–29.xi.1978, 4.xii.1979, 29.x,2,12.xi.1980, 3.i.1981, 12.iv,13.xii.1984; 1♂, Mt. York, 7.iii.1982; 1♂, Mt Bell, Blue Mtns, 17.xii.1981; 1♂, Mt Tomah, Blue Mtns, 2.x.1980; 1♀, 15 km NE Kurrajong 26.x.1977 (all AM); 3♂, 1♀, Brisbane Water Nat. Pk, Warrah Trig., 26–31.1985, 20.i.1986; 1♂, French’s Forest, 1.i.1924; 1?, Cowra, 29.i.1925; 1♂, Como, 1.xii.1927; 1♀, National Pk, 14.ii.1926. **Australian Capital Territory**: 1♀, Molonglo R, 25.ii.1930; 7♂, 4♀, Black Mountain, Canberra, 20.xii.1929, 15.i.1934, 28–29.i.1953, 26.i.1955; 19.xii.1957, 29.xii.1965, 10.i.1966, 11,19.i.1968; 10♂, 3♀, Canberra, 17.iii.1930, 4.xii.1933, 7,11.ii,19.iii,1.xi.1948, 30.x.1949, 15.iii.1951, 18.i.1952, 13.i.1956, 21.xi.1958, 14.xii.1959, 25.i,15.ii.1980, (all ANIC). **Victoria**: 1♂, Gunbower, 3.iii.1933 (SCC). **South Australia**: 1♂, Cooper Ck, 28 39’S 138 27’E, 7.iii.1972, on *Eucalyptus*; 1♂, Foothills of Kelmscott, 21.xi.1958; 1♂, Torrens Gorge, 25.i.1939; 2♂, Sandy Ck, i.1940; 1♂, Adelaide, i.1940; 1♂, Eladunna Homestead, 7,8.iii.1972 (all SAM). **Western Australia:** 1♂, Moorine Rock, 31°08’S 119°08’E, 7.i.1978; 1♀, Moore R. Nat. Pk, 31°10’S 115°40’E, 31.xii.1989; 1♂, Dedari, 40 mls [64 km] W Coolgardie, 11–21.i.1936; 1♂, Dedari, 45 km WSW Coolgardie, 28.i.1982, on flowers of *Eucalyptus cylindriflora*; 1♂, 70–75 km ENE Norseman, 10–16.xi.1978, on flowers of *Thryptomere australis* (all WAM); 1♂, Bunbury, 3.i.1957 (AM). **Northern Territory:** 1♂, 47 km N Alice Springs, 5.xi.1974, on *Eucalyptus intertexta* (UQIC); 1♂, Alice Springs, 23°46’07”S 133°52’46”E, 1.iii.1995, on *Eucalyptus* (MVMA).

Diagnosis

Frons smooth, black medially and posteriorly, yellow-orange anterolaterally; antennae mainly dark brown to black; face yellow; cheek black. Thorax yellow pruinose on postpronotal lobe, medial and narrowly posterior of postpronotal lobe and on mediotergite; white pruinose on laterotergite. Femora mainly reddish orange; band on basal half dark brown; tibiae with basal half yellowish brown; distal half brown. Abdomen yellow pruinose on T2, T5 and protandrium in male; on T2, T6 and T7 in female.

Redescription

Head. Occiput mainly dark brown, black dorsally around eye margin, with narrow silvery pruinose band around lower half of eye margin; occipital setae short. Median occipital sclerite brownish black. Vertex yellowish brown, sometimes dark brown; setae quite long, longer than occipital setae, across posterior surface. Ocellar tubercle blackish brown, distinctly posterior of anterior margin of vertex. Frons black to dark brown posteriorly and medially, yellow-orange anterolaterally; usually entirely smooth but sometimes with some shallow longitudinal grooves anterolaterally; as long as wide; with some moderately long setae posterolaterally. Fronto-orbital region not demarcated from mesofrons. Lunule length about 3x diameter of base of antenna. Eye height 0.86x head height. Antenna brown to black, pedicel apically and first flagellomere ventrally, lighter brown; ratio of segment lengths: 1:1.7:1.1; stylus black, about 0.3x length of first flagellomere.

Face bare. Parafacial yellow, black or brown on ventral one quarter, silver pruinose. Facial ridge long, extending below level of frontoclypeal tubercle grooved, yellow. Antennal fovea yellow except for dark brown lower extremity, silver pruinose on lower half. Facial carina light brown with dark line along ridge. Frontoclypeal tubercle dark brown. Cheek dark brown to black, flat with some moderately long setae, especially around epistoma. Postgena brownish black; setae short. Haustellum length 1.8x head length.

Thorax. Postpronotal lobe brown; at least posterior part yellow pruinose, setae sparse, about 5, moderately short, one usually longer than others and in yellow area. Mesonotum brownish black; yellow pruinose medial and narrowly posterior of postpronotal lobe; with several npl (3 long and strong), several pal (2 long and strong), one ial. Scutellum with short, strong setae over entire surface and one pair of long convergent posterior bristles. Postnotum blackish brown, silvery yellow pruinose on mediotergite, white pruinose on laterotergite. Pleura blackish brown, finely white pruinose. One prepst bristle (occasionally an additional shorter one) and several (one long dorsally directed) kepst bristles. Prosternum mid to dark brown, silver pruinose. Coxae mid to blackish brown, silvery pruinose. Trochanters yellowish brown. Femora mainly reddish orange; band on basal half dark brown; finely white pruinose; mid femur with defined row of longer setae on posterodorsal margin. Tibiae with basal half yellowish brown, distal half brown; finely white pruinose. Tarsi yellowish brown; silvery pruinose; dense microsetae golden on fore tibia and tarsus, golden brown on hind tibia and tarsus. Wing dark brown in cells bc, c, sc, r_1, r_{2+3}, anteriorly and along vena spuria in r_{4+5}; pale brown anterior of CuA_1 in dm; veins black except bases of C, Sc, R reddish yellow to level of h, and other veins yellowish basally, M to beyond bm-cu; vena spuria conspicuous. Petiole length about 0.6x length of dm-cu. CuA_2+A_1 1.6x length of petiole. Haltere base dark brown, pedicel yellow, capitellum reddish.

Abdomen. T1 and T2 narrower than T3 especially in males. T1 distinctly wider than T2, in male; slightly wider in female; T1, T3 and T4 blackish brown; T1 with a narrow posterolateral white pruinose strip, more distinct in male. T2 brownish black anteriorly, yellowish-brown posteriorly; pruinose band golden yellow dorsally, silvery yellow laterally, on posterior half to two-thirds, with scattered short black setae over entire surface. T3 without pruinose band; about same length as T2. T4 with scattered, short black setae over entire surface; female with transverse, posterior row of longer setae; pruinose band absent. S1–4 dark brown, finely silver pruinose; S2 yellowish and more densely pruinose posteriorly in line with dorsal pruinose band.

Female. T5 and T6 blackish brown; T5 with scattered short setae anteriorly and moderately long setae arranged in transverse row posteriorly. T6 almost entirely golden pruinose; about half length of segments 3–5 together. T7 dark brown, golden pruinose on anterior half, with moderately long setae anteriorly and laterally; about same height as T6 in lateral view. T8 shiny dark tan. Female genital plate (Fig. 101) dark brown, large, broadly rounded, distinctly longer than wide, with 12–15 clearly defined rows of closely arranged spicules. Spicules (Fig.102) with broad, tiered ridges. S6 with at least 15 rows of closely arranged spicules.

Male. T5, S5, protandrium and epandrium brownish black. T5 golden pruinose except narrow anterior and lateral band. Protandrium golden pruinose except for ventrolateral area; not much longer than T2 or T3. S8 shiny dark brown; convex in continuous curve with anterior part of protandrium; slightly shorter than epandrium. S5 with posteromedial patch of spicules.

Measurements. Total length = 9.0 mm (6.1–10.6 mm); wing length = 7.6 mm (4.2–7.8 mm).

Distribution. Throughout mainland Australia (Fig. 132).

Comments. This species is the most abundant and widely distributed of the genus.

Australoconops vespoides, sp. nov. (Figs 56, 72, 76, 103, 104, 133)

Type material. Holotype. ♂, **New South Wales**: Mt Tomah, Blue Mtns, 21.xi.1981, N. W. Rodd (AM). Paratypes. **New South Wales**: 1♂, 1♀, Mt Tomah, Blue Mtns, 11.x, 5.xi.1980 (AM); 1♀, Alpine Ck, 24.ii.1935, Mackerras (ANIC); 1♀, Rutherford Ck, Brown Mtn, nr Nimmitabel, 26.xii.1974, G. Daniels (UQIC); 1♂,

Snowy R., Mt Kosciusko, 12.xii.1931 (ANIC). **Victoria**: 2♀, Flowerdale, 8,15.xii.1954; 1♂, Dandenong Ranges, 15.x.1922 (all MVMA).

Diagnosis

Frons grooved, mainly dark, reddish black, brown posteromedially, sometimes entirely brown; parafacial dark brown with yellow pubescence. Thorax yellow pruinose on postpronotal lobe, mesoscutum medial and posterior of postpronotal lobe and narrowly anterior of scutellum; whitish pruinose on anepisternum and katepisternum and on laterotergite. Male with narrow yellow pruinose transverse bands on T2 and T3 and yellow pruinose patch on protandrium; female with narrow yellow pruinose band on T2, elongate yellow lateral patch on T3 and large dorsal yellow pruinose patch on T6; female genital plate short.

Description

Habitus (Fig. 76); resembles *A. aequatus* and differs from the description given for that species as follows:

Head. Median occipital sclerite black ventrally, reddish black dorsally. Vertex reddish black, darker around anterior margin and ocellar tubercle. Frons brown posteromedially, brownish black anteriorly and laterally; width 1.5x length. Eye height 0.74x head height. Antenna with scape black; pedicel dark reddish brown; first flagellomere mainly black, reddish orange basally and ventrally. Facial ridge long, extending below level of frontoclypeal tubercle.

Thorax. Mesoscutum brownish black, golden yellow pruinose medial and narrowly posterior of postpronotal lobe and narrowly anterior of scutellum. Pruinose patch on laterotergite and pleural stripe whitish. One prepst and 7 kepst bristles present. Trochanters yellowish brown. Femora mainly dark reddish brown to black; ventroapical area shiny, distinctly paler brown. Tibiae tan; whitish pruinose as for *A. aequatus*; hind tibia not distinctly darker distally. Tarsi tan. Wing (Fig. 72) with CuA_2+A_1 slightly longer than petiole.

Abdomen. Yellow pruinose transverse band on T2 narrow, on posterior third only. Pruinose band on T3 of male usually narrower than band on T2, on posterior quarter only.

Female. Female genital plate (Fig. 103) short, broadly rounded, distinctly wider than longer, with about 13 rows of spicules. Spicules (Fig. 104) shorter than those of *A. aequatus*, with ridges not merging medially; pedestals with rounded rim below base of spicule. S6 with at least 15 rows of closely arranged spicules.

Male. Postabdomen as in Fig. 56.

Variation. Some specimens have the frons entirely dark tan, not blackish.

Measurements. Total length = 13 mm (10–13 mm); wing length = 8 mm (7.7–8.2 mm).

Distribution. South-eastern highland areas of New South Wales and southern Victoria (Fig. 133).

Comments. The females of this species are easily distinguished from others of the *A. aequatus* group by the short genital plate. This species is also distinguished by the elongate spermathecae.

Etymology. The specific name is from the Latin *vespa* (= wasp) and refers to the wasp-like appearance of the species.

4.5.6 *Camrasiconops* gen. nov.

Introduction

This genus is proposed to accommodate species which have maxillary palps and three ocelli. Included in the genus are two species described as *Microconops* by Camras (1961). These are redescribed below. Four new species are recognised in accumulated material from Australian collections. These will be described later.

Genus CAMRASICONOPS, gen. nov. (Figs 140–143)

CAMRASICONOPS gen. nov. Type species: *Microconops ater* Camras

Diagnosis

Three ocelli present; frons smooth posteriorly, at least slightly tuberculate and rugose anteriorly; first flagellomere elongate, narrow, without distinct dorsal swelling; parafacial not strongly projecting; antennal foveae shallow dorsally and ventrally; postgena not especially swollen; palpus present; haustellum long. Mesoscutum with very short, strong setae; more than 1 prepst bristle present; mid femur without defined row of longer setae on posterodorsal margin; fore and mid tibiae without distinct apical, oval pruinose patches on posterior surfaces.

Description

Head. Vertex extending laterally to eye margin; median occipital sclerite and frons not confluent; setae of vertex moderately dense and strong. Ocellar tubercle distinct, smooth, brownish black; with three large, conspicuous, round ocelli. Frons bare, with rounded, smooth ridge along fronto-orbital region; rugose and tuberculate, at least slightly, anteromedially; differentiated fronto-orbital setae absent. Lunule length at least equal to diameter of base of antenna. Eye elongate, oval. Antenna as long as or slightly longer than head height. Pedicel of antenna with base narrow short, bare, separated from long, minutely setose distal section by transverse dorsal keel. Stylus usually three-segmented (sometimes two-segmented), about 0.2x length of first flagellomere. Parafacial not strongly projecting, narrower than facial ridge. Facial ridge short, not clearly demarcated from parafacial. Antennal foveae deepest at about mid length; shallow dorsally and ventrally. Facial carina poorly developed. Frontoclypeal tubercle large, prominent; clearly projecting beyond margin of antennal fossa in lateral view. Cheek slightly concave, finely setose around epistomal margin, otherwise bare. Postgena not especially swollen and protruding anteriorly below eye. Clypeus bare. Palpus present, length less than half diameter of base of haustellum. Haustellum black, long, 1.7x–2x head length.

Thorax. Dark brown to black. Setae short, strong; mesoscutal bristles present: 2 npl, 2 pal, sometimes 1 ipal. More than 1 prepst bristle; anepisternal and anepimeral bristles absent; 4–6 kepst bristles. Legs entirely setose; femora without distinct bare areas and mid femur without defined row of longer setae on posterodorsal margin. Fore and mid tibiae without distinct apical, oval pruinose patches on posterior surfaces. Dense microsetae present on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing with Sc ending mid length of wing; R1 ending far beyond apex of Sc; extending along costa to end a little before R2+3; vena spuria conspicuous; cell r4+5 long, acute apically.

Abdomen. Narrowest at T2–3 margin; posterior segments broad. Well defined pruinose bands absent. T1 wider than T2; rounded, lobe-like laterally, especially in male, with numerous long bristles laterally. T2 about 2.5x length of T1 in male (about 2x in female).

Female (Fig. 140). T6 about same length as T2. T6 with posteromedial projection and T7 with anteromedial notch. Female genital plate sparsely setose anteriorly; large, broadly rounded apically (Fig. 141); spicules of female genital plate (Fig. 142) sometimes different from those of S6 (Fig. 143).

Male. T5 slightly shorter than T4. Protandrium almost as long as T5 dorsally; as high as T5. S8 pubescent, not shiny, differentiated from anterior part of protandrium by groove; not longer than T1; slightly narrower than epandrium, slightly more convex than anterior part of protandrium. Epandrium entirely setose, wider than long. S5 with or without spicules.

Measurements. Total length = 6.1–11.3 mm; wing length = 4.2–7.0 mm.

Etymology. The generic name is masculine. It honours Dr Sidney Camras of Chicago, USA who has contributed much to the knowledge of the world Conopidae fauna.

***Camrasiconops ater* (Camras), comb. nov. (Figs 134, 135, 138, 139)**

Microconops ater Camras 1961: 70.

Type material. Holotype (examined). ♂, **New South Wales**: **L1**: Sydney NSW; **L2**: Bridwell Collection; **L3**: HOLOTYPE Microconops ater CAMRAS (USNM 64921). Paratypes. **New South Wales**: 2♂, same data as holotype (CC, USNM).

Additional material. **Queensland**: 1♂, Brisbane, 6.ix.1966; 1♀, Brown Lake, Stradbroke Island, 19.ix.1981 (all UQIC).

Diagnosis

Frons blackish brown; first flagellomere of antenna much longer than length of scape and pedicle together; stylus two-segmented; face with fine, short setae along lateral margins of antennal foveae. Wing hyaline.

Redescription

Head (Fig. 134). Occiput blackish brown dorsally; pale yellow ventrally; occipital setae black, mainly dorsal, especially medially. Vertex distinctly higher than frons, about one-third length of frons, emarginate medially; setae moderately long and strong. Ocellar tubercle distinctly raised above plane of vertex, smooth, brownish black. Frons blackish brown; mainly smooth; rugose, slightly tuberculate anteromedially; slightly wider than long. Lunule dark brown, length about equal to diameter of base of antenna. Eyes 0.7x head height. Antenna about as long as head height; mainly blackish brown, first flagellomere ventrally yellowish brown; ratio of segment lengths: 1:1.6:3.6; first flagellomere elongate, more or less uniformly tapered. Stylus two-segmented (Fig. 135), about 0.2 length of first flagellomere. Face with fine, short setae along lateral margins of antennal foveae. Parafacial colour yellowish brown, very finely whitish pruinose. Facial ridge, antennal foveae and facial carina shiny, brown to yellowish brown. Frontoclypeal tubercle dark brown. Cheek and postgena yellow; setae moderately short, fine, yellow. Haustellum 2x head length.

Thorax. Mainly blackish brown. Postpronotal lobe silver pruinose posteriorly; setae sparse, moderately short and strong. Mesonotum with very short, moderately strong setae over entire surface; mesoscutal bristles present: 2 npl, 2 pal, 1 ipal. Scutellum with 1 pair of long, convergent apical bristles. Postnotum finely white pruinose. Anepisternum and katepisternum finely white pruinose posteriorly in continuous band. Two prepst bristles, 1 fine, 1 strong. Four or 5 kepst bristles, 1 or 2 long and strong, others shorter, finer. Legs blackish brown except basal half tibiae yellowish brown; finely white pruinose. Wing completely hyaline; petiole 0.7x length of dm-cu; CuA_2+A_1 same length as dm-cu. Haltere yellow, base dark brown.

Abdomen. Dark brown to black; T1–3 white pruinose posteriorly. Female T2,3 relatively broader than in male. T2 and T3 with lateral bristles not much shorter than those of T1. T2 about 2.6x length of T1 in male; 1.9x T1 in female. T3 slightly longer than T2. T4 faintly white pruinose posteriorly; slightly shorter than T2 in male; 0.7x T2 in female. S2–4 narrow in male; relatively broad in female. S1–4 with long setae.

Female. T5 setae moderately long. T6 same length as T2. T6–7 entirely setose. T7 about same length as T6. T8 shiny, setose. Female genital plate (Fig. 138) with about 10 irregular rows of spicules. Spicules (Fig. 139) relatively large, somewhat tapered apically, with ridges not merging medially, without obvious pedestals. S6 with closely arranged spicules, number of rows not able to be counted in available specimens.

Male. T5 entirely short setose; slightly shorter than T4. Protandrium finely whitish pruinose, entirely setose, almost as long as T5 dorsally; as high as T5. S8 not shiny; shorter than T1; slightly narrower than epandrium. Epandrium dark brown, wider than long. S5 without spicules.

Measurements. Total length = 7.3 mm (6.3–6.5 mm); wing length = 4.9 mm (4.2–4.7 mm).

Distribution. South-eastern Queensland, New South Wales.

***Camrasiconops rufofemoris* (Camras), comb. nov.**

Microconops rufofemoris Camras 1961: 71

Type material. Holotype. ♂, **New South Wales**: **L1**: Sydney NSW; **L2**: Bridwell Collection; **L3**: HOLOTYPE Microconops rufofemoris CAMRAS (USNM 64922).

Additional material. **Queensland**: 2♂, Bunya Mtns, rainforest behind Rice's Cabins, 16.i.1997 (UQIC).

Diagnosis

Head almost entirely blackish brown to black; ocellar tubercle on mesofrons anterior of vertex; frons strongly rugose, tuberculate anteriorly; antennal stylus three-segmented; wing brown anteriorly. Femora mainly reddish orange; bases dark brown.

Redescription

Head (Fig. 136). Occiput entirely blackish brown, silvery pruinose adjacent to eye; setae moderately short. Median occipital sclerite yellowish brown dorsally. Vertex yellowish brown; distinctly higher than frons, cushion-like, about one-quarter length of frons, slightly projecting anteromedially; setae of moderately dense, short, moderately strong, black. Ocellar tubercle on mesofrons anterior of vertex; brownish black; ocellar bristles absent. Frons bare; brown posteriorly, becoming black anteriorly; smooth posteriorly, strongly rugose, tuberculate anteriorly; with raised ridge along fronto-orbital region; slightly longer than wide. Lunule dark brown; slightly longer than diameter of base of antenna. Eye 0.8x head height. Antenna slightly longer than head height; scape and pedicle mid brown; first flagellomere dark brown dorsoapically, otherwise orange; ratio of segment lengths: 1:1.6:2.2; scape about 4x as long as wide; pedicle narrow, elongate; first flagellomere more or less uniformly tapered to narrow apex. Stylus (Fig. 137) blackish brown, distinctly three-segmented, length about 0.2x length of first flagellomere; segments 1 and 2 about equal length. Face bare. Parafacial brownish black, silvery pruinose; narrower than facial ridge. Facial ridge mainly blackish brown, yellowish brown medially. Antennal foveae yellowish brown dorsally, blackish ventrally, silvery pruinose. Facial carina dark brown. Frontoclypeal tubercle blackish brown. Cheek black with sparse fine setae. Postgena blackish brown, white pruinose; setae moderately long, fine, brown. Haustellum 1.7x head length.

Thorax. Mainly brownish black. Postpronotal lobe narrowly pale yellow pruinose posteriorly; setae sparse, short, strong. Mesoscutum with extremely short, strong setae over entire surface; 2 npl, 2 pal present, ipal absent. Scutellum dark brown, dark yellow pruinose; with short, strong setae over entire surface, marginal bristles absent. Postnotum pale yellow pruinose. Pleura finely whitish pruinose, distinct bands absent. Bristles present: 4 prepst, all strong, unequal length; 6 kepst, moderately long, fine. Coxae dark brown, white pruinose. Trochanters dark brown. Femora mainly reddish orange; bases dark brown. Tibiae with basal half yellowish brown; distal half dark brown; finely pale yellow pruinose. Tarsi brown. Wing infuscated brown; darker brown in cells bc, c, apex of r1, distal half of r2+3, r4+5, most of dm; petiole 0.4x length of dm-cu; CuA2+A1 1.7x length of petiole. Haltere yellow, base dark brown.

Abdomen. Mainly blackish brown. T1 narrowly pale yellowish pruinose posteriorly; lateral setae curved. T2,3 broadly pale yellowish pruinose posteriorly; T2 without long lateral bristles; about 2.5x length of T1 in male. T3 slightly shorter than T2. T4 without pruinose areas; 0.8x T2 in male. S2–4 well developed in male, relatively broad. S1–4 short setose.

Female. Unknown.

Male. T5 entirely short setose; slightly shorter than T4. Protandrium extensively yellow pruinose dorsally; entirely short setose. S8 same length as T1. S5 with posterior long setae and posteromedial patch of black spicules.

Measurements. Total length = 9.4 mm (8.4–9.3 mm); wing length = 6.2 mm (5.7–6 mm).

Distribution. Southern Queensland, New South Wales.

Comments. This species is remarkable for the position of the ocellar tubercle on the frons rather than on the vertex. The species is not listed in Smith (1989). As with other specimens from the Bridwell Collection, I doubt the accuracy of the collection site of the holotype especially since the other two known specimens were collected in rainforest at an elevation of about 1100 m.

4.5.7 *Chrysidiomyia* Kröber

Introduction

Kröber (1940) proposed the genus *Callosiconops* based on one female specimen of *C. hirsutus*. He distinguished *Callosiconops* from *Chrysidiomyia* by the two-segmented stylus observed in *C. hirsutus* and by features of the frons. The availability of more specimens, including males, of *C. hirsutus* has shown that the characters Kröber used are not distinctive enough to justify a separate genus for the species with a frons like that of *C. hirsutus*. The distinctive black 'callosity' formed by the fronto-orbital region is variable in colour. When not black as in the type of *C. hirsutus*, the frons does not appear sufficiently different from that of *Chrysidiomyia sensu stricto* that its form can be considered a generic character. Although the type of *C. hirsutus* appears to have a two-segmented stylus, other specimens of this species have a very small basal segment evident, sometimes more obvious on one antenna than the other of one individual. All species have the palpus represented by a small setose swelling and have a distinctive pointed protandrium.

Genus CHRYSIDIOMYIA Kröber (Figs 144, 147)

CHRYSIDIOMYIA Kröber 1940: 73. Type species: *Chrysidiomyia rufa* Kröber; designation Smith, 1989.
CALLOSICONOPS Kröber 1940: 75, syn. nov. Type species: *Callosiconops hirsutus* Kröber, by monotypy.

Diagnosis

Occiput dark brown to black dorsally, pale yellow ventrally; ocellar tubercle prominent, with three ocelli; frons strongly rugose; first flagellomere of antenna long, 1.5–2.2x length of pedicel; stylus three-segmented, sometimes apparently two-segmented, the last segment usually projecting out of the second at an acute angle; palpus represented by a small setose swelling. Thorax, and sometimes abdomen, with dense, long pubescence. Wing with cell r4+5 long, acute apically; petiole short. Abdomen with T2, T3 and T4 approximately the same length and width; protandrium somewhat pointed, dorsal length shorter than recurved posteroventral length; female T6 with posteromedial projection and T7 with anteromedial notch; male S5 with spicule-like setae.

Redescription

Head. Occiput dark brown to black dorsally, pale yellow ventrally; occipital setae moderately dense, fine, long, black dorsally, short, pale yellow ventrally. Median occipital sclerite dorsolaterally separated from posterolateral margin of frons by lateral extremity of vertex. Vertex smooth, narrow, much shorter than frons, demarcated from frons by ridge but not raised above plane of frons; differentiated setae absent; setae long, moderately strong, blackish brown. Ocellar bristles not differentiated from other setae of vertex. Ocellar tubercle with three ocelli; median round, lateral ovoid. Frons bare or with minute sparse setae; strongly rugose; transverse ridges, except posterior few, turning forwards laterally; fronto-orbital region prominent, forming a rounded ridge, anteriorly much higher than eye; differentiated fronto-orbital setae absent. Lunule dark brown to brownish black. Eye elongate, oval, height 0.6–0.75x head height. Antenna length 0.75–0.85x head height; scape with short strong setae laterally and along anterior margin; pedicel covered with very short, strong setae; first flagellomere at least 1.5x as long as pedicel. Stylus three-segmented; sometimes apparently two-segmented because basal segment small and sunken into apex of first flagellomere; segment 1 short, disc-shaped; segment 2 with ventral projection; segment 3 narrow, finely tapered, usually projecting out of segment 2 at an acute angle. Face, cheek and postgena pale yellow to orange. Parafacial at right angles to inner margin of eye. Facial ridge (Fig. 144) long, broad, more or less at right angles to parafacial; longitudinal grooves continuous with grooves of frons. Antennal foveae deep. Facial carina poorly developed dorsally, strong ventrally. Frontoclypeal tubercle present. Cheek concave. Postgena convex, protruding. Setae of cheek and postgena fine, pale yellow to pale brown. Palpus represented by a small setose swelling. Haustellum blackish brown; length variable from 1x–2.5x head length.

Thorax. Postpronotal lobe with many long, moderately strong, black setae. Mesonotum with many bristle-like black setae and poorly differentiated npl, pal and ipal bristles. Pleura with prepst and kepst bristles. Mid femur with defined row of longer setae on posterodorsal margin. Tibiae without apical, oval pruinose patch; preapical, dorsal tibial bristles absent. Dense microsetae on anteroventral surfaces of fore tibia and tarsus and posterior surfaces of hind tibia and tarsus. Wing completely hyaline; R_1 extending along costa to end a little before R_{2+3}; vena spuria present; cell r_{4+5} long; acute apically; petiole at most 0.8x length of dm-cu.

Abdomen. More or less parallel sided, narrow; dense pruinose bands absent. T1 with numerous long bristles laterally; at most slightly wider than T2. T2 usually about 2x length of T1 and about equal to length of T3. Length of male T4 about equal to length of T2; T4 of female two-thirds to three-quarters length of T2. S1–4 well developed.

Female. T7 elongate, at least as long as T6, with anteromedial notch.

Male. Protandrium (Fig. 147) somewhat pointed, dorsal length shorter than recurved posteroventral length. Epandrium yellowish brown. S5 without spicules.

Measurements. Total length = 5.4–15.4 mm; wing length = 3.5–9.5 mm.

Key to Australian species of *Chrysidiomyia*

1. Vertex posterior of ocellar tubercle and median occipital sclerite dorsally dark brown to black; segment 1 of stylus often inconspicuous, very short (Figs 148, 149); 1 proepisternal bristle . . . . . 2.
-. Vertex posterior of ocellar tubercle and median occipital sclerite dorsally yellow or orange; segment 1 of stylus always distinct (Figs 145, 146); at least 2 proepisternal bristles . . . . . 3.
2. Thorax and abdomen black; face and cheek with many moderately short pale brown setae; postgena and cheek pale yellow; fronto-orbital region usually entirely black . . . . . ***hirsuta*** (Kröber)
-. Abdomen blackish brown at most dorsally, otherwise mid brown; face and cheek with few sparse setae; postgena darker yellow than cheek; fronto-orbital region never entirely black. . . . . ***rugifrons*** sp. nov.
3. Pedicel of antenna without distinct dorsobasal ridge (Fig. 145); 2 or 3 proepisternal bristles present; setae of shaft of haustellum about as long as diameter of shaft . . . . . ***setosa*** sp. nov.
-. Pedicel of antenna with dorsobasal ridge; numerous proepisternal bristles present; setae of shaft of haustellum much shorter than diameter of shaft . . . . . 4.
4. Length of haustellum about 1.5x head length; abdominal T4 and T5 of male and T5 and T6 of female mainly orange brown . . . . . ***rufa*** Kröber
-. Length of haustellum about 2.5x head length; abdominal T4 and T5 of male (female unknown) mainly blackish brown . . . . . ***pulchella*** Kröber

Chrysidiomyia hirsuta (Kröber), comb. nov. (Figs 148, 149, 152, 203)

Callosiconops hirsutus Kröber 1940: 75

Type material. Holotype (examined). ♀, **Western Australia**: **L1**: Type; **L2**: Callosiconops hirsutus, Kröb. examined & det. O. Kröber, 1938.; **L3**: Callosiconops hirsutus Krb ♀ [hand written pencil]; **L4**: Sep.14–Oct.31,1913. R. E. Turner. 1914-27.; **L5**: Yallingup, Nr Cape Naturaliste, S. W. Australia.; **L6**: TYPE (NHM).

Additional material. **Western Australia**: 1♀, 115 km E Wiluna, 29.vii.1983, on flowers of *Acacia*; 1♂, 13 km S Wannoo, 26°49'S 114°37'E, 21–23.viii.1985, on flowers of *Hakea* (WAM); 2♂, Kalbarri Gabba Gabba Gully, 19.ix.1981, on heath (ANIC); 1♂, 10 km SW Paynes Find, 29.viii.1981 (AM); 1♂, nr Weelawadji Cave, Eneabba, 29°48'S 115°06'E, 19.ix.1982; 1♂, 14 km WSW Eneabba, 29°49S 115°16E, 8.ix.1987, on flowers of *Scholtzia laxiflora* (WAM); 2♂, 21 km NE Yellowdine, 31°17'S 119°53'E, 10.x.1981 (ANIC).

Diagnosis

Thorax and abdomen almost entirely black; thorax densely white pubescent. Frons yellow anteromedially, usually black laterally, otherwise yellowish brown; fronto-orbital region raised above plane of mesofrons, strongly ridged, projecting anteriorly. Stylus either apparently two-segmented or with very short basal segment.

Redescription

Head. Occiput blackish brown dorsally, pale yellow ventrally. Median occipital sclerite brownish black, suture lines reddish brown. Vertex black posterior of ocellar tubercle, otherwise yellowish brown; setae moderately dense across posterior half, usually some lateral of ocellar tubercle. Ocellar tubercle black. Frons yellow anteromedially, usually black laterally, otherwise yellowish brown; anteriorly and laterally ridges deep and large, projecting beyond insertion of antenna; frons width 1.7–1.9x length. Fronto-orbital region forming a rounded ridge; raised above plane of mesofrons, anteriorly much higher than eye, expanded mesad and traversed by ridges; usually black, shiny; sometimes mainly yellowish brown; setae of frons sparse, minute. Lunule dark brown; length about 1.5x diameter of base of antenna. Antenna (Fig. 148) slightly shorter than head height; mainly dark brown; first flagellomere often yellowish brown dorsobasally and brown ventrally; pedicel densely white pruinose; ratio of segment lengths: 1:1.7:3.8; pedicel silvery pubescent except for extreme base, without transverse dorsobasal ridge. Stylus (Fig. 149) brown, sometimes basal segment small and sunken into apex of first flagellomere; segment 3 narrow, finely tapered; about 0.2x length of first flagellomere. Face with fine, pale brown setulae. Parafacial colour dark brown dorsally if fronto-orbital callosity dark brown, otherwise pale yellow, silvery pruinose. Setae of cheek pale brown, moderately long in female, shorter in male. Postgena pale yellow, silvery pruinose; setae moderately short, pale brown. Haustellum of holotype about equal to head length.

Thorax. Almost entirely black with long, white pubescence. Postpronotal lobe covered with dense long white pubescence and numerous setae; shiny dark brown anterior of lobe. Mesoscutum with white pubescence denser medial and posterior of postpronotal lobe and on supra-alar region; postalar callus brown; mesoscutal bristles present: 2 npl, several pal, 1 ipal. Scutellum with 2 pairs of convergent, dorsally directed bristles slightly longer and thicker than other scutellar setae. Pleural bristles present: 1 prepst; usually 5 or 6, sometimes numerous, kepst. Prosternum yellowish brown. Fore coxa yellowish brown, mid and hind coxae mainly blackish brown, all white pruinose. Trochanters yellowish brown. Femora mainly yellowish brown; dorsal surface of fore and mid femora, except base and apex, and all hind femur except base, dark brown; densely white pruinose. Tibiae mainly yellowish brown; distal half to one-third dark brown; white pruinose. Tarsi dark brown; microsetae golden brown. Wing (Fig. 152) with vena spuria conspicuous as row of microtrichia; petiole length 0.6–0.8x length of dm-cu; CuA_2+A_1 length 0.7–1.1x length of petiole. Haltere pale yellow, base yellowish brown.

Abdomen. Mainly brownish black, white pruinose; with moderately long black setae on all tergites and sternites; tergites brown along lateral margins and sometimes across posterior margin. T1 not wider than T2, sometimes brown medially. T2 about 2x length of T1; T2, T3 and T4 about equal length. S1–4 dark brown, white pruinose.

Female. T6 sometimes with brown patch dorsally, about 0.7x length of T3–5 together. T7 dark brown posteriorly. T8 dark brown. Female genital plate brown, white pruinose; long, relatively narrow; spicules closely arranged in about 12 poorly defined rows; with long, fine setae on anterior and posterior surfaces. S6 with spicules closely arranged but not in defined rows.

Male. T5 about same length as T4. S8 yellowish to dark brown, white pruinose; slightly narrower and shorter than epandrium and slightly more convex than distal part of protandrium. Epandrium yellowish brown. S5 dark brown with band of spicule-like setae.

Variation. Haustellum of males 1.1–1.5x head length. Two specimens have the fronto-orbital dark brown only posteriorly. These specimens also have a less setose face and cheek.

Measurements. Total length = 8.5 mm (6.1–8.6 mm); wing length = 5.6 mm (3.7–5.9 mm).

Distribution. Western Australia (Fig. 203).

Comments. This species resembles *C. rugifrons*; both have the frons coarsely rugose anterolaterally and the fronto-orbital distinctly higher than the mesofrons. *C. hirsuta* usually has the fronto-orbital entirely black and the overall colour is darker than that of *C. rugifrons*.

Chrysidiomyia pulchella Kröber (Figs 153, 204)

Chrysidiomyia pulchella Kröber 1940: 74

Type material. Holotype (examined). ♂, **Western Australia**: **L1**: Type; **L2**: Chrysidiomyia pulchella, Kröb. examined & det. O. Kröber, 1938.; **L3**: Chrysidiomyia pulchella Krb ♂ [hand written pencil]; **L4**: S. W. Australia. Yallingup. 1–12 Dec.1913. R. E. Turner. 1914-190; **L5**: TYPE Holo-Type (NHM).

Additional material. **South Australia**: 1♂, 14 km WNW Renmark, 34°07'S 140°37'E, 7.xi–13.xii.1995, Malaise trap; 1♂, 4 mls [6.4 km] E Lucindale, 26.xii.1968, on *Leptospermum myrsinoides* (SAM).

Diagnosis

Median occipital sclerite mainly orange; frons entirely orange; pedicel of antenna with transverse dorsal ridge; haustellum 2.5x head length. Thorax black except postalar callus dark brown. Abdominal T1, T4 and T5 mainly black, abdomen otherwise deep yellow to orange.

Description

Head. Occiput blackish brown dorsally, pale yellow ventrally. Median occipital sclerite mainly orange, dark brown ventrally. Vertex orange; setae across posterior half and over ocellar tubercle, moderately dense medially, sparse laterally. Ocellar tubercle dark reddish black, punctate, distinctly posterior of anterior margin of vertex. Frons orange, width 1.5x length, almost bare, setae minute, orange. Fronto-orbital region orange; forming a smooth ridge; not raised above plane of mesofrons; anteriorly much higher than eye and traversed by ridges. Lunule brownish black; length about equal to diameter of base of antenna. Eye height 0.7x head height. Antenna about three-quarters head height; mainly brownish black; first flagellomere dark brown ventrally and orange at extreme base; ratio of segment lengths: 1:1.6:4; pedicel base narrow, shiny, smooth, with transverse dorsal ridge; distal half much expanded, with minute setae; transverse dorsobasal ridge present. Stylus dark brown, distinctly three-segmented; length 0.23x length of first flagellomere. Entire face and cheek orange; face with minute orange setae; facial carina with longitudinal grooves broadly continuous with grooves of frons; setae of cheek short, orange. Postgena pale yellow, finely white pruinose, setae moderately short. Haustellum 2.5x head length.

Thorax. Postpronotal lobe black, finely white pruinose with numerous setae. Mesoscutum mainly black, postalar callus dark brown; densely white pubescent medial and posterior of postpronotal lobe; with moderately long and strong, dense setae over entire surface; several poorly differentiated npl, pal and 1 ipal present. Scutellum black with 2 pairs of convergent, dorsally directed bristles slightly longer and thicker than other scutellar setae. Postnotum black, laterotergite densely white pubescent. Pleura brownish black; white pubescent, more densely as a broad band on anepisternum and katepisternum. Eight or 9 prepst and numerous dorsal kepst bristles present. Prosternum blackish brown, silver pruinose. Fore coxa yellowish orange, mid coxa yellowish brown, hind coxae dark brown. Fore and mid trochanters yellowish brown; hind trochanter dark brown. Femora mainly yellowish orange, apical third of hind femur dark brown. Tibiae mainly yellowish orange; apical third of hind tibia dark brown. Tarsi dark brown; microsetae golden on fore tibia, golden brown on fore and hind tarsus and hind tibia. Wing (Fig. 153) with Sc ending just beyond mid wing length; vena spuria conspicuous, ending beyond dm-cu; petiole about 0.3x length of dm-cu; discal cell with distal section of M arching forward; CuA_2+A_1 3x length of petiole. Haltere pale yellow, base reddish brown.

Abdomen. Tergites finely silvery yellow pruinose laterally and posteriorly; entirely covered with short black setae. T1 blackish brown, slightly wider than T2. T2 and T3 entirely dark yellow. T4 mainly blackish brown, orange laterally and narrowly across posterior margin; slightly shorter than T2. S1 dark brown; S2 yellow; S3 and S4 yellowish brown; setae moderately long, dark brown.

Female. Unknown.

Male. T5 mainly blackish brown, orange laterally and narrowly across posterior margin; about same length as T4. Protandrium including S8 orange. S8 slightly narrower and shorter than epandrium; convex in same plane as protandrium. S5 orange; with broad band of orange spicule-like setae.

Variation. The following variations in the character states of the holotype were observed in the only other available specimen: ratio of antennal segment lengths: 1:1.6:4.3; stylus 0.2x length of first flagellomere; colour of wing veins generally lighter; T2 orange, narrowly black across anterior margin; T3 orange.

Measurements. Total length = 11.6 mm (8.3 mm); wing length = 6.7 mm (5.2 mm).

Distribution. South Australia and Western Australia (Fig. 204).

Comments. Despite the wide geographic separation of the collection sites of the holotype and the other two known specimens of this species, they are very similar, the main difference being the larger size of the holotype.

Chrysidiomyia rufa Kröber (Fig. 205)

Chrysidiomyia rufa Kröber 1940: 73

Type material. Holotype (examined). ♂, **Western Australia**: **L1**: Holo-Type; **L2**: Chrysidiomyia rufa, Kröb. examined & det. O. Kröber, 1938.; **L3**: Chrysidiomyia rufa Krb ♂ [hand written pencil]; **L4**: Sep.14–Oct.31, 1913. R. E. Turner. 1914-27; **L5**: Yallingup, Nr Cape Naturaliste, S. W. Australia.; **L6**: TYPE (NHM), Paratypes (examined). **Western Australia**: 2♂, 1♀, same data as holotype; 3♀, Yallingup, -.xi.1913, R. E. Turner; 1♂, W. Aust., no date (all NHM).

Additional material. **Victoria**: 1♂, Grampians, no date (MVMA).

Diagnosis

Frons orange, diffusely brown medially; grooves of frons uniform in size, broadly continuous with grooves of facial ridge; haustellum 1.5x head length. Postpronotal lobe yellowish brown; pleura densely silvery yellow pubescent; legs mainly orange. Abdomen mainly orange brown; tergites golden pruinose laterally and posteriorly.

Redescription

Head. Occiput reddish black dorsally, pale yellow ventrally. Median occipital sclerite reddish orange dorsomedially, sometimes entirely black; upper part of suture lines reddish brown. Vertex orange except dark reddish brown or black behind ocellar tubercle; setae dense, across posterior half and over ocellar tubercle. Ocellar tubercle at anterior margin of vertex, smooth; dark reddish brown or black. Frons orange, diffusely brown medially; width 1.8–2.2x length; setae orange, short, sparse, fine. Fronto-orbital region orange, forming a rounded, smooth ridge; only slightly raised above plane of mesofrons; anteriorly much higher than eye, not traversed by ridges. Lunule dark brown; length about 1.5x diameter of base of antenna. Eye height 0.6–0.7x head height. Antenna slightly shorter than head height; mainly brownish black, first flagellomere dark brown ventrally; ratio of segment lengths: 1:2:3.1 to 1:1.7:3.6; pedicel covered with strong short setae and silvery pubescence except for extreme base; transverse dorsobasal ridge present. Stylus black, distinctly three-segmented; length about 0.5x length of first flagellomere. Face with fine orange setae, longer on upper part of parafacial. Parafacial, facial ridge and cheek orange. Facial ridge with longitudinal grooves broadly continu-

ous with grooves of frons. Facial carina dark yellow. Frontoclypeal tubercle yellow. Setae of cheek orange, moderately long. Postgena pale yellow, finely white pruinose; setae moderately short. Haustellum 1.5x head length.

Thorax. Postpronotal lobe yellowish brown, covered with dense yellow pubescence; anterior of lobe shiny dark brown; setae dense. Mesoscutum mainly black; supra-alar region, and postalar callus, brown; yellowish pubescence forming three dorsal longitudinal bands and lateral band; moderately long and strong, dense setae over entire surface; several npl and pal and 1 ipal poorly differentiated bristles present. Scutellum mainly black; dark reddish brown at apex and laterally; with 2 pairs of convergent, dorsally directed bristles slightly longer and thicker than other scutellar setae. Mediotergite blackish brown, white pubescent; laterotergite brown, densely silvery yellow pubescent. Pleura partially blackish brown, otherwise brown; entirely densely silvery yellow pubescent; with about 7 prepst and numerous katepisternal bristles distributed over entire surface. Prosternum yellow. Coxae yellow, silvery yellow pruinose. Trochanters yellowish brown. Femora orange; apex of hind femur with small dorsal dark brown patch and sometimes brown ventrally. Tibiae orange; apex of hind tibia dark brown. Fore and mid tarsi orange; hind tarsus dark brown; microsetae golden on fore tibia, golden brown on fore and hind tarsus and hind tibia. Wing with Sc ending just beyond mid wing length; vena spuria strong for entire length; petiole length 0.3–0.5x length of dm-cu; discal cell with distal section of M almost straight. CuA_2+A_1 0.6–0.8x length of petiole in male; about equal to length of petiole in female. Haltere mainly golden yellow, base brown.

Abdomen. Tergites mainly orange brown; golden pruinose especially laterally and posteriorly; with black setae dorsally and longer, golden brown setae laterally. T1 slightly wider than T2, blackish brown. T2, T3 and T4 mainly orange brown, densely golden pruinose laterally. T2 sometimes brown mid-dorsally; with long, fine yellow setae; male T2 about 2x length of T1; female T2 about 1.5x length of T1. T3 and T4 dark brown dorsally. T4 of female about two-thirds length of T3; length of male T4 about equal to length of T2. S1–4 orange brown, yellow pruinose; setae long, golden brown.

Female. T5 and T6 orange brown, yellow pruinose laterally. T6 about 0.8x length of T3–5 together. T7 orange brown; long, about same length as T6. T8 shiny orange tan. Female genital plate orange, finely yellowish pruinose; large, distinctly longer than wide, broadly rounded apically; extensively covered with many rows of closely arranged spicules; with short, fine setae on anterior surface and long, fine setae on posterior surface. S6 with many rows of closely arranged spicules.

Male. T5 orange brown, dark brown along posterior margin or over most of dorsal surface; about same length as T4. Protandrium orange brown, almost entirely yellow pruinose. S8 orange brown, almost entirely yellow pruinose; distinctly narrower and shorter than epandrium; convex in same plane as protandrium. S5 orange; with broad band of orange spicule-like setae.

Measurements. Total length = 10.3 mm (10.4–15.4 mm); wing length = 6.7 mm (7.0–9.5 mm).

Distribution. Western Australia and western Victoria (Fig. 205).

Comments. This species is the largest of the genus. Females are usually considerably larger than males and have a very large genital plate, longer than T6 length . The specimen from The Grampians shows no significant difference from the Western Australian specimens. I have no justification for considering them distinct despite the disjunct distribution of the available specimens.

Chrysidiomyia rugifrons sp. nov. (Fig. 206)

Type material. Holotype. ♀, **Western Australia**: 30 km SSW Ravensthorpe, 33°43'S 119°45'E, 22.ix.1981, I. D. Naumann and J. C. Cardale (ANIC). Paratypes. **Western Australia**: 1♂, Kojarena, 6.ix.1926, E. W. Ferguson (QM); 1♀, Yanchep, 11.ix.1972, K. T. Richards (WADA).

Diagnosis

Frons yellowish to dark brown posteriorly, yellowish brown anteriorly; fronto-orbital region raised above plane of mesofrons, strongly ridged, projecting anteriorly. Stylus either apparently two-segmented or with very short basal segment. Thorax dark brown to black; densely white pubescent. Abdomen mainly mid brown; at most blackish brown dorsally.

Description

Head. Occiput blackish brown dorsally, pale yellow ventrally. Median occipital sclerite blackish brown. Vertex dark brown, lighter brown anteriorly; setae moderately dense across posterior half, some lateral of ocellar tubercle. Ocellar tubercle smooth, blackish brown, distinctly posterior of anterior margin of vertex. Frons mainly yellowish brown, blackish brown posterolaterally; width 1.7x length; almost bare, setae minute, very fine. Fronto-orbital region brownish black posteriorly, yellowish brown anteriorly; forming a rounded, ridge; raised above plane of mesofrons; anteriorly much higher than eye, expanded mesad and traversed by at least one strong ridge. Lunule dark brown, length about equal to diameter of base of antenna. Eye height 0.75x head height. Antenna dark brown, slightly shorter than head height; ratio of segment lengths 1:2:3.5. Pedicel covered with strong short setae and silvery pubescence except for extreme base; transverse dorsobasal ridge absent. Stylus dark brown, three-segmented; sometimes apparently two-segmented because basal segment small and sunken into apex of first flagellomere; length about 0.4x length of first flagellomere. Face and cheek entirely yellow with fine, pale brown setulae; parafacial silvery pruinose; facial ridge with longitudinal grooves narrowly continuous with grooves of frons. Cheek almost bare; a few setae around epistoma and across dorsal part. Postgena deeper yellow than cheek; setae short. Haustellum 1.5x head length.

Thorax. Postpronotal lobe blackish brown, white pubescent; anterior of lobe shiny dark brown, yellow along anterior part of margin with mesoscutum; with numerous setae. Mesoscutum mainly black, postalar callus brown; entirely white pubescent, denser medial and posterior of postpronotal lobe and on supra-alar region; long, strong setae over entire surface; bristles present: 2 npl, several pal, 1 ipal. Scutellum dark brown with 1 pair of convergent, dorsally directed bristles longer than other scutellar setae. Postnotum and pleura blackish brown, white pubescent. Pleural bristles present: 1 prepst, 4 katepisternal bristles on dorsal part of sclerite. Prosternum yellow. Fore coxa yellow, mid and hind coxae mainly greyish brown, all white pruinose. Fore and mid trochanters yellowish; hind trochanter brown. Fore and mid femora brown dorsally, otherwise yellowish brown; hind femur mainly brown; all femora finely white pruinose. Tibiae mainly yellowish brown; distal half to one-third dark brown; finely white pruinose. Tarsi dark brown; white pruinose; microsetae golden brown. Wing with Sc ending mid length; vena spuria weak, ending before dm-cu; petiole 0.75x length of dm-cu; discal cell with distal section of M almost straight; CuA_2+A_1 about equal to length of petiole. Haltere pale yellow, base yellowish brown.

Abdomen. Tergites mainly blackish brown dorsally, mid brown laterally and across posterior margins of tergites; finely white pruinose; with moderately long dark brown setae on all tergites and sternites. T1 brown along lateral margin and sometimes medially, not wider than T2. T2, T3 and T4 brown along lateral margin; T2 and T3 of male with lateral setae longer than dorsal setae but not as dense as on T1. T2 about 2x length of T1 and about equal to length of T3. T4 of female about two-thirds length of T3; length of male T4 about equal to length of T2. S1–4 dark brown, white pruinose; yellowish brown in male specimen.

Female. T5 and T6 brown along lateral margin. T6 sometimes with brown patch dorsally; about two-thirds length of T3–5 together. T7 dark brown anteriorly, otherwise mid brown; long, about same length as T6. T8 shiny dark brown. Female genital plate brown, white pruinose; with short, fine setae on anterior surface and long, fine setae on posterior surface; distinctly longer than wide, broadly rounded apically; with 7 rows of large spicules and some scattered more basal spicules. S6 with about 6, more or less defined rows of large spicules.

Male. T5 brown, about same length as T4. Protandrium brown. S8 yellowish, white pruinose; slightly narrower and shorter than epandrium; slightly more convex than distal part of protandrium. S5 brown, with broad band of brownish spicule-like setae.

Variation. The following variations in the character states of the holotype were observed in some specimens: median occipital sclerite reddish brown; vertex reddish brown posteriorly, yellowish brown anteriorly; frons brown posterolaterally; width 1.6x length; fronto-orbital region mid brown posteriorly; ratio of antennal segment lengths in male: 1:1.8:3; 5 kepst bristles present; hind femur mainly yellowish brown; petiole in male about equal to length of dm-cu. The single male specimen available is not as dark brown overall as the holotype.

Measurements. Total length = 6.5 mm (6.0–7.0 mm); wing length = 4.0 mm (3.8–4.1 mm).

Distribution. Western Australia (Fig. 206).

Comments. This species is similar to *C. hirsuta*. Differences are as indicated in the key and in the comments for *C. hirsuta***.** In addition, the female genital plate has distinctly larger spicules and fewer rows than that of *C. hirsuta***.**

Etymology. The specific name is formed from the Latin nouns *ruga* (= crease, wrinkle) and *frons* (= brow) and refers to the strongly grooved frons.

Chrysidiomyia setosa, sp. nov. (Figs 144–147, 154, 159, 160, 207)

Type material. Holotype. ♂, **Western Australia**: 115 km E Wiluna, 39.xii.1983, T. F. Houston & R. P. McMillan, on flowers of *Thryptomene maisonneuvei* (WAM). Paratypes. **Western Australia:** 1♂, 1♀, 24–25 km ENE Beyondie HS, 24°27'S 120°02'E, 17–20.xiii.1984, T. F. Houston & B. P. Hanich; 1♀, same data as holotype; 2♂, 13 km S Wannoo, 26°49'S 114°37'E, 31.xii,21–23.xiii.1985, T. F. Houston (all WAM); 3♂, 6 mls N Neale Junction, 16.vii.1974, K. T. Richards (WADA).

Additional material. **South Australia**: 1♀, 11 km W Kimba, 6.ix.1983 (CC).

Diagnosis

Frons and vertex, except immediately posterior of ocellar tubercle, entirely deep yellow or orange; pedicel of antenna without transverse dorsobasal keel; haustellum slightly longer than head length, setae about as long as diameter of shaft. Thorax black; 2 or 3 prepst bristles present; pleura densely whitish bronze pubescent. Abdominal tergites finely golden pruinose, especially laterally and posteriorly; blackish brown dorsally, otherwise yellowish brown; spicules of female genital plate and S6 not arranged in distinct rows and not very dense.

Description

Head. Occiput black dorsally, pale yellow ventrally. Median occipital sclerite black ventrally and laterally, otherwise orange. Vertex orange, dark reddish brown behind ocellar tubercle; setae moderately dense across posterior half and over ocellar tubercle. Ocellar tubercle smooth, dark reddish black, at anterior margin of vertex. Frons orange, almost bare, width 1.8x length. Fronto-orbital region orange, forming a smooth ridge; not raised above plane of mesofrons; anteriorly much higher than eye and traversed by ridges. Lunule brownish black; length about 2x diameter of base of antenna. Eye height 0.7x head height. Antenna (Fig. 145) about 0.8x head height; mainly brownish black; first flagellomere dark brown ventrally and orange at extreme base; ratio of segment lengths: 1:1.4:2.6; pedicel base narrow, shiny, smooth, without transverse dorsal keel; distal half much expanded, with minute setae. Stylus (Fig. 146) brownish black, distinctly three-segmented, length about 0.4x length of first flagellomere. Face with minute yellow setae; parafacial deep yellow; facial ridge (Fig. 144) yellow, longitudinal grooves broadly continuous with grooves of frons; facial carina deep yellow;

frontoclypeal tubercle yellow. Cheek yellow; setae very short, yellow. Postgena pale yellow, finely white pruinose; setae short. Haustellum slightly longer than head length; with bristly appearance, setae about as long as diameter of median region.

Thorax. Postpronotal lobe black, covered with dense long white pubescence; anterior of lobe shiny dark brown; with numerous setae. Mesoscutum black; densely whitish pubescent medial and posterior of postpronotal lobe; otherwise bronze pruinose; moderately long and strong setae over entire surface and several poorly differentiated npl, pal and 1 ipal. Scutellum black with one pair of convergent, dorsally directed bristles longer than other scutellar setae. Postnotum and pleura black, whitish bronze pubescent. Pleura with 2 or 3 prepst and numerous dorsal kepst bristles. Prosternum yellowish brown. Fore coxa yellowish orange, mid coxa yellowish brown, hind coxae dark brown. Trochanters brown. Femora mainly yellowish orange, dorsal surfaces dark brown to variable extent distally. Tibiae mainly yellowish orange, apical third of hind tibia dark brown. Tarsi dark brown; microsetae golden on fore tibia, golden brown on fore and hind tarsus and hind tibia. Wing (Fig. 154) with Sc ending mid length; vena spuria moderately strong; ending beyond dm-cu; petiole length 0.75x length of dm-cu; discal cell with distal section of M arching forward; CuA_2+A_1 about equal to length of petiole. Haltere pale yellow, base reddish brown.

Abdomen. Tergites finely golden pruinose, especially laterally and posteriorly; covered with black setae, short dorsally, longer laterally. T1 blackish brown; slightly wider than T2. T2, T3 and T4 blackish brown dorsally, otherwise yellowish brown. T2 with long, fine yellow setae; about 2x length of T1 and about equal to length of T3. T4 slightly shorter than T2; T4 of female about 0.75x length of T3. S1–4 yellowish brown; setae long, dark brown.

Female. T5 and T6 blackish brown dorsally, otherwise yellowish brown. T6 about 0.6x length of T3–5 together. T7 orange brown; slightly longer than T6. T8 moderately elongate, about as long as wide, shiny dark brown. Female genital plate (Fig. 159) yellowish brown, distinctly longer than wide, somewhat pointed apically; spicules (Fig. 160) not arranged in distinct rows and not very dense; with long, fine setae on anterior and posterior surfaces. S6 with spicules not arranged in distinct rows and not very dense.

Male (Fig. 147). T5 blackish brown dorsally, otherwise yellowish brown; slightly shorter than T4. Protandrium yellowish brown; dorsal length much shorter than recurved posteroventral length. S8 yellowish brown, almost entirely finely yellow pruinose; slightly narrower and shorter than epandrium; slightly more convex than distal part of protandrium. S5 yellowish brown; spicules absent; with broad band of brownish spicule-like setae.

Variation. The following variations in the character states of the holotype were observed in some specimens: fore and mid tibiae sometimes brown apically; petiole of wing as short as 0.5x length of dm-cu; if petiole short, CuA_2+A_1 longer than petiole.

Measurements. Total length = 7.3 mm (5.4–8 mm); wing length = 4.9 mm (3.5–5.1 mm).

Distribution. Southern Victoria and Western Australia (Fig. 207).

Comments. This species has a frons similar to that of *C. rufa* and *C. pulchella* with the grooves broadly continuous with the facial ridge grooves. It lacks the dorsobasal ridge on the antennal pedicel.

Etymology. The specific name is from the Latin adjective *setosus* (= bristly) and refers to the haustellum.

4.5.8 *Conops* Linnaeus

Introduction

Nine Australian species of *Conops* are recognised. Four new species are described; *C. demeijerei* Kröber is considered a junior synonym of *C. seminiger* de Meijere; *C. nubeculosus* Bigot is excluded because I considered it not to occur in Australia. The genus is best represented in eastern Australia, especially Queensland (seven species) but all states have records of at least one species. All species belong in the subgenus *Asicon-*

ops Chen. They are characteristically relatively large and excellent vespoid wasp mimics. Kröber (1919b; 1930, 1936) and Chen (1939) erroneously list *Pleurocerina* Macquart (see Section 4.5.13) as a junior synonym of *Conops*.

Genus CONOPS Linnaeus

CONOPS Linnaeus, 1758: 604. Type species: *Conops flavipes* Linnaeus; designation Curtis, 1831.

Diagnosis

Antenna at least as long as head; first flagellomere not longer than scape or pedicel; stylus three-segmented. Ocelli absent. Parafacial broad. Facial ridge short. Haustellum at least as long as head; palpus present or absent. Wing with cell r4+5 long; vena spuria present. Width of abdominal T2 more than half greatest width of abdomen in both sexes; T2 as long as or longer than T3 and longer than T4; T1 not much broader than T2.

Comments

The shape and size of the female genital plate of *C. flavipes* (the Palaearctic type species) shows marked differences from that of species of the subgenus *Asiconops*. The latter are discussed below. In *C. flavipes* the plate is relatively longer and narrower and has spicules covering most of the posterior surface (Fig. 161). Scanning electron microscopy revealed further differences between Australian species of *Asiconops* and *C. flavipes*. In the latter, spicules are grouped in short rows of two to eight spicules (Fig. 162). As in *Asiconops* each spicule is articulated with a short pedestal but in *C. flavipes* two or three erect microtrichia lie against the wall of the pedestal. These occur in some other Australian genera but not in species of *Asiconops*. The ultrastructure of the surface surrounding the spicules of *C. flavipes* is seen in Fig. 162; the cover of microtrichia that occurs in *Asiconops* spp. is not present in *C. flavipes*.

Subgenus *Asiconops* Chen

Subgenus *Asiconops* Chen 1939: 171
Type species: *Conops aureomaculatus* Kröber 1933: 16; original designation

Diagnosis

Frons transversely grooved; eye height at least 0.7x head height; palpus absent or vestigial. Wing usually with dark brown to black anterior band, never completely hyaline; petiole short, never as long as CuA_2+A_1. Female T6 with posteromedial projection.

Redescription

Head. Occiput orange to black, not distinctly blackish dorsally and pale yellow ventrally; occipital setae fine, moderately dense, black. Median occipital sclerite dorsally separated from posterolateral margin of frons by a low ridge. Vertex smooth, much shorter than frons. Ocellar tubercle and ocelli absent. Frons transversely rugose, at least posteriorly; setae sparse, fine. Fronto-orbital region silvery or yellow pruinose. Lunule at least twice diameter of base of antenna. Eye elongate, oval. Antenna distinctly longer than head height; first flagellomere always shorter than pedicel. Scape elongate, narrow, with a row of short strong setae along anterior margin. Pedicel with strong, short, black setae over entire surface. First flagellomere convex ventrally, tapered distally. Stylus three-segmented; segment one disc-shaped, segment two slightly projecting ventrally, segment three long, finely tapered. Parafacial broad, pruinose, not strongly projecting anteriorly. Facial ridge short, grooved. Facial carina relatively short, poorly developed dorsally, strong ventrally. Cheek slightly concave or flat. Palpus absent or vestigial. Haustellum strongly sclerotised, 1.7–2x head length; labellum narrowly lobe-like.

Thorax. Mesonotum with very short, strong black setae and npl, pal and marginal sctl bristles. Pleural bristles present: two to seven prepst; several to numerous kepst. Mid femur with defined row of longer setae on posterodorsal margin; dorsal surface with sparse, extremely short black setae. Tibiae with apical, oval, densely pruinose patch present on at least posterior surfaces of fore and mid tibiae, usually on posterior surface of fore tibia, both anterior and posterior surfaces of mid tibia, and anterior surface of hind tibia. Anteroventral surfaces of fore tibia and tarsus and posterior surfaces of hind tibia and tarsus with dense microsetae. Wing usually with dark brown to black anterior band, never completely hyaline. Sc ending at least mid length of wing. Vena spuria conspicuous. Cell r_{4+5} long, acute apically; petiole short, never longer than CuA_2+A_1.

Abdomen. Some tergites with broad, dense yellow or golden pruinose bands. T1 not markedly wider than T2; with numerous long bristles laterally. T3 about same length as T2 or shorter.

Female. T6 about 0.75x length of T3–5 together; with posteromedial projection. T7 long, about same length as T6; with anteromedial notch. Female genital plate (except *C. badius* and *C. sparsus*) large, broadly rounded, with more than 200 spicules; area between spicules finely sculptured with slits and at apex with dense microtrichia; articulated pedestals of spicules at apex usually without erect microtrichia. S6 covered with spicules, usually in many closely arranged rows.

Male. T5 and protandrium with very short black setae over entire surface. S8 about same width as epandrium. S5 with posteromedial band of black spicules or spicule-like setae.

Measurements. Total length = 10.0–19.0 mm; wing length = 7.4–14.0 mm.

Comments. This description of *Asiconops* is based on only the Australian species of *Conops*, all of which possess the characters used by Chen (1939) to define the subgenus. I realise that many of the character states included in this description of *Asiconops* may apply to *Conops sensu lato* or other subgenera. Unfortunately the scope of this paper does not permit me to make a comparative study specimens of *Conops* from other regions. Such a study is needed to review the subgeneric limits and geographic distributions.

Key to Species of Australian *Conops* (Subgenus *Asiconops*)

1. Parafacial pruinose only to level of frontoclypeal tubercle; vertex with setae across width; antennal foveae about same depth throughout . . . . . 2.
-. Parafacial entirely pruinose; vertex with setae in median region only; antennal foveae shallow dorsally, deeper toward frontoclypeal tubercle . . . . . 3.
2. Face black, silver pruinose; T2 black with gold pruinose band; palpus absent . . . . . ***satanicus*** Bigot
-. Parafacial orange, silvery yellow pruinose; T2 orange with gold pruinose band; vestigial palpus present . . . . . ***aureolus*** sp. nov.
3. Abdominal T3–6 almost entirely orange-tan, at most with small areas of blackish brown . . . . . 4.
-. Abdominal T3 and T4 (usually T5 and T6 also) almost entirely blackish brown or black . . . . . 5.
4. Frontofacial patch black; occiput, frons, antenna and mesonotum almost entirely black . . . . . ***seminiger*** de Meijere
-. Frontofacial patch tan; occiput tan ventrally; frons brown; antenna reddish; mesonotum largely orange-brown . . . . . ***badius*** sp. nov.
5. Frontofacial patch and occiput black or dark brown. . . . . 6.
-. Frontofacial patch not distinct; occiput at most partially dark tan . . . . . 8.
6. Postpronotal lobe, scutellum and abdominal T2 and T6 orange-tan. . . . . ***thoracicus*** Kröber
-. Postpronotal lobe, scutellum and abdominal T2 and T6 dark brown or black . . . . . 7.
7. Occiput, frons, thorax and abdomen deep black; female genital plate with spicules dense, arranged in defined rows . . . . . ***chvalai*** sp. nov.
-. Occiput, frons, thorax and abdomen mainly blackish brown; propleuron orange except for black spot at base of bristles; female genital plate with spicules not dense or arranged in defined rows (Figs 172, 173) . . . . ***sparsus*** sp. nov.
8. Mesoscutum, pleura and abdominal T2 mainly blackish brown . . . . . ***nigrescens*** Camras
-. Mesoscutum, pleura and abdominal T2 orange-tan with variable amounts of blackish brown . ***australianus*** Camras

***Conops aureolus*, sp. nov. (Figs 155, 157, 208)**

Type material. Holotype. ♂, **Western Australia**: 36 km W Byro Stn, 6.x.1996, J. O'Grady (AM). Paratype. **Western Australia**: 1♂, 30 km WNW Lorna Glen HS, 26°13'S 121°33'E, 10.viii.1983, T. F. Houston & R. P. McMillan (WAMA).

Diagnosis

Head entirely orange; vestigial palps present. Thorax black except for dark orange postpronotal lobe, postalar callus posteriorly, scutellum and patch anterior of scutellum, with defined golden-yellow pruinose bands; wing with Sc, R_1 and bases of other veins golden. Tergite 2 orange with a wide golden pruinose band, markedly longer than T3 (Fig. 157).

Description

Head. Occiput orange; setae moderately dense and long, fine, black. Median occipital sclerite orange, dorsally slightly curving forward on to posterolateral margin of frons. Vertex orange, smooth, cushion-like, raised above plane of frons, much shorter than frons length; setae of vertex moderately dense and long, fine, dark brown, across posterior half, few setae anteriorly. Frons orange, rugose medially, as long as wide; setae sparse, minute, very fine, whitish. Fronto-orbital region smooth, silvery yellow pubescent. Lunule orange-tan, length about twice diameter of base of antenna. Eye height 0.7x head height. Antenna distinctly longer than head height, mainly orange, first flagellomere variably infuscated black; ratio of segment lengths: 1:1.5:1.2; scape with row of short strong setae along anterior margin and basolaterally; pedicel with strong, short, black setae over entire surface; stylus black, slightly more than 0.5x length of first flagellomere. Face with very fine, short, pale yellow setulae. Parafacial orange, silvery yellow pruinose to level of frontoclypeal tubercle. Facial ridge orange, extending to level of frontoclypeal tubercle. Antennal foveae about same depth throughout length, yellow, silvery pruinose on lower half. Facial carina orange, poorly developed dorsally, strong ventrally. Frontoclypeal tubercle orange. Cheek orange, slightly concave, with narrow silvery yellow, pruinose band around lower margin of eye; setae fine, moderately short, yellow. Postgena orange; setae moderately long, fine, dark brown. Palpus vestigial, rounded, minute; haustellum yellow-orange for most of length, about 1.7x head length; labellum black.

Thorax. Postpronotal lobe orange, densely golden pruinose; setae sparse, very short, strong, black. Mesoscutum mainly black, postalar callus posteriorly and patch anterior of scutellum dark orange; densely golden pruinose posterior and medial of postpronotal lobe and anterior of scutellum; with short, strong setae over entire surface; mesoscutal bristles present: numerous npl and pal. Scutellum dark orange with short, strong setae over entire surface; one unequal pair of marginal bristles in one specimen, absent in other specimen. Postnotum black; laterotergite, except posteriorly, and band below scutellum densely golden pruinose. Pleura black, dense, golden pruinose areas on anepisternum and katepisternum forming broad band continuous with areas on mesoscutum. Pleural bristles present: four to seven strong prepst, some long; numerous fairly strong, black kepst. Prosternum blackish brown with black setae. Coxae mainly orange, fore coxa of one specimen partially black; hind coxa densely silver-yellow pruinose. Trochanters orange. Femora orange. Tibiae orange, yellow pruinose; apical, oval, densely silvery yellow pruinose patch present on posterior surfaces of fore and mid tibiae. Tarsi orange-brown, finely yellow pruinose; dense golden microsetae on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing (Fig. 155) with cells bc, sc, r1, basal half r2+3, basal half br, and bm pale yellow; veins bordering pale areas golden yellow. Apical halves of cells r2+3 and br, all cell r4+5, some of dm, and surrounding veins blackish brown; wing otherwise hyaline; Sc ending well beyond mid wing length; R1 ending far beyond apex of Sc, a little before apex of R2+3. Haltere yellow, base dark brown.

Abdomen. Abdomen more or less parallel sided, widening slightly posteriorly. Tergites with golden pruinose bands. T1 not wider than T2, orange laterally and posteriorly, black anterodorsally, pruinose band absent. T2 orange with pruinose band covering almost all surface except for narrow anterior and lateral bands; with scattered, very short black setae over entire surface. T3 black except for narrow anterior tan band; without pruinose band, with scattered, short, black setae, length markedly shorter than T2. T4 black with scattered, short, black setae; pruinose band present posterodorsally. S1–4 orange with long black setae.

Female. Unknown**.**

Male. T5 black, entirely golden pruinose dorsally, with very short, black setae. Protandrium black, entirely golden pruinose dorsally, with very short black setae over entire surface. S8 black, shiny, about same length and width as epandrium. S5 black with posterior band of spicules.

Measurements. Total length = 14.0 mm (14.9 mm); wing length = 9.2 mm (8.9 mm).

Distribution. Central Western Australia (Fig. 208).

Comments. This species and *C. satanicus* differ from other Australian *Asiconops* in sharing the following distinguishing character states: vertex distinctly higher than frons; fronto-orbital region flat, wider than other species; base of pedicel with distinct keel-like ridge across width; facial ridge extending down to level of frontoclypeal tubercle; antennal foveae deep for entire length; parafacial pruinose only to level of frontoclypeal tubercle; vestigial palpus sometimes present; shiny pruinose patches only on posterior surfaces of apices of fore and mid tibiae (other species also pruinose on anterior surfaces of apices of mid and hind tibiae); abdominal T2 distinctly longer than T3; male with short spicules rather than spicule-like setae on S5; and both species have densely pruinose, broad bands on some tergites as do species of *Australoconops*. Further study of the genus worldwide may indicate that these difference are significant at the subgeneric level.

Etymology. The specific name is from the Latin *aureolus* (= golden, glittering, splendid) and refers to the dense golden pruinose pattern on the thorax and abdomen and partially golden veins of the wings.

Conops australianus Camras (Figs 156, 158, 163–166, 209)

Conops australianus Camras 1961: 62

Type material. Holotype (examined). ♂, **Queensland**: **L1**: Cairns N.Q. 20; **L2** ex. field A. P. Dodd (USNM 64916). Paratypes. **Queensland:** Allotype on same pin as holotype (abdomen mounted separately) (USNM); 1♂, no locality, Sugar Cane HDA, 19.x.1931, A. W. Lopez, emerged from Australian wasps (SCC); 1♀, 1? (abdomen missing), A. W. Lopez, emerged from Australian wasps (USNM).

Additional material. **Queensland**: 1♂, Gunshot Ck, 13 km NW Heathlands H.S., 11°43'S 142°28'E, 16.iii.1992 (UQIC); 1♀, waterhole nr Wenlock Rv xing, Portland Roads Rd, 13°06'S 142°56'E, 31.xii.1994 (UQIC); 1♂, Mt Webb Nat Pk, 15°04'S 145°07'E, 29.ix.1980 (ANIC); 1♂, 1 km N Rounded Hill, 15°17'S 145°13'E (ANIC); 1♀, Cooktown, 13.ix.1978 (UQIC); 2♂, 2♀, Cairns, ?.1917, v,viii.1960, 19.i.1974 (AM, UQIC); 1♂, 8–15 km E Mareeba, 17.v.1987 (SCC); 1?, Meringa, 2.i.1947 (QDPI); 1♂, 2♀, Gordonvale, 2.v.1918, ?.1919, 18.xii.1963 (MVMA, QDPI, UQIC); 1♀, nr Dimbulah, 19.iv.1987 (SCC); 1♂, Tinaroo Lk. nr Atherton, 23.iv.1980 (UQIC); 1♀, Townsville, 29.xii.1967 (ANIC); 1♂, Mt Abbott, upper slopes, 700–900 m, 20°06'S 147°45'E, 10–12.iv.1997, open forest (QM); 1♀, Mackay, 12.iv.1928 (QDPI); 3♂, Yeppoon, 23.xii.1961, 2.i.1965, 18–23.xii.1979 (ANIC, UQIC); 1♀, Mt Archer nr Rockhampton, 31.xii.1975 (UQIC); 2♂, Bundaberg, 31.i.1927, 16.xii.1971; 1♂, Cordalba Forest, 29 km S Bundaberg, 11.iii.1978 (all ANIC); 1♀, Mt Moffatt Nat Pk, Mt Rugged summit, 1130 m, 24°54'S 148°00'E; 24.xi.1995 (QM); 1♀, Bluff Ra. 1500–3000 ft, Biggenden, 10.xii.1971; 1♂, 5♀, Mt Walsh Nat. Pk nr Biggenden, 15.xii.1971, 3.i.1972, 10.i.1973, 12–17.i.1977; 1♂, Ban Ban Rge via Coalstoun Lakes, SW Biggenden, 24.ii.1976 (all ANIC); 1♂, Mary Cairncross Pk via Maleny, 22.iii.1978 (UQIC); 2♂, Brisbane, 1–10.i.1982, 4.xii.1994 (QDPI, UQIC); 1♀, Shailer Park, Logan, 27°40'S 153°10'E, 10.i.1997 (QM); 1♂, Toowoomba, 2.i.1965 (UQIC). **Northern Ter-**

ritory: 2♂, 1♀, 11°00'S 132°09'E Black Point, Coburg Pen, 11, 15–23.ii.1977; 1♂, Cooper Ck 19 km SE Mt Borradaile, 5.vi.1973; 1♀, Koongarra, 15 km E Mt Cahill, 12.vi.1973 (all ANIC).

Diagnosis

Frons deep yellow, sometimes dark brown posteriorly; antenna and face yellow; without black frontofacial patch; thorax mainly orange; extensive dark marks on mesonotum, katepisternum, meron; wings yellowish, brown in anterior apical half. Ground colour of T1, T3 and T4 blackish brown; T2, T5, protandrium orange-tan (Fig. 158).

Redescription

Character states as in original description (Camras 1961). Additional notes as follows:

Head. Vertex about 0.6x frons length. Frons about half as long as wide. Eye height 0.78x head height. Antennal ratio: 1:2:1.3. Stylus 0.66x length of first flagellomere; segment three very long, finely tapered. Haustellum 2x head length.

Thorax. Proepisternum with four to eight bristles, two longer and stronger than others. Katepisternum with one long, strong bristle and two or three smaller bristles. Wing as in Fig. 156.

Abdomen. Extensively yellow pruinose. Ground colour of T1, T3 and T4 blackish brown; T2 orange-tan. S1–4 brown, broad.

Female. T5 partially blackish, otherwise orange-tan. T6, T7 orange-tan, golden pruinose. T6 large, about 0.8x length of T3–5 together. T7 height almost equal to length of T6. T8 shiny tan. Female genital plate (Fig. 163) broadly rounded; spicules in basal region (Fig. 165) relatively longer, thinner and more pointed than those at apex (Fig. 164). S6 with spicules dense but not in defined rows (Fig. 166).

Male. Ground colour of T5 and protandrium orange-tan; yellow pruinose. S8 orange to dark brown; about 0.5x length of epandrium, slightly more convex than anterior part of protandrium. S5 with broad posterior band of spicule-like setae.

Measurements. Total length = 15.4 mm (11.0–16.9 mm); wing length = 11.3 mm (7.4–12.3 mm).

Distribution. Northern Territory and eastern Queensland (Fig. 209).

Comments. The original description was based on specimens collected during a study of insects controlling populations of cane grubs in northern Queensland. Jarvis (1924) identified two scoliid wasps, *Campsomeris tasmaniensis* and *C. radula*, parasitising the grubs but noted that the numbers and effectiveness of these wasps were 'checked by various controlling factors. Three of these are the hyperparasites *Macrosiagon pictipennis* Lea, *Hyperalonia satyrus* Fabr., and a *Conopid* fly (undetermined), which subsists on the eggs and larval stages of these digger-wasps.' The data labels on the type specimens read 'emerged from wasps' indicating that the fly spent the pupal stage inside the host rather than pupating in the soil. See comments on *Conops nubeculosus* for mistaken synonomy.

***Conops badius*, sp. nov. (Figs 151, 210)**

Type material. Holotype. ♂, **Queensland**: Mt Moffatt Nat. Pk, Marlong Arch. 24°59'28"S 147°53'48"E, 820 m, 19.xi.1995, C. J. Burwell (QM).

Additional material. **Queensland:** 1♀, Green Is., 16°46'S 145°58'E, 26.ix.1968 (QM).

Diagnosis

Frons dark brown; frontofacial patch brown; antenna reddish. Postpronotal lobe and most of mesonotum tan; pleura mainly blackish brown. Abdominal T1 black; all other tergites mainly orange-tan, golden pruinose.

Description

Head. Occiput blackish brown dorsally, tan ventrally; setae black, fine, moderately dense and long. Median occipital sclerite tan dorsally, dark brown ventrally, with silvery yellow transverse pruinose band. Vertex tan, darker brown laterally, smooth; setae black, moderately dense, long and strong, in median region only. Frons dark brown, strongly rugose, width 1.5x length, setae sparse, minute, very fine, dark brown. Fronto-orbital region not demarcated from mesofrons but a narrow, smooth, brown, silvery yellow pruinose ridge present along eye margin. Lunule blackish brown, length about 3x diameter of base of antenna. Eye height 0.8x head height. Antenna reddish brown, first flagellomere reddish orange; ratio of segment lengths: 1:1.8:1.2. Stylus reddish orange; brown apically; about 0.75x length of first flagellomere. Frontofacial patch brown. Face with minute sparse, brown setulae. Parafacial dark yellow; yellow pruinose. Facial ridge dark yellow. Antennal foveae orange, silvery yellow pruinose. Facial carina yellow dorsally, dark brown toward blackish brown frontoclypeal tubercle. Cheek orange; silvery yellow pruinose; flat; setae fine, minute, brown. Postgena brown with finely silvery pruinose; setae moderately long, fine, dark brown. Haustellum blackish brown, about 2x head length (Fig. 151).

Thorax. Postpronotal lobe tan, faintly yellow pruinose; setae sparse, mainly in centre, short, strong, black. Mesoscutum mainly tan; black between and behind postpronotal lobes, and behind postalar callus; finely golden pruinose, especially if viewed from in front; with short, strong setae over entire surface; mesoscutal bristles present: numerous npl and several pal. Scutellum tan, very faintly yellow pruinose with short, strong setae over entire surface; one pair of marginal bristles present. Postnotum tan, except blackish brown on lower, posterior three quarters of mediotergite and narrowly around lower part of laterotergite; golden pruinose. Pleura mainly black; katepisternum posterodorsally and meron anteriorly, tan; finely silvery yellow pruinose. Pleural bristles present: three to five strong prepst, some long; three dorsally-directed and two, more ventral, shorter, posteriorly-directed black kepst. Prosternum blackish brown, silvery pruinose. Coxae blackish brown and tan, silvery pruinose. Trochanters orange-tan. Femora mainly orange-tan; fore and mid femora infuscated dark brown dorsally. Tibiae orange-tan, finely silver pruinose; apical, oval patch silver pruinose. Fore and mid tarsi black, hind tarsus dark brown; dense microsetae on anteroventral surfaces of fore tibia and tarsus black; dark brown on posterior surface of hind tibia and tarsus. Wing blackish in cells c, sc, r_1, r_{2+3}, basally in front of vena spuria and anterior apical part of r_{4+5}; bc, br and posterior part of bm brown; Sc ending mid wing length. R_1 apically running along costa to end a little before apex of R_{2+3}; petiole 0.3x length of dm-cu. Haltere yellow, base brown.

Abdomen. Gradually widening posteriorly to T5. T1 mainly black, tan laterally; yellow pruinose posteriorly; with numerous long bristles laterally. T2 mainly orange-tan; narrowly blackish brown medially and ventrolaterally; yellow pruinose, particularly posterolaterally; with a few anterolateral long, black bristles and sparse short, black setae over entire surface. T3 mainly orange-tan; narrowly blackish brown medially and ventrolaterally; with scattered, short, black setae; about same length as T2. T4 mainly orange-tan; narrowly blackish brown anteromedially and ventrolaterally; narrowly yellow pruinose posterodorsally; with scattered, short, black setae. S1–4 blackish brown, finely silver pruinose; with sparse, short, black setae and one or two long setae posterolaterally

Female. T5 orange; setae black, across posterior half. T6 orange, almost entirely golden pruinose; setae black, short, slightly longer and denser ventrolaterally. T7 orange, golden pruinose; with moderately long, black setae except posteromedially; long, about same length as segment 6. T8 shiny, orange-tan. Female genital plate orange, longer than wide, pointed, anterior surface markedly convex; posterior surface not sharply demarcated from anterior surface; spicules not dense or arranged in defined rows, extending on to posterolateral surface. S6 with spicules not in defined rows.

Male. T5 mainly orange-tan; narrowly blackish brown ventrolaterally, entirely golden yellow pruinose; setae very short, black. Protandrium orange-tan, entirely golden-yellow pruinose with very short black setae over entire surface; length much shorter than the length of segments 3–5 together. S8 tan; about same width as epandrium. S5 tan; with posteromedial band of spicule-like setae.

Measurements. Total length = 13.0 mm; wing length = 8.5 mm (8.0 mm).

Distribution. Southern central and north-eastern Queensland (Fig. 210).

Comments. The female specimen is identified as conspecific with the holotype despite its somewhat shrivelled state and some colour differences. The specimen is labelled 'ex spirit'. The specimen lacks most of the dark colouration of the holotype but this may be a consequence of bleaching. An accurate measurement of the total length could not be made because of the state of the specimen. The female genital plate is a similar shape to that of *C. sparsus*.

Etymology. The specific name is the Latin adjective *badius* (= chestnut-brown) and refers to the overall colour of the species.

Conops chvalai, sp. nov. (Figs 150, 211)

Type material. Holotype. ♀, **Queensland**: Bluewater State Forest, NW Townsville, 19°13'74" 146°24'04", 15.i.1995, 640 m., G. & A. Daniels, wet sclerophyl site 2 (QM).

Diagnosis

Occiput, frons, thorax and abdominal sclerites entirely black; intersegmental membranes of the single known specimen are reddish-purple.

Description

Head. Occiput black with narrow reddish, silvery yellow pruinose band around eye margin; lateral, nodular swelling above midline (Fig. 150); setae fine, black, moderately dense and long. Median occipital sclerite blackish brown with silvery yellow transverse pruinose band. Vertex dark brown, blackish brown medially; smooth, demarcated from frons by groove but not raised above plane of frons; much shorter than frons length; setae black, moderately dense, long and strong, in median region only. Frons black, strongly rugose; 1.5x wider than long; setae dark brown, sparse, minute, very fine. Fronto-orbital region not demarcated from mesofrons but a narrow, smooth, silvery yellow pubescent ridge present along eye margin. Lunule blackish brown, length about 3x diameter of base of antenna. Eye height 0.8x head height. Antenna distinctly longer than head height; tan, pedicel darker brown, first flagellomere blackish brown dorsoapically; ratio of segment lengths: 1:1.6:1.3; stylus black; length about 0.6x length of first flagellomere. Face with minute sparse, pale yellow setulae. Parafacial dark yellow; yellow pruinose. Facial ridge dark yellow. Antennal foveae dark yellow below antennae, dark brown around tubercle, yellow pruinose on lower half. Facial carina yellow dorsally, dark brown toward frontoclypeal tubercle; frontoclypeal tubercle blackish brown. Cheek dark yellow, reddish below eye; yellow pruinose, flat, bare. Postgena black, finely silvery pruinose; setae of postgena dark brown, fine, moderately long. Haustellum dark brown basally, yellowish brown apically including labellum; about 2x head length.

Thorax. Postpronotal lobe black; orange-brown band on postpronotum medial of lobe; with a few short, strong, black setae clustered in centre. Mesoscutum entirely black, finely golden pruinose; silvery yellow pruinose below postalar callus; with short, strong setae, sparse anteriorly, denser posteriorly; mesoscutal bristles present: numerous npl and several pal. Scutellum black, silvery yellow pruinose with short, strong setae over entire surface; one pair marginal bristles. Postnotum black, silvery yellow pruinose. Pleura black, finely silvery yellow pruinose. Pleural bristles present: three or four strong prepst, some long; two fairly strong, black, dorsally-directed and two, more ventral, shorter, posteriorly-directed kepst. Prosternum blackish brown, silvery pruinose. Coxae blackish brown and tan, silvery pruinose. Trochanters mainly orange-tan; hind trochanter black basally. Femora mainly orange; basal half of mid femur partially and hind femur entirely, dark brown; finely white pruinose. Tibiae orange, finely silver pruinose; apical, oval, densely silver pruinose patch

on posterior surface of fore tibia, both anterior and posterior surfaces of mid tibia, and anterior surface of hind tibia. Fore and mid tarsi dark brown, hind tarsus orange-brown; dense microsetae black on fore tarsus, dark brown on hind tarsus. Wing brown in cells bc, c, sc, r_1, r_{2+3}, r_{4+5}, and along CuA_1 in dm. Sc ending mid wing length. R_1 ending far beyond apex of Sc, apically running along costa to end a little before apex of R_{2+3}. Petiole 0.3x length of dm-cu. Haltere yellow, base brown.

Abdomen. T1 slightly wider than T2; black, silvery yellow pruinose particularly posteriorly. T2 black, silvery yellow pruinose, particularly posterolaterally; with numerous long bristles laterally and sparse short, black setae over entire surface. T3 black, silvery yellow pruinose; with scattered, short, black setae; slightly longer than T2. T4 black, finely yellow pruinose; with scattered, short, black setae. S1–4 black, finely silver pruinose; with sparse, short, black setae and one or two long setae posterolaterally.

Female. T5 black, silvery yellow pruinose with black setae across posterior half. T6 black, silvery yellow pruinose; about 0.75x length of T3–5 together; setae black, shorter dorsally, longer and denser ventrolaterally. T7 blackish brown, shiny mid brown posteriorly, very finely yellow pruinose; with moderately long black setae except posteromedially; slightly shorter than T6. T8 shiny dark tan. Female genital plate black, very finely yellow pruinose, large, broadly rounded, distinctly longer than wide with more than 20 rows of closely arranged spicules and with long, fine setae. S6 covered with many rows of closely arranged spicules.

Male. Unknown.

Measurements. Total length = 11.5 mm; wing length = 9.2 mm.

Distribution. North-eastern Queensland (Fig. 211).

Comments. The species is described despite the availability of only a single specimen because it is sufficiently distinct in colouration from all other known species. The swelling on the lateral margin of the occiput may be peculiar to the specimen at hand rather than a characteristic of the species.

Etymology. The specific epithet honours Dr Milan Chvála of Prague who has contributed much to the knowledge of Palaearctic Conopidae.

Conops nigrescens Camras (Figs 167, 180, 212)

Conops nigrescens Camras 1961: 64

Type material. Holotype ♀ (examined). **Queensland**. **L1:** Holotype; **L2**: AUSTRALIA: N. Queensland. Redlynch. 2–10. ix.1938. R.G. Wind.; **L3**: Papuan-Australian Expedition. B.M. 1939-127; **L4**: [red] Conops nigrescens CAMRAS Holotype (NHM).

Additional material. **Queensland**: 1♀, Moreton, 12°27'S 142°38'E, 21.viii.1992 (ANIC); 1♂, Cairns, no date, ex. corn (SCC); 1♂, 8–15 km E Mareeba, 9.v.1987 (SCC); 3♂, Gordonvale, no date (QDPI, QM); 2♂, N. Percy Is., no date (QDPI).

Diagnosis

Frons deep yellow anteriorly, pale brown posteriorly; antenna reddish brown; face yellow; without black frontofacial patch. Postpronotal lobe and scutellum reddish-brown; mesoscutum mainly black; wing diffusely brown anteriorly. Abdomen mainly black, extensively yellow pruinose.

Redescription

Head. Occiput dark brown to black with narrow silvery pruinose band around eye margin and very short, fine, black setae; median occipital sclerite yellowish brown with dense silvery pruinose band across lower half, dorsally separated from posterolateral margin of frons by low ridge. Vertex yellowish brown, smooth, demarcated from frons by slight ridge and only slightly raised above plane of frons; length much shorter than frons; with sparse, black setulae in median region only. Frons deep yellow anteriorly, pale brown posteriorly,

transversely rugose posteriorly, slightly shorter than wide, with minute sparse setulae; fronto-orbital region not demarcated from mesofrons. Lunule pale brown, length about 3x diameter of base of antenna. Eye height 0.76x head height. Antenna reddish brown, only scape and pedicel of left antenna of type present; scape with a row of short strong setae along anterior margin; pedicel with strong, short, black setae on entire surface; ratio of segment lengths: 1:2:1.2; stylus orange-brown, apex dark brown; length about 0.75x length of first flagellomere. Face bare, golden yellow, silvery yellow pruinose; facial ridge yellow, grooved; antennal foveae shallow, yellow, silvery pruinose on lower half; facial carina yellow, frontoclypeal tubercle black. Cheek golden yellow, silvery yellow pruinose, otherwise bare, very slightly concave. Postgena blackish, silvery pruinose, with fine, dark brown setulae. Haustellum black, reddish in middle; length about 2x head length.

Thorax. Postpronotal lobe reddish-brown, faintly yellow pruinose, with sparse, minute, black setae. Mesoscutum mainly black, reddish-brown around margins; distinctly yellow pruinose posteromedial of postpronotal lobe and very faintly so otherwise; with very short, strong setae over entire surface; differentiated mesoscutal bristles present: five or six npl, several pal. Scutellum reddish-brown, very faintly yellow pruinose, with very short, strong setae over entire surface and one pair marginal bristles. Postnotum reddish-brown, yellow pruinose. Pleura reddish-brown, faintly white pruinose; pleural bristles: five or six prepst, one strong kepst. Prosternum dark brown. Coxae mainly dark reddish-brown with some orange-yellow areas, silvery pruinose. Trochanters reddish-orange. Femora reddish brown, apices and ventrolateral one third dark yellow; mid femur with defined row of longer setae on posterodorsal margin, dorsal surface with sparse, extremely short black setae. Tibiae dark yellow basally, reddish brown distally; dense, short, black setae on anteroventral surface of fore tibia; apical, oval densely pruinose patch which shines silver at some angles on posterior surface of fore tibia, both anterior and posterior surfaces of mid tibia, and anterior surface of hind tibia. Fore and mid tarsi black, hind tarsus fulvous; dense black microsetae on posterior surface of hind tibia and tarsus. Wing (Fig. 180) dark brown in cells bc, distal parts of r_1 and r_{2+3}, r_{4+5} anterior to vena spuria, and anterior to CuA_1 in dm; wing otherwise infuscated pale brown; Sc ending beyond mid wing length; sc-r very short, just proximal of apex of Sc; R_1 ending far beyond apex of Sc, apically running along costa to end a little before R_{2+3}; haltere dark yellow, base dark brown.

Abdomen. Gradually widening posteriorly; with yellow pruinose bands present; T1 slightly wider than T2, black with narrow yellow pruinose band posteriorly and numerous long black bristles laterally; T2 black with broad yellow triangular pruinose patch on each side of midline; with a few anterolateral, black bristles. T3 black, bare, pruinose band absent; T4 black, posterolateral margin brown, with a few ventrolateral short, black setae; pruinose band absent but with some fine yellow dusting. S1–4 dark brown, finely white pruinose with sparse, short, black setae.

Female. T5 black, yellow pruinose with short, black setae along posterior margin; T6 dark brown, yellow pruinose, with very short, black setae dorsally and longer setae ventrolaterally. T7 reddish brown, very finely yellow pruinose, with very short, sparse, black setae; long, about same length as segment 6. T8 shiny dark tan. Female genital plate black, broadly rounded, not much longer than wide, with approximately 16 rows of closely arranged spicules, rows more defined apically; long, fine marginal setae present; apical spicules (Fig. 167) similar to those of *C. australianus* (Fig. 164) but with ridges extending to base of each spicule rather than ending in midline up the spicule; spicules in basal region relatively longer, thinner and more pointed than those at apex. S6 entirely covered with closely arranged spicules.

Male. T5 dark brown, almost entirely yellow pruinose dorsally with very short black setae. T6 mid brown, yellow pruinose over almost all surface except for narrow posterior, dark brown area. S8 dark brown, narrower than epandrium. S5 with posterior band of spicule-like setae.

Measurements. Total length = 13.3 mm (10.0–16.0 mm); wing length = 9.3 mm (7.5–12.0 mm).

Distribution. Eastern Queensland (Fig. 212).

Comments. The ANIC specimen from Moreton most nearly resembles the holotype. It differs as follows: patch on frons in front of vertical swelling and lunule darker than type; scutellum paler than type; legs show

main differences: femora entirely yellowish; in type, femora dark reddish brown except for ventroapical third which is fulvous; tibiae yellowish; in type, basal half yellowish, apical half dark reddish brown; abdominal T2, 5 and 6 of type less densely yellow pruinose; no obvious differences in genitalia.

Conops nubeculosus Bigot

Conops nubeculosus Bigot 1887:36

Diagnosis
Frons, antennae, face yellow; black frontofacial mark present. Thorax mainly orange, whitish pruinose; black longitudinal bands on mesonotum; katepisternum, meron with blackish brown patches; wing with defined apical blackish brown patch. Ground colour of T1, T3, T4 and T5 dark brown; T2, and genital segments yellow-tan.

Comments
Kröber (1916) suggested that specimens he examined from Cape York were *C. nubeculosus* and on this basis the species has been tentatively included in the catalogue of Australian species (Smith 1989). I examined the type of *C. nubeculosus* in NHM (ex. Bigot Collection) and the Kröber specimens. They are not conspecific. *C. nubeculosus* is similar to *C. australianus*. Following his description of the latter, Camras (1961: 63) correctly comments 'Kröber's record of *nubeculosus* from Cape York, probably belongs to this species. Kröber noted that his specimen lacked the dark apical area in the wing pattern of *nubeculosus*'. *C. australianus* also lacks the black frontofacial patch present in *C. nubeculosus*. I conclude that *C. nubeculosus* does not occur in Australia but does occur in the Oriental Region.

Conops satanicus Bigot (Figs 168, 169, 181, 213)

Conops satanicus Bigot 1887: 43
Kröber 1916: 65 (transcript of Bigot description)

Type material. Holotype (examined). ♂, **L1**: Type; **L2**: C. satanicus ♂ [symbol upside-down] Australie J. Bigot (NHM).

Additional material. **Victoria**: 1♂, 3 km SE Rocket Lk, Murray-Sunset Nat. Pk., 34°39' 141°48', 3.xii.1992 (AM); 1♂, Linga, x.1922 (ANIC). **South Australia**: 1♀, Kimba, 29.xi.1958 (ANIC). **Western Australia**: 2♀, Thomas River, 1.xi.1983 (ANIC); 1♀, Wannoo, 1.ix.1973 (WADA); 1♀, 8 km N Nerren Nerren, 25.ix.1985 (WAMA); 3♂, Coolgardie, 27–28.x.1958 (ANIC); 1♂, Yanchep, 32 mls [51 km] N. Perth, 13–23.xi.1935 (NHM); 1♀, Bushmead, no date; 1♀, Dudinin, no date; 2♂, Kukerin, no date (all WAMA).

Diagnosis
Predominantly black with densely golden pruinose bands; frons mainly orange-tan, blackish anteriorly; face usually black, densely silver pruinose. Postpronotal lobe and scutellum orange-tan; legs usually mainly orange-tan. T2 always with broad golden pruinose band; T5 and T6 sometimes with golden pruinose band or patch.

Redescription
Head. Occiput dark brown dorsally, black ventrally; occipital setae fine, black, moderately dense and long. Median occipital sclerite mid brown. Vertex orange-tan; setae black, moderately dense and strong distributed across posterior half, few setae anteriorly. Frons mainly orange-tan, brownish black anteriorly, strongly rugose, width 1.5x length; setae short, fine, dark brown. Fronto-orbital region flat, weakly demar-

cated from mesofrons, silvery pruinose. Lunule blackish brown, length about 4x diameter of base of antenna. Eye height 0.68x head height. Antenna scape reddish brown; pedicel and first flagellomere mainly black with some reddish brown; ratio of segment lengths: 1:1.8:1.6. Stylus black, about half length of first flagellomere. Frontofacial patch absent. Face with very fine, short, dark brown setulae. Parafacial black, densely silver-pruinose to level of frontoclypeal tubercle. Facial ridge black, extending to level of frontoclypeal tubercle. Antennal foveae about same depth throughout length, brown, silver-pruinose. Facial carina and frontoclypeal tubercle blackish brown. Cheek black, flat; setae short, blackish brown. Postgena black, finely silvery pruinose; setae black. Haustellum blackish brown, about 1.8x head length.

Thorax. Postpronotal lobe orange-tan, densely golden-pruinose; setae sparse, very short. Mesoscutum mainly black; supra-alar region, postalar callus and anterior of scutellum reddish-brown; densely golden pruinose posterior and medial of postpronotal lobe and anterior of scutellum, with short, strong setae over entire surface; mesoscutal bristles present: numerous npl and pal. Scutellum reddish brown with one pair of marginal bristles. Postnotum black; laterotergite, except posteriorly, and band below scutellum densely golden pruinose. Pleura blackish brown, finely white-pruinose. Pleural bristles present: numerous long and strong prepst and numerous fairly strong kepst. Prosternum brownish black with long black setae. Coxae blackish brown, finely silvery pruinose. Trochanters blackish brown. Femora dark reddish brown basally, yellow-brown apically. Tibiae yellow-brown basally, dark reddish brown distally; apical, oval, densely pruinose patch which shines silver at some angles present on posterior surfaces of fore and mid tibiae. Tarsi dark brown; dense golden microsetae on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing (Fig. 181) dark brown in cells r1, r2+3, r4+5, br, posterior part of bm, basal half and along distal halves of M and CuA1 in dm, anterior to free section of CuA2, basal part of cu*p*; yellowish in cell sc basad of sc-r. Sc ending a little beyond mid wing length. R1 ending far beyond apex of Sc, a little before apex of R2+3. Petiole 0.3x length of dm-cu. CuA2+A1 about 2x length of petiole. Haltere dark yellow, base dark brown.

Abdomen. Abdomen more or less parallel sided, widening slightly posteriorly. T1 not wider than T2; black with numerous long bristles laterally. T2 black anteriorly, with broad densely golden pruinose band posteriorly; with scattered, very short black setae anteriorly; longer setae laterally. T3 black with scattered, short, black setae. T4 black with scattered, short, black setae. S1–4 blackish brown, finely silver pruinose with long black setae.

Female. All sclerites black. T5 setae short. T6 with large golden pruinose dorsal patch; about 0.7x length of segments 3–5 together; setae short, slightly longer and denser ventrolaterally. T7 about same length as T6, with moderately long black setae except posteromedially. T8 shiny. Female genital plate (Fig. 168) large, broadly rounded, not much longer than wide, rows of spicules closer, more defined apically. Ridges on spicules (Fig. 169) arising from median smooth tapered band. S6 with large plate of closely arranged spicules.

Male. All sclerites black. T5 golden pruinose dorsally. Protandrium golden pruinose over most of surface. S8 shiny, about 0.7x length of epandrium and same width; with convex transverse ridge anteriorly. S5 with broad posterior band of spicules.

Variation. Frons width as much as 2x length; parafacial brown, blackish brown or black; antennal foveae dark brown to black; laterotergite sometimes tan; femora and tibiae often entirely orange-tan. T6 of female sometimes without golden pruinose patch. Males may be without the golden pruinose areas on T5 or T5 and the protandrium.

Measurements. Total length = 16.0 mm (11.0–19.0 mm); wing length = 10.6 mm (7.5–13.0 mm).

Distribution. Southern Australia from Victoria to Western Australia (Fig. 213).

Comments. Kröber (1939b: 599) described a male and a female from Adelaide. He stated that the female type was in Berlin; presumably he designated the female before him as the allotype. The genitalia of males with each of the variations in abdominal colour patterns were dissected and show no differences. Scanning electron micrographs of the spicules and their arrangements on females with and without golden areas on T6

also showed no differences. The geographic distribution of examined specimens did not correlate with colour patterns. I therefore concluded that all specimens examined were conspecific despite their colour differences.

Conops seminiger de Meijere (Figs 170, 171, 182, 214)

Conops seminiger de Meijere 1910: 162; Kröber 1916: 62
Conops demeijerei Kröber 1939b: 599, syn. nov.

Type material. Holotype (not examined). ♂, **New South Wales** (HNM). Type of Synonym (examined). ♀, **L1**: Type; **L2**: Conops seminiger, var. demeijerei, Kröb. examined & det. O. Kröber, 1938.; **L3**: Conops seminiger var. de meijerei n var ♀; **L4**: Australia B.M. 1859-102.; **L5**: TYPE; **L6**: 59 103; [other side] Austr. (NHM).

Additional material. **Queensland**: 1♀, **L1:** Herberton, Dodd, i.1911, 3700 ft; **L2**: Type [pink]; **L3**: coll. Lichtwardt; **L4**: Conops ♀ seminigra Meij. O. Kröber det. 1914 (DEI); 1♀, Poona, 25°42'S 152°55'E, 23.x.1992 (UQIC); 2♀, Amiens, 16.xii.1967, 1♂, Amiens, 21.xii.1968 (all ANIC); 1♂, Mt Marlay nr Stanthorpe, 24–25.xi.1984 (UQIC). **New South Wales**: 1♂, Wylie Ck, 22.xii.1968; 1♀, Ruby Ck via Stanthorpe, 17.xii.1967 (all ANIC); 1♂, No.1 Break, Pilliga State Forest, 23.xi.1985; 1♀, S end Newell Highway, NE Coonabarabran, 23.xi.1985; 1♀, "Calumet" 26 miles [41.6 km] NE Binnaway, xi.1931; 1♀, 4 km NE Bilpin, Blue Mtns, 19.xi.1982; 1♂, 5 km E Bilpin nr Kurrajong, 30.xi.1981; 1♂, Spence Rd, Berkshire Pk, Sydney, 23.xi.1986 (all AM); 1♂, Sydney, 20.xii.1910 (ANIC); 1♀, Mt Westmacott nr Waterfall, 31.xii.1978 (UQIC); 1♂, Como, x.1924 (ANIC).

Diagnosis
Occiput, frons, antenna, and mesonotum almost entirely black. Abdominal T3–6 almost entirely orange-tan; T1 and T2 black.

Redescription
Head. Occiput black with narrow yellowish brown, silvery pruinose band around eye margin; occipital setae moderately dense and long, strong, black. Median occipital sclerite orange, dark brown around occipital foramen. Vertex yellowish brown, smooth, demarcated from frons by slight ridge but not raised above plane of frons; setae of vertex moderately sparse, long, and strong, black, in median region only. Frons blackish brown, strongly rugose, slightly shorter than wide with sparse, minute, very fine, dark brown setae; frontoorbital region not demarcated from mesofrons but a narrow, smooth, brown, yellow-pruinose ridge present along eye margin. Lunule blackish brown; length about 4x diameter of base of antenna. Eye height 0.76x head height. Antenna mainly black, first flagellomere partially reddish brown; ratio of segment lengths: 1:2:1.1. Stylus black; length about 0.7x length of first flagellomere. Face with minute sparse, pale yellow setulae. Parafacial orange, pale yellow pruinose. Facial ridge orange. Antennal foveae shallow dorsally, deep and diverging ventrally, shiny yellow, brown on either side of carina proximal to frontoclypeal tubercle. Facial carina yellow dorsally, dark brown toward frontoclypeal tubercle; frontoclypeal tubercle blackish brown. Cheek orange, slightly concave, short; setae fine, yellow. Postgena black, setae short, fine, black. Haustellum blackish brown, length 1.8x head length.

Thorax. Postpronotal lobe blackish brown; orange-brown band on postpronotum medial of lobe; setae of postpronotal lobe sparse, very short, strong, black. Mesoscutum mainly black, postalar callus tan; golden pruinose, especially if viewed from in front; with short, strong setae over entire surface; differentiated mesoscutal bristles present: numerous npl and pal. Scutellum blackish-brown, variable amount of orange-brown apically, yellowish grey pruinose, with short, strong setae over entire surface and one pair of subapical bristles slightly longer than other scutellar setae. Postnotum blackish brown, finely pale yellow pruinose. Pleura blackish

brown, finely white pruinose; pleural bristles present: four to seven strong prepst, some long; one strong, black kepst. Prosternum black. Coxae blackish brown and tan, silvery pruinose, setae strong, black, longer on mid and hind coxae than on fore coxa. Trochanters mainly orange-tan. Femora blackish brown except reddish brown at base, apex and on ventrolateral distal one third; hind femur entirely reddish brown on distal one third; mid femur with defined row of longer setae on posterodorsal margin. Tibiae mainly yellowish brown; fore tibia dark brown anteriorly and on distal half of posterior surface; silvery, densely pruinose apical, oval patch present on posterior surface of fore tibia, both anterior and posterior surfaces of mid tibia, and anterior surface of hind tibia. Fore and mid tarsi black, hind tarsus fulvous; dense, brown microsetae on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing (Fig. 182) dark brown in cells bc, c, sc, r1, r2+3, basally in front of vena spuria and anterior apical part of r4+5, anterior half of br, posterior part of bm, along CuA1 in dm, anterior to basal half of CuA2, basal part of cup; Sc ending mid wing length; R1 ending far beyond apex of Sc; petiole 0.2x length of dm-cu; CuA2+A1 about 2x length of petiole. Haltere yellow, base dark brown.

Abdomen. Gradually widening posteriorly to T5. Tergites without pruinose bands. T1 slightly wider than T2, blackish brown. T2 usually mainly blackish-brown with two orange dorsal patches and narrow orange posterior band; sometimes mainly orange dorsally, either without long lateral setae or with a few setae. T3 mainly orange, blackish brown along ventrolateral edge and sometimes anterodorsally, with some scattered, short, black setae ventrally. T4 mainly orange, blackish brown along ventrolateral edge and sometimes anterodorsally, with a few ventrolateral short, black setae, shorter in male than in female. S1–4 dark brown, finely silver pruinose with sparse, short, black setae

Female. T5 orange, with black setae across posterior half. T6 orange, sometimes blackish brown ventrolaterally; finely golden pruinose, especially dorsally, about 0.75x length of T3–5 together, with short black setae over entire surface, denser ventrolaterally. T7 orange, golden pruinose, with short black setae over entire surface, long, about same length as T6. T8 blackish brown. Female genital plate (Fig. 170) usually orange, sometimes dark brown; large, broadly rounded, not much longer than wide with more than 20 rows of closely arranged spicules. Spicules at apex (Fig. 171) shorter, less pointed, and with fewer ridges than those in basal region. S6 covered with many rows of closely arranged spicules.

Male. T5 orange, sometimes patchy black dorsally; finely golden pruinose; with short black setae across posterior half. Protandrium orange, finely golden pruinose; with short, black setae over entire surface. S8 blackish brown, finely whitish pruinose; slightly narrower than epandrium. Epandrium blackish brown. S5 mainly orange, with posteromedial patch of spicule-like setae.

Measurements. Total length = 13.0–17.0 mm; wing length = 10.0–12.7 mm.

Distribution. Eastern Australia (Fig. 214).

Comments. The type of *C. demeijerei* matches the description of *C. seminiger.* Camras (1961) comments ‘It is possible that *demeijerei* is the true female of *seminiger* and that the female described by Meijere represents another species’. I believe Camras meant to write ‘the female described by Kröber’. I examined this latter specimen and found that the differences in the colour of T2 and the female genital plate represent intraspecific variation rather than species character states.

Conops sparsus, sp. nov. (Figs 172, 173, 183, 215)

Type material. Holotype. ♀, **Queensland**: 8 km W Cooktown, 17.vii.1982, N. W. Rodd (AM). Paratypes. **Queensland:** 1♂, Iron Range, Cape York Pen., 26–31.v.1971, G. B. Monteith (UQIC); 1♂, 1♀, Isabella Ck, 12 km N ‘Bald Hills' Stn Hsd, 30 km N Cooktown, 14.ii.1982, M. S. & B. J. Moulds (AM); 2♀, Kuranda, no date, F. P. Dodd (SAM); 1♂, 1 ml [1.6 km] E Kuranda, 11.iii.1964, I. F. B. Common & M. S. Upton; 1♂, 9 mls [14.5 km] E El Arish, 7.iii.1964, I. F. B. Common & M. S. Upton (all ANIC).

Diagnosis

Occiput black except ventromedially, frons black; face yellow; antenna mainly orange. Thorax black; fore and mid tarsi black, legs otherwise mainly yellowish brown. Abdomen blackish brown; tergites distinctly yellow pruinose except T3 and T4; female genital plate pointed, anterior surface markedly convex; spicules not densely arranged.

Description

Head. Occiput blackish brown, with narrow brown band around lower two-thirds of eye margin; silver pruinose band around eye margin; setae moderately dense and long, fine, black. Median occipital sclerite blackish brown with silver transverse pruinose band. Vertex dark brown, demarcated from frons by groove but not raised above plane of frons; setae black, moderately dense, long and strong, in median region only. Frons blackish brown, strongly rugose, width 1.5x length; setae minute, dark brown. Ridge along eye margin silvery yellow pubescent. Lunule blackish brown, length about 4x diameter of base of antenna. Eye height 0.84x head height. Antenna mid- to orange-brown; ratio of segment lengths: 1:1.8:1.3. Stylus dark to orange-brown; slightly more than 0.5x length of first flagellomere. Frontofacial patch dark brown. Face with minute, sparse, brown setulae. Parafacial dark yellow, yellow pruinose. Facial ridge dark yellow. Antennal foveae shallow dorsally, deeper and diverging ventrally; dark yellow below antennae, dark brown around tubercle, yellow pruinose on lower half. Facial carina yellow dorsally, dark brown toward frontoclypeal tubercle. Frontoclypeal tubercle blackish brown. Cheek flat; golden yellow, silvery yellow pruinose; setae fine, minute, brown. Postgena blackish brown, silvery pruinose; setae moderately long, fine, dark brown. Haustellum blackish brown basally and on labellum; otherwise yellow-brown; about 2x head length.

Thorax. Postpronotal lobe black; postpronotum medial of lobe with orange-brown band; setae very short, sparse, mainly in centre of lobe. Mesoscutum mainly black; finely golden pruinose, especially if viewed from in front; postalar callus dark brown; mesoscutum with short, strong setae over entire surface; mesoscutal bristles present: numerous npl and several pal. Scutellum blackish brown, yellow pruinose; with short, strong setae over entire surface and one pair of marginal bristles. Postnotum blackish brown, finely silvery yellow pruinose. Propleuron orange except for black spot where prepst bristles arise; pleura otherwise blackish brown, finely white pruinose. Pleural bristles present: two prepst; three kepst, one longer and stronger than other two. Prosternum blackish brown, silvery pruinose. Coxae orange with areas of dark brown, finely white pruinose. Trochanters orange, dark brown around distal margin; hind trochanter also dark brown basally. Femora mainly reddish brown; basal third to quarter, except adjacent to trochanter, dark brown. Tibiae orange-tan, finely silver pruinose; apical, oval, pruinose patch silver. Fore and mid tarsi dark brown, hind tarsus orange-brown; dense microsetae on fore tibia and tarsus black, dark brown on hind tibia and tarsus. Wing (Fig. 183) dark brown in cells bc, c, sc, r_1, r_{2+3}, basally in front of vena spuria and anterior apical parts of r_{4+5}, in front of vein CuA_1 in dm. Sc ending a little beyond mid wing length. R_1 ending far beyond apex of Sc, apically running along costa to end a little before apex of R_{2+3}. Petiole 0.3x length of dm-cu. CuA_2+A_1 about 1.5x length of petiole. Haltere yellow, base brown.

Abdomen. Gradually widening posteriorly to T5. T1 slightly wider than T2; blackish brown, silvery yellow pruinose. T2 blackish brown, silvery yellow pruinose, particularly posterolaterally; with scattered, very short black setae. T3 tan posteriorly, otherwise blackish brown, very finely silvery yellow pruinose; with scattered, very short black setae dorsally and some longer setae posterolaterally; slightly longer than T2. T4 blackish brown anteriorly, tan posteriorly, very finely silvery yellow pruinose; with scattered, very short black setae dorsally and some longer setae laterally. S1–4 blackish brown, finely silver pruinose; S1 with fairly long black setae across middle; S2–4 with sparse, short, black setae and one or two long setae.

Female. T5 blackish brown except for narrow posterior light tan band; yellow pruinose; setae moderately long, black. T6 blackish brown except for posterior yellowish brown margin; almost entirely yellow pruinose; length nearly 0.75x length of T3–5 together; setae black, short, slightly longer and denser ventrolaterally. T7

blackish brown anteriorly, mid brown posteromedially; yellow pruinose; with moderately long black setae except posteromedially; long, about same length as segment 6. T8 shiny, orange-tan. Female genital plate (Fig. 172) mid to dark brown; longer than wide, pointed, anterior surface markedly convex, posterior surface not sharply demarcated from anterior surface; spicules (Fig. 173) not dense or arranged in defined rows, extending on to posterolateral surface. Spicules of S6 not in defined rows or dense.

Male. T5 blackish brown; yellow pruinose; with very short, black setae. Protandrium dark brown, yellow pruinose with very short black setae over entire surface; length much shorter than the length of T3–5 together. S8 dark brown; about half length and same width as epandrium. S5 dark brown with posterior band of spicule-like setae.

Measurements. Total length = 11.8 mm (11.7–14.7 mm); wing length = 8.3 mm (7.5–10.8 mm).

Distribution. North-eastern Queensland (Fig. 215).

Comments. The female genital plates of this species and *C. badius* are distinctive in being pointed and curved posteriorly rather than broadly rounded and relatively flat as in other species of *Asiconops*. In both species the spicules on the females genital segments are relatively sparse compared with other species. However both species are typical of the subgenus in all other characters.

Etymology. The specific name is the Latin adjective, *sparsus* (= scattered or few) and refers to the spicules on the female genital plate and S6.

Conops thoracicus Kröber (Figs 174, 175, 216)

Conops thoracicus Kröber 1939b: 597

Type material. Holotype (examined). ♀, **L1**: Type; **L2**: Conops thoracicus, Krb. examined & det. O. Kröber, 1938. **L3**: Conops thoracicus Krb ♀ [hand written pencil]; **L4**: New South Wales A.R. Wallace. B.M. 1868-4; **L5**: NSW [hand written]; **L6**: 68 4; **L6**: TYPE (in NHM).

Additional material. **Queensland**: 1♀, Kuranda, xii.1927 (UQIC); 1♀, Paluma, 27.i.1982 (AM); 1♀, Benarkin, Blackbutt, 7.xi.1993 (UQIC); 1♂, 3♀, North Stradbroke Is., 2.x.1911 (QM); 1♂, 10 km N Dunwich, 30.ix.1981; 1♂, Brown Lake, North Stradbroke Is., 21–24.ix.1984 (all UQIC); 1♀, The Blunder, Brisbane, 8.x.1967; 1♀, Amiens State Forest, 14.xii.1969 (all ANIC); 1♀, Severnlea via Stanthorpe, 10.xii.1980; 1♂, Girraween Nat. Pk, 1–2.xii.1981 (all UQIC). **New South Wales**: 1♂, Wylie Ck, 22.xii.1968 (ANIC); 1♀, Crowdy Bay Nat. Pk, 19–21.xi.1979; 2♂, 4 km NE Bilpin, 19.xi.1982 (all AM); 1♂, Thornleigh, x.1890; 1♀, Cheltenham, xi–xii.1950 (all AM); 1♂, Roseville, Sydney, 14.xi.1914 (ANIC); 1♂, Mt Westmacott nr Waterfall, 31.xii.1978 (UQIC). **Tasmania**: 1♀, King George's Sound (AM).

Diagnosis

Vertex tan; frons blackish brown; antenna blackish brown; first flagellomere partly reddish; face yellow. Postpronotal lobe orange; mesoscutum mainly orange to mainly black, dark colouration usually forming three diffuse, broad, longitudinal stripes; pleura black; legs mainly orange; fore and mid tarsi black. Abdominal T1, T3, T4, and T5 mainly black; T2, male protandrium, and female T6, T7, T8 mainly orange; male S8 and epandrium black.

Redescription

Head. Occiput black with narrow orange, silver pruinose band around eye margin; setae moderately dense and long, fine, black. Median occipital sclerite blackish brown to tan dorsally, black below with silver transverse pruinose band, dorsally separated from posterolateral margin of frons by a low ridge. Vertex yellowish brown, demarcated from frons by slight ridge, slightly raised above plane of frons, much shorter than frons length; setae of vertex moderately sparse, long and strong, black, in median region only. Frons blackish brown, strongly rugose, slightly shorter than wide; setae sparse, minute, very fine, black. Fronto-orbital region

not demarcated from mesofrons but a narrow, smooth, brown, silver pruinose ridge present along eye margin. Lunule blackish brown, length about 4x diameter of base of antenna. Eye height 0.8x head height. Antenna mainly black, first flagellomere partially reddish brown; ratio of segment lengths: 1:2:1.2; stylus black, about 0.6x length of first flagellomere. Face with minute sparse, brown setulae. Parafacial orange, pale yellow pruinose. Facial ridge orange. Antennal foveae shallow dorsally, deeper and diverging ventrally, shiny yellow, brown on either side of carina proximal to frontoclypeal tubercle. Facial carina yellow dorsally, dark brown toward frontoclypeal tubercle; frontoclypeal tubercle blackish brown. Cheek orange, silvery yellow pruinose, slightly concave; setae fine, minute, brown. Postgena blackish brown, silvery pruinose; setae moderately long, fine, dark brown. Haustellum black, usually orange-brown in middle; length 1.8x head length.

Thorax. Postpronotal lobe usually orange, sometimes infuscated with dark brown; setae sparse, very short, strong, black. Mesoscutum mainly orange to mainly black, dark colouration usually forming three diffuse, broad, longitudinal stripes; with short, strong setae over entire surface; mesoscutal bristles present: numerous npl and four or five pal. Scutellum orange, with short, strong setae over entire surface and one pair marginal bristles. Postnotum entirely black or with patch of orange below scutellum, finely white pruinose. Pleura blackish brown, finely white pruinose; pleural bristles present: five or six prepst; several dorsally-directed and several more ventral, weaker, posteriorly-directed kepst. Prosternum blackish brown, silvery pruinose. Coxae mainly blackish brown, otherwise orange, silvery pruinose. Trochanters mainly orange-tan. Femora mainly orange, basal half sometimes brown ventrally. Tibiae orange, finely silver pruinose; apical, oval, densely silver pruinose patch present on posterior surface of fore tibia, both anterior and posterior surfaces of mid tibia, and anterior surface of hind tibia. Fore and mid tarsi black, hind tarsus orange-brown; dense golden brown microsetae on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing dark brown in cells bc, c, sc, r_1, r_{2+3}, basally in front of vena spuria and anterior apical part of r_{4+5}, br, posterior part of bm, along CuA_1 in dm, anterior to free section of CuA_2, basal part of cell cu*p*; Sc ending beyond mid wing length; R_1 ending far beyond apex of Sc, apically running along costa to end a little before apex of R_{2+3}; vena spuria conspicuous; petiole 0.2x length of dm-cu; CuA_2+A_1 about 2x length of petiole. Haltere yellow, base dark brown.

Abdomen. Gradually widening posteriorly to T5. Defined pruinose bands absent. T1 slightly wider than T2, mainly black, variable amount of orange posteriorly. T2 usually entirely or mainly orange, variable amount of black, especially ventrolaterally, with yellow pruinose area laterally and with a few posterolateral black bristles. T3 black, rarely partially orange, with some scattered, short, black setae ventrolaterally. T4 black, sometimes brown posteriorly, with few ventrolateral short, black setae; shorter in male than in female. S1–4 dark brown, finely silver pruinose with sparse, short, black setae.

Female. T5 mainly black, orange along posterior margin; with short black setae along posterior margin. T6 orange, blackish brown ventrolaterally; finely golden pruinose, especially dorsally, about three quarters length of T3–5 together; setae black, very short dorsally, longer and denser ventrolaterally. T7 orange, golden pruinose, with short black setae over entire surface, about same length as segment 6. T8 shiny, orange-tan. Female genital plate (Fig. 174) blackish-brown, large, broadly rounded, distinctly longer than wide, with more than 20 rows of closely arranged spicules. Spicules (Fig. 175) with ridges merging basomedially. S6 covered with many rows of closely arranged spicules.

Male. T5 mainly blackish brown with a variable amount of orange, especially posteriorly, yellow pruinose with very short, black setae. Protandrium orange, yellow pruinose entirely very short setose. S8 black, finely pale yellow pruinose, about half length and same width as epandrium. S5 blackish brown, with posteromedial patch of black spicule-like setae.

Measurements. Total length = 15.1 mm (10.6–18.5 mm); wing length = 10.3 mm (7.6–14 mm).

Distribution. Eastern Australia including Tasmania (Fig. 216).

Comments. At Brown Lake on North Stradbroke Island specimens were collected on blossom of *Leptospermum flavescens*.

4.5.9 *Delkeskampomyia* Kröber

Introduction

This genus was described from a single specimen. Kröber (1940) states that the type is in 'Berlin'. It is not listed in Rohlfien and Ewald (1975) as being present in the Deutsches Entomologisches Institut and I was unable to determine its present location. No other material of this genus is known. The description of the type species is detailed and seemingly diagnostic but none of the material I have examined during this study matches the description. The genus may be congeneric with *Heteroconops*, and is certainly similar to that genus, as suggested by Kröber. Similarities include the short haustellum, the rugose frons, the hyaline wing with a relatively long petiole, and the shape of the abdomen. Some character states cannot be compared because Kröber does not mention them in his description *e.g.* presence or absence of palpi. However, based on the relatively shorter overall length of the antenna, differences in the ratio of antennomere lengths and presence of the lateral 'callosities' on the frons, I prefer to retain generic status for *Delkeskampomyia*. Another possible difference lies in the nature of the vertex. In his description of the vertex in the generic and species descriptions, Kröber uses the term 'Scheitelblase'. A literal translation of this word is 'vertex cushion'. In other species this term aptly describes a swollen, cushion-like vertex. Such a vertex is not present in *Heteroconops*, species of which have a poorly differentiated, narrow vertex.

Genus DELKESKAMPOMYIA Kröber

DELKESKAMPOMYIA Kröber 1940: 71. Type species: *Delkeskampomyia fasciata* Kröber, by monotypy

Diagnosis

Translation of original description (Kröber 1940) using current terminology:
Sister group of *Heteroconops*. Haustellum scarcely as long as the head, black, fleshy. Cell r_{4+5} as in *Conops*, although rather long petiolate. Vertex with ocellar tubercle and two ocelli. Frons grooved. First flagellomere of antenna about twice the length of the pedicel. Stylus two-segmented. Abdomen rather slender. Setae very fine, but rather long.

***Delkeskampomyia fasciata* Kröber (Figs 191, 192)**

Delkeskampomyia fasciata Kröber 1940: 71

Type material. Holotype (not examined). ♂, **Western Australia**: Marloo Stat[ion], Wurarga, viii.–ix. (?Berlin).

Redescription

Translation of original description (Kröber 1940) using current terminology:
Length 4 mm. Antenna under 1 mm; wing length 3 mm, width more than 1 mm.
Vertex and upper part of occiput blackish brown. Frons transversely wrinkled, with a black calcus at the eye-margin as in *Callosiconops*; the part above the antennae and face [frons] yellow-brown, below almost whitish yellow, also the antennal foveae and facial carina. [Parafacial] without any silvery sheen. Haustellum as long as the mouth cavity, black, with big fleshy labella. Antenna [Fig. 191] short, black. Scape barely longer than wide; pedicel twice as long as the scape; first flagellomere twice as long as the pedicel. The stylus [Fig. 192] seems to be two-segmented. Sides of thorax, scutellum, metanotum black with a delicate silvery gloss as a result of an extremely fine pubescence. Legs blackish brown, bases of tibiae yellowish-brown. Tarsi black. All more or less pruinose. Haltere yellow. Wing entirely hyaline, rather strongly iridescent; venation as in *Conops*. Abdomen rather slender, black, somewhat shiny; T2 and T3 with silvery-glossy hind margin, widened

laterally, T4 with some trace of it. T2 and T3 nearly the same length, both a little longer than wide, T4 dorsally almost as long, T5 and T6 distinctly shorter.

Measurements. Total length = 4.0 mm; wing length = 3.0 mm.

Comments. The black 'calcus' along the fronto-orbital region of an otherwise yellowish-brown frons is a distinguishing character state of this species. I have reproduced Kröber's illustrations (1940: 71, Fig. 18) of the lateral view of the antenna and dorsal view of the stylus for comparison with species of other genera.

4.5.10 *Heteroconops* Kröber

Introduction

Heteroconops is the most difficult genus of all the Australian Conopinae to define. Species included in the genus by Kröber (1915a, 1940) have many similarities but differ most significantly in having a variable number of ocelli. In all other genera the number of ocelli is constant. Historically, this feature has been considered a good generic character. In the initial sorting of accumulated specimens for this study I attempted to separate specimens with a short haustellum, short cell r_{4+5}, and no palps according to the number of ocelli present—zero, two or three. This task was not straight forward. Several factors made determination of the number of ocelli present in some specimens difficult: many species are small (less than 3 mm) with correspondingly very small ocelli (particularly the median ocellus); presence of ocelli is not always associated with the presence of an ocellar tubercle; and frons is typically weakly sclerotised and therefore inclined to partially collapse in dried specimens. The ocelli are so poorly defined in some species that their presence and number is difficult to determine. I could find no other character consistently correlating with the number of ocelli to separate species in this complex into more than one genus.

Other variable characters demonstrated by species of *Heteroconops* include the length of the anal cell which may be no longer than cell bm, presence or absence of crossvein m-cu, length of petiole relative to length of cell r_{4+5} (Figs 184–188), and length and degree of sclerotisation of haustellum. Many specimens or groups of specimens show subtle differences in shape and/or length of structures, in venation, and in size. The problem with species delimitation is exacerbated by low numbers and sometimes disjunct distributions of what appear to be conspecific specimens. Regrettably the task of defining and describing all of the many species of *Heteroconops* has been made impossible by the time restrictions on this study. The final decisions about species' limits and a complete revision of the genus will be presented later.

Below I present a diagnosis and redescription of *Heteroconops*, diagnoses and redescriptions of the Kröber species, *H. antennatus*, *H. gracilis*, *H. minutus*, and *H. tasmaniensis*, and the description of one new species. The species described by Kröber as *H. curticornis* is considered not congeneric with these species. Many species remain to be described and perhaps *Heteroconops* will be found to be of a similar size to *Australoconops* when its taxonomy is completed. No key to species or distribution maps are presented because of the preliminary nature of the account of this genus.

Genus HETEROCONOPS Kröber

HETEROCONOPS Kröber 1915a: 80. Type species: *Heteroconops gracilis* Kröber, by monotypy

Diagnosis

Ocelli absent in type species; two or three ocelli present in other species; frons grooved; antenna about as long as head height; scape and pedicel short, first flagellomere long, spatulate, at least 3x length of pedicel; stylus short, two-segmented; eye almost round, height short so that cheek broad; postgena swollen; haustellum fleshy, at most as long as head. Wing with cell r_{4+5} short and petiole long. Abdomen more or less parallel-sided in both sexes, about as broad as scutellum, blackish, without dense pruinose bands.

Redescription

Head. Occiput blackish brown dorsally, pale whitish yellow ventrally; setae moderately dense, fine; brown, somewhat appressed on dorsal half, white on ventral half. Median occipital sclerite blackish brown, not extending laterally to eye margin. Vertex dark brown, smooth; usually slightly raised above plane of frons and slightly curving forward on to posterolateral margin of frons; very narrow, much shorter than frons. Setae of vertex fine, across width. Ocelli absent or variable in number (two or three), shape and size; number sometimes difficult to determine because weakly developed; lateral ocellus often ovoid. Frons weakly sclerotised, finely rugose especially medially; wider than long. Fronto-orbital region forming a narrow rounded, smooth ridge; bare or with a few scattered short setulae. Lunule narrow. Eyes relatively small, almost round, 0.6–0.7x head height. Antenna about as long as head height. Scape short, cylindrical, with a row of short strong setae along anterior margin. First flagellomere at least 3x length of pedicel. Stylus two-segmented, very short; segment 1 projecting ventromedially, segment 2 short, pointed apically. Face entirely pale yellow; with shallow median carina and long, deep, narrow, parallel antennal foveae. Facial ridge long, smooth. Facial carina height less than depth of foveae; frontocypeal tubercle prominent. Cheek concave, lower margin meeting ventral end of facial ridge at about 90°; almost bare, some short, fine, pale yellowish setae around epistoma. Postgena yellow, swollen so that extending anteriorly below eye; setae short, fine, whitish. Palpus absent. Haustellum shorter than head length; usually weakly sclerotised.

Thorax. Mainly blackish brown, with fine white pruinose areas; setae usually moderately long, fine; mesonotal bristles absent or poorly differentiated. Pleural bristles present: 1 prepst; 3 or more kepst. Legs mainly yellowish, with some brown areas. Mid femur without longer setae on posterodorsal margin. Tibiae without pruinose oval patches and preapical dorsal bristles; dense microsetae present. Wing completely hyaline; Sc ending mid wing length or before; R_1 extending along costa to end a little before R_{2+3}; R_{2+3} ending at about half distance between apices of Sc and petiole; vena spuria absent or represented by an indistinct fold; cell r_{4+5} short, petiole correspondingly long. Haltere mainly yellowish.

Abdomen. Mainly blackish brown, pruinose bands absent. More or less parallel sided, widening slightly posteriorly in male; T1 not wider than T2. T2 no more than 2x length of T1; T3 slightly longer than T2. S1–4 present, usually narrow.

Female. Posterior margin of T6 straight; T6 about half length of T3–5 together. Anterior margin of T7 emarginate mid dorsally.

Male. T5 about 0.8x length of T4; entirely short setose. Epandrium wider than long. S5 with posterior band of spicules.

Measurements. Total length = 1.9–7.7 mm; wing length = 1.6–4.4 mm.

Heteroconops antennatus Kröber (Fig. 184)

Heteroconops antennatus Kröber 1940: 69

Type material. Holotype (examined). ♂, **L1**: Type; **L2**: Heteroconops antennatus, Krb. examined & det. O. Kröber, 1938.; **L3**: Heteroconops antennatus Krb ♂ [hand written pencil]; **L4**: Yanchep. 32 mls. N. of Perth. 3–19.xii.1935; **L5**: TYPE; **L6**: W. AUSTRALIA: R. E. Turner. B.M.1936-28 (NHM).

Additional material. **Western Australia**: 1♀, Mingenew, 15–22.x.1935 (NHM); 1♂, Jandakot, 25.xi.1970 (WADA).

Diagnosis

Two ocelli present; frons mainly yellow; haustellum only slightly shorter than head length. Thorax entirely blackish brown; silvery pruinose in region of postpronotal lobe and on pleura except anepimeron; setae of mesonotum dark brown, only moderately fine; femora mainly yellow; fore and mid femora with dorsal brown patch on distal half, hind femur with apical quarter of length dark brown except ventrally; setae on anterior

surfaces of femora shorter and darker than setae on posterior surfaces; apex of cell r_{4+5} squarish. Tergites narrowly white pruinose across posterior margins; male S5 with posteromedial band of black spicules.

Redescription

Head. Occipital setae moderately dense and short. Vertex narrow, about one-third length of frons; setae golden brown, moderately long, anterior setae straight, directed anteriorly over frons. Ocellar tubercle blackish brown, smooth, poorly developed, projecting beyond anterior margin of vertex; ocellar bristles not differentiated from other setae of vertex; 2 moderately distinct, slightly ovoid ocelli present. Frons mainly yellow; diffusely brown posteriorly; transversely rugose especially medially; slightly tuberculate anteromedially; width about twice length; fronto-orbital region dark brown posteriorly, yellow anteriorly; setae short, very fine, along inner margin of fronto-orbital region, frons otherwise bare or with a few scattered short setulae. Lunule dark brown; length about equal to diameter of base of antenna. Antenna slightly longer than head height; mainly mid brown, first flagellomere ventrally, lighter brown; ratio of segment lengths: 1:1.5:5.6. Pedicel base shiny; transverse dorsal keel distinct; distally only slightly expanded, white pruinose with minute setae. First flagellomere gradually tapered distally. Stylus dark brown. Face entirely yellow; with fine, pale yellowish setae, short dorsally, moderately long ventrally adjacent to epistoma. Parafacial finely silvery pruinose; widest about mid eye height where about same width as facial ridge. Cheek pale yellow. Haustellum slightly shorter than head length, moderately sclerotised, mid brown; labella base whitish; setae of labella about same length as those of haustellum.

Thorax. Entirely blackish brown. Postpronotal lobe finely silvery pruinose posteriorly; setae dark brown, moderately dense, long and fine, on posterior half. Mesoscutum finely white pruinose adjacent to postpronotal lobe; setae moderately fine, long and dense; 2 or 3 poorly differentiated np, pal present. Scutellum with 1 pair of marginal setae longer than other setae. Postnotum finely white pruinose especially on laterotergite. Pleura finely white pruinose, less densely on anepimeron. One prepst bristle, moderately fine, curving out and dorsally. About 6 dorsal, upwardly directed, fine kepst bristles present. Prosternum pale yellow; lightly sclerotised. Fore coxa pale yellow, white pruinose; mid coxa yellowish brown; hind coxa mainly dark brown, white pruinose. Trochanters yellow. Femora mainly yellow; fore and mid femora with dorsal brown patch on distal half, hind femur with apical quarter of length dark brown except ventrally; setae on anterior surfaces of femora shorter and darker than setae on posterior surfaces. Tibiae mainly yellow; hind tibia indistinctly brown apically. Tarsi yellowish; apical segments yellowish brown; microsetae yellowish. Wing (Fig. 184) with Sc ending mid length; R_{2+3} ending at about half distance between apices of Sc and petiole; M meeting R_{4+5} at about a 90° angle; petiole 2.3x length of dm crossvein; cell cu*p* markedly longer than cell bm; CuA_2+A_1 about 0.6x length of petiole. Haltere pale yellow, base and most of pedicel pale brown.

Abdomen. Tergites blackish brown, narrowly and finely white pruinose across posterior margins. T1 with lateral setae slightly longer and denser than those on T2. T2 about 1.8x length of T1 in male. T3 about 1.3x length of T2 in male; setae shorter and less dense than those on T2. T4 slightly shorter than length of T3; setae slightly longer across posterior margin. S1–4 dark brown.

Female. Not examined (see comments below).

Male. T5 mainly blackish brown; lighter brown along posterior margin, yellowish brown laterally. Protandrium shiny; dorsal length about 0.8x length of T5; vertical height greater than that of T5. S8 dark brown anteriorly, paler brown on posterior half; entirely whitish pruinose; short, narrower than epandrium; convex in continuous plane with anterior part of protandrium. Epandrium yellowish brown. S5 dark brown with posteromedial band of about 4 rows of black spicules.

Measurements. Total length = 5.5 mm (5 mm); wing length = 3.4 mm (3 mm).

Distribution. South-western Western Australia.

Comments. Kröber (1940) described *H. antennatus* as 'similar in all respects to *H. tasmaniensis*, but the ocellar tubercle is absent'. Clearly this is not correct although the tubercle is not as distinct as that of *H. tas-*

maniensis which also differs in bearing three distinct ocelli. Camras (1961) included brief notes on a female specimen from Minegenew, WA, which he suggested may be *H. antennatus*. I did not study this specimen which is listed as housed in the NHM. Both wings of the holotype (Kröber 1940: 70, Fig. 16) have three short vein appendages associated with cell r4+5, one on R4+5, and two on M—one directed inside, one outside the apex of cell r4+5; these appendages are not present on the specimens from Mingenew and Jandakot. The female genital segments and spicules of a closely related species are illustrated in Figs 16–18.

***Heteroconops carnarvonensis*, sp. nov. (Figs 185, 193)**

Type material. Holotype. ♂, Queensland: Carnarvon Nat Pk, Base of the Chimneys, 25°06'08"S 147°52'01"E, 680 m, 21.xi.1995, D. K. Yeates (QM). Paratypes. **Queensland**: 4♂, 6♀, Carnarvon Nat. Pk, Mt Moffatt Section, Marlong Arch Summit, 24°59'28"S 147°53'48"E, 820 m, 19.xi.1995, D. K. Yeates, C. J. Burwell (QM, UQIC); 4♂, 9♀, Carnarvon Nat. Pk, Mt Moffatt Section, 3 km SE Ranger Station, 740 m, 18,20.xi.1995, D. K. Yeates, C. J. Burwell (QM, UQIC); 1♂, Mt Moffatt Nat. Pk, Mt Moffatt summit, 25°04'S 148°03'E, 1097 m, 23.xi.1995, C. J. Burwell (QM); 1♂, same data as holotype (UQIC).

Additional material. Queensland: 1♀, Murrays Spring, 7 km W Musselbrook Resource Centre, Lawn Hill Nat. Pk, 18°35'15"S 138°04'28"E, 200 m, 21.iv.1995 (UQIC). **Northern Territory**: 1♀, Baroalba Creek Springs, 19 km ENE Mt Cahill, 12°48'S 132°49'E, at light, 28.x.1972 (ANIC).

Diagnosis

Ocelli absent; frons mainly yellow; antenna mainly mid to dark brown; first flagellomere ventrobasally yellowish brown. Mesonotal setae moderately short, fine, shiny golden brown; scutellum without differentiated marginal bristles; femora mainly yellow; fore and mid femora with small subapical dorsal dark brown patch, hind femur with apical quarter of length except ventrally, dark brown; tibiae mainly yellow; hind tibia distinctly brown apically and irregularly dorsally. Female genital plate with about 6 complete rows of spicules apically; S6 with 5 or 6 complete rows of spicules. Male epandrium mainly dark yellowish brown; dark brown around cerci.

Description

Head. Occipital setae short. Setae of vertex moderately short, dark brown. Ocelli, ocellar tubercle and bristles absent, vertex projecting forwards medially. Frons mainly yellow; usually diffusely brown posteriorly and along fronto-orbital ridge, transversely finely rugose especially medially; slightly tuberculate anteromedially; width about 2x length; fronto-orbital region dark brown posteriorly, yellow anteriorly; frons with fine, short setae along inner margin of fronto-orbital region, otherwise bare or with a few scattered short setulae. Lunule dark brown. Antenna (Fig. 193) slightly shorter than head height; mainly mid to dark brown; first flagellomere ventrobasally yellowish brown; ratio of segment lengths: 1:1:4.6. Pedicel basal half narrow with shallow transverse dorsal keel close to base; distal half expanded, with minute setae. Stylus dark brown. Face with fine, short, pale yellowish setae. Parafacial whitish; at widest part about same width as facial ridge; anterior extension of frons reaching down face to about half eye height. Remainder of face and cheek yellow. Postgena pale yellowish. Haustellum not strongly sclerotised, pale to mid brown; base of labellum whitish; haustellum length 0.7–0.9x head length; setae of labellum longer than those of haustellum.

Thorax. Postpronotal lobe blackish brown, silvery pruinose, especially posteriorly; setae shining pale brown, fine, moderately short, moderately dense on posterior half. Mesoscutum brownish black; finely white pruinose, more densely adjacent to postpronotal lobe; setae moderately short, fine, shiny golden brown, over entire surface; with numerous np and pal which are longer but not well differentiated from other mesoscutal setae. Scutellum brownish black, without differentiated marginal bristles. Postnotum brownish black, finely

white pruinose. Pleura brownish black, densely white pruinose on propleuron, anepisternum and katepisternum. Prepst bristle moderately strong, directed dorsally. Several dorsal kepst bristles. Prosternum dark brown, white pruinose, lateral edges directed ventrally, pale. Fore coxa pale yellow, white pruinose; mid coxa yellowish brown; hind coxa mainly dark brown, white pruinose. Trochanters yellow. Femora mainly yellow; fore and mid femora with small subapical dorsal dark brown patch, hind femur with apical quarter of length except ventrally, dark brown; fore femur with several dorsal setae longer and stronger than surrounding setae; dorsal and posterior setae longer than those of mid femur; anterior surface of female hind femur with short strong brown setae. Tibiae mainly yellow; hind tibia distinctly brown apically and irregularly on much of dorsal surface (fore and mid tibiae sometimes brown on distal half). Tarsi yellowish; apical segments yellowish brown; microsetae pale yellow on fore tibia and tarsus, golden brown on hind tibia and tarsus. Wing (Fig. 185) with Sc ending slightly before mid length. R_{2+3} ending slightly before half distance between apices of Sc and petiole. M meeting R_{4+5} at about a 90° angle. Petiole 2.5x length of discal crossvein. CuA_2+A_1 about 0.6x length of petiole. Haltere pale yellow, base and pedicel light brown.

Abdomen. T1 brownish black; lateral setae not especially long, about same length as those on T2. T2 and T3 brownish black, narrowly white pruinose across posterior margins. T2 about 2x length of T1 in male and 1.6x length in female. T3 with short, fine setae; T3 slightly longer than T2. T4 pale brown along lateral and posterior margin, especially in female, otherwise brownish black; with transverse row of longer setae in female; T4 as long as T3 in male; about 0.6x length of T3 in female.

Female. T5 narrowly whitish posteriorly; light brown laterally, otherwise blackish brown; about half length of T4. T6–7 shiny brownish black. T7 short setose; about 1.25x height of T6. T8 shiny mid to dark tan. Female genital plate yellowish brown anteriorly; long, relatively narrow; with about 6 complete rows of spicules apically and scattered spicules basally; spicules occupying more than half of posterior surface; with very short setae on anterior surface and long, fine marginal setae. S6 with 5 or 6 complete rows of spicules and additional anterior scattered spicules.

Male. T5 mainly brownish black; lighter brown along posterior and lateral margins. Protandrium shiny brownish black; dorsal length about 0.6x length of T5; vertical height about equal to that of T5. S8 blackish brown, brown pruinose; short, about same width as epandrium; convex in continuous plane as anterior part of protandrium. Epandrium mainly dark yellowish brown; dark brown around cerci. S5 blackish brown; with posterior band of 3 rows of spicules.

Measurements. Total length = 4.6 mm (3.8–5.5 mm); wing length = 2.9 mm (2.7–3.8 mm).

Distribution. Central and north-western Queensland, Northern Territory.

Comments. This species is very similar to *H. gracilis*; differences include: hind tibia extensively dark brown; cell r_{4+5} with broad apex; female genital plate and S6 with 5 or 6 complete rows of spicules; male epandrium dark brown around cerci.

Etymology. The specific name refers to Carnarvon National Park in which most specimens were collected.

Heteroconops gracilis Kröber (Figs 186, 194, 195, 197)

Heteroconops gracilis Kröber 1915a: 81

Type material. Holotype (examined). ♂, **L1**: Palmerston, N. Australien, XI.1908; **L2**: coll. Lichtwardt; **L3**: Holotypus; **L4**: Type; **L5**: *Heteroconops gracilis* Kröb. ♂ O. Kröber det. 1914 (DEI). Paratype (examined). ♀, same date as holotype; **L3**: Allotype (DEI).

Additional material. **Queensland**: 1♂, Cooktown, 14.xi.1978, on *Eucalyptus papuana* (UQIC). **Western Australia**: 2♂, 24 km SW Kununurra, 7.iii.1973, on *Eucalyptus* ?*pruinosa* (UQIC). **Northern Territory**: 3♂, 4♀, Cooper Ck, 19 km SE Mt Borradaile, 2,9.xi.1972, 5.vi.1973; 1♂, Cooper Ck, 11 km SW Nimbuwah

Rock, 1.xi.1973; 2♂, Jabaluka Lagoon, 14 km N Mudginbarry HS, 14.xi.1972 (all ANIC); 1♂, Port Darwin, iii.1909 (NHM); 2♂, Baroalba Ck Springs, 19 km ENE Mt Cahill, 16.xi.1972 (ANIC); 1?, 16 km S Katherine, 14.iii.1973, on *Eucalyptus foelcheana*; 1♂, Barrow Ck, 8,9.xi.1974, on *Eucalyptus camaldulensis* (all UQIC); 1♀, 53 km NE Alice Springs, 6.xii.1978, at light (ANIC).

Diagnosis

Ocelli absent; frons yellow, grooved; haustellum mainly brown, about as long as head. Tibiae dark brown at most on apex; apex of cell r4+5 somewhat tapered. Female genital plate with 4 or 5 complete rows of spicules apically; S6 with 4 complete rows of spicules; male protandrium strongly angled anteroventrally.

Redescription

Similar to *H. carnarvonensis*; character states not mentioned are as for that species.

Head (Figs 194, 195). Frons 1.5–2x wider than long. Antenna mainly mid brown, pedicel apically and first flagellomere ventrally, pale brown; ratio of segment lengths: 1:1.2:4.4; stylus brown. Parafacial yellow, finely silvery pruinose; narrower than facial ridge; lower half wider and more projecting than upper half. Postgena pale yellow (Kröber 1919c, Figs 10a,b).

Thorax. Mesoscutum entirely blackish brown; white pruinose, less densely posterior of transverse suture. Scutellum and postnotum blackish brown. Pleura blackish brown, finely white pruinose. Prosternum yellowish to pale brown. Coxae yellowish; hind coxae usually infuscated with pale brown. Femora mainly yellowish; dorsum of distal end usually brown, hind femur more distinctly so than fore and mid femora. Tibiae mainly yellow; hind tibia indistinctly brown apically. Kröber (1915a) description states: 'Base of femora almost whitish yellow, the ends brown. All tibial apices brownish'. Wing as in Fig. 186; the left wing of the holotype is abnormal in that the apex of cell r4+5 has a short external vein-appendage that runs parallel to the petiole.

Abdomen. Tergites blackish brown. T2–4 white pruinose posterolaterally margin. T2 about 1.8x length of T1 in male and 2x length in female.

Female. T5 narrowly light brown posteriorly. Female genital plate with 4 or 5 complete rows of spicules apically and several incomplete rows and scattered spicules basally; spicules occupying more than half of posterior surface. S6 with 4 complete rows of spicules and additional anterior scattered spicules.

Male. Protandrium (Fig. 197) strongly angled anteroventrally; vertical height slightly greater than that of T5. S8 slightly more convex than anterior part of protandrium. Epandrium dark yellowish brown.

Measurements. Total length = 4 mm (from Kröber 1915a) (3.5–4.2 mm); wing length = 2.6 mm (2–2.7 mm).

Distribution. Northern and central Australia.

Comments. The holotype and allotype are now headless. The male specimen labelled 'Port Darwin, iii.1909' is an excellent match for the holotype in all character states of the thorax and abdomen. The types were collected at Palmerston, a former name for Darwin. I am therefore confident that the type species of *Heteroconops*, despite the loss of the head on the holotype, has no ocelli, a short haustellum and a grooved frons. Kröber did not mention ocelli in his description of the genus or this species.

Heteroconops minutus Kröber (Fig. 196)

Heteroconops minutus Kröber 1940: 67

Type material. Holotype (examined). ♂, **L1**: Type; **L2**: Heteroconops minutus, Kröb. examined & det. O. Kröber, 1938.; **L3**: Heteroconops minutus Krb ♂ [hand written pencil]; **L4**: Victoria, Australia. C. French. 1912-491; **L5**: TYPE (NHM).

Additional material. **Queensland**: 1♂, Howard, 30.viii.1966 (UQIC); 1♂, summit Mt Tempest, Moreton Is, 27°09'S 153°24'E, 280 m, 22.iii.1998 (UQIC). **South Australia**: 1♂, Poochera to Streaky Bay, 23.x.1977 (ANIC).

Diagnosis

Ocellar tubercle anterior of narrow vertex; with three ocelli; first flagellomere of antenna broad basally, sharply tapered distally; haustellum about half head length; labella not broader than haustellum. Mesonotum with 2 or 3 npl and pal bristles and 1 pair of dorsally-directed, convergent sctl bristles; cell r_{4+5} very short, shorter than length of petiole; cell cu*p* short; bm confluent with discal cell.

Redescription

Head. Dorsal half of occiput convex so that expanded beyond posterior margin of eye; occipital setae moderately dense on lower half, sparse on upper half. Vertex dark brown, bare; margins difficult to define. Ocellar tubercle smooth, black, anterior of narrow vertex. Three ocelli, moderately large, conspicuous, slightly ovoid. Frons bare, mainly yellowish brown, darker brown posteriorly; dark brown along fronto-orbital ridge; finely rugose; slightly tuberculate anteromedially; width about 1.4x length. Lunule yellow. Antenna dark brown; ratio of segment lengths: 1:1.5:4.5. Pedicel with base shiny; transverse dorsal keel poorly developed. First flagellomere laterally compressed, broad basally, sharply tapered distally. Stylus dark brown. Face entirely yellow, with sparse minute setae. Parafacial shiny, not pruinose. Antennal fovea very deep. Cheek pale yellow. Postgena pale yellowish. Haustellum about half head length; labella not broader than haustellum.

Thorax. Postpronotal lobe dark brown, finely white pruinose; setae sparse, long, moderately fine, dark brown. Mesoscutum entirely blackish brown, finely white pruinose, less dense posterior of transverse suture; setae moderately fine, long and sparse; mesoscutal bristles present: 2 or 3 np, pal. Scutellum with 1 pair of long, convergent bristles. Postnotum and pleura blackish brown, finely white pruinose. Single prepst bristle fine, directed posteriorly; numerous dorsally-directed, fine, pale yellowish kepst bristles. Prosternum pale yellow; lightly sclerotised; lateral edges directed ventrally. Fore coxa pale yellow, white pruinose; mid coxa yellowish brown; hind coxa at least partially dark brown, white pruinose. Trochanters yellowish; hind trochanter infuscated with brown. Fore and mid femora yellow anteriorly, brown posteriorly; hind femur mainly brown; fore femur with dorsal and posterior setae longer than those of mid femur. Tibiae yellowish brown. Tarsi yellowish brown; dense microsetae golden brown. Wing with Sc ending distinctly before mid length. R_{2+3} ending at about half distance between apices of Sc and petiole. Vena spuria absent. Cell r_{4+5} very short, length about 0.8x length of petiole but apex distinctly beyond discal crossvein in holotype; M meeting R_{4+5} at less than a 90° angle; petiole 4x length of dm crossvein. Cell cu*p* short; bm confluent with discal cell. $CuA_{2}+A_{1}$ slightly less than half length of petiole. Haltere pale yellow, base and most of pedicel light brown.

Abdomen. T1–3 matt, dark brown. T2 about 2x length of T1 in male. T3 slightly longer than T2. T4 blackish brown dorsally except pale brown along posterior margin, dark brown laterally; about same length as T3.

Female. Unknown.

Male. T5 blackish brown dorsally except pale brown along posterior margin, dark brown laterally. Protandrium (Fig. 196) shiny blackish brown; setae directed medially; dorsal length about 0.8x length of T5; vertical height about equal to that of T5. S8 blackish brown, pale pruinose; convex in continuous plane as anterior part of protandrium. Epandrium dark yellowish brown. S5 blackish brown with posterior band of spicules.

Variation. Apex of cell r_{4+5} not much beyond discal crossvein; cell length 0.6–0.75x length of petiole.

Measurements. Total length = 2.6 mm (2.2–2.7 mm); wing length = 2 mm (1.7–2 mm).

Distribution. Eastern and southern Australia.

Comments. This species is the smallest of the known *Heteroconops* and is known from only four specimens. Despite the wide distribution, variation in character states is only slight; the most obvious variation lies in the length of cell r_{4+5} which is longest in the holotype.

***Heteroconops tasmaniensis* Kröber**

Heteroconops tasmaniensis Kröber 1940: 68

Type material. Holotype (examined). ♂, **L1**: Type; **L2**: Heteroconops tasmaniensis, Kröb. examined & det. O. Kröber, 1938.; **L3**: Heteroconops tasmaniensis Krb ♂ [hand written pencil]; **L4**: CH Hardy Hobart 27.9 1914 /60; **L5**: TYPE; **L6**: TASMANIA: Purch. from G. H. White. B.M.1917-104 (NHM).

Diagnosis
Three ocelli present; frons mainly blackish brown; first flagellomere of antenna slender, not markedly broader at base than toward apex; haustellum slightly more than half head length. Thoracic and abdominal setae rather dense, fine and long. Male epandrium setose, markedly broader than long, yellowish.

Description
Translation of Kröber (1940) description using current terminology:
Length almost 6 mm. Antenna almost 1 mm; wing length 3 mm, width 1mm. Like an *Occemyia* [*Thecophora*] in appearance. Similar to *H. minutus*. Head exactly the same, only the antennae are more slender. Haustellum blackish brown. Frons mainly black, only above the antennae reddish yellow, wrinkled. Ocelli distinct. At the eye-margin below [parafacial] somewhat silver-shining. Thorax shiny black, between the postpronotal lobes somewhat silver-shining, one silver spot on the pleura. Legs and fore coxae yellow-brown; hind leg and all tarsi somewhat darker, brown. Squamae and halteres pale yellow. Wings grey hyaline, strongly iridescent. Cell r_{4+5} more rounded, the petiole shorter than the cell. Abdomen shiny black. Setae rather dense, black. In the paratype there is also a vein appendage from the discal cell, parallel to the vein R_{4+5}.

Measurements. Total length = 6 mm; wing length = 3 mm.

Distribution. Tasmania.

Comments. This species, like *H. minutus*, has three ocelli. The most obvious differences between the two species lie in size, shape of antenna and venation.

4.5.11 *Microconops* Kröber

Introduction
The seven *Microconops* species described by Kröber (1915a, 1919a, 1940) share, among other characteristics, two ocelli, a smooth sloping frons and moderately long and strong mesonotal setae. Two species described by Camras (1961) have three ocelli, a more horizontal tuberculate frons and very short mesonotal setae. A complete revision of *Microconops sensu lato* is not presented here due to time restraints and descriptions of all new species of *Microconops* will be presented later. However, preliminary studies indicate that the Kröber species are not congeneric with those possessing three ocelli. A new genus, *Camrasiconops* is characterised above for such species. Kröber (1940) provided a key to the seven described species. The account of *Microconops* presented here is limited to a full redescription of the genus, the type species (*M. ornatus*), and *M. nigrithorax* together with a translation of Kröber's descriptions of each of the other species. A lectotype is designated for *M. fasciatus*.

Genus MICROCONOPS Kröber (Fig. 176)

MICROCONOPS Kröber 1915a: 77. Type species: *Microconops ornatus* Kröber; designation Smith, 1989.

Diagnosis
Vertex usually not extending to eye margin; two ocelli; frons bare, smooth, velvety in appearance, without transverse grooves or anterior region tuberculate; stylus three-segmented, short conical, segment 3 projecting

laterally; parafacial about same width as facial ridge, strongly projecting at right angles to inner margin of eye; facial ridge short, grooved; antennal foveae deep throughout length; postgena swollen; palpus present; haustellum 1.25–2x head length. Thorax and abdomen blackish, moderately long setose; 1 strong prepst bristle. Female with posterior margin of T6 and anterior margin of T7 straight; genital plate large, entirely setose anteriorly. Male S8 large, shiny; S5 with spicules.

Redescription

Head. Occiput blackish brown dorsally; pale yellow ventrally; median occipital sclerite distinctly demarcated from surrounding occiput by a ridge on each side. Vertex usually not extending to eye margin; median occipital sclerite and frons narrowly confluent laterally; vertex distinctly higher than frons, about one-third frons length, emarginate medially; setae of vertex black, moderately dense and strong. Ocellar tubercle distinctly raised above plane of vertex, brownish black with two large ovoid ocelli. Frons bare, smooth, velvety in appearance, without transverse grooves; slightly wider than long; differentiated fronto-orbital setae absent. Fronto-orbital region not demarcated from mesofrons. Eye 0.85x head height. Antenna about as long as head height. Scape with ventrolateral and dorsal apical minute setae. Pedicel base narrow, short, bare, separated from long, minutely setose distal section by transverse dorsal keel. First flagellomere longer than pedicle; base convex ventrally, narrow distally. Stylus three-segmented; segment 1 disc-shaped; segment 2 projecting medially; segment 3 broad basally, projecting laterally, abruptly tapered to narrow point distally; about 0.2x length of first flagellomere. Entire face and cheek yellow. Face bare or minutely setose. Parafacial silvery yellow pruinose, about same width as facial ridge, strongly projecting at right angles to inner margin of eye. Facial ridge short, grooved. Antennal foveae deep throughout entire length, silvery yellow pruinose on lower half. Facial carina poorly developed except adjacent to frontoclypeal tubercle. Frontoclypeal tubercle large, prominent but barely, if at all, projecting beyond margin of antennal foveae in lateral view. Postgena swollen, projecting anteriorly under eye. Clypeus bare. Palpus present. Haustellum 1.25–2x head length.

Thorax. Predominantly black to blackish brown with silvery or yellow pruinose markings and moderately long and strong dorsal setae; mesoscutal bristles present: 2 npl, 2 pal, 1 ipal; 1 or 2 pairs of long, convergent apical sctl. One strong prepst bristle and 1 to several kepst bristles present. Anepisternal and anepimeral bristles absent. Fore femur bare on pruinose posterior surface; mid femur with defined row of longer setae on posterodorsal margin. Fore and mid tibiae with apical, oval pruinose patch on posterior surfaces. Dense microsetae on anteroventral surface of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing completely hyaline. Sc ending mid length of wing. R_1 ending far beyond apex of Sc; extending along costa to end a little before R_{2+3}. Vena spuria conspicuous. Cell r_{4+5} long, acute apically.

Abdomen. Predominantly black to blackish brown; strongly setose; slender, narrowest in region of T2–3; if pruinose bands present, not especially dense. T1 rounded, lobe-like laterally, especially in male, with numerous long lateral bristles. T2 and T3 similar length, longer than other tergites. S2–4 narrow in male, broader in female. S1–4 with long setae.

Female. T6 similar length to T2 and T3; without posteromedial projection. T7 about same length as T6; anterior margin straight. T8 setose. Female genital plate large, broadly rounded apically, setose anteriorly, with long, fine marginal setae and very long setae across base adjacent to basal spicules; cuticle of apex (Fig. 176) sculptured with slits and pits. Female genital plate and S6 with numerous clearly defined rows of closely arranged spicules. Spicules with relatively large pedestal; base of each spicule with slight median notch.

Male. T5 about same length as T4 or slightly shorter. Protandrium short dorsally, rounded, as high as T5. S8 shiny; clearly differentiated from anterior part of protandrium by groove, although convex in continuous plane; relatively long, at least 0.75x length of T1. Epandrium setose posteriorly. S5 with posterior long setae and posteromedial patch of black spicules.

Measurements. Total length = 3.7–8 mm; wing length = 2.4–6 mm.

Microconops atricornis Kröber

Microconops atricornis Kröber 1919a: 143

Type material. Holotype (examined). ♂, Queensland: **L1**: Herberton Dodd. I.1911 3700 Ft; **L2**: Holotypus **L3**: Type; **L4**: Microconops atricornis Kröb. ♂ det. O. Kröber 1918.; **L5**: coll. Lichtwardt (DEI).

Diagnosis

Translation of Kröber (1919a) description using current terminology:

Antennae rather robust, entirely black. Scape about twice as long as wide, with short but thick black setae. Pedicel slightly longer than scape, black setose. First flagellomere about 1.5x length of pedicel, strongly and evenly tapered. First flagellomere with distinctly two-segmented stylus, the first segment of which is wider than long and appears to be very swollen. Apical segment robust, conical and thick [stylus only apparently two-segmented because segment 1 almost entirely retracted into the apex of first flagellomere of holotype]. Head reddish yellow, without setae, rather dull. Face paler. Ocellar tubercle and occiput black, with sparse fine black setae. Haustellum about 2x head length, black. Mesoscutum black, somewhat shining, with the beginning of two greyish white stripes and postpronotal lobes similarly coloured. Pleura with dull greyish white patches. Coxae dull greyish white pruinose. Legs black, base of tibiae yellowish brown. Scutellum black, semicircular, greyish pruinose, dull. Halteres reddish yellow with big capitellum. Setae of mesonotum erect, very fine, black. Abdomen slender, club-shaped, very similar to that of *Occemyia* [= *Thecophora*]. Badly preserved. Tergites laterally with greyish pruinose bands. Protandrium dull yellowish grey pruinose. Wings hyaline, somewhat greyish tinged, with strong black veins. Length 5.5 mm.

Additional descriptive notes. Ratio of antennal segments lengths: 1:2:2.1. Haustellum 1.7x head length. Wing with petiole, dm-cu and A_1+CuA_2 of equal length. Ratio of length of T1–4: male = 1:1.8:2.25:2.25; female = 1:1.2:1.4:0.9. Male S8 0.6x length of epandrium.

Distribution. Northern Queensland.

Measurements. Total length = 5.5 mm; wing length = 3.3 mm.

Comments. The holotype is difficult to study because it is covered in pale brown material, possibly a mould. This obscures several features including some chaetotaxy, genitalia and the extent of pruinose markings.

Microconops brunnicornis Kröber

Microconops brunnicornis Kröber 1940: 78

Type material. Holotype (examined). ♀, Western Australia: **L1**: Type; **L2**: Microconops brunnicornis, Kröb. examined & det. O. Kröber, 1938.; **L3**: Microconops brunnicornis Krb ♀ [hand written pencil]; **L4**: Kalamunda, S.W. Australia. 14 Mch.14 Apl. 1914. R.E. Turner. 1914-349.; **L5**: TYPE (NHM).

Additional material: **New South Wales**: 2♂, 1♀, Sydney, Bridwell Collection (CC, USNM).

Diagnosis

Translation of Kröber (1940) description using current terminology:

Face, antennal foveae and facial carina bright yellow, shiny white pruinose around eye margin. Frons reddish yellow; vertex yellow. Ocellar tubercle shiny black with two ocelli. Haustellum short, hardly 1.5x head length, black. Antennae bright brown; scape only a little longer than wide. Pedicel twice as long as scape; first flagellomere about twice as long as pedicle, rather broad. Stylus appears two-segmented to me, unclear, the apical segment small. Occiput black above, white below, setae black. Thorax shiny black, postpronotal lobe

with small silver stripe medially and posteriorly. Pleura black with a broad silver band. Haltere and squama yellow. Wing hyaline, Veins as for *Conops*. Legs dark brown, base of tibiae and metatarsi yellowish brown. Coxae blackish brown, somewhat silvery. Abdomen black with brownish tone, slightly shiny, T5 and 6 [protandrium] completely shiny; T2 and 3 with silver bands. Female genital plate large, pointed, yellowish brown, apex black.

Measurements. Total length = 4 mm; wing length = 3 mm.

Distribution. ?New South Wales, Western Australia.

Microconops fasciatus Kröber (Fig. 176)

Microconops fasciatus Kröber 1915a: 79

Type material. Lectotype (examined, here designated). ♂, **L1**: Co-Type; **L2**: Palmerston N. Austral. XI. CoType No. 24254 U.S.N.M.; **L3**: Microconops fasciatus ♂ Krb O. Kröber det 1914. (DEI). A lectotype is designated to ensure stability of nomenclature because two other species, *M. ornatus* and *M.atricornis* are described from the same area. Paralectotypes. **Northern Territory**: 2♂, 3♀, Palmerston, IX–XII (DEI); 1♂, 1♀, (in coitus): **L1**: Co-Type; **L2**: Palmerston N. Austral. XI. CoType No. 24254 U.S.N.M.; **L3**: Microconops ♂ ♀ fasciatus Krb O. Kröber 1914. (USNM).

Diagnosis

Translation of Kröber (1915a) description using current terminology:

Male. Entirely black, silvery pruinose. Very like the former species [*M. ornatus*]. Head (Kröber 1919c, Fig. 8) whitish yellow, becoming brownish yellow, dull behind the vertex. Postgena shiny silver-white. Haustellum black, at least 1.5x head length. Vertex reddish brown to black, also with a small tubercle. Occiput shiny black above, pure white below, finely white setose. Antenna black, first flagellomere dull reddish brown, pale yellow ventrally. Scape twice as long as wide; pedicel twice as long as the scape, widened funnel-shaped. First flagellomere, measured along the upper margin about 1.25x pedicel length, 1.5x measured along lower margin. First flagellomere peculiarly swollen. Dorsum with two swellings, ventral surface strongly swollen basally then uniformly tapered. Stylus robust, short three-segmented, ending in a quite short stiff bristle; lateral expansion big, plump. Thorax as in *M. ornatus*, but all pruinose areas silvery white. Legs slender, black; apices of femora and tibial bases bright yellowish brown. Tarsi shiny brown, silky [short and close] setose. Pulvilli and claws yellowish brown, claw apices black. Haltere pale yellow. Squamae whitish. Abdomen slender, black, entirely dull, whitish pruinose on the hind margin of segment 1. Hind margin of T2–4 with dense silvery white sharply defined band which is narrowed dorsally and actually broken on T4. Fifth segment entirely black, except greyish pruinose laterally. T6 [protandrium] appears dull whitish-grey pruinose but on close examination shines black or whitish-grey. Genitalia shiny black. Bristles moderately strong, black. Wings entirely hyaline, iridescent, with fine black veins. Length 4 mm. One male has stripes on the mesoscutum, the spot anterior of the scutellum and the pruinose areas of the protandrium pale yellow. Length 4.5 mm.

Female. One pair in copula. The female looks like the male. The abdomen appears somewhat less slender, the silver bands are narrower. T4 pruinose only laterally. T5 without pruinose areas. T7 shiny blackish brown. Female genital plate large, blackish brown, yellowish brown ventrobasally, with black spicules apically. Length 4.5 mm.

Additional descriptive notes. Female genital plate with 10 rows of spicules; apex Fig. 176. Spicules similar to those of *M. ornatus*; pedestals without microsetae. S6 with 11 defined rows of closely arranged spicules.

Measurements. Total length = 5.4 mm (3.7–5.6 mm); wing length = 3.3 mm (2.3–3.6 mm).

Distribution. Western Australia, Northern Territory.

Microconops nigrithorax Kröber

Microconops nigrithorax Kröber 1940: 77

Type material. Holotype. ♂, Western Australia: **L1**: Holo-Type; **L2**: Microconops nigrithorax, Krb. examined & det. O. Kröber, 1938.; **L3**: Microconops nigrithorax Krb ♂ [hand written pencil]; **L4**: Sep.14–Oct.31,1913. R. E. Turner. 1914-27.; **L5**: Yallingup, Nr Cape Naturaliste, S.W. Australia.; **L6**: TYPE (NHM). Paratypes. **Western Australia**: 1♀, **L1**: ALLO-Type; **L2**: Microconops nigrithorax, Kröb. examined & det. O. Kröber, 1938.; **L3**: Microconops nigrithorax Krb ♀ [hand written pencil]; **L4**: Sep.14–Oct.31, 1913. R.E. Turner. 1914-27.; **L5**: Yallingup, Nr Cape Naturaliste, S.W. Australia.; **L6**: TYPE; 4♂, 1♀, 1? [end of abdomen removed], same data as holotype (NHM).

Diagnosis

Mainly black with silvery pruinose markings and bands. Frons dark brown anteromedially, otherwise reddish yellow. Antenna black; scape about 3x as long as wide; segment 1 of stylus almost as long as wide.

Redescription

Head. Occipital setae sparse, short ventrally; moderately dense, long dorsally; stronger dorsally; setae longer, denser on median occipital sclerite than on surrounding occiput. Median occipital sclerite black. Vertex mainly dark brown, black behind ocellar tubercle; setae moderately long, distributed posterior of ocellar tubercle and across posterior margin. Frons dark brown anteromedially, otherwise reddish yellow. Lunule black, length about equal to diameter of base of antenna. Antenna black; ratio of segment lengths: 1:1.5:2 (female 1:1.5:2.25); scape about 3x as long as wide. Stylus 0.2–0.25 length of first flagellomere; segment 1 almost as long as wide. Face and cheek minutely setose. Parafacial about same width as facial ridge. Postgena with short, fine, whitish setae. Palpus less than half diameter of base of haustellum. Haustellum 1.6x head length (female x1.4).

Thorax. Mainly black. Postpronotal lobe silver pruinose posteriorly; setae dense, moderately long. Mesoscutum silver pruinose medial and posterior of postpronotal lobe; setae moderately long. Scutellum with long, strong, erect setae over entire surface and 1 or 2 pairs of marginal bristles longer and stronger than other setae. Postnotum with mediotergite finely white pruinose; laterotergite densely white pruinose. Propleuron white pruinose; anepisternum and katepisternum white pruinose posteriorly in continuous band. Katepisternum with 3 or 4 bristles. Femora brownish black except extreme apices yellow; white pruinose dorsally and posteriorly. Tibiae with basal half yellow; distal half dark brown, silver pruinose. Tarsi dark brown; white pruinose. Wing with petiole length 0.3–0.5x length of dm-cu. CuA_2+A_1 slightly longer than dm-cu. Haltere yellow, base dark brown.

Abdomen. Mainly black. Slender, especially in male; male narrowest at junction of T2–3; female gradually widening from T2 posteriorly; pruinose bands weak dorsally, silvery. T1 faintly silvery pruinose posteriorly. T2–3 with silvery pruinose posterior band much broader laterally than dorsally, especially in male; lateral bristles not much shorter than those of T1. T2 about 2x length of T1 in male; 1.7x T1 in female. T3 slightly longer than T2 in male; about same length as T2 in female. T4 with silvery pruinose posterior band denser laterally than dorsally in male; pruinose only laterally in female; same length as T2 in male; 0.7x T2 in female. S1–4 with long setae.

Female. T6 not pruinose; slightly longer than T2 or T3; entirely setose. T7 shiny, entirely setose. T8 long setose. Female genital plate with about 8 complete rows of closely arranged spicules apically and about 8 incomplete irregular basal rows. S6 with at least 15 rows of closely arranged spicules.

Male. T5 black, silvery pruinose laterally, entirely short setose, slightly shorter than T4. Protandrium black, with large whitish pruinose posterodorsal patch. Protandrium entirely setose. S8 about same width as epandrium; about 0.75 length of T1. Epandrium wider than long. S5 black, silvery pruinose.

Measurements. Total length = 9.1 mm (7.6 mm); wing length = 5.5 mm (5.2 mm).

Distribution. South-western Western Australia.

Microconops ornatus Kröber (Figs 177, 189, 198, 199)

Microconops ornatus Kröber 1915a: 78

Type material. Holotype. ♂, Queensland: **L1**: Cairns N.O. Aust.; **L2**: coll. Lichtwardt; **L3**: Holotypus; **L4**: ~~Type~~; **L5**: Microconops ornatus, Kröb. ♂ O. Kröber—det. 1914. (DEI). Paratypes. **Queensland**: 1♂, Redlynch (NHM).

Diagnosis

Haustellum 1.3x head length. Thorax with conspicuous yellow pruinose patches and bands; femora yellow pruinose on posterior surface, especially fore femur. Abdomen with broad yellow bands on all tergites; protandrium almost entirely yellow

Redescription

Head (Fig.198). Occiput with narrow silvery pruinose band around eye margin; setae sparse, short, moderately fine, longer, denser on median occipital sclerite than on surrounding occiput. Median occipital sclerite blackish brown, finely yellow pruinose, distinctly demarcated from surrounding occiput by a ridge on each side. Vertex yellowish brown; with a few short setae posterior of ocellar tubercle. Frons mustard brown posteriorly, otherwise yellow. Lunule dark brown, narrow, length shorter than diameter of base of antenna. Antenna mainly blackish brown; medial distal surface of pedicle and most of first flagellomere ventrally reddish brown; ratio of segment lengths: 1:1.6:2.3. Stylus (Fig. 199) about 0.1 length of first flagellomere. Face bare; parafacial not much wider than facial ridge. Cheek and postgena bare. Maxillary palps about half diameter of base of haustellum. Haustellum 1.3x head length.

Thorax. Postpronotal lobe black, golden pruinose except anteriorly; with 1 long and several moderately short setae. Mesoscutum black; golden pruinose medial and posterior of postpronotal lobe, in a band along dorsocentral line anterior of transverse suture, and anterior of scutellum. Mesonotum with short, strong setae over entire surface. Scutellum with 1 pair of long, convergent apical bristles. Mediotergite finely white pruinose; laterotergites golden pruinose. Propleuron white pruinose; anepisternum pale yellow pruinose posteriorly; katepisternum white pruinose in continuous band with band on anepisternum. One kepst bristle. Femora brownish black except apices yellow; white pruinose dorsally and posteriorly. Tibiae with basal half yellow; distal half dark brown; finely golden pruinose; apical patch shines golden at some angles. Tarsi brown; finely yellow pruinose. Petiole of wing (Fig. 189) 1.2x length of dm-cu. CuA_2+A_1 same length as dm-cu. Haltere yellowish brown, base brown.

Abdomen. Mainly brownish black. Male constricted at T1–2, T2 parallel sided, widening from T3 posteriorly; female not noticeably constricted at T1–2. T1 pale yellow pruinose posteriorly. T2–3 with yellow pruinose posterior band much broader laterally than dorsally, especially in male. T2 without long lateral bristles; 1.8x length of T1 in male; 1.5x T1 in female. T3 slightly longer than T2. T4 with yellow pruinose posterior band narrow mid-dorsally, not reaching lateral margin in male; yellow pruinose only laterally in female.

Female. T5 moderately long. T6 extensively pale yellow pruinose. T7 shiny, not pruinose. T8 shiny, setose. Female genital plate dark brown, with 10 complete rows of closely arranged spicules. S6 with at least 13 rows of closely arranged spicules. Spicules (Fig. 177) relatively narrow, long; ridges fine; pedestals with 1 short microseta.

Male. T5 brownish black, broadly yellow pruinose dorsally, about same length as T4. Protandrium brownish black, setose, almost entirely yellow pruinose. S8 shiny blackish brown; as long as T1, slightly narrower than epandrium. Epandrium flattened posterolaterally; longer than wide. S5 brownish black.

Measurements. Total length = 8.5 mm; wing length = 4.9 mm.

Distribution. Northern Queensland.

Microconops similis Kröber

Microconops similis Kröber 1940: 79

Type material. Holotype. ♂, Western Australia: **L1**: Type; **L2**: Microconops similis, Krb. examined & det. O. Kröber, 1938.; **L3**: Microconops similis Krb ♂ [hand written pencil]; **L4**: Sep.14–Oct.31, 1913. R.E. Turner. 1914-27.; **L5**: Yallingup, Nr Cape Naturaliste, S.W. Australia.; **L6**: TYPE (NHM).

Diagnosis

Translation of Kröber (1940) description using current terminology:

Head entirely reddish yellow, lower eye margin shiny silver. Ocellar tubercle blackish brown with two reddish yellow ocelli. Haustellum 1.5x head length, black. Antenna black, first flagellomere brown, at least ventrally shiny brown. Stylus three-segmented. Occiput black above, yellow below. Thorax black, shiny. Postpronotal lobes shiny yellowish, likewise a stripe medially. Laterotergite whitish shining. Pleura with indistinct whitish stripe. Coxae brownish black, shiny white. Legs blackish brown, bases of tarsi yellowish brown. Haltere and squama yellow. Wing hyaline, veins as for *Conops*. Abdomen black, rather slender. Setae long, fine black. Only T6 [protandrium] and 7 [epandrium] are shiny; T2 and 3 with silver bands on posterior margin; T6 ± yellow shimmer.

Measurements. Total length = 5.1 mm; wing length = 4 mm.

Distribution. South-western Western Australia.

Microconops tasmaniensis Kröber (Figs 178, 179)

Microconops tasmaniensis Kröber 1940: 79

Type material. Holotype. ♂, Tasmania: **L1**: Type; **L2**: Microconops tasmaniensis, Krb. examined & det. O. Kröber, 1938.; **L3**: Microconops tasmaniensis Krb ♂ [hand written pencil]; **L4**: Bagdad TASMANIA: Purch. from G. H. White. B.M.1917-104.; **L5**: TYPE (NHM).

Diagnosis

Translation of Kröber (1940) description using current terminology:

Head entirely dark reddish yellow. Eye margin with silver shine. Ocellar tubercle blackish brown with two reddish yellow ocelli. Haustellum 1.5x head length. Antenna black, stylus three-segmented, considerably more slender than that of *M. similis*. Occiput black above, yellow below. Thorax black. The beginnings of two fine yellowish stripes medial of postpronotal lobes. greyish yellow patch anterior of scutellum, likewise the laterotergites. Pleura with bright silvery stripe. Coxae silvery shining. Legs black. Basal half of tibiae yellowish brown. Haltere and squama yellowish. Wing transparent as glass, strongly iridescent. Abdomen black, dull. Setae long, fine black. T2–4 with silver bands on posterior margins, especially laterally; T6 [protandrium] yellowish pruinose.

Additional descriptive notes. The clearly defined rows of spicules on the female genital plate are shown in Fig. 178. Fig. 179 shows the ridges and the slight basomedial notch of individual spicules.

Measurements. Total length = 5.0 mm; wing length = 3.5 mm.

Distribution. Tasmania.

4.5.12 *Neoconops* Kröber

Introduction

Kröber (1915a) characterised *Neoconops* for one species, *N. longicornis*. In 1940 he described a second species, *N. robustus* but this species has many character states that do not agree with the type species: frons finely rugose, ocelli absent, palps absent, and abdominal segments much broader than long. The latter species does not belong in *Neoconops* and is transferred to *Setosiconops* gen. nov. described below. Two new species of *Neoconops* are recognised.

Genus NEOCONOPS Kröber

NEOCONOPS Kröber 1915a: 75. Type species: *Neoconops longicornis* Kröber, by monotypy.

Diagnosis

Ocellar tubercle with three ocelli; frons grooved, median length less than half width; first flagellomere of antenna at least twice length of scape and pedicel together; stylus two-segmented, segment 2 elongate, narrow, pointed; palpus represented by small setose swelling; haustellum more than 2x length of head. Dorsum of thorax densely setose. Abdomen narrow, parallel-sided, segments longer than wide; female genital plate narrow, pointed; female T6 without median posterior projection.

Redescription

Head. Occiput blackish brown dorsally, pale yellow ventrally. Setae of occiput moderately dense, fine; pale yellow, very short ventrally; black, longer dorsally. Median occipital sclerite black, dorsolaterally separated from posterolateral margin of frons by lateral extremity of vertex. Vertex dark brown to blackish, smooth, narrow, demarcated from frons by a ridge but not raised above plane of frons; setae blackish brown, moderately dense, long and strong, across posterior half and over ocellar tubercle. Ocellar tubercle smooth, black; setae not differentiated from other setae of vertex. Three large ocelli present, median round, lateral ovoid. Frons with six transverse ridges, each turning forwards laterally; median length short, width at least 2.5x length. Fronto-orbital region forming a rounded ridge; raised above plane of mesofrons and eye margin; with row of fine, short, brown setae. Mesofrons bare or almost bare; setae fine, brown, moderately short. Lunule blackish brown, triangular. Eye elongate oval. Antenna slightly shorter than head height; first flagellomere at least 2x length of scape and pedicel together; scape with short strong setae laterally and along anterior margin; pedicel base narrow, shiny, smooth; distal part much expanded, with minute setae; first flagellomere with distal half slightly bent laterally. Stylus two-segmented; segment 1 very short, only slightly expanded ventrally; segment 2 narrow, pointed. Face with minute, sparse setae. Parafacial yellow, silvery pruinose, at about 100°–110° angle to inner margin of eye. Facial ridge yellow, long, flat, broad medially, narrow at upper and lower limits. Antennal fovea deep; shiny yellow to transparent. Facial carina yellow, poorly developed dorsally, strong ventrally. Frontoclypeal tubercle yellow. Cheek pale yellow, concave; setae sparse, very fine, pale yellow. Postgena pale yellow, finely white pruinose; not especially swollen; setae short, very fine, yellowish. Clypeus usually with short setae on median ridge. Palpus represented by a small setose swelling. Haustellum blackish brown, long, 2–3x length of head.

Thorax. Postpronotal lobe blackish brown, posterior half densely white pruinose; with numerous moderately long and strong black setae. Mesonotum mainly black, postalar callus blackish brown; densely white pubescent medial and posterior of postpronotal lobe to transverse suture; moderately long, strong and dense setae over entire surface; bristles present: 2 npl, 2 ial, 2 pal, 1 ipal, 1 dorsocentral. Scutellum with 1 pair of strong convergent, dorsally directed bristles. Postnotum black, white pruinose, laterotergite more densely. Pleura blackish brown; white pruinose, more densely on propleuron, anepisternum, katepisternum and metepisternum; with 1 prepst and at least 3 dorsal kepst bristles. Mid femur with defined row of long setae on

posterodorsal margin. Tibiae without apical, oval pruinose patch; preapical dorsal tibial bristles absent. Anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus with dense microsetae. Wing completely hyaline; Sc ending mid wing length; R_1 ending well before R_{2+3}; vena spuria weak, no more than a fold; cell r_{4+5} long, acute apically. Haltere pale yellow, base brown.

Abdomen. More or less parallel sided; segments longer than wide; brownish black; T1–4 with narrow, finely white pruinose band across posterior margin. T1 with numerous long bristles laterally. S1–4 well developed; S2 with pair long anterior setae and pair shorter posterior setae.

Female. T6 short, less than one-third length of T3–5 together; without median posterior projection. T7 distinctly longer than T6. Female genital plate long, narrow, apex pointed; spicules not in defined rows, dense only at apex; setae long, fine on posterior surfaces, minute on anterior surface. S6 with long, fine setae and spicules very short, closely arranged, but not in defined rows.

Male. T5 slightly shorter than T4. Protandrium evenly rounded, shorter than T5. S5 without spicules.

Measurements. Total length = 5.0–8.2 mm; wing length = 3.3–5.1 mm.

Key to Australian species of *Neoconops*

1. Clypeus bare; r-m crossvein well before mid length of discal cell; pedicel of antenna with distinct dorsobasal ridge . ..... ***glaber*** sp. nov.
-. Clypeus setose; r-m crossvein at about mid length of discal cell (Fig. 190); pedicel of antenna without distinct dorsobasal ridge (Fig. 202) ..... 2.
2. Femora mainly yellow; antennal pedicel about twice length of scape; stylus length about 0.2x first flagellomere length (Fig. 202)..... ***longicornis*** Kröber
-. Femora mainly blackish brown; antennal pedicel and scape about equal length; stylus minute (Fig. 200), length about 0.1x first flagellomere length ..... ***brevistylus*** sp. nov.

***Neoconops brevistylus*, sp. nov. (Figs 200, 217)**

Type material. Holotype. ♀, Queensland: Carnarvon Nat. Pk, Mt Moffatt Section, 2 km N West Branch Campground, 24°52’18”S 148°00’50”E, 820 m, 24.xi.1995, M. E. Irwin (QM). Paratypes. **Queensland**: 1♂, same data as holotype (UQIC); 1♀, Mt Moffatt Nat. Pk, Park Headquarters, 740 m, 25°01’S 147°47’E, 18.xi.1995, C. J. Burwell (QM); 1♀, Carnarvon Nat. Pk, Mt Moffatt Section, 25°03’49”S 148°01’57”E, 26.xi.1997, J. Skevington, C. Lambkin, Malaise trap (UQIC).

Diagnosis

Mesofrons short, median length about same as that of vertex, only slightly more than 0.25x width; scape and pedicel of antenna about equal length; first flagellomere 5x length of pedicel; stylus very short; clypeus setose. Femora mainly blackish brown; fore and mid femora paler brown ventrally; tibiae pale brown on basal half; distal half blackish brown.

Description

Head. Vertex blackish brown, narrow, equal to median length of frons; anterior ocellus situated at about equal to its diameter posterior of anterior margin of vertex. Frons mainly blackish brown, yellowish brown anteriorly; bare; width 3.75x median length. Fronto-orbital region mainly blackish brown, yellowish brown anteriorly, with row of fine, short, brown setae along length. Lunule triangular, greatest length less than diameter of base of antenna. Eye height 0.8x head height. Antenna mainly blackish brown; first flagellomere and base of pedicel paler brown; ratio of segment lengths: 1:1:5; pedicel base narrow, shiny, smooth, transverse dorsal ridge poorly developed; distal part much expanded, with minute setae. Stylus (Fig. 200) with segment 1 disc-shaped, very slightly expanded ventrally; segment 2 a short spike (tip broken in holotype); length of sty-

lus about 0.1x length of first flagellomere. Face with minute pale yellow setae. Facial ridge with one or two longitudinal grooves. Facial carina yellow. Cheek almost bare. Clypeus with short setae on median ridge. Palpal swelling minute, with 3 setae. Haustellum 2.2x head length.

Thorax. Postpronotal lobe blackish brown, posterior half densely white pruinose. Mesonotum mainly black, postalar callus blackish brown; densely white pubescent medial and posterior of postpronotal lobe to transverse suture. Postnotum black, white pruinose, laterotergite more densely. Pleura blackish brown; white pruinose, more densely on propleuron, anepisternum, katepisternum and metepisternum; 5 kepst bristles present. Prosternum brown. Fore coxa yellowish brown and dark brown, mid and hind coxae mainly blackish brown, all white pruinose. Trochanters brown. Femora mainly blackish brown; fore and mid femora paler brown ventrally; white pruinose. Tibiae pale brown on basal half; distal half blackish brown; white pruinose. Tarsi blackish brown; microsetae golden brown. Wing with petiole about same length as dm-cu; r-m crossvein at about mid length of discal cell; CuA_2+A_1 equal to length of petiole.

Abdomen. Brownish black, T1–4 with narrow white pruinose band across posterior margin; with moderately long black setae on all tergites. T1 about equal width as T2. T2 2.5x length of T1 and slightly shorter than T3. T4 about same length as T2.

Female. T5 brownish black; posterior margin pale brown. T6 short, less than 0.25x length of segments 3–5 together. T7 shiny blackish brown. T7 long, 2x length of T6. T8 shiny dark brown. Female genital plate blackish brown.

Male. Unknown.

Measurements. Total length = 5.0 mm (6.0 mm); wing length = 3.3 mm (3.6 mm).

Distribution. Southern central Queensland (Fig. 217).

Etymology. The specific name is formed from the Latin adjective *brevis* (= short) the Greek noun *stylos* (= pillar, column) and refers to the short antennal stylus.

Neoconops glaber, sp. nov. (Figs 201, 218)

Type material. Holotype. ♀, Queensland: Carnarvon Nat. Pk, Mt Moffatt Section, 3 km SE Ranger Station, 25°04’39”S 148°00’30”E, 18.xi.1995, 740m, D. K. Yeates (QM).

Diagnosis

Anterior ocellus situated at about twice its diameter posterior of anterior margin of vertex; mesofrons with some moderately long setae posterolaterally; pedicel of antenna twice length of scape, transverse dorsobasal ridge present; clypeus bare. Base and apex of all femora and ventroapical one-third of fore and mid femora yellowish brown; tibiae yellowish brown on basal half; distal half blackish brown; r-m crossvein distinctly before mid length of discal cell.

Description

Similar to *N. brevistylus*; character states not mentioned are as for that species.

Head. Vertex dark brown, about 0.8x median length of frons; anterior ocellus about twice its diameter posterior of anterior margin of vertex. Frons mainly yellowish brown, brown posteriorly; width 2.75x length. Fronto-orbital region mainly yellowish brown, brown posteriorly; with row of fine, short, brown setae, longer posteriorly. Mesofrons with some moderately long setae, mainly posterolaterally. Lunule greatest length about equal to the diameter of base of antenna. Eye height 0.7x head height. Antenna entirely blackish brown; ratio of segment lengths: 1:2:6.2. Pedicel base narrow, shiny, smooth, transverse dorsal ridge present; distal part much expanded, with minute setae. Stylus (Fig. 201) with segment 1 expanded ventrally; segment 2 with terminal bristle-like process; about 0.2 of first flagellomere. Grooves on facial ridge weak. Facial carina dark yellow. Cheek with a few setae around epistoma. Clypeus bare. Palpal swelling black, with 4 setae.

Thorax. Three kepst bristles present. Femora mainly blackish brown; base and apex of all and ventroapical one-third of fore and mid femora yellowish brown; white pruinose. Tibiae yellowish brown on basal half; distal half blackish brown; finely white pruinose. Wing with petiole 0.75x length of dm-cu; r-m crossvein distinctly before mid length of discal cell. CuA_2+A_1 1.3x length of petiole.

Abdomen. With short black setae on all tergites; setae moderately long across posterior margins. T2 about 2x length of T1 and slightly shorter than T3. T4 slightly shorter than T2.

Female. T5 brownish black; posterior margin not pale brown T7 shiny brownish black; long, 1.7x longer than T6. T8 shiny blackish brown.

Male. Unknown.

Measurements. Total length = 6.4 mm; wing length = 4.4 mm.

Distribution. Southern central Queensland (Fig. 218).

Etymology. The specific name is the Latin adjective glaber (= hairless, bald, smooth) and refers to the lack of setae on the clypeus.

Neoconops longicornis Kröber (Figs 190, 202, 219)

Neoconops longicornis Kröber 1915a: 75

Type material. Holotype. ♂, **Queensland**: **L1**: Herberton, i.1911, Dodd, 3,700 ft; **L2**: coll. Lichtwardt; **L3**: Holotypus; **L4**: Neoconops longicornis Kröb ♂ O. Kröber det. 1914 (DEI).

Additional material. **Queensland**: 1♂, 1♀, Carnarvon Nat. Pk, Mt Moffatt Section, 3 km SE Ranger Station, 25°04’39”S 148°00’30”E, 18–26.xi.1995, 740 m; 1♂, Great Sandy Nat. Pk, Cooloola Section, 26°02’19”S 153°02’48”E, 1–5.x.1996; 1♀, 3.5 km WSW Point Lookout, Nth Stradbroke, 27°26’S 153°30’E, 8.iii.1991, mv lamp; 1♂, 1♀, Brown Lake, Nth Stradbroke Is., 27°29’S 153°25’E, 15.iii.1986, 12.iii.1988 (all UQIC). **New South Wales**: 1♀, Halfway Ck, 18 mls [29 km] S Grafton, 27.xi.1970 (AM); 2♀, Warrumbungle Nat. Pk Woolshed, Wambelong Creek, 420 m, 23–26.xii.1992; 3♀, Warrumbungle Nat. Pk Woolshed, Buckleys Creek, 1.7 km N Camp Blackman, 480 m, 23–31.xii.1992 (all CC).

Diagnosis

Antenna mainly blackish brown; first flagellomere yellowish brown ventrally; pedicel of antenna 2x length of scape, without distinct dorsobasal ridge; clypeus setose. Femora mainly or entirely yellowish brown; tibiae mainly yellowish brown; distal third dark brown.

Redescription

Similar to *N. brevistylus*; character states not mentioned are as for that species.

Head (Fig. 202). Vertex narrow, 0.7x median length of frons. Frons blackish brown in more or less V-shaped area from posterior margin narrowing anteromedially, otherwise yellow to yellowish brown; width 2.5x length. Fronto-orbital region yellowish brown. Lunule greatest length little more than diameter of base of antenna. Antenna mainly blackish brown; first flagellomere yellowish brown ventrally; pedicel, except base, white pruinose; ratio of segment lengths: 1:2:6.6. Stylus with segment 1 short, very slightly expanded ventrally; segment 2 very narrow, finely tapered, about 0.2 of first flagellomere. Face with minute yellow or pale brown setae. Cheek with very short setae. Palpal swelling brown, with 5 setae. Haustellum 2.5x head length.

Thorax. Five kepst bristles present. Prosternum blackish brown, silver pruinose. Femora mainly yellowish brown, dorsal surfaces diffusely brown to variable extent distally, white pruinose. Tibiae mainly yellowish brown; distal third dark brown; white pruinose. Microsetae golden on fore tibia, golden brown on fore and hind tarsus and hind tibia. Wing (Fig. 190) with CuA_2+A_1 about equal to length of petiole.

Abdomen. T1 slightly wider than T2 in male, about equal width as T2 in female. T2 of male with lateral setae longer than dorsal setae; about 2x length of T1 and slightly shorter than T3. T4 slightly shorter than T2.

Female. T6 short, less than one-third length of T3–5 together. T7 long, about 1.5x longer than T6. T8 shiny dark brown or yellowish brown. Female genital plate mid to dark brown.

Male. T5 slightly shorter than T4. Protandrium finely white pruinose with dense setae; evenly rounded, shorter than T5. S8 brownish black, finely white pruinose; slightly narrower and shorter than epandrium and slightly more convex than distal part of protandrium. Epandrium brownish black, densely short setose. S5 dark brown; spicules absent; with median black spicule-like setae and long lateral setae.

Variation. Ratio of antennal segment lengths: 1:1.5:6. Palpal swelling occasionally blackish and apparently with fewer than 5 setae. Haustellum 2.3–3x head length. Three to 6 kepst bristles present. Femora entirely yellowish. Petiole and CuA_2+A_1 sometimes shorter than dm-cu.

Measurements. Total length = 6.0 mm (Kröber, 1915a) (6.1–8.2 mm); wing length = 4.0 mm (3.7–5.1 mm).

Distribution. Eastern and southern central Queensland; north-eastern New South Wales (Fig. 219).

Comments. The holotype is fragmented; the head is glued to the pin; most of the thorax (including wings and mid and hind legs), is glued to a card attached to the pin; the abdomen is missing. The holotype is a paler colour than more recently collected specimens and paler than original description indicates. This difference is almost certainly a result of fading with age. The specimens studied show some variation in overall size, length of the haustellum relative to head length, colour of legs, and relative lengths of some sections of the wing veins. However I do not consider the differences sufficient to distinguish more than one species.

4.5.13 *Physocephala* Schiner

Introduction

The Australian fauna of this genus is remarkable for its lack of diversity and speciation. Only three species are recognised from the previously named Australian *Physocephala* and no additional species are known. *Conops emarginata* Macquart, *C. sphegiformis* Walker, *C. macer* Bigot and *P. pallipes* Kröber are all considered junior synonyms of *P. nigrotestacea* Macquart. *P. aureopygia* Kröber is considered not to occur in Australia. The described species are difficult to differentiate and delimit because character states show considerable intraspecific variation.

Genus PHYSOCEPHALA Schiner (Figs 220–224)

PHYSOCEPHALA Schiner 1861: 137. Type species: *Conops rufipes* Fabricius, by original designation.

Diagnosis

Ocelli absent; first flagellomere of antenna short, markedly shorter than the pedicel; stylus short, two-segmented; palpus absent. Proepisternum bare; anepimeral bristles present; hind femur and tibia of irregular shape; cell r_{4+5} long; r-m crossvein at about the distal third of the discal cell. Abdomen elongate, petiolate; T1, T2 and T3 fused; T2 and T3 long and narrow; male segment 2 very long and narrow; female T6 with small posteromedial projection.

Redescription

Head. Vertex not demarcated from median occipital sclerite; smooth, cushion-like, raised above plane of frons, demarcated by a ridge; almost entirely bare, some setae extending on to posterior surface from median occipital sclerite. Ocelli absent. Frons smooth, without transverse grooves, bare; fronto-orbital region not demarcated from mesofrons. Lunule narrow, length no greater than diameter of base of antenna. Eye height about 0.8x head height. Antenna (Fig. 224) long; scape narrow, cylindrical, with ventrolateral and dorsal api-

cal minute setae; pedicel long, narrow, with short strong setae, especially dorsally; first flagellomere short, bulbous. Stylus two-segmented, short, usually about 0.2x length of first flagellomere; segment 1 projecting ventrally; segment 2 pointed. Face bare; antennal foveae shallow, narrow dorsally, deep and diverging ventrally; facial carina poorly developed dorsally, strong ventrally; frontoclypeal tubercle prominent; cheek slightly concave, bare. Palpus absent. Haustellum narrow, at least 2x head length.

Thorax. Postpronotal lobe with sparse, very short, strong, dark brown setae. Mesoscutum with short, strong setae over entire surface; several moderately short notopleural and postalar bristles present; marginal bristles of scutellum not developed or short. Proepisternum bare. Katepisternal bristles few, very short. Anepimeral bristles moderately short. Hind femur and tibia (Fig. 223) of irregular shape; tibia usually with transverse ridge at distal third. Mid femur without defined row of longer setae on posterodorsal margin. Fore and mid tibiae with one or two very short, strong preapical, dorsal bristles and usually with distinct apical, oval densely pruinose patch on posterior surface. Dense microsetae present on anteroventral surface of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing with Sc ending mid wing length; R_1 ending at 0.7x length of wing; distal end extending along costa for a short distance to end at apex of R_{2+3}; vena spuria present as distinct fold; cell r_{4+5} moderately short, petiolate. Capitellum of haltere with small patch of moderately short, close, dark brown setae.

Abdomen (Figs 220, 222). All tergites with short sparse setae; longer setae across posterior surface of female T5. T1–3 fused, margins usually indicated by narrow, finely pruinose bands. T1 markedly wider than T2 in both sexes, rounded, lobe-like laterally; with numerous long strong black lateral bristles. T2 long and narrow. T3 wider posteriorly than anteriorly, markedly so in male. S1–4 concealed by folding ventromedially of tergites. S4 markedly wider than S3.

Female. T6 with short, broadly rounded median posterior projection (Fig. 221). Female genital plate with one row of long, dorsally-directed setae immediately dorsad of most dorsal row of spicules; spicules on dorsal half in more defined, well-spaced rows than apically. Spicules with two or more ridges fusing to a median point; spicules with short pedestals; pedestals without microtrichia on side wall.

Male. Dorsal length of T6 shorter than T5. S8 much shorter than and about same width as epandrium. S5 without spicules; with scattered minute setae medially.

Measurements. Total length = 6.0–13.0 mm; wing length = 3.5–7.5 mm.

Key to Australian species of *Physocephala*

1 Wing, including all of discal cell, extensively brown; large species, 15–16 mm . . . . . ***aureopygia*** Kröber
-. Wing brown anteriorly only (Figs 230–232); discal cell never entirely brown; smaller species, length 6–13 mm . . 2.
2. Frons and face entirely yellow; wing not dark brown posterior of R4+5 (Fig. 230) . . . . . ***australiana*** Camras
-. Frons and antennal foveae partially dark brown; wing with some dark brown areas posterior of R4+5 (Figs 231, 232) . . . . . 3.
3. Antennal foveae usually with more than just small brown spot on each side of carina; all femora completely or partially dark brown; wing with dark brown patch posterior of petiole (Fig. 231) . . . . . ***minuta*** Kröber
-. Antennal foveae with only a small brown spot on each side of carina; hind femur dark brown on distal half, fore and mid femora yellowish brown; wing with dark brown of cell r2+3 not extending posterior of petiole (Fig. 232) . . . . . ***nigrotestacea*** (Macquart)

Physocephala aureopygia Kröber

Physocephala aureopygia Kröber 1915b: 123

Type material. Co-type (examined). ♂: **L1**: Cotype; **L2**: Sikkim; **L3**: CoType No. 24278 U.S.N.M.; **L4**: Physocephala aureopygia Krb Kröber det. 1914 (USNM).

Diagnosis

Head mainly deep yellow; occiput partially brown; posterior eye margin yellow pruinose. Thorax reddish brown, yellow pruinose on postpronotal lobe, notopleuron and postnotum; wing brown except laterally and posterior of CuA2. Abdomen yellow pruinose on T3 posteriorly and extensively on T4, T5 and protandrium.

Measurements. Total length = approx. 15 mm; wing length = 9.1 mm (the specimen is squashed flat making accurate measurement of total length impossible).

Distribution. India (Sikkim); ? Queensland (Kröber, 1915b).

Comments. This species is strikingly different from all other Australian species. It is included in the key given above even though I believe the species does not occur in Australia. Kröber (1915b) studied a specimen labelled 'Cap. York'; the specimen was almost certainly mislabelled.

Physocephala australiana Camras (Figs 220–222, 226, 227, 230, 285)

Physocephala australiana Camras 1961:74

Type material. Holotype (examined). ♂, **L1**: Type; **L2**: Yanchep. 32 mls. N. of Perth. 9–23.i.1936. **L3**: W. AUSTRALIA: R. E. Turner. B.M.1936-28; **L4**: HOLOTYPE ♂ Physocephala australiana CAMRAS (NHM). Paratype. **Western Australia**: 1♂, Dedari, 40 mls W. Coolgardie, 11–21.i.1936, R. E. Turner (CC).

Additional material. **Queensland**: 1♀, 23 km NW Mt Molloy, 16°20'S 145°06'E, 27.x.1988, on *Eucalyptus sp.*; 1♂, Mt Carbine, 16°32'S 145°08'E, 27.x.1988 (all MVMA); 1♀, 3 km W Mt Molloy, 22.v.1980 (ANIC); 2♂, 1♀, 22 km N Mareeba, 16°50'S 145°10'E, 27.x.1988, on *Grevillea striata* (MVMA); 1♂, 1?, 40 mls [64 km] W Rockhampton, 29.iii.1975 on *Eucalyptus* sp.; 1♀, 15 km S Theodore, 25°03'S 150°02'E, 4.xi.1991, 190 m, on *Eremophila mitchellii*; 1♀, 15 km W Biggenden, 26.x.1977, on *Eucalyptus teretecornis* (all UQIC); 1♀, Mt Walsh Nat. Pk Biggenden, 17.i.1977; 1♂, Durham Downs-Nokandra, 13.xi.1919; 1♂, 30 mls [48 km] SE Charleville, 20.x.1957 (all ANIC); 1♀, Mungallala, 3.xi.1971 on *Eucalyptus* flwrs; 1♂, Amby, 22–27.xi.1979; 2♂, 18 km S Miles, 28.xi.1979, on *Eucalyptus populenea*; 1♂, Murphy's Ck, 25.xi.1965; 1m, 6 km S Noccundra turnoff, 27°42'S 142°42'E, 17.ix.1990, on *Eucalyptus* sp.; 2♂, Glenmorgan, 22.x.1958; 2♂, Leyburn via Warwick, 4.x.1981, on *Melaleuca alternifolia*; 1♂, 25 km E Bollon, 17.xii.1976, on *Angophora floribunda* (all UQIC); 2♂, 1♀, McPherson Range, 12.xi.1949; 3♂, Nokandra-Grey Range, 14.xi.1949 (all ANIC). **New South Wales**: 3♂, Tibooburra, Cobham Lake, 17.xi.1949; 1♂, Cobham Lake, 18.xi.1949; 2♂, 1♀, nr Bourke, 20–29.x.1949 (all ANIC); 1♂, 21 km E Narrabri, 2.xii.1976, on *Eucalyptus populnea*; 1♂, 23 km E Narrabri, 2.xii.1976, on *Eucalyptus* (all UQIC); 1♀, Gnalta Stn. nr. Broken Hill, 9.xii.1964 (SAM); 1♂, 1♀, Fowler's Spelling Gap, 19.xi.1949 (ANIC); 1♂, 53 km W Cobar, 11.xii.1976, on *Atalaya hemiglauca* (UQIC); 5♂, 2♀, Wilcannia, Mt Boppy, 24.xi.1949 (ANIC); 1♀, Nyngan, 10.xii.1976, on *Eucalyptus melliodora* (UQIC); 1♀, Milson Is., 18.xii.1912 (ANIC); 1♀, 5 mls [8 km] W Euston, 10.xi.1964 (AM). **Victoria:** 1♂, 2 km E Hattah Vic., 21.xi.1975; 1♂, 9 mls [14.4 km] S Rainbow, 4.ii.1956 (all ANIC). **South Australia**: 1♂, New Kalamurina HS Warburton R, 10.iii.1972 (SAM); 1♂, 20 km NNE Roxby Downs, 30°32'S 136°48'E, 31.x.1990 on *Hakea*; 1♂, 12 km E Copley, 30°33'S 138°31'E, 27.x.1990, on *Eucalyptus*; 1♂, 95 km SW Moolawatana, 30°41'S 130°40'E, 28.x.1990, on *Eucalyptus* (all MVMA); 2♂, Lake Hart, 12.xi.1970 (SAM); 2♂, Kimba, 29.xi.1958 (ANIC); 1♂, Burra, iii.1940; 2♂, Sandy Ck, i.1940 (all SAM). **Western Australia**: 1♂, 186 km ESE Broome, 18°53'S 123°43'E, 10.viii.1976; 1♀, 1 km N Millstream, 21°35'S 117°04'E, 28.x.1970 (all UQIC); 1♂, 33 km SE Mt Bruce, 22°36'S 118°08'E, 16–18.v.1980 (WAM); 1♀, 17 km N Boologoora HS, N Carnarvon, 11.ix.1981, sand ridge-heath (ANIC); 1♂, 1♀, 13 km S Carnarvon, 2,4.i.1976, on *Eucalyptus* sp. (UQIC); 2♂, 2 km SW Glenayle HS, 25°18'S 122°02'E, 8.viii.1983; 1♂, 17 km E Mt Nossiter, 25°25'S 123°47'E, 7.viii.1983 (WAM); 1♂, NW Coastal Hwy, 102 km N Murchison R. crossing, 6.i.1976, on *Eucalyptus* sp. (UQIC); 1♂, 13 km S Wannoo, 26°49'S 114°37'E, 31.vii.1985;

1♂, 24 km NW Meeberrie HS, 26°58'S 115°58'E, 28.viii.1988; 1♀, NE end Lake Throssell, 27°22'S 124°21'E, 13.ix.1982 (all WAM); 1♂, 25 mls [40 km] E Kalbarrie, 6.iii.1974 (WADA); 2♂, 12.5 km SSE Banjiwarn HS, 27°42'S 121°37'E, 22–28.ii.1980; 2♂, 9.5 km SE Banjiwarn HS, 27°42'S 121°37'E, 22–28.ii.1980; 1♀, 36 km NNE Neale Junction, 28°03'S 126°02'E, 18–20.ix.1982; 1♂, 98 km NNE Neale Junction, 28°18'S 125°49'E, 16–17.ix.1982; 1♂, 12 km ENE Comet Vale Siding, 29°57'S 121°07'E, 7–15.iii.1979; 1♂, Jurien Bay, 12.xii.1962; 1♂, Moorine Rock, 31°08'S 119°08'E, 7.i.1978; 1♂, 1 km W Boorabbin Rock, 31°12'S 120°17'E, 9.i.1985 (all WAM); 1♂, 22 mls [35 km] E Southern Cross, 28.i.1973, on *Melaleuca pauperiflora*; 1♂, 34 mls [55 km] E Merredin, 27.i.1973, on *Eucalyptus redunca* (all UQIC); 1♂, 20 km N Widgiemooltha, 10.xi.1977 (ANIC); 1♀, York, 23.i.1973, on *Eucalyptus* sp. (UQIC); 1♂, Dedari, 45 km WSW Coolgardie, 20.i.1982; 1?, Dedari, 23–25.i.1962; 1♂, Hatter Hill, 40 km NE Lake King PO, 29.xii.1979, on mallee flowers (all WAM); 2♂, Salmon Gums (ANIC); 1?, King George's Sound (AM). **Northern Territory**: 2♀, Cooper Ck, 19 km, SE Mt Borradaile, 2.xi.1972, 6.xi.1973 (ANIC); 1♂, 8 km N Mataranka, 19.xi.1974, on *Eucalyptus tectifica*; 1♀, 19 km N Daly Waters, 16.xi.1974, on *Eucalyptus argillacea* (all UQIC); 1♂, McArthur River, 48 km SSW Borroloola, 14.vi.1976 (ANIC); 1♂, 91 km N Elliott, 14.xi.1974, on *Eucalyptus argillacea*; 2♂, 9 km E Tennant Ck, 10.xi.1974, on *Eucalyptus odontocarpa* (all UQIC); 1♂, 70 km N Alice Springs, 23°07'S 133°52'E, 5.iii.1995, on *Goodenia hetarochile* (MVMA); 2♂, 47 km N Alice Springs, 5.xi.1974, on *Eucalyptus intertexta* (UQIC); 1♀, 12–17 mls [19–27 km] E Alice Springs, 22–27.ix.1972; 1♂, Roe Ck, 12 km WSW Alice Springs, 10.x.1978, Malaise Trap (all ANIC); 1♂, 22 km W Alice Springs, 2.xi.1974, on *Melaleuca bracteata* (UQIC); 1♂, 24°24'16"S 131°46'19"E Stokes Ck, Watarrka, 20.x.1994, on *Acacia*; 1♂, 51 km S Finke Gorge Ranger Station, 24°28'S 132°48'E, 10.x.1994, on *Crotalaria*; 3♂, 2♀, 2 km W Curin Springs, 25°19'S 131°44'E, 23.x.1994, on *Hakea*; 1♂, 25°29'59"S 131°02'28"E, Uluru, 24.x.1994 (all MVMA); 1♀, 44–45 km NE Andado HS, Simpson Desert, 29.ix.1972; 1♀, Old Andado HS Simpson Desert, 30.ix.1972 (all ANIC); 1♂, 6 km along Boorooloola Road from Junc. Stuart Hwy, 15.xi.1974, on *Eucalyptus argillacea* (UQIC).

Diagnosis

Frons and antennal foveae yellow; narrowly dark brown along lateral epistomal margin; postpronotal lobe, mesoscutum laterally and posteriorly, and scutellum at least partially, reddish tan; wing light brown in cells bc and c; darker brown in cells r_1 and r_{2+3}. Female T6 and male protandrium yellowish to yellowish brown; male S8 shiny yellow.

Redescription

As given in Camras 1961, except vertex and frons not black; brown colouration on fore and mid femora usually barely discernible. Similar to *P. nigrotestacea*; major consistent differences as follows:

Head. Frons yellow. Lunule usually yellowish brown; length less than diameter of base of antenna. Antennal foveae shiny yellow. Haustellum about 2.4x head length.

Thorax. Postpronotal lobe yellow to yellowish brown; finely whitish or yellow pruinose. Mesoscutum mainly black; notopleuron yellow to yellowish brown; usually whitish-yellow pruinose; band medial of postpronotal lobe, supra-alar region, postalar callus and narrowly anterior of scutellum, tan. Scutellum black to dark brown with variable extent of reddish tan medially. Postnotum usually tan below scutellum and extensively on laterotergite. Dorsal pleural sclerites mainly tan. Prosternum dark brown. Wing (Fig. 230) light brown in cells bc and c; darker brown in cells r_1 and r_{2+3}; often paler brown in distal part of r_{2+3}; occasionally some brown in r_{4+5}; petiole usually slightly shorter than dm-cu; CuA_2+A_1 about same length as petiole.

Abdomen (Figs 220, 222). T2 and T3 usually entirely yellowish brown to tan; T2 only sometimes with dark brown dorsolateral mark on anterior two-thirds.

Female (Fig. 221). T5 dark brown. T6 and T7 tan to yellowish. T8 shiny dark tan to black. Female genital plate (Fig. 226) dark brown, broadly rounded; with about eleven rows of closely arranged spicules (Fig. 227). S6 with large area of closely arranged spicules; only posterior ones in defined rows.

Male. T5 mainly mid to dark brown; yellow pruinose and sometimes yellowish brown posteriorly. Protandrium yellow to yellowish brown. S8 shiny yellow. Epandrium mid to dark brown. S5 dark brown.

Measurements. Total length = 8.4 mm (6–13 mm); wing length = 4.6 mm (3.5–7.5 mm).

Distribution. Widely distributed throughout mainland Australia (Fig. 285).

Physocephala minuta Kröber (Figs 231, 286)

Physocephala minuta Kröber 1915b: 131; Camras 1961: 74

Type material. Holotype (examined). ♂, Queensland: **L1**: Cairns N. Queensland. 1907; **L2**: Holotypus; **L3**: ~~Type~~; **L4**: Physocephala minuta ♂, Kröb. O. Kröber det. 1914 (DEI). Paratypes (examined). **Queensland**: 1♂, same data as holotype (DEI); 1♂, **L1**: Cairns N. Queensld. **L2**: Cotype No. 24279 U.S.N.M. (USNM).

Additional material. **Queensland:** 1♀, Lockerbie, Cape York, 10–15.vi.1969 (UQIC); 1♂, 4♀, Lockerbie area, Cape York, 13–27.iv.1973 (ANIC); 1♂, 12 km NE Bamaga, 10°48'S 142°25'E, 7.xi.1988, on *Eucalyptus* sp. (MVMA); 1♂, 3 km E Double Mouth Ck, 30 km NE Heathlands HS, 11°37'S 142°49'E, 19.iii.1992 (UQIC); 1♀, East Claudie R., Iron Range Nat. Pk site 2, 12°43'41"S 143°17'01"E, 31.xii.1995, 20 m; 1♀, Iron Range Cape York Pen, 11–17.v.1968; 1♀, 'Eclectus', Iron Range, 12°45'46"S 143°17'10"E, 20 m, 13.vii.1997 (all UQIC); 1♂, 14 km NW Hope Vale Missn, 15°16'S 144°59'E, 10.x.1980; 1♀, Mt Cook Nat. Pk, 15°30'S 145°16'E, 10.x.1980, at light; 1♂, 1♀, Shiptons flat, 15°47'S 145°14'E, 19.x.1980 (all ANIC); 2♂, Cape Tribulation, 16°04'S 145°28'E, 16.xii.1986 (UQIC); 1♀, Mt Lewis, 8 mls [13 km] NW Mt Molloy, 2700 ft, 15.iii.1964 (ANIC); 1?, Kuranda, 3.v.–20.vi.1913 (NHM); 2♂, 1♀, 1?, Kuranda, no date (SAM, AM); 1?, Cairns dist. (SAM); 1♀, Upper Mulgrave R., 1–3.xii.1965 (UQIC); 1♀, Etty Bay, 6 km SE Innisfail, 27.vii.1982; 1♂, Halliday Bay, 50 km NE Mackay, 19.ix.1983 (all AM).

Diagnosis

Vertex pale to mid brown; frons with large diffuse dark brown triangular mark; antennal foveae wider than parafacial; usually extensively brown. All femora at least partially dark brown. Wing dark brown in cells bc, c, sc, br, bm, r1, r2+3, basal part of r4+5, dm basally and along anterior and posterior margins to about level of dm-cu; brown of r2+3 extending over petiole into apical part of m. Tergites dark brown; female genital plate longer than wide.

Redescription

Similar to *P. nigrotestacea*; character states not mentioned are as for that species:

Head. Median occipital sclerite and vertex pale to mid brown. Vertex short, length about 0.4x length of frons. Frons with large diffuse dark brown triangular mark from posterior margin to lunule, otherwise yellowish brown; frons not much wider than long. Lunule usually light brown with dark brown anterior margin. Ptilinal suture dark brown. Antenna dark brown above, light brown below; sometimes entirely yellowish brown or reddish brown ventrally; length equal to head height; pedicel very slender; ratio of segment lengths: about 1:3.7:1.6. Face yellow; not much protruding. Antennal foveae very broad ventrally, wider than parafacial; usually extensively brown. Cheek yellow; dark brown along lateral epistomal margin absent or almost so. Postgena light to dark brown. Haustellum about 2.4x head length.

Thorax. Postpronotal lobe yellow to yellowish brown; yellow or golden pruinose. Mesoscutum mainly black, bronze pruinose; notopleuron, supra-alar region, postalar callus and narrowly anterior of scutellum, brown. Scutellum dark brown. Postnotum mainly dark brown, golden pruinose. Pleura mid to dark brown, anepisternum and katepisternum with white pruinose band. All femora partially dark brown. Hind tibia with some brown on distal half. Wing (Fig. 231) dark brown in cells bc, c, sc, br, bm, r1, r2+3, basal part of r4+5, dm basally and along anterior and posterior margins to about level of dm-cu; brown of r2+3 extending over petiole

into apical part of m; usually with basal brown streak; petiole slightly shorter than dm-cu; CuA_2+A_1 about 0.6x length of petiole. Haltere deep yellow.

Abdomen. All tergites mid to dark brown. T2 tapering slightly posteriorly, length more than 3x length of T1; in female length 2.5x width; in male narrow for entire length, length about 5x width. T3 slightly shorter than T2 in male, about 1.3x longer in female. T4 about 0.5x length of T2.

Female. T5, T6 dark brown dorsally, dark tan ventrolaterally. T7 dark brown dorsally, otherwise dark tan. T8 shiny dark tan to black. Female genital plate dark brown, longer than wide; with about twelve rows of closely arranged spicules. Spicules with slight median basal notch. Only posterior spicules of S6 in defined rows.

Male. T5 dark brown, yellow pruinose posteriorly. Protandrium dark tan, almost entirely yellow pruinose. S8 shiny pale to mid brown. S5 mid to dark brown; with scattered minute setae medially; spicules absent.

Measurements. Total length = 8 mm (7.5–10.8 mm); wing length = 5.3 mm (4.7–6.8 mm).

Distribution. North-eastern Queensland (Fig. 286).

Physocephala nigrotestacea Macquart (Figs 223–225, 228,229,232,287)

Conops nigrotestacea Macquart 1851: 135 (162); Kröber 1939b: 597
Conops emarginata Macquart 1851: 136 (163); Kröber 1939b: 597, 605
Conops sphegiformis Walker 1853: 256; Kröber 1939b: 597, 605; syn. nov.
Conops macer Bigot 1887: 44; Kröber 1939b: 597, 605-6; syn. nov.
Physocephala pallipes Kröber 1915b: 132; Kröber 1939b: 597, 605

Type material. Holotype (examined). ♀, **L1**: 1225; **L2**: pink above; underside [date]: 4 46; **L3**: Conops nigrotestacea Macq. n. sp. Tasm. (NMNH).

Synonyms (examined):

Conops emarginata Macquart ♂, **L1**: pink above; underside [date]: 3 47; **L2**: Conops emarginata Macq. n. sp. Tasm. (NMNH).

Conops sphegiformis Walker ♀, **L1**: P[ort] Phil[lip] Cott???; **L2**: sphegiformis [?Walker hand writing]; **L3**: Saunders. 68-4.; **L4**: Type; **L5**: Conops sphegiformis Walk. [*underside*: identified as the type by E. A. Waterhouse.] (NHM).

Conops macer Bigot ♀, **L1**: Type; **L2**: C. Macer ♀ Australie J. Bigot (NHM).

Physocephala pallipes Kröber ♂, **L1**: Herberton Dodd. I. 1911. 3700 Ft; **L2**: Type; **L3**: coll. Lichtwardt; **L4**: Physocephala pallipes ♂ Kröb. O. Kröber det. 1914 (DEI).

Additional material. **Queensland**: 1♀, 5 km S Coen, 6.xi.1978, on *Eucalyptus confertiflora*; 1♀, Kuranda (AM); 1♂, Herberton, 11.i.1911; 1♂, 32 km NW Cracow, 25°03'S 150°09'E, 4.xi.1981, 190 m, on *Eremophila mitchelli*; 3♀, Carnarvon Nat. Pk Mt Moffatt Section, 740 m 3 km SE Ranger Station, 25°04'39"S 148°00'30"E, 20.xi.1995; 1♀, Carnarvon Nat. Pk, Mt Moffatt Section, Base Chimneys, 25°06'08"S 147°52'01"E, 80 m, 21.xi.1995 (all UQIC); 2♀, 24 km NE Eidsvold, 25°09'S 151°11'E, 11.xi.1984, on *Eucalyptus* flowers (ANIC); 1♀, 28 km NW Mundubbera, 11.iii.1976, on *Eucalyptus* sp.; 1♂, 6 km N Taroom, 25°36'S 149°46'E, 14.i.1991; 8♂, 6♀, Elanda Point, Lake Cootharaba, 26°14'S 153°00'E, 2.ii.1986; 1♂, Brisbane, iii.1962 (all UQIC); 1♂, Sunnybank, 23.ix.1929 (QDPI); 1♂, Amiens, 4.xi.1965 (UQIC). **New South Wales:** 1♀, 10 km W Murwillumbah, 25–27.ix.1981 (AM); 1♂, 1♀, Wilson's Downfall, 15–19.xii.1969 (UQIC); 1♀, Mittagong, 17.xii.1927 (ANIC). **Australian Capital Territory:** 1♀, Cotter R., 24.xi.1948 (ANIC). **Victoria:** 1♂, Cann R., xi.1928 (MVMA). **Western Australia:** 1♀, King's Park, Perth, 15.i.1934 (ANIC). **Northern Territory:** 1♂, Magella Ck, Kakadu Nat. Pk, 26.iii.1980 (ANIC); 1♀, Manton R. Crossing, 12°50'S 131°08'E, 17.i.1996; 1♀, Manton Dam, 12°52'S 131°07'E; 1♂, 1♀, nr Umbrawarra Gorge, 27 km SW of Pine Ck, 13°57'S 131°41'E (all UQIC).

Diagnosis

Frons with brown to black median band or triangular mark; antennal foveae with dark brown patch on each side of carina; narrowly dark brown along lateral epistomal margin; postgena dark brown. Scutellum blackish brown; hind femur dark brown on apical half; other femora yellowish brown; wing dark brown cells bc, c, sc, br, bm, r1, r2+3, basal part of r4+5 and dm.

Redescription

Head. Occiput blackish brown, darkest dorsolaterally, with narrow silvery pruinose band around eye margin; setae dark brown, fine, moderately dense and short. Median occipital sclerite yellowish brown dorsally, blackish brown ventrally. Vertex yellowish brown; about 0.7x length of frons; setae dark brown, very fine, moderately dense and short. Frons with diffuse brown to blackish brown triangular mark from posterior margin to lunule, otherwise yellowish brown; size of brown patch variable, sometimes hardly discernible; frons about twice as wide as long. Lunule usually blackish brown; length about equal to diameter of base of antenna. Antenna missing in type except for scape which is pale yellow below, covered by extended ptilinum above; other specimens usually dark brown above, light brown below; sometimes entirely yellowish brown or reddish brown ventrally; length 0.8x head height; ratio of segment lengths: about 1:3.5:1.8; stylus yellowish to dark brown; about 0.2x length of first flagellomere (Fig. 224). Face yellow; protruding from eye margin to margin of antennal foveae. Antennal foveae shiny yellow, with small brown patch on either side of carina proximal to frontoclypeal tubercle; sometimes entirely shiny yellow. Cheek yellow; narrowly dark brown along lateral epistomal margin. Postgena dark to blackish brown; setae short, fine, blackish brown. Haustellum blackish brown; about 2x head length.

Thorax. Postpronotal lobe yellow to yellowish brown; yellow pruinose. Mesoscutum mainly black, bronze pruinose; notopleuron yellow to yellowish brown; yellow pruinose; supra-alar region, postalar callus and narrowly anterior of scutellum, tan; bristles present: several short npl, pal. Scutellum black to dark brown. Postnotum mainly blackish brown, golden pruinose; laterotergite tan anterodorsally. Pleura blackish brown, finely white pruinose; dorsal sclerites variably tan; bristles present: several very short kepst and moderately short anepimeral. Prosternum yellowish brown. Coxae dark brown, white pruinose. Trochanters mainly yellowish brown, hind trochanter often darker brown. Femora mainly yellowish brown, distal half hind femur, except apex, dark brown (darker brown on hind femur of type not distinct). Tibiae yellowish brown, silvery pruinose. Tarsi yellowish brown; finely silvery pruinose. Dense microsetae golden on fore leg, golden brown on hind leg. Wing (Fig. 232) dark brown in cells bc, c, sc, br, bm, r_1, r_{2+3}, basal part of r_{4+5}; dm usually with basal brown streak; petiole slightly longer than dm-cu; CuA_2+A_1 about 0.4x length of petiole. Haltere yellow, base dark brown.

Abdomen. With short sparse setae on all tergites; longer setae across posterior surface of female T4–6. T1 blackish brown, white pruinose posterolaterally. T2 yellowish brown to tan with dark brown dorsolateral mark on anterior two-thirds; narrowly white pruinose anterolaterally and posterolaterally; with scattered moderately long bristles laterally; long and narrow; in female parallel-sided, length at least 2x width, about 2.5x length of T1; in male tapering posteriorly, length more than 3x width and more than 3x length of T1. T3 yellowish brown to tan anteriorly and along narrow band posteriorly, otherwise dark brown; narrowly white pruinose anterolaterally; yellow pruinose posteriorly, narrowly dorsally and broadly laterally; about same length as T2; wider posteriorly than anteriorly, markedly so in male. T4 mainly mid to dark brown; yellow pruinose and sometimes yellowish brown posteriorly; setae longer posteriorly in female; about 0.7x length of T2.

Female (Fig. 225). T5 mainly dark brown, yellow pruinose along posterior margin. T6 dark brown anteriorly, lighter brown posteriorly and laterally; yellow pruinose dorsally; about 0.4x length of T3–5 together; with short rounded median posterior projection. T7 usually dark brown dorsally, otherwise tan to yellowish; yellow pruinose dorsally; about 1.25x length of T6. T8 shiny dark tan to black. Female genital plate (Fig. 228) dark brown, broadly rounded; with about nine rows of closely arranged spicules (Fig. 229) and with long, fine marginal setae. S6 spicules smaller than those of genital plate, fewer rows.

Male. T5 mainly mid to dark brown; yellow pruinose and sometimes yellowish brown posteriorly. Protandrium dark yellow to tan, almost entirely yellow pruinose; entirely short setose; evenly rounded, dorsal length shorter than T5. S8 shiny pale to mid brown; much shorter than and about same width as epandrium. Epandrium dark brown. S5 yellowish to dark brown; with scattered minute setae medially; spicules absent.

Variation. The following notes refer to differences observed between the types of the synonyms and the type of *P. nigrotestacea*. *C. emarginata* has the median band on frons black; antennae blackish dorsally, yellowish brown ventrally; hind femur dark brown from just before middle to distal end except apex; T2 mainly yellowish brown, a little dark brown anterolaterally; T3 entirely yellowish brown. *P. pallipes* bears a short bristle on segment 2 of the stylus (Kröber 1919c, Fig. 22); this character could not be observed in *P. nigrotestacea* as the pedicel and first flagellomere of both antennae are missing. The type of *C. sphegiformis* is badly damaged; all that remains is the head (without antennae and glued to thorax), thorax, left femora and tibiae, right foreleg and mid femur and tibia, small piece of wing. The type of *C. macer* is also damaged; it is missing the left antenna, right wing, left hind leg, right hind tarsus, and abdomen. From Bigot's description: antennae black; halteres reddish; female genital plate black; sternum and coxae black.

Measurements. Total length = 8.7–10.5 mm; wing length = 5.1–6.5 mm

Distribution. Widely distributed throughout mainland Australia (Fig. 287).

Comments. Kröber (1939b) lists *P. emarginata* and *P. pallipes* as synonyms of *P. nigrotestacea* and *P. macer* as a synonym of *P. sphegiformis*. All five species show variation in overall size, colour and proportion of various structures. However I could find no constant differences between them and therefore have decided to consider the five as conspecific.

4.5.14 *Pleurocerina* Macquart

Introduction

The generic name pertains to the insertion of the antennae on either side of the projection caused by the non-retraction of the ptilinum. This aberrant tubercle-like projection of the head is enhanced by the collapsed state of the face and frons. Williston (1888), in discussing the validity of genera considered to belong to Conopinae, mentioned *Pleurocerina*. He acknowledged that the type specimen could have a malformed head but did not examine it. He therefore did not add the genus to his list of three genera he recognised in Conopinae. Kröber (1915a) reproduced Macquart's description of the genus and of the type species, *P. fasciata* but in his key to genera listed *Pleurocerina* as a synonym of *Conops*. In this same paper he described his new genus, *Paraconops* which I consider to be a junior synonym of *Pleurocerina*. When Kröber (1939b) described *Stenoconops niger* he compared the appearance of it with the description of *P. fasciata* but indicated that he still had not seen Macquart's specimen. The only suggestion I can find of the specimen being examined since Macquart described the species, is a reference to it in the description of *Pleurocerinella* Brunetti. Brunetti (1923) stated that *Pleurocerinella* is intermediate between *Conops* and *Pleurocerina*.

Pleurocerina is one of the most speciose Australian genera and is exceeded in numbers of species only by *Australoconops* and *Heteroconops* (most species of the latter genus await description). Sixteen species of *Pleurocerina* are now recognised, ten of which are described below as new.

Genus PLEUROCERINA Macquart (Fig. 282)

PLEUROCERINA Macquart 1851: 164. Type species: *Pleurocerina fasciata* Macquart, by original designation
PARACONOPS Kröber 1915a: 74, syn. nov. Type species: *Paraconops longicornis* Kröber, by monotypy

Diagnosis

Three ocelli present; frons rugose; fronto-orbital region forming a rounded, smooth ridge, not pruinose;

antenna at least as long as head height; scape long, cylindrical; pedicel with basal half narrow, distal half much expanded; first flagellomere at least twice as long as pedicel; stylus three-segmented; haustellum long; palpus absent. Mesonotum with very short, strong setae; wing with cell r4+5 long, acute; petiole short. Female T7 with anteromedial notch.

Redescription

Head. Occipital setae short, usually fine ventrally, stronger dorsally. Median occipital sclerite dorsally separated from posterolateral margin of frons by a low ridge. Vertex smooth, usually cushion-like, raised above plane of frons; much shorter than frons. Head lacking differentiated bristles. Setae of vertex moderately dense, moderately fine, dark brown to black; across width of vertex posterior of ocellar tubercle. Ocellar tubercle clearly demarcated from surrounding surface of vertex; three conspicuous ocelli present, median round, lateral ovoid. Frons transversely rugose; bare; at least 1.5x wider than long. Fronto-orbital region forming a rounded, smooth ridge, slightly raised above plane of frons; not pruinose. Eyes elongate-oval, height about 0.7x head height. Antenna at least as long as head height; first flagellomere at least 2x length of pedicel. Scape cylindrical, with ventrolateral and dorsoapical minute setae. Pedicel with basal half narrow and transverse dorsal keel or flange close to base, distal half much expanded, with minute setae. First flagellomere laterally compressed, tapered distally. Face bare or with only minute, fine setae. Parafacial much wider than facial ridge. Facial ridge short, narrow. Antennal foveae long, moderately shallow throughout length. Facial carina poorly developed dorsally, strong ventrally adjacent to prominent frontoclypeal tubercle. Cheek slightly concave. Postgena with fine, usually short setae. Clypeus bare. Palpus absent. Haustellum long, usually at least 2x head length.

Thorax. Dorsum with short, strong black setae over entire surface. Differentiated thoracic bristles present: npl, pal, ial, ipal, sctl, prepst, kepst. Prosternum long, deeply bifurcate posteriorly, with posterolateral corner narrowed and flange-like. Mid femur with longer setae on posterodorsal margin. Tibiae without apical, oval densely pruinose patch. Dense microsetae present on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Claws yellowish basally, black apically. Wing with Sc ending beyond mid length; R1 extending along costa to end a little before R2+3; vena spuria conspicuous; r4+5 long, acute apically; petiole short.

Abdomen. Overall shape of female more or less parallel sided, widening slightly to T5; male constricted at T2–3; all tergites with short black setae; broad defined pruinose bands absent. T1 lobe-like laterally, with long bristles. T3 usually about same length as T2. S1–4 well developed; with long setae.

Female. T5 with setae longer across posterior margin. T6 with posterior margin straight. T7 with distinct anteromedial notch. Female genital plate large. Pedestals of spicules relatively high, with 3 or more microtrichia (Fig. 282). Ridges of spicules not merging medially, reaching base independently; second ridges from midline usually fusing apically into long point.

Male. T5 about same length as T4. S8 narrower than epandrium. S5 with or without spicules posteriorly.

Measurements. Total length = 6.3–13.0 mm; wing length = 3.9–9.3 mm.

Key to Australian species of *Pleurocerina*

1. Pedicel of antenna with prominent transverse dorsobasal flange (Fig. 256); fore femur with short black spines anterobasally (Fig. 259) . . . . . 2.
-. Pedicel of antenna with transverse dorsobasal ridge (Fig. 250); fore femur without short black spines anterobasally . . . . . 3.
2. Facial carina blackish brown; tibiae distally and most of tarsi dark brown to blackish; abdomen blackish brown at least partially on most segments; otherwise yellow or orange . . . . . ***longicornis*** (Kröber)
-. Facial carina yellow; legs entirely yellow; abdomen mainly yellow; T4 entirely and T5 partly blackish brown . . . . . ***lamellata*** sp. nov.

3. Parafacial, facial ridge and carina, frontoclypeal tubercle, cheek, postgena and most of occiput and antenna black 4.
-. Head not as extensively black . . . . . 5.
4. Wing brown anteriorly on apical half (*e.g.* Fig. 236); T2, T3 and protandrium almost entirely reddish tan (female unknown) . . . . . ***nigrifacies*** (Kröber)
-. Wing entirely brown anteriorly (*e.g.* Fig. 238); T2 entirely and T3 anteriorly orange; male protandrium and female T6 with orange, golden pruinose dorsal patch . . . . . ***chrysopyga*** sp. nov.
5. Head, antennae, legs and T2 almost entirely yellow; thorax and abdomen otherwise yellow and blackish brown, and extensively golden yellow pruinose . . . . . ***lutea*** sp. nov.
-. Not so extensively yellow . . . . . 6.
6. Wing with distinct anterior brown band (*e.g.* Fig. 234) . . . . . 7.
Wing hyaline, without distinct anterior brown band (*e.g.* Fig. 237) . . . . . 12.
7. Legs, postpronotal lobe and scutellum dark yellow to reddish orange; thorax otherwise black; abdomen mainly black, yellow pruinose on T2 and T3 posteriorly, male T5 and protandrium dorsally, female T6 and T7. . . . . ***aquila*** sp. nov.
-. Femora usually partially dark reddish or blackish brown; thorax and abdomen not so extensively black . . . . . 8.
8. Femora and tibiae entirely dark yellow to reddish orange; mesoscutum broadly yellowish brown laterally and posteriorly; abdominal T2 and T3 almost entirely orange . . . . . ***similis*** (Kröber)
-. Femora usually partially dark reddish or blackish brown; mesoscutum not completely yellow laterally and posteriorly; T2 and T3 not mainly orange . . . . . 9.
9. Mesoscutum, including notopleuron, and pleura mainly black or blackish brown; postpronotal lobe, supra-alar region, postalar callus and scutellum yellowish brown to tan . . . . . 10.
-. Thorax and abdomen predominantly dark reddish brown and black; mesoscutum with three broad, longitudinal, almost confluent black bands; mesoscutum laterally and broadly posteriorly, reddish brown. . . . . 11.
10. Occiput extensively yellowish brown. Female T6 orange-tan dorsally; otherwise dark brown; yellow pruinose; T7 tan, bulbous anteriorly, tapered and laterally compressed distally (Fig. 252); T8 elongate, laterally compressed (Fig. 254). Male T5 blackish brown; yellow pruinose. Protandrium with orange patch; otherwise blackish brown; extensively yellow pruinose . . . . . ***fasciata*** Macquart
-. Occiput extensively dark brown. Female T6 mainly orange; usually dark brown ventrolaterally; yellow pruinose; slightly wider than long; T7 yellowish orange; yellow pruinose. T7 and T8 not laterally compressed. Male T5 mainly blackish brown; orange dorsally; finely yellowish pruinose. Protandrium mainly orange; blackish brown anterolaterally; extensively yellow pruinose. . . . . ***saxatilis*** sp. nov.
11. First flagellomere of antenna very long, more than 2x length of pedicel (Fig. 240); haustellum more than 2x head length; several npl bristles present; femora dark reddish black on basal half, reddish orange on distal half; mid femur with single row of longer setae on posterodorsal margin. Female T6, T7 and genital plate short . . . . ***brevis*** sp. nov.
-. First flagellomere of antenna about 2x length of pedicel (Fig. 273); scape and pedicel long; haustellum slightly less than 2x head length; 2 npl bristles present; femora extensively dark reddish brown, reddish apically; ventral surface lighter coloured, partially yellow; mid femur with longer setae on posterodorsal margin not in single defined row. Female T6, T7 and genital plate long and narrow (Fig. 238) . . . . . ***vespiformis*** sp. nov.
12. Abdominal T2 entirely or mainly black . . . . . 13.
-. Abdominal T2 dark yellow to reddish . . . . . 14.
13. Legs mainly dark brown; abdominal T2 reddish around margins . . . . . ***aristalis*** (Camras)
-. Legs mainly yellow to reddish orange; all abdominal tergites brownish black . . . . . ***scutellata*** sp. nov.
14. Postpronotal lobe deep yellow; setae on mesonotum dense and moderately long; female T7 bulbous anteriorly, tapered and laterally compressed distally; T8 elongate, laterally compressed (Fig. 269) . . . . . ***occidua*** sp. nov.
-. Postpronotal lobe brownish black; setae on mesonotum sparse and very short; female postabdomen not as above 15.
15. Occiput ventrally, and postgena yellowish; female T7 and genital plate mainly yellowish brown, T8 shiny yellowish brown; posterior margin of male S5 with band of spicules but without posteromedial projection . ***luteiceps*** sp. nov.
-. Occiput ventrally, and postgena dark brown; female T7, T8 and genital plate blackish brown; male S5 blackish brown; concave posteriorly with posteromedial projection covered in black spicules (Fig. 270) . . . ***turneri*** (Camras)

***Pleurocerina aquila*, sp. nov. (Figs 242-244, 288)**

Type material. Holotype. ♂, Tasmania: horse yards area, Mt William Nat Pk, 40°52'S 148°10'E, 20.i.1992, G. & A. Daniels (AM). Paratype. **Tasmania**: 1♂, George Town, 16.xi.1914 (SAM); 1♀, Flinders Island, 40°01'S 148°02'E, 9–11.xii.1997, A. I. Knight (QM).

Diagnosis

Mainly black. Parafacial mainly yellowish brown. Postpronotal lobe orange-tan, scutellum mainly reddish orange; legs reddish orange to yellow; wing dark brown anteriorly. Tergite 2 with narrow yellowish brown, densely pale yellow pruinose posterior band; male T5 and protandrium, female T6 and T7 yellow pruinose; protandrium also with orange dorsal patch.

Description

Head. Occiput dark brown ventrally, black dorsally with small orange patch adjacent to middle of eye margin; setae moderately dense, fine, black. Median occipital sclerite brownish black. Vertex brownish black laterally and posterior of ocellar tubercle, otherwise transparent dark yellowish brown; slightly raised above plane of frons, about half length of frons; setae moderately long. Ocellar tubercle black. Frons with broad blackish brown triangular mark from posterior margin to lunule; dark yellowish brown anterolaterally; strongly rugose; width 1.7x length. Lunule black; length about 2x diameter of base of antenna. Antenna (Fig. 242) a little longer than head height; with scape and pedicel blackish brown; first flagellomere reddish-orange at base and ventrally, otherwise black; ratio of segment lengths: 1:1.3:3.2. Pedicel with transverse dorsal keel close to base. First flagellomere without dorsal swelling. Stylus (Fig. 243) black; about 0.2x length of first flagellomere. Parafacial mainly yellowish brown; blackish brown ventrally and adjacent to ptilinal suture; finely white pruinose laterally; irregularly rugose. Facial ridge yellow. Antennal foveae dark brown medially, otherwise yellow, silvery pruinose. Facial carina black. Frontoclypeal tubercle black. Cheek blackish brown; setae short, blackish. Postgena reddish black; setae moderately long, dark brown. Haustellum black, 2.3x head length.

Thorax. Postpronotal lobe orange-tan, finely silvery pruinose posteriorly; setae moderately short and sparse. Mesoscutum mainly black; dark brown on supra-alar region and postalar callus; yellowish bronze pruinose; with short, strong black setae over entire surface; several npl and pal, 1 ipal present. Scutellum black anteriorly, dark brown laterally, otherwise reddish orange; with one pair moderately weak, subapical convergent bristles. Postnotum brownish black, silvery pruinose, especially on laterotergite. Pleura brownish black, finely silvery pruinose; numerous prepst and dorsal kepst bristles present. Prosternum and coxae black, finely silvery pruinose. Trochanters blackish brown. Femora reddish orange; mid femur with longer setae on posterodorsal margin, but not in single defined row. Tibiae yellow to reddish orange. Tarsi yellow; microsetae golden. Wing dark brown in cells bc, c, sc, r_1, r_{2+3}, basal and anterior apical parts of r_{4+5}; petiole length slightly more than half length of dm-cu. CuA_2+A_1 1.3x length of petiole.

Abdomen. Constricted at T2–3; all tergites with short black setae. T1 black, finely white pruinose posteriorly; markedly wider than T2, rounded, lobe-like laterally;with dense long bristles. T2 mainly black, with narrow yellowish brown, densely pale yellow pruinose posterior band; with numerous long setae laterally; elongate, 2.7x length of T1. T3 mainly black; narrowly brown, yellow pruinose posteriorly; with long lateral setae; same length as T2. T4 black; about same length as T2 in male. S1–4 brownish black; with long lateral setae. S4 markedly wider than S3.

Female. Unknown.

Male. T5 black, finely yellow pruinose dorsally; about same length as T4. Protandrium (Fig. 244) black, yellow pruinose, with orange dorsal patch; about as long dorsally as T5. S8 brownish black, finely yellow pruinose; pointed anteromedially, about same length as epandrium, slightly narrower than epandrium; slightly

more convex than protandrium. Epandrium brownish black. S5 black; with broad posterior band of spicules and long, lateral black setae.

Measurements. Total length = 12.5 mm (12.6 mm); wing length = 8.2 mm (8.3 mm).

Distribution. Northern Tasmania (Fig. 288).

Comments. One poor quality female specimen in the UQIC labelled "Sydney, Deane" may be this species. It differs in several character states including colour of face, cheeks and legs. In the absence of other female specimens for comparison, I prefer not to include it in the description.

Etymology. The specific name is from the Latin word *aquilus* (= dark-coloured, blackish) and refers to the extensive black colouration of this species.

Pleurocerina aristalis (Camras), comb. nov. (Fig. 289)

Paraconops aristalis Camras 1961: 72

Type material. Holotype (examined). ♀, **L1**: W. AUSTRALIA: Perth. 26.–28.i.1936. R. E. Turner. B.M.1936-28. **L2**: ?pD; **L3**: HOLOTYPE ♀ Paraconops aristalis CAMRAS (NHM).

Diagnosis

Stylus apparently two-segmented; frontoclypeal tubercle blackish brown. Thorax mainly brownish black, mesoscutum dark brown laterally; scutellum orange-brown; legs dark brown except yellowish brown apices of femora and bases of tibiae; wing completely hyaline. Abdomen mainly blackish brown; T1 reddish posteriorly; T2 reddish anteriorly, posteriorly and laterally; T3 narrowly reddish anteriorly.

Redescription

Similar to *P. turneri*; the holotype of *P. aristalis* differs in the following character states:

Head. Frons width 1.5x length. Antennal scape and pedicel brown, finely pruinose except dorsum of pedicel; first flagellomere brown dorsally, orange-brown ventrally; ratio of antennal segment lengths: 1:1:2.25; stylus 0.2x length of first flagellomere. Facial carina and frontoclypeal tubercle brown. Haustellum 2.5x head length.

Thorax. Postalar callus dark brown. Mesoscutal bristles present: 2 npl, 2 ial, several pal, 1 ipal. Several kepst bristles present. Femora dark brown; apices yellowish brown. Tibiae mainly dark brown; bases yellowish brown.

Abdomen. T1 mainly blackish brown; posteriorly reddish, white pruinose. T2 reddish across anterior and posterior margins and laterally, otherwise blackish brown; white pruinose anteriorly and posteriorly. T3 narrowly reddish, white pruinose anteriorly, otherwise blackish brown.

Female. Female genital plate dark brown, long, relatively narrow, with about 8 irregular rows of spicules.

Male. Unknown.

Measurements. Total length = 6.3 mm; wing length = 3.9 mm.

Distribution. South-western Western Australia (Fig. 289).

Comments. Camras described *P. aristalis* as distinct from *P. turneri* primarily because of the absence of a three-segmented stylus in *P. aristalis*. My examination of the two holotypes confirmed this apparent difference and also the colour differences between them. Subsequent studies have shown that the basal segment of the stylus of some specimens of *Pleurocerina* can be sunken into the apex of the first flagellomere. The distinction between *P. aristalis* and *P. turneri* on the basis of the number of segments of the stylus therefore may not be valid. However, I consider the colour differences to be significant and prefer to maintain the two species as distinct. The status of *P. aristalis* may need to be reconsidered if more material becomes available.

***Pleurocerina brevis*, sp. nov. (Figs 233, 240, 241, 290)**

Type material. Holotype. ♀, Queensland: Amiens, 16.xii.1967, C. F. Ashby (ANIC). Paratypes. **Queensland**: 1♀, Carnarvon Nat. Pk, Mt Moffatt Section, 3 km SE Ranger Station, 25°04'39"S 148°00'30"E, 740 m, 20.xi.1995, D. K. Yeates (QM); 1♂, Paschendaele, 14.xii.1969, C. F. Ashby; 1♂, 1♀, Amiens, 18.xii.1966,67, C. F. Ashby (ANIC).

Additional material. **Queensland**: 1♂, The Blunder, 18.viii.1966 (ANIC); 1♂, Brisbane, 26.ix.1916 (QM); 2♀, Stradbroke Is., 2.x.1911, 5.ii.1979 (QM, UQIC). **New South Wales**: 1♀, Harrington, 17.xii.1986; 1♂, Wollombi Brook, nr Broke, 18.xi.1985 (all AM).

Diagnosis

Antenna distinctly longer than head height; first flagellomere more than twice length of pedicel; haustellum more than twice head length. Thorax and abdomen predominantly dark reddish brown. Thorax with three broad, longitudinal, almost confluent black bands; several notopleural bristles; femora reddish black basally. Female T6, T7 and genital plate short.

Description

Similar to *P. vespiformis*; character states not mentioned are as for that species.

Head. Median occipital sclerite mainly yellowish brown; infuscated with pink; dark brown around occipital foramen. Ocellar tubercle pinkish yellow. Frons yellowish brown with dark brown V-shaped mark from posterior corners to lunule. Antenna (Fig. 240) about 1.5x longer than head height; mainly deep yellowish brown; first flagellomere black distally to variable extent, especially dorsally; ratio of segment lengths: 1:1:2.5. Stylus (Fig. 241) mainly dark brown; segment 3 yellowish brown except fine apex; about 0.2x length of first flagellomere. Parafacial yellow dorsally, brown ventrally. Facial ridge yellow. Cheek mainly brown, yellow around margins; almost bare except for some minute setae around epistomal margin. Postgena yellow, infuscated pinkish brown. Haustellum length slightly more than 2x head length.

Thorax. Broad black bands of mesoscutum almost confluent. Several npl bristles present, usually three stronger than others. Meron blackish brown except for narrow dorsal band. Femora dark reddish black on basal half, reddish orange on distal half; mid femur with single row of longer setae on posterodorsal margin. Tibiae dark yellow to reddish orange. Tarsi yellowish brown, slightly darker apically; microsetae golden. Claws of female not thick and long. Wing (Fig. 233) brown in cells bc, c, sc, r_1, r_{2+3}, anterior half of r_{4+5}; brown colour slightly darker on either side of distal section of R_{4+5}; petiole about 0.4x length of dm-cu; CuA_2+A_1 1.5x length of petiole.

Abdomen. T2 mainly reddish brown infuscated blackish brown dorsally; densely yellow pruinose posteriorly. T2–3 dark reddish brown. T3 slightly longer than T2; T4 of female slightly shorter than T2.

Female. T5 dark reddish brown. T6 dark reddish brown ventrolaterally, reddish orange dorsally, about half length of T3–5 together; slightly wider than long. T7 reddish orange, about 1.2x length of T6. T8 shiny yellowish brown. Female genital plate short, broadly rounded, spicules in dense rows over most of surface.

Male. T5 mainly dark reddish brown, reddish orange dorsally. Protandrium mainly reddish orange, dark reddish brown ventrolaterally. S8 dark reddish brown, slightly more convex than protandrium. Epandrium yellowish brown. S5 with band of scattered spicules posteromedial.

Variation. First flagellomere and stylus of antenna sometimes entirely yellowish brown. Thorax and abdomen of some older specimens predominantly mid brown rather than reddish brown.

Measurements. Total length = 11.2 mm (10.2–12.1 mm); wing length = 7.8 mm (7.2–8.5 mm).

Distribution. South-eastern and southern central Queensland, eastern New South Wales (Fig. 290).

Comments. This species is very similar to *P. vespiformis*; female genitalia are much shorter than those of *P. vespiformis*; females are therefore easy to differentiate. *P. brevis* is not restricted to coastal areas as *P. vespiformis* seems to be.

Etymology. The specific name is the Latin adjective *brevis* (= short) and refers to the short female genital plate of this species.

Pleurocerina chrysopyga, sp. nov. (Figs 245–247, 291)

Type material. Holotype. ♂, Western Australia: 1 km W Lake King, 33°05'S 119°40'E, 2.xi.1989, K. L. Walker, on *Eucalyptus* (MVMA). Paratypes. **Western Australia**: 1♀, Coolgardie, 29.ix.1956, J. H. Calaby (ANIC); 2♂, same data as holotype (MVMA).

Additional material. 1♀, no locality or date, K36976 (AM).

Diagnosis

Face, frontoclypeal tubercle and cheek black; postgena blackish brown. Postpronotal lobe deep yellowish brown; notopleuron, postalar callus, scutellum and narrowly anterior of scutellum orange-tan; pleura black. Abdominal T2 entirely and T3 anteriorly orange; T6 with large orange, golden pruinose dorsal patch.

Description

Head. Occiput mainly black, orange dorsolaterally; occipital setae black, moderately sparse, fine ventrally, stronger dorsolaterally. Median occipital sclerite orange, blackish brown around occipital foramen. Vertex transparent yellowish brown, orange posterior of ocellar tubercle; cushion-like, raised above plane of frons; setae brown, moderately short and strong, across width posterior of ocellar tubercle. Ocellar tubercle blackish brown anteriorly, orange posteriorly. Frons mainly yellowish brown, with blackish brown median patch posterior of lunule; transversely rugose, slightly tuberculate anteromedially; width 1.6x length. Lunule blackish brown; length about 1.5x diameter of base of antenna. Antenna a little longer than head height; mainly blackish brown; scape reddish ventrally; pedicel reddish apically; first flagellomere reddish-orange at base and ventrally, dorsal swelling near base only vaguely indicated; ratio of segment lengths: 1:1:2.75. Stylus (Figs 245, 246) black; about 0.2x length of first flagellomere; segment 1 relatively long. Parafacial black; narrowly silver pruinose laterally. Facial ridge wrinkled, black. Antennal foveae blackish brown medially; laterally very pale brown, white pruinose. Facial carina poorly developed, light brown along most of length of crest, black near frontoclypeal tubercle. Frontoclypeal tubercle and cheek black. Setae of cheek short, blackish. Postgena blackish brown, silvery pruinose; setae moderately short, black. Haustellum black, about 2x head length.

Thorax. Postpronotal lobe deep yellowish brown, fine white pruinose; setae moderately short and sparse. Mesoscutum mainly black; notopleuron, postalar callus, and narrowly anterior of scutellum orange-tan; silvery pruinose medial and posterior of postpronotal lobe; with very short, strong black setae over entire surface; mesoscutal bristles present: numerous npl and pal, 2 short ial, 1 ipal. Scutellum orange-tan with sparse, very short setae and one pair of strong, moderately long marginal bristles. Postnotum mainly black; narrow band below scutellum and laterotergite anterodorsally, tan. Pleura black; numerous prepst and dorsal long, moderately strong kepst bristles present. Prosternum black. Coxae brownish black, finely white pruinose. Trochanters blackish brown. Femora reddish orange; extreme base blackish; fore femur with dense, very short black setae anterobasally; mid femur with defined row of longer setae on posterodorsal margin, dorsal surface almost bare. Tibiae mainly reddish brown, paler basally. Tarsi yellowish brown, slightly darker apically; microsetae golden brown. Wing dark brown in cells bc, c, sc, r1, r2+3, basal and anterior apical parts of r4+5, anterior of vein CuA1 of dm, anterior basal band of cu*p*; petiole length about 0.6x length of dm-cu. CuA2+A1 1.6x length of petiole. Haltere yellowish except for light brown base.

Abdomen. Female gradually widening to T5; male constricted at T2–3; all tergites with short black setae, shorter and less dense dorsally on T1–3. T1 wider than T2, rounded, lobe-like laterally; mainly black; reddish

tan across posterior margin. T2 orange, finely white pruinose posteriorly; with numerous long setae laterally; about 3x length of T1 and distinctly longer than wide in male; about 2x length of T1 and slightly wider than long in female. T3 orange on anterior third, otherwise brownish black; male with orange projecting medially into black of posterior two-thirds; about twice as wide as long in female. T4 black, about 0.8x length of T2 in male; 0.6x in female. S1 and S4 blackish brown; S2 and S3 partially. S1–4 with long lateral setae.

Female. T5 blackish brown; setae longer across posterior margin. T6 blackish brown with large orange, golden pruinose dorsal patch; about 0.75x length of T3–5 together; entirely setose, setae distinctly longer laterally. T7 blackish brown; long. T8 shiny blackish brown, paler dorsally. Female genital plate (Fig. 247) dark brown; very long, projecting far below level of genitalia; spicules over most of surface, most dense at apex; anterior surface with fine, short setae; posterior surface with long setae. S6 with long fine setae and large area of spicules, densely arranged but not in defined rows.

Male. T5 black; slightly longer than T4. Protandrium black with large orange, golden pruinose dorsal patch; dorsal length slightly shorter than length of T5. S8 black; narrower and shorter than epandrium; convex in continuous plane with protandrium. Epandrium black. S5 brownish black with broad posterior band of spicules and long, lateral black setae.

Variation. Eye of female about 0.6x head height. Femora sometimes entirely reddish orange; petiole 0.5 to 0.7x length of dm-cu.

Measurements. Total length = 9.2 mm (10–12 mm); wing length = 6.3 mm (6.5–9 mm).

Distribution. Southern Western Australia (Fig. 291).

Etymology. The specific name is formed from the Greek words *chrysos* (= gold) and *pyge* (= rump) and refers to the golden patch on abdominal segment 6.

Pleurocerina fasciata Macquart (Figs 234, 235, 248–254, 292)

Pleurocerina fasciata Macquart 1851: 164

Type material. Holotype (examined). ♀, **L1**: pink above; underside [date]: 4 46; **L2**: Pleurocerina fasciata Macq. n.g., n.sp. Tasm. (NMNH).

Additional material. **Queensland**: 1♂, Carnarvon Nat. Pk, Mt Moffatt Section, 2 km N West Branch Campground, 24°52’18”S 148°00’50”E, 24.xi.1995, 820 m (UQIC); 1♀, Mountain Ck, Buderim, 18.xi.–2.xii.1982, Malaise trap (QDPI); 1♂, 1♀, Beerburrum State Forest, 10 km NW Beerburrum, 26°56’S 152°51’E, 20,26.xi.1991, 150 m (UQIC). **New South Wales**: 1♂, Broadwater Nat. Pk, lookout, 29°02’S 153°26’E, 16.xii.1997, Malaise trap; 1♂, Bundjalung Nat. Pk, nr Evans head, 29°08’S 153°24’E, 8.i.1997; 1♂, Milson Is., 16.i.1915; 1♂, Sydney, 1.i.1923, (all ANIC); 1♂, Maroubra, 9.xii.1906 (AM).

Diagnosis

Head mainly yellowish; diffusely brown on frons and cheek. Postpronotal lobe, supra-alar region, postalar callus, anterior of scutellum and scutellum yellowish brown to tan; thorax otherwise brownish black; femora dark brown basally, legs otherwise yellowish brown; wing brown anteriorly. Abdomen mainly blackish brown; T2 and T3 partially orange-tan; female with T6 dorsally and all T7 orange-tan; male protandrium anterodorsally orange-tan; female T7 bulbous anteriorly, tapered and laterally compressed distally; T8 elongate, laterally compressed.

Redescription

Head (Fig. 250). Occiput, median occipital sclerite and vertex yellowish brown; occipital setae brown, short, moderately sparse, fine ventrally, stronger dorsally. Setae of vertex across width posterior of ocellar tubercle. Ocellar tubercle smooth, blackish brown anteriorly, orange posteriorly. Frons collapsed in type,

colour not distinct; apparently yellowish brown posteriorly and laterally, dull reddish brown medially; other specimens similar; bare; width about 1.7x length; differentiated fronto-orbital setae absent. Lunule obscured by protruding ptilinum in type; other specimens mid to dark brown; length about 1.5x diameter of base of antenna. Antenna distinctly longer than head height; scape and ventrobasal part of pedicel yellowish brown, dorsoapical half of first flagellomere blackish; otherwise reddish brown; covered in dirt in type; ratio of segment lengths: 1:0.8:4 (approximately). Pedicel with transverse dorsal keel close to base. First flagellomere with slight dorsal swelling on basal half. Stylus (Fig. 251) black; about 0.2x length of first flagellomere; stylus of type damaged and covered in dirt. Face almost bare. Parafacial of type not able to be seen; other specimens mainly yellowish; brown ventrally and lateral of ptilinal suture; narrowly silver pruinose laterally; much wider than facial ridge. Facial ridge yellowish; damaged in type. Antennal fovea shiny dark brown medially, otherwise yellow, silvery pruinose. Facial carina black; poorly developed dorsally, strong ventrally adjacent to frontoclypeal tubercle. Frontoclypeal tubercle mainly yellow; proximal part blackish brown. Cheek diffusely brown medially, otherwise yellow; slightly concave; almost bare except for some minute, fine, yellowish setae around epistomal margin. Postgena yellow, finely white pruinose; setae short, fine, pale brown. Haustellum blackish brown, about 2x head length.

Thorax. Postpronotal lobe yellowish brown to tan; about 7 short, strong, black setae. Mesoscutum mainly brownish black; supra-alar region, postalar callus, and anterior of scutellum yellowish brown to tan; silvery yellow pruinose medial of postpronotal lobe and finely on tan areas; with short, strong setae over entire surface; bristles present: several npl, pal; 1 short ial, ipal. Scutellum yellowish brown to tan, finely silvery yellow pruinose; with short, strong setae over entire surface and one pair of moderately long, strong bristles. Postnotum brownish black, silvery yellow pruinose, especially on laterotergite. Pleura blackish brown, finely silvery yellow pruinose. Type specimen with 1 prepst bristle; other specimens with numerous; numerous kepst bristles present. Prosternum dark brown, silvery pruinose. Coxae dark brown, silvery pruinose. Trochanters yellowish brown. Femora with basal half extensively dark brown, otherwise yellowish brown; finely white pruinose. Tibiae and tarsi yellowish brown, silvery pruinose; microsetae golden. Claws (Figs 248,249) long; thicker and less curved apically in female than in male. Wing (Fig. 234) brown in cells bc, c, sc, r_1, r_{2+3}, anteriorly in r_{4+5}; brown areas somewhat darker in apical half of wing. Sc ending beyond mid wing length. Vena spuria conspicuous. Distal section of M with distinct curve closer to discal cell than to its apex and sharp bend at apex so that it meets R_{4+5} almost at right angles. Petiole length about 0.4x length of dm-cu. CuA_2+A_1 about 2x length of petiole. Haltere yellowish except for light brown base.

Abdomen. Shape of female more or less parallel sided, widening slightly to T5; male constricted at T2–3; all tergites with short black setae. T1 of female only slightly wider than T2; in male markedly wider than T2, rounded, lobe-like laterally; mainly blackish brown, lighter brown and whitish pruinose across posterior margin. T2 blackish brown on anterior two-thirds to three-quarters dorsally and narrowly laterally; otherwise orange-tan; white pruinose; about 2x length of T1. T3 narrowly orange-tan anteriorly, otherwise blackish brown; male also very narrowly orange-tan posteriorly; about same length as T2. T4 blackish brown; about 0.8x length of T2. S1–4 brown, finely white pruinose; with several long lateral setae.

Female (Fig. 235). T5 blackish brown; yellowish brown pruinose; setae longer across posterior margin. T6 orange-tan dorsally; otherwise dark brown; yellow pruinose; about 0.7x length of T3–5 together. T7 (Fig. 252) tan; finely yellow pruinose except distally; long, about 0.8x length of T6; bulbous anteriorly; tapered and laterally compressed distally; setae very short, spicule-like distally except for a few moderately long ventral setae. T8 (Figs 253,254) strongly sclerotised, shiny dark tan; elongate, laterally compressed; with very short, spicule-like setae laterally and a few moderately long anterodorsal setae. Female genital plate (Fig. 252) dark brown; long; anterior surface folding posteriorly; apex narrowed but squarish; spicules dense at apex; otherwise scattered over most of surface; anterior surface bare except for fine, short setae at apex; posterior surface with long, scattered setae. S6 (Fig. 254) compressed, projecting ventrally, with dense spicules and long fine setae.

Male. T5 blackish brown, finely yellowish pruinose dorsally; about same length as T4. Protandrium orange anterodorsally; otherwise blackish brown; extensively yellow pruinose; about as long dorsally as T5. S8 blackish brown, finely whitish pruinose; narrower than epandrium; convex in continuous plane with protandrium. Epandrium dark brown. S5 blackish brown; with moderately long setae posteriorly and a few spicules posteromedial.

Measurements. Total length = 9.7–11.3 mm; wing length = 6.5–7.6 mm.

Distribution. The type is labelled as collected in Tasmania. The other material examined is from south-eastern and southern central Queensland and eastern New South Wales (Fig. 292).

Comments. Hardy (1929) discussed the accuracy of Tasmania as the collection locality of many of the flies described by Macquart in *Diptères Exotiques.* He concluded that the correct locality for many species may be Sydney. Since no material of *P. fasciata* is available from Tasmania and all other specimens are from mainland Australia, Sydney seems a more likely collection area for the type specimen of this species.

Pleurocerina lamellata, sp. nov. (Figs 236, 255–258, 293)

Type material. Holotype. ♂, New South Wales: Tibooburra—Cobham Lake, 17.xi.1949, S. J. K. Paramonov (ANIC). Paratypes. **Queensland**: 1♂, 3♀, 62 km SW Boulia, 16–17.x.1978, D. H. Colless, on blossom (ANIC); 1♂, 95 km W Bollon, 17.xi.1979, K. L. Walker, on *Eucalyptus camaldulensis* Dehnh. (UQIC); 1♀, Cunnamulla, 27–29.x.1979, H. E. & M. A. Evans & A. Hook (UQIC); 1♂, Warri Border Gate—Naryilco, 3.xi.1949, S. J. Paramonov (ANIC). **New South Wales:** 2♂, 1♀, same data as holotype (ANIC); 2♀, Cobham Lake, 18.xi.1949, S. J. K. Paramonov (ANIC). **South Australia**: 1♂, 52 km S Hamilton Down HS, 27°05’11”S 135°15’41”E, 19.x.1995, K. Walker, on *Hakea* (MVMA). **Northern Territory:** 1♂, 25 km S Barrow Ck, 7.xi.1974, E. M. Exley & R. I. Storey, on *Eucalyptus normantonensis* (UQIC); 1♀, 65 km E Alice Springs, 23°35’15”S 134°21’31”E, 12.x.1995, K. Walker, on *Leptospermum*; 1♂, 30 km N Hermansberg, 23°50’28”S 132°41’31”E, 9.x.1995, K. Walker, on *Hakea* (all MVMA).

Diagnosis

Head entirely yellow; pedicel of antenna with prominent transverse dorsal flange close to base. Postpronotal lobe, mesoscutum laterally and posteriorly, and scutellum yellow; legs yellow; fore femur with short black spines anterobasally. Abdominal T4 entirely and T5 partly blackish brown; tergites otherwise yellow.

Description

Similar to *P. longicornis*; character states not mentioned are as for that species.

Head. Occiput yellow; setae moderately sparse. Median occipital sclerite, vertex and frons yellow. Lunule dark brown. Antenna (Fig. 255) mainly orange; first flagellomere blackish dorsally on distal two-thirds; ratio of segment lengths: 1:1.2:3. Pedicel with prominent transverse dorsal flange close to base (Fig. 256). First flagellomere with distinct dorsal swelling on basal half. Stylus (Fig. 257) blackish brown, about 0.13x length of first flagellomere. Antennal foveae, facial carina, frontoclypeal tubercle, and cheek yellow; setae of cheek very short, yellow. Postgena yellow, finely white pruinose. Clypeus light brown. Haustellum yellowish brown; labellum black; 2.2x head length.

Thorax. Postpronotal lobe yellow, white pruinose on posterior part. Mesoscutum (Fig. 258) mainly black; medial of postpronotal lobe, notopleuron, supra-alar region, postalar callus, and anterior of scutellum yellowish; white pruinose medial and posterior of postpronotal lobe. Scutellum yellowish, finely white pruinose; marginal bristles not developed. Postnotum white pruinose, more densely on laterotergite; mediotergite blackish brown; laterotergite mainly yellow with narrow posterior dark brown band. Pleura with broad white pruinose band on posterior halves of anepisternum and katepisternum; these areas plus propleuron, anterior band of

anepisternum and posterior half of anepimeron, yellowish brown; pleura otherwise dark brown. Several prepst and kepst bristles present. Prosternum brown anteriorly, yellow posteriorly. Legs entirely yellow; tarsi yellowish brown; microsetae golden. Wing (Fig. 236) smoky brown in cell sc distal to crossvein, apical halves of cells r_1 and r_{2+3}, and r_{4+5} anterior of vena spuria. Crossvein sc-r at apex of Sc; petiole 0.6x length of dm-cu; CuA_2+A_1 about same length as or slightly shorter than dm-cu; longer than petiole.

Abdomen. T1 wider than T2, rounded, lobe-like laterally; deep yellow, diffusely darker at base. T2 and T3 yellow; T2 about 3x length of T1 in male; about 2x length of T1 in female. T3 slightly shorter than T2. T4 blackish brown; about 0.8x length of T2. S1–3 yellowish; S4 blackish brown.

Female. T5 mainly blackish brown dorsally; yellowish orange posteriorly and laterally, finely yellow pruinose. T6–8 yellowish orange. T6 finely golden yellow pruinose; about 0.6x length of T3–5 together. Female genital plate brown, often partly yellow anteriorly; with about 8 close rows of spicules on apical half; spicules less densely scattered over base.

Male. T5 mainly yellowish orange, dark brown laterally; finely golden yellow pruinose; about same length as T4. Protandrium yellowish orange, entirely golden yellow pruinose; dorsal length slightly longer than length of T5. S8 yellowish, finely yellow pruinose. Epandrium yellowish orange; cerci brown. S5 blackish brown; spicules absent.

Variation. Lunule light to dark brown. Scutellum occasionally with one pair of moderately weak, short, subapical convergent bristles; mediotergite sometimes yellowish orange immediately below scutellum; anepisternum and anepimeron sometimes entirely or mostly yellowish brown; sc-r crossvein usually a little before apex of Sc.

Measurements. Total length = 11.5 mm (8.9–12.2 mm); wing length = 7.2 mm (5.7–7.8 mm).

Distribution. South-western Queensland, north-western New South Wales, central Australia (Fig. 293).

Comments. This species resembles *P. longicornis*; both species have the dorsobasal flange on the antennal pedicel and the short black spines on the femur. *P. longicornis* has blackish brown markings on the tibiae, tarsi and facial carina.

Etymology. The specific name is from the Latin word *lamella* (= small plate or blade) and refers to the prominent process at the base of the pedicel of the antenna.

Pleurocerina longicornis (Kröber), comb. nov. (Figs 259, 275, 276, 294)

Paraconops longicornis Kröber 1915a: 74

Type material. Holotype (examined). ♀, Queensland: **L1**: Cairns, N.O. Aust.; **L2**: coll. Lichtwardt; **L3**: Holotypus; **L4**: Paraconops longicornis Kröb. ♂ O. Kröber det. 1914 (DEI).

Additional material. **Queensland**: 1♂, Bamaga, 10°53’S 142°24’E, 5–12.xii.1986, malaise trap (QDPI); 1♀, Gordon Ck area Claudie Riv. district, 29.vi.1982 (UQIC); 2♂, 2♀, 3 km NE Mt Webb, 15°03S 145°09E, 2–3.x.1980 (ANIC); 1♀, Turtle Ck, Cairns, 6.viii.1972 (UQIC); 1♀, Luster Ck. 8 km NW Mt. Molloy, 21–22.v.1980 (ANIC); 1♀, 2 km E Wild R. xing, nr lnnot Hot Springs, 10.i.1981; 1♂, 3♀, Yeppoon, 11.i.1962, 13.x.1979; 1♂, Capricorn Coast Nat. Pk, Rosslyn Head Section, Kemp Beach, Malaise trap, 23°10’13”S 150°47’3019”E, 18.xi.1995; 1♂, Mt. Moffatt Nat. Pk, Marlong Arch, 820 m, 24°59’28”S 147°53’48”E, 19.xi.1995; 2♂, Mt. Moffatt Nat. Pk, Park Headquarters, 740 m, 25°01’S 147°47’E, 17.xi.1995; 1♂, Carnarvon Nat Pk, Mt. Moffatt Section, 740 m, Rangers Station, 25°01’19”S 147°57’18”E, 16–18.xi.1995; 1♂, 1♀, Carnarvon Nat Pk, Mt. Moffatt Section, 25°04’01”S 148°00’50”E, 26.xi.–2.xii.1997, Malaise trap; 1♂, Carnarvon Nat Pk, Mt. Moffatt Section, 740 m, 3 km SE Ranger Station, 25°04’39”S 148°00’30”E, 18.xi.1995; 2♂, Carnarvon Nat Pk, Mt. Moffatt Section, Chimneys, 25°06’01”S 147°52’01”E, 1.xii.1997; 1♂, 21 km S of Eidsvold, 27.x.1977, on *Atalaya hemiglauca*; 1♂, Lake Broadwater, 25 km SW Dalby, 27°21’S 151°06’E,

12.iv.1986, site B (QM, UQIC); 1♂, Brisbane, 17.i.1927 (QDPI); 1♂, 1♀, 5 km N Leyburn, 27°58'S 151°38'E, 12.ii.1986; 1♂, Goondiwindi, xii.1927 (all UQIC). **New South Wales:** 1♀, 10 km S Coonabarabran, 13–17.i.1980 (UQIC); **Northern Territory:** 1♂, 2♀, Cooper Ck, 19 km SE Mt Borradaile, 9.xi.1972, 5.xi.1973; 1♀, 5 km NNW Cahills Crossing, East Alligator R., 9.vi.1973; 2♀, 12 km WNW Ross R. Tourist Camp, 23°32'S 134°23'E, 13,20.x.1978 (all ANIC).

Diagnosis

Pedicel of antenna with prominent transverse dorsal flange close to base; frontoclypeal tubercle and cheek yellow. Postpronotal lobe, notopleuron, postalar callus, scutellum, laterotergite, and band on anepisternum and katepisternum, yellowish, golden yellow pruinose; femora and tibiae mainly yellow, tibiae dark brown distally; fore femur with short black spines on anterobasally; tarsi mainly blackish brown. Abdomen blackish brown at least partially on most segments; otherwise yellow or orange.

Redescription

Head. Occiput yellowish brown, lighter ventrally; occipital setae fine ventrally, stronger dorsally, brown dorsally; yellow ventrally. Median occipital sclerite yellow to deep yellowish brown, sometimes dark brown around occipital foramen. Vertex transparent yellowish brown; cushion-like, raised above plane of frons; setae sparse, moderately short. Ocellar tubercle blackish brown. Frons mainly yellow, with narrow brown median stripe from ocellar tubercle to lunule (stripe occasionally absent or hardly discernible); frons nearly twice as wide as long. Lunule brown to black; length variable; usually about 1.5x diameter of base of antenna. Antenna slightly longer than head height; mainly light reddish orange; lateral surface of pedicel often brown; first flagellomere black distally to variable extent, especially dorsally; ratio of segment lengths: female about 1:1:3; male about 1:1.2:2.5. Basal half of pedicel with prominent transverse dorsobasal flange. Stylus black; apparently two-segmented in type (Kröber 1915a) and some other specimens; usually a short basal segment discernible; segment 1 short, disc-shaped, segment 2 with short, ventral projection; segment 3 with short, sharp bristle apically; length about 0.15x length of first flagellomere. Parafacial yellow, silver pruinose laterally. Facial ridge yellow. Antennal fovea pale yellow except adjacent to carina, white pruinose. Facial carina blackish brown. Frontoclypeal tubercle yellow. Cheek yellow; setae minute, yellowish. Postgena yellow, finely white pruinose; setae short, pale brown. Clypeus brown to black. Haustellum variably coloured from mainly yellow to black; 2.3x head length (Kröber 1919c, Figs 3a,b).

Thorax. Postpronotal lobe yellowish, yellow pruinose on posterior part; setae sparse. Mesoscutum mainly brownish black, finely yellowish pruinose; notopleuron, postalar callus, and narrowly, to variable extent anterior of scutellum, yellowish brown; supra-alar region partially brown; densely golden yellow pruinose medial and posterior to postpronotal lobe, on notopleuron and post-alar callus; several npl, pal present. Scutellum yellowish brown, golden yellow pruinose; with one pair moderately weak, subapical convergent marginal bristles. Postnotum yellow pruinose, more densely on laterotergite; mediotergite blackish brown, laterotergite mainly yellow with narrow posterior dark brown band. Pleura with broad yellow pruinose band on posterior halves of anepisternum and katepisternum; these areas plus anterior band of anepisternum and posterior half of anepimeron, yellowish brown; pleura otherwise dark brown; several prepst and fine kepst bristles present. Prosternum brown, sometimes yellow. Fore coxa yellow; mid and hind coxae orange, white pruinose. Trochanters yellowish brown. Femora yellow; hind femur of type and some others with brown patch posteroapically; fore femur (Fig. 259) curved, with short black spines anterobasally; mid femur with defined row of longer setae on posterodorsal margin, dorsal surface with sparse, extremely short black setae. Tibiae mainly yellowish, apical third of fore and mid tibiae, especially posteriorly, blackish brown; hind tibia sometimes dark brown apically. Fore and mid tarsi blackish brown except orange apex of tarsomere five; hind tarsus dark yellowish brown, lighter apically; tarsi broad, dorsoventrally flattened; microsetae golden brown. Wing smoky brown in cells sc distal to crossvein, r1, apical half of r2+3, anterior of vena spuria of r4+5. Petiole

length from 0.45–0.7x length of dm-cu. CuA_2+A_1 about same length as or slightly shorter than dm-cu; longer than petiole.

Abdomen. Overall shape of female more or less parallel sided, widening slightly to T5; male constricted at T2–3; all tergites with black setae, shorter and less dense dorsally on T1–3. T1 of female only slightly wider than T2; in male markedly wider than T2, rounded, lobe-like laterally; orange on lateral tubercle, otherwise blackish brown; white pruinose posteriorly; with numerous long bristles laterally. T2 mainly yellow to reddish orange; blackish brown anterodorsally; lateral setae finer and longer than dorsal setae, more numerous in male; T2 more than 2x length of T1; female slightly longer than wide; male narrow, tapered posteriorly. T3 yellow to reddish orange anteriorly, blackish brown posteriorly; males often with only narrow blackish brown posterior band; slightly shorter than T2. T4 blackish brown; about 0.7x length of T2. S1 and S4 brown; S2 brown anteriorly, yellowish posteriorly; S3 mainly yellowish. S1 with long setae across base; all sternites with several long lateral setae.

Female. T5 narrowly yellowish orange posterolaterally, otherwise blackish brown; finely yellow pruinose. T6 blackish brown dorsally, otherwise yellowish orange; golden yellow pruinose; about 0.7x length of T3–5 together. T7 yellowish orange, anterior margin often deep reddish brown; about same length as T6. T8 shiny yellowish orange. Female genital plate (Fig. 275) dark brown, long, broadly rounded apically; anterior surface bare except for fine, short setae at apex; posterior surface with long, scattered setae; spicules (Fig. 276) relatively short, broad; dense at apex, otherwise scattered over most of surface. S6 with dense short spicules and long fine setae.

Male. T5 blackish brown, almost entirely golden yellow pruinose; slightly longer than T4. Protandrium mainly yellowish orange, variably blackish brown anteriorly; entirely golden yellow pruinose; about as long dorsally as T5. S8 yellowish, finely yellow pruinose, slightly more convex than protandrium. Epandrium mainly brown dorsally, otherwise yellowish brown. S5 blackish brown; with a few minute spicules posteromedial and moderately long setae posteriorly.

Variation. The extent of the brown mark on the frons varies from absent or hardly discernible to large and triangular, extending from the posterior corners to the lunule. The pleura sclerites are occasionally almost entirely brownish black except for the pruinose areas or may be more extensively yellow than indicated above; the anepisternum and katepisternum anteriorly and the meron are always dark.

Measurements. Total length = 8.5–11.5 mm; wing length = 5.6–7.1 mm.

Distribution. Eastern Queensland, New South Wales and Northern Territory (Fig. 294).

Comments. Kröber's determination label on the holotype mistakenly indicates that the specimen is a male. Four female specimens from northern Queensland (Mt Webb and Captain Billy Landing) have additional brown markings on the following areas: vertex, posterodorsal margin of eye, frontoclypeal tubercle, and dorsal surface of all femora; these specimens also have a large triangular mark on the frons. In the absence of male specimens similarly marked and because some of these differences are seen in specimens I consider to be *P. longicornis*, I refrain from distinguishing them as different from *P. longicornis.*

Pleurocerina lutea, sp. nov. (Figs 260, 261, 266, 295)

Type material. Holotype. ♂, Queensland: 14 km NW Monto, 12.iii.1976, E. Exley, on *Eucalyptus* sp. (QM).

Diagnosis

Head, including antenna and haustellum, mainly yellow; frons with pale brown median band; cheek with pale brown patch. Postpronotal lobe, mesoscutum laterally and posteriorly, scutellum, and laterotergite yellow; thorax extensively golden-yellow pruinose; legs entirely yellow. Abdomen mainly blackish brown; T2 entirely, T3 anteriorly, S8, and epandrium yellow.

Description

Similar to *P. longicornis*; character states not mentioned are as for that species.

Head. Occiput and median occipital sclerite pale yellow. Ocellar tubercle brown. Frons mainly yellow, diffusely pale brown medially. Lunule yellow. Antenna slightly longer than head height; almost entirely golden yellow; stylus partially brown; ratio of segment lengths: 1:1.25:2.5. Stylus (Fig. 266) distinctly three-segmented; length about 0.25x length of first flagellomere. Facial carina brown adjacent to yellowish brown frontoclypeal tubercle. Cheek yellow with diffuse pale brown patch. Postgena whitish yellow, finely white pruinose. Haustellum mainly yellow; slightly more than 2x head length.

Thorax. Postpronotal lobe yellowish, yellow pruinose on posterior part. Mesoscutum mainly brownish black as in *P. lamellata* (Fig. 258), golden-yellow pruinose; notopleuron, supra-alar region, postalar callus, and broadly anterior of scutellum, yellowish brown; mesoscutum entirely golden yellow pruinose, more densely medial and posterior of postpronotal lobe and on notopleuron; several npl, pal present. Scutellum yellowish brown, golden-yellow pruinose. Postnotum yellow pruinose, more densely on laterotergite; mediotergite blackish brown, laterotergite mainly yellow with narrow posterior dark brown band. Pleura white pruinose with broad yellow pruinose band on posterior half of anepisternum; this area plus anterior band of anepisternum and posterior halves of anepimeron and katepisternum, yellowish brown; pleura otherwise dark brown; several long prepst and 4 or 5 long, very fine kepst bristles present. Prosternum yellow. Legs entirely yellow. Wing light brown in cells c, sc, r_1, r_{2+3}, anterior half of r_{4+5}; brown slightly darker around distal half of R_{4+5}.

Abdomen. Male markedly constricted at T2–3 (Fig. 260). T1 light brown; golden-yellow pruinose posteriorly. T2 yellow; golden-yellow pruinose. T3 yellow anteriorly, blackish brown posteriorly. T4 blackish brown. S1, S3, S4 brown; S2 yellow.

Female. Unknown.

Male. T5 and protandrium blackish brown, almost entirely densely golden-yellow pruinose. S8 brown, finely yellow pruinose. Epandrium yellowish brown. S5 (Fig. 261) dark brown, broad; posteromedial area slightly raised, covered with spicules.

Measurements. Total length = 9.7 mm; wing length = 7.0 mm.

Distribution. South-eastern Queensland (Fig. 295).

Comments. This species differs from *P. longicornis* and *P. lamellata* in lacking a flange on the base of the antennal pedicel and short black spines on the anterobasal surface of the fore femur. The shape of the abdomen is distinctive.

Etymology. The specific name is from the Latin adjective *luteus* (= yellow) and refers to the overall yellow colouration of this species.

***Pleurocerina luteiceps*, sp. nov. (Figs 237, 264, 265, 296)**

Type material. Holotype. ♂, **Western Australia**: 13 km SE Dongara, 30.xii.1975, E. Exley & R. Storey, on *Eucalyptus* sp. (QM). Paratypes. **South Australia**: 2♀, ca 20 km W Nullarbor HS, 24.xi.1987, T. F. Houston (WAM); 1♀, Brookfield Cons. Pk, 34°21'S 139°29'E, 1.xii.1992, I. Naumann & J. Cardale (ANIC). **Western Australia**: 3♂, same data as holotype (UQIC); 1♀, 26 km E Madura, 31°54'S 127°14'E, 21.xi.1989, K. L. Walker, on *Melaleuca* (MVMA); 1♂, 1♀, nr Madura, 29.xi.1989, B. Heterick, at Mallee blossom (WADA); 1♂, Dedari, 45 km WSW Coolgardie, 20.i.1982, B. Hanich & T. F. Houston (WAM); 1♂, Tarin Rock, 48.2701 (WAM).

Diagnosis

Head yellow except for blackish brown facial carina, frontoclypeal tubercle and band on upper part of occiput. Postpronotal lobe brownish black; scutellum orange-brown; pleura blackish brown; legs reddish orange to

yellow; wings hyaline. Abdominal T2 and T3 reddish orange; female T8 and genital plate yellowish brown; male with band of spicules on S5.

Description

Similar to *P. turneri*; character states not mentioned are as for that species.

Head. Occiput blackish brown dorsally, pale yellow ventrally. Median occipital sclerite and vertex yellowish brown. Frons yellow. Lunule narrow, length at most equal to diameter of base of antenna. Antenna (Fig. 264) a little shorter than head height; scape and pedicel dark brown; first flagellomere dark brown dorsoapically, otherwise orange-brown; ratio of segment lengths: 1:1.5:3. Stylus (Fig. 265) blackish brown; about 0.2x length of first flagellomere. Facial carina and frontoclypeal tubercle blackish brown; otherwise face, cheek, and postgena entirely yellow; cheek almost bare except fore some minute yellowish setae around epistomal margin. Setae of postgena short, yellow. Haustellum 2.3x head length.

Thorax. Postpronotal lobe mainly brownish black, dark brown anteriorly; finely white pruinose. Mesoscutum mainly black; supra-alar region, postalar callus, and narrowly anterior of scutellum brown; silvery yellow pruinose; several npl and pal, 1 ipal present. Scutellum orange-brown; two pairs marginal bristles present; one pair convergent, posterior and second pair shorter, more lateral and dorsal. Pleura blackish brown, finely white pruinose. Several prepst and numerous dorsal kepst bristles. Coxae yellowish brown, white pruinose. Trochanters yellowish brown. Femora reddish orange; fore femur with dense, very short black setae anterobasally. Tibiae yellowish to reddish orange; hind tibia somewhat darker anteriorly. Tarsi yellowish brown. Claws of female thicker than those of male. Wing (Fig. 237) entirely hyaline; petiole 0.6x length of dm-cu; CuA_2+A_1 1.3x length of petiole.

Abdomen. T1 of female only slightly wider than T2; in male markedly wider than T2, rounded, lobe-like laterally; T1 partially dark brown dorsally, otherwise reddish orange; silvery pruinose across posterior margin. T2 reddish orange; silvery pruinose across posterior margin; in male distinctly longer than wide, about 2x length of T1; in female about as long as wide, 1.5x longer than T1. T3 reddish orange; silvery pruinose across posterior margin; female dark brown across posterior margin. T3 about same length as T2 in male; slightly longer than T2 in female. T4 brownish black; about 0.8x length of T2. S4 about same width as S3.

Female. T5 and T6 blackish brown, finely white pruinose. T6 about 0.5x length of T3–5 together. T7 blackish brown around projection of T6, otherwise yellowish brown; relatively narrow, slightly longer than T6. T8 shiny yellowish brown. Female genital plate mainly yellowish brown, darker brown basally; moderately short, broadly rounded apically; spicules dense at apex; anterior surface with fine, short setae; posterior surface with long setae. S6 with long fine setae and large area of spicules, moderately densely arranged but not in defined rows.

Male. T5 brownish black, finely white pruinose; about same length as T4. Protandrium brownish black, finely white pruinose; with diffuse median orange patch; not distinctly angulate. S8 brown anteriorly, blackish brown posteriorly; narrower and much shorter than epandrium; slightly more convex than protandrium. Epandrium dark brown. S5 dark brown, with broad posterior band of spicules and long, lateral black setae.

Variation. Ratio of antennal segment lengths in female: 1:1.4:3.25; usually 2 or 3 npl bristles and sometimes 1 or 2 short intra-alar bristles present; femora sometimes yellowish. Petiole of wing may be relatively longer than in holotype. T1 of female often mainly dark yellowish brown. Protandrium sometimes without orange patch.

Measurements. Total length = 9.7 mm (6.4–10.5 mm); wing length = 6.2 mm (4.3–6.5 mm).

Distribution. Southern South Australia and south-western Western Australia (Fig. 296).

Comments. This species can be distinguished from *P. turneri* by the yellow frons, cheek and postgena and absence of dark basal bands on the femora. The female genital plate is yellowish brown, not dark brown as in *P. turneri*. Males of *P. luteiceps* lack the distinct spicule-bearing projection of S5 found in *P. turneri*.

Etymology. The specific name is formed from the Latin words *luteus* (= yellow) and *caput* (= head).

***Pleurocerina nigrifacies* (Kröber), comb. nov. (Figs 262, 263, 267, 297)**

Paraconops nigrifacies Kröber 1940: 66

Type material. Holotype (not examined). ♂, Western Australia: Marloo Station, Wurarga, viii.–ix. (Berlin).

Additional material. **Western Australia:** 3♂, 7 km W Lake King, 33°05'S 119°40'E, 2.xi.1989, on *Eucalyptus* (MVMA).

Diagnosis

Face, cheek, postgena and most of occiput black. Postpronotal lobe, mesoscutum laterally and posteriorly, and scutellum orange-tan; mesoscutum otherwise black; wing with anterior brown band on apical half. Abdominal T2, T3 and protandrium mainly reddish-tan; tergites otherwise black.

Redescription

Head. Occiput mainly black, orange dorsolaterally; setae black, moderately sparse, fine ventrally, stronger dorsolaterally. Median occipital sclerite orange, blackish brown around occipital foramen. Vertex orange, yellowish brown anteriorly; cushion-like, raised above plane of frons; setae black, moderately long and strong. Ocellar tubercle with median longitudinal groove; blackish brown anteriorly, orange posteriorly. Frons mainly yellow, usually with black median patch posterior of lunule or with black band from ocellar tubercle to lunule; shallowly transversely rugose, slightly tuberculate anteromedially; width 1.5x length. Lunule blackish brown; length about 1.5x diameter of base of antenna. Antenna (Fig. 262) mainly black or blackish brown; scape reddish ventrally; first flagellomere sometimes reddish-orange at base and ventrally; ratio of segment lengths: 1:1.3:3; dorsal swelling on base of first flagellomere only vaguely indicated. Stylus (Fig. 263) black; about 0.2x length of first flagellomere. Parafacial blackish brown; narrowly silver pruinose laterally (1 specimen only partially brown, otherwise yellowish). Facial ridge wrinkled; yellowish brown to black. Antennal foveae blackish brown medially; otherwise colourless, white pruinose. Facial carina black; poorly developed dorsally, strong ventrally adjacent to frontoclypeal tubercle. Frontoclypeal tubercle black. Cheek black, almost bare except fore some minute setae around epistomal margin; setae blackish. Postgena blackish brown, silvery pruinose; setae moderately short, black. Haustellum blackish brown, about 2x head length.

Thorax. Postpronotal lobe orange-tan, finely silvery pruinose posteriorly; setae moderately dense laterally, moderately long. Mesoscutum mainly black; notopleuron, supra-alar region, postalar callus, and anterior of scutellum orange-tan; silvery pruinose medial and posterior of postpronotal lobe and on orange-tan areas; with very short, strong black setae over entire surface; numerous npl and pal, 2 short ial present. Scutellum orange-tan; with one pair of long, convergent bristles. Postnotum mainly black; band below scutellum and laterotergite, except posterolaterally, orange-tan. Pleura mainly black; anepisternum and anepimeron sometimes partially tan; finely white pruinose especially on anepisternum and katepisternum; numerous prepst and dorsal and ventral kepst bristles present. Prosternum black. Coxae black, silvery pruinose. Trochanters blackish brown. Femora deep reddish brown, black basally (1 specimen entirely orange); fore femur with dense, very short black setae anterobasally; mid femur with defined row of longer setae on posterodorsal margin, dorsal surface almost bare. Tibiae deep reddish brown. Tarsi dark brown; microsetae golden. Wing dark brown in distal halves of cells r_1 and r_{2+3}, and anterior half of r_{4+5}; pale brown in remainder of distal half of wing; petiole length about half length of dm-cu; CuA_2+A_1 about same length as petiole. Haltere base and pedicel brown, capitellum yellow.

Abdomen. Overall shape elongate, narrowest at T2–3; all tergites with very short black setae, shorter and less dense dorsally on T2–3. T1 markedly wider than T2, rounded, lobe-like laterally; mainly black; reddish tan across posterior margin. T2 and T3 reddish tan; finely white pruinose posteriorly. T2 with numerous long setae laterally; about 3x length of T1. T3 about same length as T2. T4 black; about 0.7x length of T2. S1 and S4 blackish brown; S2 and S3 partially or entirely orange; all sternites finely white pruinose with long lateral setae.

Female. Unknown.

Male. T5 black, sometimes with orange dorsal patches, about same length as T4. Protandrium (Fig. 267) reddish tan; distinctly pointed, dorsal length 1.5x length of T5. S8 black, distinctly more convex than protandrium. Epandrium and S5 brownish black. S5 with long black setae, spicules absent.

Measurements. Total length = 11.5 mm (11.7–13 mm); wing length = 8.5 mm (8.2–9 mm).

Distribution. South-western Western Australia (Fig. 297).

Comments. The type is not in the Deutsches Entomologisches Institut at Eberswalde where most of the Australian types of Kröber are located. I have not carried out an exhaustive search for this type because the original description was adequate to positively identify the three male specimens listed above as conspecific with Kröber's *Paraconops nigrifacies*.

Pleurocerina occidua, sp. nov. (Figs 268, 269, 298)

Type material. Holotype. ♂, Western Australia: Fitzgerald R. Nat. Pk, 33°59'S 119°15'E, 24–28.xii.1978, T. F. Houston (WAM). Paratypes. **Western Australia**: 1♀, Cranbrook, 1.ii.1954, A. Douglas, Mallee (WAM).

Diagnosis

Postgena dark brown except for anterior yellow band. Postpronotal lobe deep yellow; mesoscutum mainly black; supra-alar region, postalar callus, anterior of scutellum and scutellum reddish orange; pleura blackish brown; legs reddish to yellowish brown; wing completely hyaline. Abdominal T2 (entirely) and T3 (at least anteriorly) orange; female T7 bulbous anteriorly; tapered and laterally compressed distally; T8 elongate, laterally compressed.

Description

Similar to *P. turneri*; character states not mentioned are as for that species.

Head. Occiput blackish brown except for dorsolateral orange-brown patch; with narrow silvery pruinose band around eye margin; occipital setae dark brown, moderately dense. Median occipital sclerite and vertex yellowish brown. Vertex about 0.6x length of frons, cushion-like, raised above plane of frons; setae concentrated in median region. Ocellar tubercle blackish brown anteriorly, orange posteriorly. Frons yellow laterally, yellow-brown posteriorly, black anteromedially; width 1.5x length. Lunule blackish brown; length about 1.5x diameter of base of antenna. Antennal scape and base of pedicel blackish brown; pedicel orange-brown distally; first flagellomere blackish brown dorsally except base, otherwise orange-brown; dorsal swelling on base of first flagellomere only vaguely indicated; ratio of segment lengths: 1:1:2.8. Stylus blackish brown; about 0.2x length of first flagellomere. Face with minute pale yellow setae. Parafacial yellow, narrowly dark brown adjacent to ptilinal suture; finely silver pruinose laterally. Facial ridge yellow. Antennal foveae yellow, blackish brown medially. Facial carina and frontoclypeal tubercle black. Cheek diffusely brown medially, otherwise yellow; setae minute, more dense around epistomal margin. Postgena yellow anteriorly, black posteriorly; finely silvery pruinose; setae moderately short, dark brown. Haustellum slightly more than 2x head length.

Thorax. Postpronotal lobe deep yellow; setae dark brown, moderately dense, strong and long. Mesoscutum mainly black; supra-alar region, postalar callus, and anterior of scutellum reddish orange; silvery yellow pruinose; with moderately short, dense black setae over entire surface; numerous npl and pal, and 1 or 2 ial and ipal, all poorly differentiated from surrounding setae. Scutellum reddish orange; with moderately long and dense setae over entire surface and two pairs bristles longer and stronger than other scutellar setae. Postnotum mainly black; laterotergite tan anterodorsally. Pleura brownish black, silvery pruinose; numerous prepst and dorsal and ventral kepst bristles present. Prosternum blackish brown, finely silvery pruinose. Fore coxa dark brown; mid and hind coxae blackish brown; all silvery pruinose. Trochanters blackish brown. Femora reddish

orange; fore femur with small posterobasal dark brown patch; fore femur with dense, very short black setae anterobasally and a row of extremely short, stout black setae on posteroventral margin of apical half; mid femur with longer setae on posterodorsal margin but not in a single row. Tibiae yellowish to reddish orange; fore and mid tibiae with small dark brown patch at extreme apex of posterior surface. Tarsi yellowish brown. Claws of female thicker than those of male. Wing completely hyaline; petiole 0.6x length of dm-cu; CuA_2+A_1 1.3x length of petiole.

Abdomen (Figs 268, 269). Male almost parallel-sided to posterior margin of T2, then gradually widening to end of T5; female almost parallel-sided to T4 then tapering. T1 of female only slightly wider than T2; in male markedly wider than T2, rounded, lobe-like laterally. T1 blackish brown, silver pruinose across posterior margin; with dense long bristles laterally. T2 reddish orange; silvery pruinose posteriorly; about 2x length of T1. T3 orange anteriorly and narrowly posteriorly, otherwise blackish brown; female without posterior orange band; T3 of male slightly shorter than T2; T3 of female same length as T2. T4 brownish black; about 0.8x length of T2. S1 and S4 blackish brown; S2 orange around margins, blackish brown medially; S3 mainly orange. S4 slightly wider than S3.

Female. T5–6 blackish brown, finely white pruinose. T6 about 0.7x length of T3–5 together. T7 (Fig. 269) blackish brown, finely white pruinose anteriorly; dark brown distally; slightly shorter than T6; bulbous anteriorly; tapered, laterally compressed distally. T8 shiny dark brown; laterally compressed, elongate, about 0.3x length of T7; with very short, spicule-like setae laterally and moderately long dorsal setae. Female genital plate strongly convex anteriorly, not markedly flattened; with about 8 irregular rows of spicules, not densely arranged; anterior surface with fine, moderately short setae; posterior surface with long setae.

Male. T5, protandrium and S8 brownish black, finely white pruinose. T5 slightly shorter than T4. S8 slightly more convex than protandrium. Epandrium dark brown. S5 with long black setae; spicules absent.

Variation. Paratype with fore coxa yellowish brown; other coxae and trochanters dark brown; femora dark yellow.

Measurements. Total length = 11.3 mm (12.2 mm); wing length = 7.4 mm (8 mm).

Distribution. South-western Western Australia (Fig. 298).

Comments. The first flagellomere and stylus of the left antenna of the holotype and both antennae of the paratype are missing. The female of this species has the compressed, elongate form of genitalia also possessed by *P. fasciata* and *P. scutellata*.

Etymology. The specific name is from the Latin word *occiduus* (= western); the species is known only from Western Australia.

Pleurocerina saxatilis, sp. nov. (Figs 238, 299)

Type material. Holotype. ♂, Queensland: Girraween Nat. Pk, 27.xi.1981, M. A. Schneider & G. Daniels (QM). Paratypes. **Queensland:** 2♀, Paschendaele, 23.xii.1968, 14.xii.1969, C. F. Ashby (ANIC); **New South Wales:** 1♂, 4 mls W Amosfield, 17.x.1971, E. M. Exley (UQIC); 2♂, 1♀, Wylie Creek, 22.xii.1968, C. F. Ashby (ANIC); 1♂, 6 mls W Ebor, 12.xii.1952, on *Leptospermum* (ANIC).

Additional material. **Queensland**: 4♂, 1♀, Brisbane, 18.ix.1911, 9.ix.,3.x.1912, 13.x.1914, 5.ix.1916 (QM); 1♂, 1♀, Sunnybank, ix.1927, 18.ix.1927 (QDPI, UQIC); 1♀, The Blunder, 26.ix.1966 (ANIC); 1♀, Stanthorpe, 28.x.1927 (QDPI). **New South Wales**: 1♂, Blue Mtns, i.1934 (AM). **Victoria**: 1♂, Lilydale, no date (MVMA).

Diagnosis

Frons usually with dark brown triangular mark; cheek dark brown. Postpronotal lobe, supra-alar region, postalar callus, and scutellum yellowish brown to tan; femora dark brown basally; legs otherwise dark yellow;

wing brown anteriorly. Abdomen mainly blackish brown; T2 entirely and T3 anteriorly orange-tan; female with T6 dorsally and all T7 orange-tan; male T5 dorsally and protandrium almost entirely orange-tan; female genital plate very large.

Description

Similar to *P. fasciata*; character states not mentioned are as for that species.

Head. Occiput mainly blackish brown, with deep yellow lateral band and narrow black band on upper third of eye margin. Median occipital sclerite and vertex yellowish brown. Frons with broad triangular brown mark from posterior corners to lunule, otherwise yellowish brown; width 1.8x length. Lunule blackish brown. Antenna mainly deep yellow to reddish, dorsoapical half of first flagellomere and stylus blackish brown; ratio of segment lengths: 1:1.5:3.3. Stylus about 0.2x length of first flagellomere. Ptilinal suture blackish brown. Parafacial mainly yellowish; brown ventrally. Facial ridge yellow. Facial carina black. Frontoclypeal tubercle blackish brown. Cheek brown; epistomal margin yellow. Postgena brown except for yellow anterior band.

Thorax. Postpronotal lobe yellowish brown; yellow pruinose. Mesoscutum mainly brownish black, bronze pruinose; yellow pruinose posteromedial of postpronotal lobe; supra-alar region and postalar callus yellowish brown. Scutellum yellowish brown, finely yellow pruinose. Postnotum mainly brownish black; silvery pruinose, especially on laterotergite, laterotergite partially yellowish brown. Pleura mainly blackish brown, finely silvery pruinose; anepimeron yellowish brown posteriorly; kepst bristles very fine. Legs mainly yellowish brown, femora brown basally. Wing as in Fig. 238.

Abdomen. T1 mainly blackish brown; narrowly yellowish brown across posterior margin. T2 yellowish brown; usually with dark brown anterolateral patch; finely yellow pruinose, more densely posteriorly; about 2x length of T1 in female, slightly longer in male. T3 yellowish brown dorsally on anterior two-thirds and more narrowly anterolaterally, otherwise blackish brown. T4 brownish black. S2 posteriorly and S3 anteriorly yellowish brown; sternites otherwise brown.

Female. T5 blackish brown. T6 mainly orange; usually dark brown ventrolaterally; yellow pruinose; slightly wider than long. T7 yellowish orange; finely yellow pruinose except distally; long, about 1.2x length of T6. T8 shiny tan. T7 and T8 not laterally compressed. Female genital plate dark brown; very long; spicules dense over most of surface. S6 large, with dense spicules and long fine setae.

Male. T5 mainly blackish brown; orange dorsally; finely yellowish pruinose dorsally. Protandrium mainly orange; blackish brown anterolaterally; extensively yellow pruinose. S8 blackish brown, finely whitish pruinose; narrower than epandrium; convex in continuous plane with protandrium. Epandrium dark brown. S5 blackish brown; with band of spicules posteromedial.

Variation. Frons with brown patch sometimes confined to median area; lunule colour variable from pale to dark brown. Femora usually with basal half extensively dark brown. T3 sometimes entirely yellowish brown; sometimes mainly blackish brown in females.

Measurements. Total length = 11.2 mm (9–12.5 mm); wing length = 7.8 mm (6.2–9.3 mm).

Distribution. South-eastern Queensland, eastern New South Wales, Victoria (Fig. 299).

Comments. This species differs from *P. fasciata* in having T2 entirely orange-tan. The male has T5 dorsally and the protandrium almost entirely orange-tan; *P. fasciata* has only the protandrium anterodorsally orange-tan. *P. saxatilis* females lack the unusual shape of T7 and T8 seen in *P. fasciata*.

Etymology. The specific name is the Latin adjective *saxatilis* (= found among rocks) and refers to the collection localities of the known specimens, most of which were taken in rocky areas in the granite belt of southern Queensland and northern New South Wales.

***Pleurocerina scutellata*, sp. nov. (Figs 277–280, 300)**

Type material. Holotype. ♀, Victoria: Wilsons Promontory, 5 mile beach road, 38°55'32"S 146°17'37"E, 29.i.1996, K. Walker, on *Melaleuca* (MVMA). Paratypes. **Victoria**: 1♂, 1♀, Cheltenham, 19.i.1919, C. E. Cole (MVMA); 1♂, Gippsland, no date (MVMA). **Tasmania:** 1♂, King George's Sound, no date (AM).

Diagnosis

Occiput brown with black silvery pruinose patch dorsolaterally; frons with median diffuse dark brown band; cheek infuscated with dark brown. Thorax brownish black except for orange-brown scutellum; wings hyaline. Abdominal tergites brownish black; female T7 and T8 elongate, laterally compressed except T7 anteriorly.

Description

Head. Occiput blackish brown dorsolateral, yellowish brown ventrolaterally, brown medially, silvery pruinose around eye margin. Median occipital sclerite mainly yellowish brown, with small blackish brown patch dorsolaterally. Vertex yellowish brown; vertex much shorter than frons. Ocellar tubercle blackish brown. Frons mainly yellowish brown, with blackish brown median patch posterior of lunule; ptilinal suture dark brown; rugose medially. Lunule dark brown; length about equal to diameter of base of antenna. Antenna about same length as head height. Antenna mainly black or blackish brown; scape apically, and first flagellomere ventrally brown (antennae of paratypes usually lighter brown than holotype; first flagellomere always darker dorsally than ventrally; ratio of segment lengths: 1:1:3.1; stylus about 0.25x length of first flagellomere. Parafacial mainly yellow, narrowly dark brown adjacent to ptilinal suture, infuscated with brown ventrally. Facial ridge yellow. Frontoclypeal tubercle blackish brown. Cheek diffusely brown medially, otherwise yellow. Postgena yellow anteriorly, black posteriorly; finely silvery pruinose.

Thorax. Postpronotal lobe brownish black, silvery pruinose. Mesoscutum mainly black, silvery pruinose narrowly medial and posterior of postpronotal lobe and on notopleuron; postalar callus dark brown; with moderately short, dense black setae over entire surface; mesoscutal bristles present: numerous npl and pal. Scutellum orange-tan; with short, strong setae over entire surface; one pair of long, widely-spaced convergent bristles. Postnotum black; laterotergite and mediotergite laterally, densely silvery pruinose. Pleura black; silvery pruinose, more densely on anepisternum and katepisternum. Femora reddish orange; dark brown on basal quarter of fore femur and extreme base of mid femur. Tibiae yellowish to reddish orange; fore and mid tibiae with small dark brown patch at extreme apex of posterior surface. Tarsi mainly yellowish brown, darker brown apically. Wing completely hyaline.

Abdomen. All sclerites blackish brown to black. T1–3 silver pruinose especially posteriorly. T2 in male distinctly longer than wide, about 2x length of T1; in female about as long as wide, 1.5x longer than T1. T3 about same length as T2.

Female. T5–7 silvery yellow pruinose except T7 posteromedially. T7 bulbous anteriorly; tapered, laterally compressed distally. T8 shiny blackish brown, paler dorsally; laterally compressed, elongate, about 0.3x length of T7. Female genital plate (Fig. 277) finely silvery yellow pruinose; with about 7 rows of spicules on apical third; spicules (Figs 278,279) relatively large, ridges with distinctive 'fringes'. S6 densely setose; with about 6, not very closely arranged rows of spicules; spicules (Fig. 280) relatively longer and thinner than those of genital plate. Posterior sternites long and narrow.

Male. T5, protandrium, S8, S5 silvery yellow pruinose, protandrium more densely than other sclerites. Epandrium dark brown. S5 without spicules.

Variation. Femora of paratypes dark yellow with dark basal areas absent or less conspicuous. Tibiae of paratypes entirely dark yellow.

Measurements. Total length = 9.8 mm (9.2–11.7 mm); wing length = 6.5 mm (5.8–7.1 mm).

Distribution. Southern Victoria, Tasmania (Fig. 300).

Etymology. The specific name is chosen because the orange scutellum is distinct from the remainder of the blackish or dark brown thorax.

***Pleurocerina similis* (Kröber), comb. nov. (Fig. 301)**

Paraconops similis Kröber 1940: 65

Type material. Holotype (examined). **L1**: Type; **L2**: Paraconops similis, Kröb. examined & det. O. Kröber, 1938.; **L3**: Paraconops similis Krb ♀ [hand written pencil]; **L4**: S. W. Australia. Yallingup. 23 dec. 13–23 Jan. 14. R. E. Turner. 1914-190.; **L5**: TYPE (NHM).

Additional material. **Western Australia**: 1♂, Geraldton, 26.ii.1915, on flowers; 1♂, 25 mls [40 km] S Coolgardie, 28.x.1958; 1♂, White Lake, Rockingham, 24.i.1937 (all ANIC).

Diagnosis

Frons blackish anteromedially, otherwise yellow to yellowish brown; facial carina and frontoclypeal tubercle blackish brown; postgena blackish brown, silvery pruinose. Postpronotal lobe, mesoscutum laterally and posteriorly and scutellum yellowish brown; femora and tibiae dark yellow to reddish; wing with dark brown anterior band. Abdominal T2 and T3 mainly orange; T7 and T8 of female and epandrium of male reddish brown.

Redescription

Head. Occiput dorsal half orange, ventral half dark brown; occipital setae black, moderately sparse, fine ventrally, stronger dorsally. Median occipital sclerite orange, dark brown around occipital foramen. Vertex yellowish brown; setae long, moderately fine. Ocellar tubercle blackish brown anteriorly, orange posteriorly. Frons strongly rugose, yellow laterally, yellow-brown posteriorly, blackish brown, slightly tuberculate anteromedially; width 1.7x length in type; other specimens slightly wider. Lunule brown, length about 1.5x diameter of base of antenna. Antennal scape and pedicel brown, finely pruinose except base of pedicel; dorsoapical half of first flagellomere blackish brown; otherwise orange-brown; ratio of segment lengths: 1:1.3:3. Basal half of pedicel narrow with transverse dorsal keel close to base, distal half much expanded, with minute setae. First flagellomere with slight dorsal swelling on basal half. Stylus black; about 0.2x length of first flagellomere. Parafacial yellow. Facial ridge wrinkled, yellow; sometimes partially dark brown dorsally. Antennal foveae shiny dark brown medially, otherwise yellow, silvery pruinose. Facial carina blackish brown; poorly developed dorsally, strong ventrally adjacent to frontoclypeal tubercle. Frontoclypeal tubercle blackish brown. Cheek dark brown, sometimes orange; setae short, inconspicuous. Postgena blackish brown, silvery pruinose; setae moderately short, dark brown. Haustellum blackish brown; 2.3x head length.

Thorax. Postpronotal lobe yellowish brown; silvery pruinose; setae sparse, short. Mesoscutum mainly black; notopleuron, supra-alar region, postalar callus, and anterior of scutellum yellowish brown to orange; silvery pruinose medial and posterior of postpronotal lobe; with short, strong black setae over entire surface; mesoscutal bristles present: several npl (not well differentiated from surrounding setae in holotype), several pal, 1 short ipal; ial sometimes differentiated. Scutellum yellowish brown to orange; holotype with 3 long, strong, apparently not paired, scutellar bristles; other specimens with one pair of widely spaced submarginal sctl bristles. Postnotum mainly black; band below scutellum and laterotergite, except posteriorly, yellow to orange. Most or all of anepisternum, anepimeron, katepimeron, yellowish brown to orange; most or all of propleuron, katepisternum and meron dark brown; silvery pruinose on much of pleura. Numerous prepst and dorsal kepst bristles present. Prosternum dark brown. Coxae blackish brown, silvery pruinose. Trochanters dark brown. Femora dark yellow to reddish; fore femur with dense, very short, strong black setae anterobasally; mid femur with defined row of longer setae on posterodorsal margin, dorsal surface almost bare. Tibiae dark yellow to reddish. Tarsi blackish brown to mainly yellowish; microsetae golden. Wing pale brown in

cells c and most of sc; dark brown in cells bc, sc distal of sc-r crossvein, r_1, r_{2+3}, anterior half of br and r_{4+5}, anterior to CuP in cu*p*; petiole 0.6x length of dm-cu; CuA_2+A_1 1.4x length of petiole. Haltere yellowish except for pale brown base.

Abdomen. Overall shape of female more or less parallel sided, widening slightly to T5; male only slightly constricted at T2–3; all tergites with black setae, shorter and less dense anteromedially on T1–3. T1 reddish orange on lateral tubercle, otherwise blackish brown. T2 reddish orange except for narrow dark brown anterior band and patch on each side of mid line in holotype; other specimens without dark patches; T2 without long lateral bristles in female; male with numerous long setae laterally; in male more than 2x length of T1; in female relatively shorter and wider. T3 reddish orange on anterolateral two-thirds to almost entirely, otherwise blackish brown; about same length as T2. T4 blackish brown; about same length as T2 in male. S1 and S4 blackish brown; S2 and S3 partially or entirely orange; all sternites finely white pruinose.

Female. T5 and T6 blackish brown. T7 and T8 shiny reddish brown. Female genital plate dark brown; long, relatively narrow; with spicules on about distal two-thirds (rows not able to be counted) and long, fine setae. S6 with dense spicules and long fine setae.

Male. T5 brownish black, finely white pruinose; slightly shorter than T4. Protandrium and S8 brownish black, finely white pruinose; sometimes with small median orange mark; about as long dorsally as T5. S8 narrower and shorter than epandrium; distinctly more convex than protandrium. Epandrium dark reddish brown. S5 blackish brown; with long black setae; spicules absent.

Measurements. Total length = 10.7 mm (8.8–12.4 mm); wing length = 7.0 mm (5.3–7.3 mm).

Distribution. South-western Western Australia (Fig. 301).

Pleurocerina turneri (Camras), comb. nov. (Figs 270, 271, 281, 282, 302)

Paraconops turneri Camras 1961: 72

Type material. Holotype (examined). ♂, **L1**: W. AUSTRALIA: Southern Cross. 10–22.i.1936. R. E. Turner. B.M.1936–28; **L2**: HOLOTYPE ♂ Paraconops turneri CAMRAS (NHM).

Additional material. **Western Australia**: 1♂, 13 km SE Dongara, 30.xii.1975, on *Eucalyptus* sp.; 1♂, 31 mls [49.6 km] E Southern Cross, 28.i.1973, on *Eucalyptus leptopoda*; 6♂, 79 mls [126.4 km] E Southern Cross, 28.i.1973, on *Eucalyptus* sp.; 1♀, 34 mls [544 km] E Merredin, 27.i.1973, on *Eucalyptus redunca* (all UQIC); 4♂, Dedari, 23–25.i.1962 (WAM); 2♀, Lake Cronin, 29.i.1971 (WADA).

Diagnosis

Frontoclypeal tubercle black; postgena blackish brown. Postpronotal lobe brownish black; mesoscutum mainly black, postalar callus brown; scutellum orange-brown; pleura blackish brown; femora mainly reddish to yellowish brown; usually dark brown basally; tibiae reddish brown; wing completely hyaline. Abdominal T2 (entirely) and T3 (at least anteriorly) orange; male S5 with posteromedial projection covered in black spicules.

Redescription

Head. Occiput dark brown; setae sparse, short, fine, blackish. Median occipital sclerite yellowish brown, blackish brown ventrally. Vertex yellowish brown. Ocellar tubercle blackish brown. Frons yellow laterally; black to dark brown medially, mark either extending length of frons or just anteriorly; frons strongly rugose, slightly tuberculate anteromedially; width 1.7x length. Lunule dark brown, lighter brown medially; length about 2x diameter of base of antenna. Antennal scape and pedicel dark brown except apex of pedicel orange; finely pruinose except dorsum of pedicel; first flagellomere dark brown to black dorsally, orange-brown ventrally and around base; ratio of segment lengths: 1:1.2:2.2; first flagellomere with slight dorsal swelling on

basal half. Stylus blackish brown; about 0.3x length of first flagellomere. Parafacial yellow, finely whitish pruinose laterally. Facial ridge yellow, not smooth. Antennal fovea yellow, brown medially. Facial carina and frontoclypeal tubercle black Cheek diffusely brown medially, otherwise yellow; slightly concave; setae minute. Postgena blackish brown, silvery pruinose; setae moderately long, fine, brown. Haustellum blackish brown; about 2x head length.

Thorax. Postpronotal lobe brownish black, white pruinose; setae sparse, very short, strong, black. Mesoscutum mainly black, postalar callus brown; very finely white pruinose around lateral margins; mesoscutal bristles present: 3 npl, 2 ial, several pal, 1 ipal. Scutellum orange-brown; with one pair of moderately long, slightly convergent bristles. Postnotum black, white pruinose. Pleura blackish brown; very finely white pruinose; several prepst and 5 or more kepst bristles present. Prosternum dark brown. Coxae brownish black, finely white pruinose. Trochanters dark brown. Femora mainly reddish or yellowish brown; basal third to quarter usually dark brown; fore femur with dense, very short black setae anterobasally; mid femur with defined row of longer setae on posterodorsal margin, dorsal surface almost bare. Tibiae reddish brown, finely white pruinose. Tarsi brown to blackish brown; microsetae golden on fore leg, golden brown on hind leg. Claws (Fig. 271) narrow. Wing completely hyaline; petiole 0.7x length of dm-cu; CuA_2+A_1 slightly longer than petiole. Haltere yellowish except for light brown base.

Abdomen. Male constricted at T2–3; female nearly parallel-sided; gradually widening to T6. All tergites with short black setae, shorter and less dense dorsally on T2–3. T1 blackish brown; silver pruinose across posterior margin; often narrowly orange posteriorly; about two-thirds length of T2 in female, slightly less than half length of T2 in male. T2 orange; male with lateral setae longer than on other tergites; T3 usually entirely orange, sometimes blackish brown posteriorly; about same length as T2. T4 brownish black, finely white pruinose; slightly shorter than T2. S1 and S4 dark brown; S2–3 orange. S4 much wider than S3.

Female. T5–T7 blackish brown, finely whitish pruinose except posterior surface of T7. T6 about 0.7x length of T3–5 together. T8 shiny dark brown. Female genital plate (Fig. 281) dark brown; longer than wide, broadly rounded; with about 8 rows of closely arranged spicules on apical half and scattered spicules basally; anterior surface with fine, short setae; posterior surface with long setae; spicules (Fig. 282) somewhat conical. S6 with 8 to 10 rows of closely arranged spicules.

Male. T5, protandrium and S8 blackish brown, finely whitish pruinose; protandrium sometimes with slight orange mark dorsally. T5 about same length as T4. Protandrium angulate dorsally; dorsal length slightly shorter than T5. S8 somewhat saddle shaped. Epandrium dark reddish brown; wider and longer than S8. S5 (Fig. 270) blackish brown; concave posteriorly with posteromedial projection covered in black spicules. Aedeagus narrow, elongate

Measurements. Total length = 9.2 mm (6.7–10 mm); wing length = 5.5 mm (4.5–6.2 mm).

Distribution. South-western Western Australia (Fig. 302).

***Pleurocerina vespiformis*, sp. nov. (Figs 239, 272–274, 283, 284, 303)**

Type material. Holotype. ♀, Queensland: Brown Lake, Stradbroke Island, 19.ix.1981, G. & A. Daniels (UQIC). Paratypes. **Queensland**: 1♀, Great Sandy Nat. Pk, Cooloola Section, 25°57'15"S 153°06'27"E, 1–5.x.1996, D. K. Yeates, C. Lambkin & S. Winterton, malaise trap (QM); 1♂, Bribie Is, 6.ix.1955 (ANIC); 1♀, Moreton Island, Mount Tempest, 285 m, 21.ix.1997, J. & A. Skevington, hilltopping; 1♂, Swamp 7.6 km N Dunwich, Stradbroke Is, 19.ix.1981, G. & A. Daniels; 1♂, Carindale, Brisbane, 10.iv.1985 (UQIC); 3♂, Stradbroke Is., 2.x.1911, H. Hacker; x.1919, H. Poltenger (MVMA, QM); 12♂, 3♀, Brown Lake, Stradbroke Island, 19,30.ix.1981, 21–24.ix.1984, G. & A. Daniels, R. de Keyser, D. K. Yeates, on *Leptospermum flavescens* blossom (UQIC). **New South Wales**: 1♂, Lennox Head, 11.x.1990, on Leptospermum (AM); 1♂, Evans Hd, 26.ix.1950 (ANIC).

Diagnosis

Antenna distinctly longer than head height; scape and pedicel long; first flagellomere only about 2x length of pedicel; haustellum slightly less than 2x head length. Thorax and abdomen predominantly reddish brown. Thorax with three broad, longitudinal black bands; 2 notopleural bristles; femora extensively reddish black dorsally; claws thick and long in female. Female T6 and T7 and genital plate long and narrow.

Description

Head. Occiput pinkish brown dorsally, laterally and around mouth cavity, pale yellowish ventrally; with silvery pruinose band around eye margin; occipital setae moderately dense, fine ventrally, stronger dorsally. Median occipital sclerite yellowish brown except dark brown around occipital foramen. Vertex yellowish brown, pinkish posteromedially; cushion-like, raised above plane of frons. Ocellar tubercle dark reddish brown anteriorly, pinkish posteriorly. Frons yellowish brown; frons almost twice as wide as long. Lunule light brown; length 1.5–2x diameter of base of antenna. Ptilinal suture dark brown. Antenna (Fig. 273) about 1.3x longer than head height; mainly deep yellowish brown; first flagellomere black distally to variable extent, especially dorsally; ratio of segment lengths: 1:1:2.2. Pedicel with transverse dorsal keel close to base. First flagellomere without dorsal swelling. Stylus (Fig. 274) dark brown; about 0.3x length of first flagellomere. Parafacial yellow, silver pruinose laterally. Facial ridge yellow. Antennal foveae pale yellow except brown adjacent to lower half of carina, white pruinose on lower two-thirds. Facial carina yellow dorsally, blackish brown near frontoclypeal tubercle. Frontoclypeal tubercle mainly pinkish; proximal part blackish brown. Cheek yellow with small median brown patch (in males mainly brown, yellow around margins); almost bare except for some minute setae around epistomal margin. Postgena yellow, finely white pruinose. Haustellum yellowish brown; slightly less than 2x head length.

Thorax. Postpronotal lobe deep yellowish brown, yellow pruinose on posterior band; setae moderately dense laterally; very short. Mesoscutum with broad median black band from anterior margin to about mid way between transverse suture and scutellar suture; also broad, sometimes confluent, dorsolateral black band from posterior of postpronotal lobe to level of postalar callus; otherwise reddish brown; yellow pruinose posteromedial on postpronotal lobe; bristles present: 2 npl, numerous pal, 2 short ial, 1 short ipal. Scutellum reddish brown; one pair moderately weak, subapical convergent bristles. Postnotum white pruinose, more densely on laterotergite; mediotergite brownish black, laterotergite mainly reddish tan with narrow posterior dark brown band. Pleura mainly reddish tan; anepisternum anteriorly, katepisternum almost entirely, and meron ventrally blackish brown; finely white pruinose; bristles present: several prepst; numerous dorsal, mostly fine, and 1 or 2 longer and stronger kepst. Prosternum dark brown, finely silvery pruinose. Coxae and trochanters yellowish to dark brown, silvery pruinose. Femora extensively dark reddish brown, reddish apically; ventral surface lighter coloured, partially yellow; mid femur with longer setae on posterodorsal margin, but not in single defined row. Tibiae dark yellow to reddish orange. Tarsi yellowish brown, slightly darker apically; microsetae golden. Claws (Fig. 272) thick and long in female. Wing (Fig. 239) dark brown in cells bc, c, sc, r_1, r_{2+3}, anterior half of r_{4+5}; pale brown anteriorly in br; petiole about 0.6x length of dm-cu; CuA_2+A_1 1.4x length of petiole. Haltere yellowish except for light brown base.

Abdomen. Overall shape of female more or less parallel sided, widening slightly to T5; male constricted at T2–3; all tergites with black setae, shorter and less dense anteromedially on T1–3. T1 of female only slightly wider than T2; in male markedly wider than T2; rounded, lobe-like laterally; mainly blackish brown, lighter brown on lateral swelling; yellow pruinose posterodorsally. T2 mainly reddish brown with anterodorsal blackish brown patch on each side of mid line; densely yellow pruinose posteriorly; with numerous long setae laterally; 1.7x longer than T1 in female; 2x length of T1 in male. All remaining tergites reddish brown; with variable extent of patchy blackish brown; finely yellow pruinose, posterior 2 segments more densely pruinose. T3 slightly longer than T2; T4 about same length as T2. S1–5 similarly coloured to tergites.

Female. T6 twice as long as wide, 0.65x length of T3–5 together. T7 long, narrow, about 0.8x length of T6. T8 shiny reddish brown. Female genital plate (Fig. 283) long, relatively narrow; apex squarish, shiny

brown; spicules (Fig. 284) moderately dense at apex; otherwise scattered over most of surface. Spicules of S6 large, not very closely arranged; not in defined rows.

Male. T5 slightly shorter than T4. Protandrium dorsal length slightly longer than length of T5. S8 narrower and shorter than epandrium, convex in continuous plane with protandrium. S5 with band of scattered spicules posteromedial and moderately long setae posteriorly.

Variation. Ocellar tubercle sometimes yellow posteriorly rather than pink; frons often with broad diffuse darker brown triangular mark from posterior margin to lunule; first flagellomere and stylus of antenna sometimes entirely yellowish brown; frontoclypeal tubercle sometimes yellowish brown apically rather than pink; petiole of wing 0.6–0.7x length of dm-cu. Thorax and abdomen of some older specimens predominantly brown rather than reddish brown. Pleura sometimes mainly yellowish tan and anepisternum without dark mark. Dark patches on T2 sometimes faint; T2 occasionally mainly blackish brown.

Measurements. Total length = 12.8 mm (9.3–12.5 mm); wing length = 8.3 mm (6.2–8.2 mm).

Distribution. South-eastern Queensland, north-eastern New South Wales (Fig. 303).

Comments. This species is very similar to *P. brevis*; female genitalia of the two species are easily distinguished; males are difficult to differentiate.

Etymology. The specific name is formed from the Latin nouns *vespa* (= wasp) and *forma* (= shape). This species is remarkably similar in habitus to some wasps of the family Vespidae.

4.5.15 *Setosiconops* gen. nov.

Introduction

The type species of this genus was described in *Neoconops* but differs significantly from species of that genus as presently defined (see Section 4.5.12). Few specimens of *Setosiconops* are available for study but three species are recognised.

Genus SETOSICONOPS gen. nov.

SETOSICONOPS gen. nov. Type species: *Neoconops robustus* Kröber

Diagnosis

Finely, densely setose except on some pleural sclerites; anepisternum usually setose. Vertex very short, poorly defined; ocelli absent; frons finely rugose; facial ridge flat, rugose; palpus absent; haustellum long. Abdomen parallel sided; tergites wider than long; epandrium expanded laterally.

Description

Head. Occiput pale yellow ventrally, blackish brown dorsally; occipital setae moderately dense, fine, dark brown dorsally, pale yellow ventrally. Vertex indistinctly demarcated; very short, no more than a narrow anterior extension of median occipital sclerite; differentiated setae absent; setae moderately dense, long, fine, dark brown, across width. Ocellar bristles not differentiated from other setae of vertex. Ocelli absent. Frons finely rugose, about 2x wider than long; setae dense, fine, brown, most moderately long but shorter than setae of vertex; fronto-orbital region forming a smooth rounded ridge; becoming broad, projecting above eye margin anteriorly. Lunule length less than diameter of antennal scape. Eye elongate, oval. Antenna slightly shorter than head height; mainly blackish brown; first flagellomere long, about 2x length of scape and pedicle together. Scape with short strong setae along anterior margin. Pedicle with transverse dorsobasal ridge; base narrow, shiny, smooth; distally expanded, pruinose, with minute setae. Stylus two-segmented; at most 0.2x length of first flagellomere; segment 1 short, very slightly expanded ventrally; segment 2 short, cone-shaped. Face, cheek, postgena yellow, setose. Parafacial at about 100°–110° angles to inner margin of eye; broadest

level with junction of facial ridge and mesofrons. Facial ridge flat, longitudinally rugose; lateral ridge of foveae differentiated, narrow. Facial carina height less than depth of foveae, less developed dorsally than ventrally. Cheek slightly concave, about half eye height. Clypeus bare. Palpus absent. Haustellum blackish brown, 1.6–2x head length.

Thorax. Mainly black or dark brown. Dorsum, proepisternum, anepisternum (usually), and katepisternum with dense long black setae; 2 npl, 1 pal slightly longer and stronger than surrounding setae. Tibiae without apical, oval pruinose patches and preapical, dorsal bristles. Dense microsetae on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing completely hyaline; Sc ending a little beyond mid length of wing; R_1 extending along costa to end a little before apex of R_{2+3}; vena spuria weak, present as fold only; r_{4+5} long, acute; r-m crossvein at about mid length of discal cell. Haltere pale yellow, base partially dark brown.

Abdomen. More or less parallel sided, T1 not wider than T2; mainly blackish brown, with moderately long black setae on all tergites and sternites, longest laterally on T1–2; dense pruinose bands absent. T2 slightly more than 2.5x length of T1 and slightly shorter than T3. S1–4 well-developed.

Female. T6 without median posterior projection.

Male. T5 slightly shorter than T4. Protandrium evenly rounded, about same length and height as T5. S8 well developed, convex in same plane as distal part of protandrium. Epandrium constricted, shiny anteromedially; otherwise bulbous, finely pruinose. S5 with posteromedial patch of black spicules.

Measurements. Total length = 6.2–10.5 mm; wing length = 3.8–7 mm.

Etymology. The name is masculine and refers to the setose nature of all species of the genus.

Key to Australian species of *Setosiconops*

1. Thorax and abdomen predominantly yellowish brown with some dark brown areas; without dark blue iridescent sheen; 3 proepisternal bristles; anepisternum bare ..... ***epixanthus*** sp. nov.
-. Thorax and abdomen predominantly blackish brown with a dark blue iridescent sheen; numerous proepisternal bristles; anepisternum setose..... 2.
2. Fronto-orbital region yellow; antennal pedicle with transverse dorsobasal ridge weakly developed (Fig. 304); postgena and cheek pale yellow; haustellum about 2x head length; petiole about 0.8x length of dm-cu crossvein and 0.6x length of CuA2+A1 (Fig. 316)..... ***robustus*** (Kröber)
-. Fronto-orbital region brown; transverse dorsobasal ridge of pedicle sharply defined; postgena darker yellow than cheek; haustellum 1.6x head length; petiole, dm-cu crossvein and CuA2+A1 about same length ..... ***similis*** sp. nov.

Setosiconops epixanthus, sp. nov. (Fig. 333)

Type material. Holotype. ♂, Western Australia: Capel Dist., W.A. (18 miles [28.8 km] south of Bunbury). 7-1-57; Mr. A. Snell (AM).

Diagnosis

Frons deep yellow; antenna mainly brown; first flagellomere orange ventrally. Thorax mainly dark brown; postpronotal lobe yellowish brown; anepisternum bare. Abdomen largely yellowish brown.

Description

Similar to *S. robustus*. Character states not mentioned are as for that species.

Head. Occiput entirely blackish brown on dorsal one-third to one half. Vertex brown, without distinct median dark brown triangular mark. Frons deep yellow. Fronto-orbital ridge brown posteriorly. Eye length 0.8x head height. Antenna mainly brown; first flagellomere orange ventrally; ratio of segment lengths:

1:1.8:5; transverse dorsobasal ridge of pedicle sharply defined; first flagellomere more or less straight. Entire face, cheek and postgena yellow. Setae of cheek short. Haustellum 1.7x head length.

Thorax. Mainly dark brown; postpronotal lobe yellowish brown. Proepisternum with 3 bristles. Anepisternum bare. Katepisternal bristles concentrated on dorsal part of sclerite with a few fine ventral setae. Prosternum brown, with minute setae laterally. Fore coxae yellowish. Fore trochanter yellow; mid and hind trochanters brown. Femora mainly yellowish; apex of hind femur dark brown. Tibiae mainly yellowish; apex of hind tibia dark brown. Tarsi brown; microsetae yellowish on fore leg; golden brown on hind leg. Wing with petiole only slightly less than length of dm-cu; CuA_2+A_1 slightly longer than length of petiole.

Abdomen. T1 brown. T2 and 3 mainly yellowish brown with large dorsal brown patch. T4 mainly blackish brown; pale brown posteriorly and laterally. S1–4 yellowish brown.

Female. Unknown.

Male. Colour of T5 as for T4. Protandrium, S8 and epandrium yellowish. S8 0.6x length of epandrium. Epandrium with especially expanded lateral lobes. S5 yellowish with posteromedial patch of black spicules.

Measurements. Total length = 6.5 mm; wing length = 3.8 mm.

Distribution. South western Western Australia (Fig. 333).

Etymology. The specific name is from the Greek adjective *epixanthos* (= yellowish) and refers to the extensive yellowish areas of the legs and abdomen of this species.

Setosiconops robustus (Kröber), comb. nov. (Figs 304, 305, 316, 334)

Neoconops robustus Kröber 1940: 66

Type material. Holotype (examined). ♀, **L1**: Type; **L2**: Heteroconops robustus, Kröb. examined & det. O. Kröber, 1938.; **L3**: Heteroconops robustus Krb ♀ [hand written pencil]; **L4**: W. Austr. [underside 89 79]; **L5**: W. Australia. G. Clifton. B.M. 1889-79.; **L6**: TYPE (NHM).

Additional material. **Western Australia**: 2♂, Kalbarri, 22,27.ix.1981 (ANIC); 1♂, Mingenew, 15–22.x.1935 (CC); 1♀, Kings Park, Perth, 4.xi.1936 (ANIC).

Diagnosis

Vertex yellowish brown with blackish brown triangular mark medially; antenna mainly blackish brown; haustellum about 2x head length. Thorax mainly black with blue iridescent sheen; extensively white pruinose; anepisternum setose; legs extensively dark brown; CuA_2+A_1 1.5x length of petiole. Abdomen mainly blackish brown with blue iridescent sheen.

Redescription

Head. Occiput pale yellow ventrally, blackish brown on dorsal one-third, but with some dark yellow adjacent to eye margin; occipital setae short ventrally, longer dorsally. Median occipital sclerite blackish brown. Vertex yellowish brown with blackish brown triangular mark medially. Frons yellow to dark orange; holotype with two short, longitudinal blackish marks posteriorly. Lunule black; holotype with median yellow spot; length less than diameter of antennal scape. Eye length about 0.7x head height. Antenna (Fig. 304) mainly blackish brown; first flagellomere white pruinose, brown ventrally; ratio of segment lengths: 1:1.5:5 in holotype; female with relative length of first flagellomere slightly greater than male; pedicle with transverse dorsobasal ridge weakly developed; first flagellomere with distal half slightly bent laterally. Segments of stylus short (Fig. 305). Face with yellow or pale brown setae, longer and denser on cheek than on parafacial and facial ridge. Parafacial dark yellow to orange, silvery pruinose. Facial ridge dark yellow to orange, with fine, sparse pale brown setulae. Antennal foveae deep, shiny dark yellow. Frontoclypeal tubercle dark yellow. Cheek and post gena dark yellow to orange; setae moderately long, fine, pale brown. Haustellum blackish brown; about 2x head length.

Thorax. Mainly black with blue iridescent sheen; posterior half of postpronotal lobe, mesoscutum bordering postpronotal lobe, notopleuron, postnotum, and all pleura densely white pruinose; dorsum entirely black setose; marginal sctl bristles not differentiated from other scutellar setae. One prepst bristle present; anepisternum densely setose posterodorsally; with several long setae posteroventrally; kepst setae on all surface, strongest on dorsal part of sclerite. Prosternum mid to blackish brown, silver pruinose; finely setose laterally. Fore coxa mid to dark brown; mid and hind coxae blackish brown. Trochanters dark brown. Femora mainly dark brown to black; yellowish brown on anteroventral distal half and apex of fore and mid femora, distal half of ventral surface of hind femur; mid femur with very short dorsal setae, long anterior and posterior setae; longest posterodorsal setae not present in a defined row. Tibiae with basal half yellowish brown; dark brown distally. Tarsi dark brown; fore tarsi missing in type; microsetae golden brown. Wing (Fig. 316) with petiole about 0.8x length of dm-cu; CuA_2+A_1 1.5x length of petiole.

Abdomen. Mainly blackish brown with blue iridescent sheen, finely white pruinose; posterior margins, especially laterally, of male T2–5 and female T3–6 light brown. T4 slightly shorter than T2. S1–4 blackish brown, white pruinose.

Female. Female genital plate with spicules arranged in a crescent at apex (number of rows not able to be counted). S6 with spicules closely arranged in defined rows (number of rows indeterminate).

Male. Protandrium brownish black, whitish pruinose; evenly rounded, about same length and height as T5. S8 brownish black, finely white pruinose. S8 distinctly narrower than epandrium; 0.4x length of epandrium. S5 blackish brown; with large posteromedial patch of black spicules.

Measurements. Total length = 9.3 mm (6.2–10.5 mm); wing length = 5.9 mm (4–7 mm).

Distribution. South-western Western Australia (Fig. 334).

Comments. The type specimen in NHM is labelled *Heteroconops robustus* but no such species is described; only *Neoconops robustus* was described. I consider this a simple case of mislabelling. The specimen is undoubtedly the one described by Kröber as *Neoconops robustus*. The labels bear no indication of the collecting month, even though the original description states “viii”; however on **L5** the “B” of “B.M.” looks like an “8” so that the “B.M.” may have been interpreted as “8.M.” *i.e.* 8th month.

Setosiconops similis, sp. nov. (Fig. 335)

Type material. Holotype. ♂, Victoria: **L1**: nr Lake Hindmarsh, Big Desert Nat. Pk, 29–30 Nov. 1992; **L2**: Moulds, McAlpine, McEvey (AM).

Diagnosis

Occipital setae very long dorsally; transverse dorsobasal ridge of pedicle sharply defined; postgena yellowish brown; haustellum 1.6x head length. Femora dark brown dorsally, yellowish brown ventrally; wing with petiole, dm-cu crossvein and CuA_2+A_1 about same length.

Description

Similar to *S. robustus*. Character states not mentioned are as for that species.

Head. Occiput entirely blackish brown on dorsal one-third to one half; occipital setae very long dorsally, short ventrally. Frons yellow. Fronto-orbital region brown. Length of eye 0.75x head height. Ratio of antennal segment lengths: 1:1.7:4.2; transverse dorsobasal ridge of pedicle sharply defined. Antennal foveae and frontoclypeal tubercle yellow. Cheek pale yellow. Postgena yellowish brown. Haustellum 1.6x head length.

Thorax. Mainly black with blue iridescent sheen; posterior half of postpronotal lobe, mesoscutum bordering postpronotal lobe, notopleuron, postnotum, and all pleura densely white pruinose; postpronotal lobe, mesonotum, proepisternum, anepisternum, katepisternum with long black setae. Femora dark brown dorsally,

yellowish brown ventrally. Tibiae mainly yellowish; apex of hind tibia dark brown; microsetae yellowish on fore leg; golden brown on hind leg. Wing with petiole, dm-cu crossvein and CuA_2+A_1 about same length.

Abdomen. Mainly blackish brown with blue iridescent sheen, finely white pruinose; only T4 and T5 light brown posterolaterally. T4 about same length as T2.

Female. Unknown.

Male. S8 brownish black except orange along posterior margin, finely white pruinose; convex in same plane as distal part of protandrium. Epandrium brown anteriorly; yellowish brown posterolaterally. S5 with broad posteromedial patch of black spicules.

Measurements. Total length = 6.2 mm; wing length = 4.5 mm.

Distribution. Western Victoria (Fig. 335).

Etymology. The specific name is the Latin adjective *similis* (= like, resembling) and refers to the close similarity between this species and *S. robustus*.

4.5.16 *Smartiomyia* Kröber

Introduction

Smartiomyia has a similar overall appearance to *Heteroconops*. The two genera have many features in common: small; mainly black; frons rugose; first flagellomere very long; wings entirely hyaline; and petiole usually relatively long. Three of the most consistent differences are the very long haustellum, acute cell r_{4+5} and characteristic short stylus of *Smartiomyia*. Only some species of *Heteroconops* have three ocelli.

Genus SMARTIOMYIA Kröber (Figs 308, 309)

SMARTIOMYIA Kröber 1940: 72. Type species: *Smartiomyia obscura* Kröber, by monotypy.

Diagnosis

Setae of head, thorax and abdomen generally long, fine and rather dense. Vertex narrow, slightly curving forward on to posterolateral margin of frons; three ocelli present; frons with many fine, transverse ridges; ridges extending on to anterior projection around bases of antennae; frons wider posteriorly than anteriorly; eye height 0.8x head height; first flagellomere of antenna very long; stylus very short, two-segmented but often appearing one-segmented; palpus absent; haustellum long, thin, at least 1.5x as long as head. Wing completely hyaline; sc broad and Sc widely separated from R_1; petiole long as in *Heteroconops* but cell r_{4+5} acute apically. Abdomen more or less parallel sided.

Redescription

Head (Figs 308, 309). Occiput blackish brown dorsally, pale yellowish white ventrally; occipital setae dense, fine, moderately short. Median occipital sclerite blackish brown to black, not demarcated from vertex. Vertex smooth, narrow, slightly curving forward on to posterolateral margin of frons; not demarcated from frons except by absence of grooves; ocellar tubercle often protruding on to frons; setae of vertex undifferentiated, long, across width. Ocellar tubercle smooth; ocellar bristles not differentiated from surrounding setae. Three ocelli present; lateral distinct, ovoid; median small, round, often indistinct. Frons with many fine, transverse ridges; ridges extending on to anterior projection around base of antennae (Fig. 308); frons wider posteriorly than anteriorly. Lunule blackish brown, narrow, length shorter than diameter of base of antenna. Eye elongate, oval; length about 0.8x head height. Antenna about as long as or slightly shorter than head height; scape and pedicel short; first flagellomere long, up to 5x length of scape; spatulate, distal half slightly bent laterally. Stylus very short, two-segmented but often appearing one-segmented. Face usually entirely yellow. Parafacial projecting, at right angles or only slightly more than 90° to inner margin of eye. Facial ridge long,

with shallow, irregular longitudinal grooves. Antennal foveae deep, long and narrow, parallel, with sharp lateral ridge. Facial carina height distinctly less than depth of foveae. Frontoclypeal tubercle prominent. Cheek concave, broad, finely setose, yellow. Postgena usually pale yellow, strongly convex; setae moderately long, fine, dense. Palpus absent. Rostrum long. Haustellum blackish brown, long, at least 1.5x head length.

Thorax. Almost entirely brownish black, finely silvery pruinose. Dorsum entirely setose with bristles poorly differentiated. Proepisternal and kepst bristles present. Legs setose; fore femur with dense long setae on dorsal, posterior and ventral surfaces; mid femur with long black setae on entire posterior surface. Apical, densely pruinose patch on tibiae and preapical, dorsal tibial bristles absent. Golden brown microsetae on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus present but not conspicuous. Wing completely hyaline; cell sc broad and Sc widely separated from R_1, ending at about mid wing length; R_1 extending along costa to end a little before R_{2+3}; vena spuria at most faintly indicated as a fold; cell r_{4+5} usually acute; petiole relatively long. Haltere pale yellow, base partially dark brown.

Abdomen. Mainly brownish black, more or less parallel sided, cylindrical, conspicuously setose. Pruinose bands absent. T1 not wider than T2, without prominent lateral lobe. T1 and T2 with numerous long bristles laterally. T1–3 of female fused ventrolaterally; shiny with pale brown lateral band. Sternites long and narrow; usually difficult to observe in dry specimens because tergites fold to approximate mid-ventrally.

Female. T6 of female with median posterior membranous projection; T7 with median anterodorsal emargination. Female genital plate long, tapered distally, apex rounded. Spicules large, in relatively few, distinct rows; ridges of spicules not merging medially

Male. T5 of male slightly shorter than T2; height greater than length. Epandrium constricted mid-dorsally. S8 pruinose. S5 with posterior median band of spicules.

Measurements. Total length = 3.4–5.3 mm; wing length = 2.4–4.0 mm.

Key to Australian species of *Smartiomyia*

1. Setae pale brown or whitish; mesofrons bare, fronto-orbital region long setose; haustellum about 1.5x head length; labella broad . . . . . ***danielsi*** sp. nov.
   Setae usually blackish brown; mesofrons setose or fronto-orbital region short setose Figs 308, 309); haustellum more than 1.5x head length (Fig. 309); labella relatively narrow. . . . . 2.
2. Frons mainly yellowish, diffusely brown medially and posterolaterally; fronto-orbital region with row of fine short setae; mesofrons bare; male S8 and epandrium yellowish brown . . . . . ***cerina*** sp. nov.
-. Frons mainly blackish brown; usually with narrow pale brown area posterior of lunule; mesofrons and fronto-orbital region long setose; male S8 and epandrium mid or blackish brown . . . . . 3.
3. Antenna mainly light brown, dark brown dorsoapically; pale brown area posterior of antennae about half median length of mesofrons; postgena dark brown; mesonotal setae fine, pale and dense. . . . . ***macalpinei*** sp. nov.
-. Antenna entirely dark brown dorsally; pale brown area posterior of antennae absent or narrow, much less than half median length of mesofrons; postgena pale yellow; mesonotal setae black, moderately strong . . . . . 4.
4. Antenna dark brown dorsally, yellowish brown ventrally; CuA2+A1 markedly shorter than petiole (Fig. 317); from eastern Australia . . . . . ***arena*** sp. nov.
-. Antenna entirely dark brown; CuA2+A1 nearly as long as petiole; from Western Australia (Fig. 319) . . . . . ***obscura*** Kröber

Smartiomyia arena, sp. nov. (Figs 310, 311, 317, 336)

Type material. Holotype. ♂, Queensland: Great Sandy Nat. Pk, Cooloola Section, 26°02’52”S 153°04’30”E, 1–5.x.1996, D. K. Yeates, C. Lambkin, S. Winterton (QM). Paratypes. **Queensland**: 2♂, Bundaberg, viii–ix,1971; ix.1972, H. Frauca (ANIC); 11♂, 1♀, Burrum Heads, 25°11’S 152°36’E, 6.ix.1987, G. & A. Daniels; 3♂, 3♀, same data as holotype; 1♂, 1♀, Caloundra, 20.ix.1964, J. C. Cardale; 2♂, 1♀, Bribie Is, QDPI Fish-

eries Site, 27°03'S 153°11'E, 17,24–31.x.1997, S. Winterton, N. Power, D. White, heathland *Acacia* regrowth, Malaise trap (QM, UQIC). **New South Wales**: 1♀, Bundjalung Nat. Pk, nr Evans Head, 29°02'S 153°26'E, 18.xii.1997, C. Lambkin (UQIC).

Additional material. **New South Wales**: 1♀, 5–7 km NE Harrington, 7–14.x.1988 (AM); 1♂, Barrington Tops, 30.xii.1934 (UQIC).

Diagnosis

Frons mainly blackish brown; usually with narrow pale brown area posterior of lunule; antenna dark brown dorsally, yellowish brown ventrally. One prepst bristle; all legs mainly blackish brown, only apices of femora and bases of tibiae yellowish; CuA2+A1 markedly shorter than petiole. Female genital plate with 4 complete rows of large spicules and 2 additional, incomplete basal rows; male T2 about as long as wide; male S8 without narrow posterior pale brown band; epandrium mid to dark brown.

Description

Similar to *S. obscura*; character states not mentioned are as for that species.

Head. Vertex usually with small brown patch beside ocellar tubercle. Frons brownish black; sometimes with narrow pale brown area posterior of lunule. Antenna dark brown dorsally, yellowish brown ventrally; distal two-thirds of pedicel not densely white pruinose. Setae of face and cheek pale to mid brown. Haustellum at least 2x head length.

Thorax. Mesonotum entirely brownish black; whitish pruinose mainly anterior of transverse suture. Pleura blackish brown, densely whitish pruinose. One prepst bristle present. Prosternum mid to pale brown. Femora almost entirely blackish brown, apices yellowish. Tibiae mainly dark brown, only bases yellowish brown. Tarsi dark brown. Wing (Fig. 317) with Sc ending mid length; petiole about 1.9x length of dm-cu; CuA2+A1 about same length as dm-cu (slightly longer in some specimens).

Abdomen. Brownish black; male T2 about 3x length of T1 and about as wide as long; female T2 1.5x length of T1 and about 1.6x wider than long. T3 same size as T2. Male T4 slightly shorter and wider than T3; female T4 about 0.6x length of T3; 3x wider than long. S1–4 dark brown, finely silver pruinose.

Female. T6 0.6–0.7x length of T3–5 together. T7 slightly longer than T6. T8 shiny dark tan. Female genital plate (Fig. 310) dark brown, long and tapered distally, with long, fine setae; spicules occupying less than distal half of posterior surface; in 4 complete rows and 2 additional, incomplete basal rows; spicules (Fig. 311) large; bases fluted by well-spaced, tiered ridges; pedestals tall but fused basally. S6 with 4 more or less complete rows of spicules and some additional scattered anterior spicules; posterior spicules longer and more closely arranged than anterior spicules.

Male. T5 brownish black with long, dark brown setae; slightly shorter than T2; height greater than length. Protandrium shiny brownish black with moderately long, dark setae; short dorsally; almost as high as T5. S8 mainly brownish black, white pruinose; wider and shorter than epandrium. Epandrium mid to dark brown. S5 with broad posterior band of spicules.

Measurements. Total length = 4.7 mm (3.4–5.3 mm); wing length = 4.0 mm (2.4–3.8 mm).

Distribution. Coastal southern Queensland and northern New South Wales (Fig. 336).

Comments. This species is very similar to *S. obscura* and is distinguished by subtle differences in genitalia, differences in the pattern of ridges on the spicules and by the yellowish brown colour of the ventral surface of the antenna. *S. obscura* is recorded only from Western Australia.

Etymology. The specific name is the Latin noun *arena* (= sandy place) and refers to collection localities of this species.

***Smartiomyia cerina*, sp. nov. (Fig. 337)**

Type material. Holotype. ♂, Western Australia: 13 km S Wannoo, 26°49'S 114°37'E, 30.vii.1985, T. F. Houston (WAM). Paratypes. **Western Australia**: 1♂, same data as holotype except 31.vii.1985 (WAM).

Diagnosis

Vertex mid to yellowish brown; frons mainly yellowish, diffusely brown medially. Mesonotum entirely white pruinose; pleura densely white pruinose; petiole of wing only slightly longer than dm-cu. Abdominal tergites pale brownish pruinose; male S8 and epandrium yellowish brown.

Description

Similar to *S. obscura;* character states not mentioned are as for that species.

Head. Occipital setae whitish. Median occipital sclerite blackish brown. Vertex mid to yellowish brown; setae moderately dense, brown. Ocellar tubercle dark brown, only slightly raised above plane of vertex. Frons mainly yellowish, diffusely brown medially and posterolaterally, about twice as wide as long medially; fronto-orbital region narrow with row of fine moderately short setae; mesofrons bare. Antenna dark brown; ratio of segment lengths: 1:1.5:5; pedicel with scattered short setae; stylus apparently one-segmented. Short pale yellowish setae on median margin of parafacial and facial ridge. Parafacial yellow, indistinctly silvery pruinose. Facial ridge and cheek yellow. Facial carina and frontoclypeal tubercle brown. Setae of cheek and postgena moderately long, sparse, yellowish. Haustellum 1.7x length of head.

Thorax. Mesoscutum brownish black; entirely whitish pruinose; 2 or 3 npl and pal, 1 ial and 1 ipal longer and slightly stronger than surrounding setae. Pleura blackish brown, densely white pruinose. Five or 6 kepst bristles present. Prosternum pale brown, whitish pruinose. Fore coxa light brown; mid and hind coxae brown, finely white pruinose. Trochanters brown. Femora mainly brown, anterior of fore and mid femora and base of hind femur yellowish brown. Tibiae mainly brown, white pruinose; basal half and all anterior of fore tibia, and bases of mid and hind tibiae, yellowish brown. Tarsi brown. Cell r_{4+5} moderately long, acute apically; petiole only slightly longer than dm-cu. CuA_2+A_1 about as long as petiole. Haltere with setae of capitellum pale yellow.

Abdomen. More or less parallel sided, widening slightly at T4 in male; setae moderately long. T1–T4 blackish brown, whitish pruinose. T2 slightly more than 2x length of T1; about as wide as long. T3 about same size as T2. T4 with narrow pale brown lateral band; about same size as T2. S1–4 dark brown, white pruinose.

Female. Unknown.

Male. T5 dark brown with pale brown lateral band, finely white pruinose; setae short, dark brown. Protandrium dark brown, finely white pruinose; not much shorter than T5 dorsally; almost as high as T5. S8 and epandrium yellowish brown, finely white pruinose; S8 convex in continuous plane with anterior part of protandrium. S5 with broad median band of spicules.

Measurements. Total length = 4.3 mm; wing length = 3.2 mm.

Distribution. Central western Western Australia (Fig. 337).

Etymology. The specific name is from the Greek adjective *kerinos* (= wax-coloured, yellowish) and refers to the colour of the epandrium and S8 of the male.

***Smartiomyia danielsi*, sp. nov. (Figs 312, 313, 318, 338)**

Type material. Holotype. ♂, Queensland: Beerburrum State Forest, 10 km NW Beerburrum, 26°56'S 152°51'E, 26.xi.1991, 150m, G. Daniels, on *Leptospermum* (QM). Paratypes. **Queensland**: 4♂, 1♀, same data as holotype, 18,26.xi.1991 (UQIC).

Additional material. **Queensland**: 1♀, Mt Moffatt Nat. Pk, Park Headquarters, 25°01'S 147°47'E, 17.xi.1995, 740m; 2♂, 1♀, Carnarvon Nat. Pk, Mt Moffatt Section, 3 km SE Ranger Stn, 25°04'39"S 148°00'30"E, 18,20.xi.1995; 3♂, 1♀, Chimneys, Mt Moffatt Nat. Pk, 25°06'S 147°52'E, 1,2.xii.1997, *Leptospermum* (QM, UQIC); 1♂, 2♀, Lake Broadwater, nr Dalby, Site B, 27°21'S 151°06'E, 30.i.1987 (UQIC). **New South Wales**: 1♀, Round Hill Nature Reserve, 27.xii.1976 (UQIC).

Diagnosis

Setae of occiput and vertex whitish; frons mainly blackish brown, unevenly lighter brown anteriorly; fronto-orbital region with row of fine moderately long setae; mesofrons bare; pedicel of antenna with anterior long setae, some about as long as pedicel; facial carina and frontoclypeal tubercle brown; haustellum about 1.5x length of head; setae mostly about as long as diameter of haustellum; labellum large, broader than apex of haustellum. Setae of mesonotum fine, pale brown; M meeting R4+5 at about a 90° angle. Female genital plate mainly yellowish brown, apex dark brown; with 5 incomplete rows of spicules on apical third and scattered spicules over basal two-thirds.

Description

Similar to *S. obscura;* character states not mentioned are as for that species.

Head. Occipital setae whitish. Vertex brownish black; setae whitish. Frons mainly blackish brown, unevenly lighter brown anteriorly. Fronto-orbital region narrow with row of fine moderately long setae; mesofrons bare. Antenna slightly shorter than head height; blackish brown; ratio of segment lengths: 1:1.5:5; scape with a row of short strong setae along anterior margin and longer setae anterolaterally; pedicel distal two-thirds densely pruinose, with strong short setae and anterior longer setae, some about as long as pedicel. Stylus two-segmented. Face with pale yellowish setae on parafacial, facial ridge and cheek. Parafacial projecting at slightly more than 90° angle to inner margin of eye. Antennal foveae transparent, pale yellowish. Facial carina and frontoclypeal tubercle brown. Setae of cheek and postgena yellow. Haustellum about 1.5x length of head; setae mostly about as long as diameter of haustellum; labellum large, broader than apex of haustellum.

Thorax. Postpronotal lobe with fine, whitish setae. Mesoscutum and scutellum with long, pale brown fine setae over entire surface; differentiated mesoscutal bristles absent. Prosternum dark brown, whitish pruinose. Femora mainly blackish brown, apices yellowish; anterior of fore femur lighter brown. Tarsi yellowish to dark brown. Wing (Fig. 318) with Sc ending slightly before mid length; M angled apically to meet R_{4+5} at about a 90° angle; petiole about 1.7x length of dm-cu; CuA_2+A_1 about same length as petiole.

Abdomen. More or less parallel sided, widening slightly at T4 in male; segments 1 to 6 covered with long whitish setae in male; female with shorter, brown setae, less dense than those of male, especially on T2 and T3. T2 about 2x length of T1, slightly longer than wide in male; about 1.6x length of T1, 1.4x wider than long in female. T3 slightly longer than T2; 1.3x longer than wide in male, about as long as wide in female. T4 blackish brown with narrow pale brown lateral band.

Female. T5 blackish brown. T6 brownish black, finely pruinose; about half length of T3–5 together. T7 mainly brownish black, shiny, lighter brown towards apex. T8 shiny mid tan. Female genital plate mainly yellowish brown, apex dark brown, relatively long, narrow; with 5 more or less complete rows of spicules on apical half and scattered spicules basally; spicules (Fig. 312) with well developed, tiered ridges. S6 with spicules not in defined rows except for 2 posterior rows; only spicules of posterior marginal row closely arranged; spicules (Fig. 313) distinctly curved.

Male. T5 brownish black with pale brown lateral band; setae short, dark brown. Protandrium brownish black, mainly shiny. S8 brownish black, pruinose; shorter than and about same width as epandrium; more convex than anterior part of protandrium. Epandrium mid to light brown. S5 with median broad band of spicules.

Variation. Anterior of fore femur mainly yellowish brown in most specimens.

Measurements. Total length = 5.1 mm (4–5 mm); wing length = 3.3 mm (2.8–3.5 mm).

Distribution. South-eastern and southern-central Queensland, central New South Wales (Fig. 338).

Comments. This species differs from S. obscura most distinctly in the shorter length of the haustellum, the pale colour of the setae and in the arrangement of spicules on the female genital plate and S6.

Etymology. The specific epithet honours my friend and colleague, Mr Greg Daniels who collected most of the specimens of this species.

Smartiomyia macalpinei, sp. nov. (Fig. 339)

Type material. Holotype. ♂, South Australia: Seal Bay, Kangaroo Is., 4.xii.1977, D. K. McAlpine and M. A. Schneider, sand dunes (AM). Paratypes. **South Australia**: 1♂, same data as holotype (UQIC). Other material examined. **Victoria**: 1♂, 5 km S Rocket Lake, Murray-Sunset Nat. Pk, 34°39S 141°49E, 25.xi.1992 (AM); 1♂, 2 km E Hattah, 21.xi.1975 (ANIC).

Diagnosis

Antenna mainly light brown, dark brown dorsoapically; pale brown area posterior of antennae about half median length of mesofrons; postgena dark brown; mesonotal setae fine, pale and dense.

Description

Similar to *S. obscura*; character states not mentioned are as for that species.

Head. Occipital setae moderately long. Vertex dark brown; setae shining pale brown. Ocellar tubercle not much raised above plane of vertex. Frons blackish brown posteriorly and laterally; pale brown on anteromedial half posterior of lunule. Antenna slightly shorter than head height; scape and pedicel mainly brown; first flagellomere mainly pale brown, darker dorsoapically; ratio of segment lengths: 1:1.4:5.3. Stylus whitish pruinose; segment difficult to differentiate. Median margin of parafacial dark brown. Facial ridge yellow. Frontoclypeal tubercle brown. Postgena dark brown.

Thorax. Postpronotal lobe densely silvery pruinose. Mesonotal setae long, fine, pale, dense. Mesoscutum less densely pruinose posterior of transverse suture. One fine prepst bristle present. Prosternum brown. Legs brown. Wing with M meeting R4+5 at about 60° angle; petiole 1.8x length of dm-cu in holotype. CuA2+A1 nearly as long as petiole. Haltere with 2 pale brown setae on capitellum.

Abdomen. Parallel sided; almost entirely brownish black; posterior margins of T2–5 paler brown, finely white pruinose. T2 about 2x length of T1.

Female. Unknown.

Male. Protandrium shiny dark brown with setae mainly moderately long, short dorsally. S8 narrow, much shorter than epandrium; brown, white pruinose; without narrow posterior pale brown band. Epandrium brown. S5 with broad posterior band of spicules.

Measurements. Total length = 4.6 mm (4–4.7 mm); wing length = 3 mm (2.7–3.3 mm).

Distribution. North-western Victoria, Kangaroo Island (Fig. 339).

Etymology. The specific epithet honours my friend and mentor, Dr David K. McAlpine of Sydney.

Smartiomyia obscura Kröber (Figs 308, 309, 314, 315, 319, 340)

Smartiomyia obscura Kröber 1940: 72

Type material. Holotype (examined). ♀, Western Australia: **L1**: Type; **L2**: Smartiomyia obscura, Krb. examined & det. O. Kröber, 1938.; **L3**: Smartiomyia obscura Krb ♀ [hand written pencil]; **L4**: Sep.14–Oct.31, 1913. R. E. Turner. 1914-27.; **L5**: Yallingup, nr Cape Naturaliste, S.W. Australia.; **L6**: TYPE (NHM).

Additional material. **Western Australia**: 1♂, 17 km N Boologoora HS, N Carnarvon, 11.ix.1981, sand ridge—heath (ANIC); 6♂, 13 km S Wannoo, 26°49'S 114°37'E, 24–28.viii.1984, 30,31.vii.1985, 21–23.viii.1985; 1♂, 11 km NE Eurardy HS, 27°34'S 114°40'E, 23.viii.1985 (all WAM); 1♂, Kalbarri, 22.xi.1981, dry marsh gully near tip; 1♂, 1♀, 33–35 km S Dongara, 13.x.1981 (all ANIC); 1♂, 1♀, 11 km NW Cataby, 4.xi.1987, on *Leptospermum* sp. (CC); 3♂, Melaleuca Park, 12 km NE Wanneroo, 18.xi.1982; 2♂, 7.7 km WSW Glencoe (Israelite Bay), 9–13.iii.1984; 1♂, 10 km WSW Point Malcolm, 33°48'S 123°46'E, 5–18.i.1982; 2♂, Hopetoun, 1.i.1963 (all WAM).

Diagnosis

Frons mainly blackish brown; usually with narrow pale brown area posterior of lunule. Mesoscutum whitish pruinose mainly anterior of transverse suture. Abdomen with long, dark brown setae over entire surface; white pruinose areas of tergites denser posterolaterally; T2 wider than long; female T6 about 0.8x length of T3–5 together; male S8 mainly brownish black, white pruinose, with narrow posterior pale brown band; epandrium mid to dark brown.

Redescription

Head. Occipital setae moderately short; longer, dark brown dorsally, pale yellowish ventrally. Median occipital sclerite brownish black. Vertex dark brown; setae dense, dark brown. Ocellar tubercle raised above plane of vertex, black. Frons mainly blackish brown; with narrow pale brown area posterior of lunule; about 1.6x wider than long medially; anteriorly projecting around bases of antennae to protrude beyond level of eye in profile (Fig. 308); fronto-orbital region not clearly demarcated from mesofrons. Setae of frons and fronto-orbital region moderately dense, long, fine, dark brown. Antenna about as long as or slightly shorter than head height; dark brown; ratio of segment lengths: 1:1.2:4.3-5; scape with a row of short strong setae along anterior margin; pedicel basal third narrow, shiny; distal two-thirds densely white pruinose, with strong short setae on entire surface. Stylus dark brown; two-segmented but apparently one-segmented in many specimens; segment 1 disc-shaped; segment 2 narrower, pointed. Face with long, fine, pale brown setae on median margin of parafacial and on facial ridge (Fig. 309). Parafacial pale yellow, silvery pruinose; at right angles to inner margin of eye. Facial ridge pale yellow. Antennal foveae shiny yellow. Facial carina and frontoclypeal tubercle mainly yellow; sometimes brown along ridge of carina and at apex of tubercle. Cheek pale yellow with long, pale brown setae. Postgena pale yellow; setae pale brown. Haustellum blackish brown, short setose, at least twice head length; labellum relatively narrow.

Thorax. Entirely brownish black, finely silvery pruinose; setae long, moderately strong, dark brown. Mesoscutum less densely pruinose posterior of transverse suture. Mesoscutal bristles poorly differentiated; 2 or 3 npl and pal longer and stronger than surrounding setae. Scutellum with setae over entire surface; marginal bristles poorly differentiated from surrounding setae. Two prepst (1 fine) and numerous kepst bristles present. Prosternum blackish brown, silvery pruinose. Fore coxa pale to mid brown; mid and hind coxae dark brown, finely white pruinose. Trochanters dark brown. Femora mainly blackish brown, finely white pruinose, apices yellowish; anterior distal half of fore femur, yellowish brown. Tibiae mainly dark brown, white pruinose; basal half of fore tibia and about basal third of mid and hind tibiae, yellowish brown. Tarsi dark brown. Wing (Fig. 319) with Sc ending mid length; cell r_{4+5} moderately short; M meeting R_{4+5} at about 70–80° angle; petiole 1.4–1.9x length of dm-cu (1.6x in holotype). CuA_2+A_1 nearly as long as petiole. Haltere with setae of capitellum very short, brown.

Abdomen. Parallel sided; almost entirely brownish black; segments 1 to 6 covered with long dark brown setae. T1–4 very finely white pruinose, especially posterolaterally; T2 more than 2x length of T1; about 1.4x wider than long.

Female. T5 very finely pruinose. T6 and T7 shiny; T6 about 0.8x length of T3–5 together. T7 about same length as T6. T8 shiny dark tan. Female genital plate (Fig. 314) with long, fine setae; dark brown, large, with

2 or 3 apical spicules, 3 to 6 complete rows of large spicules and an additional, basal row, incomplete medially; spicules occupying less than distal half of posterior surface. Spicules (Fig. 315) conical; ridges long, pointed apically, causing fluted basal edge to spicule; pedestals fused basally; with microtrichia on walls. S6 with 4 to 6 rows of large spicules and some additional scattered anterior spicules; posterior spicules longer and more closely arranged than anterior spicules.

Male. Protandrium almost as high as T5; shiny brownish black with setae mainly moderately long, short dorsally. S8 narrower and shorter than epandrium; mainly brownish black, white pruinose; with narrow posterior pale brown band. Epandrium mid to dark brown. S5 with broad posterior band of spicules.

Measurements. Total length = 4.7 mm (3.4–5.3 mm); wing length = 4.0 mm (2.4–3.8 mm).

Distribution. Western Australia (Fig. 340).

4.5.17 *Stenoconops* Kröber

Introduction

Material for this study has been borrowed from most Australian insect collections and therefore contains representatives from as diverse a range of geographic localities as possible. Despite this, no specimens of *Stenoconops* were identified from the collections and the type specimen remains the only one known. I have studied the female type of *S. niger* and am convinced that it is not congeneric with any other genus. Kröber (1939b) states that the type has three distinct ocelli. I disagree and believe that what Kröber interpreted as the median ocellus is only an area of cuticle of paler pigmentation than the surrounding vertex.

Genus STENOCONOPS Kröber

STENOCONOPS Kröber 1939b: 606. Type species: *Stenoconops niger* Kröber, by monotypy

Diagnosis

Occiput blackish brown dorsally, pale yellow ventrally; vertex triangular; two ocelli present; frons grooved, median length less than half width; first flagellomere of antenna about 2x pedicel length; stylus three-segmented; face receding; maxillary palpus absent; haustellum about 2x head length. Dorsum of thorax with long black setae; wing hyaline. Abdomen narrow, mostly parallel-sided, T2 and T3 2x as long as wide; posterior margin of T6 and anterior margin of T7 straight; female genital plate short, broadly rounded.

Redescription

Head. Occiput blackish brown dorsally, pale yellow ventrally. Median occipital sclerite dorsolaterally separated from posterolateral margin of frons by lateral extremity of vertex. Vertex smooth, triangular, demarcated from frons by ridge which extends anteromedially; not raised above plane of frons; without differentiated setae; setae long, moderately strong, black. Ocellar tubercle raised above plane of vertex; ocellar bristles not differentiated from other setae of vertex. Two ocelli present. Frons strongly rugose; almost bare; distinctly wider than long; differentiated fronto-orbital setae absent. Fronto-orbital region raised above plane of mesofrons. Lunule large, projecting anteriorly. Eye about 0.8x head height. Antenna slightly longer than head height; scape with short strong setae laterally and along anterior margin; pedicel expanded distally; base narrow, short, shiny, smooth; otherwise rough, with minute strong setae and apical dorsal swelling. First flagellomere about 2x as long as pedicel. Stylus three-segmented. Face receding, with weak facial carina and deep antennal foveae. Parafacial at right angles to inner margin of eye. Facial ridge relatively short. Cheek slightly concave, more or less triangular-shaped. Palpus absent. Haustellum longer than head length.

Thorax. Mainly black with dense, long white pubescence; dorsum covered with long black setae; poorly differentiated npl, ial, pal and ipal bristles present; scutellum with two pairs of convergent bristles slightly lon-

ger and thicker than other scutellar setae. Pleura with prepst and kepst bristles. Tibiae without apical, oval densely pruinose patch; dense microsetae on anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus. Wing completely hyaline; R_1 extending along costa to end a little before R_{2+3}; vena spuria conspicuous; cell r_{4+5} long, acute apically.

Abdomen. Slender, parallel-sided to end of T4, widening slightly posteriorly. Tergites without dense pruinose bands. T1 with numerous long bristles laterally. T2 and T3 elongate, about twice as long as wide.

Female. Posterior margin of T6 and anterior margin of T7 straight. Female genital plate short, broadly rounded, with apical rows of spicules.

Male. Unknown.

Stenoconops niger Kröber (Figs 306, 307)

Stenoconops niger Kröber 1939b: 606

Type material. *Holotype* (examined). ♀, **L1**: Type; **L2**: Stenoconops niger Kröb. examined & det. O. Kröber, 1938.; **L3**: Stenoconops niger Krb ♀ [hand written pencil]; **L4**: W. Australia. Purchd. fr. Du Boulay. 69.50.; **L5**: 69 50; **L6**: TYPE (NHM).

Diagnosis

Frons blackish brown, strongly projecting forwards laterally; vertex triangular, projecting anteromedially; antenna almost entirely black; face yellow; haustellum 1.4x head length. Thorax and abdomen mainly black. Femora mainly brown, ventroapical half of fore and mid femora yellowish brown; fore and mid tibiae yellowish brown except for dark brown band on distal half; hind tibia entirely brown; tarsi dark brown.

Redescription

Head. Occipital setae long, fine, black. Median occipital sclerite brownish black, suture lines reddish brown. Vertex blackish brown; setae across posterior half and over ocellar tubercle; anterior margin extending forward to about half length of frons; with anteromedian groove. Ocellar tubercle black, somewhat elongate anteriorly; ocellus ovoid. Frons blackish brown; almost bare; some minute, fine setae around anterior and lateral margins; width 2x median length; anterolaterally projecting forward to protrude far beyond level of eye in profile so that anterior margin of frons V-shaped; deep lateral groove extending on to anterior projection. Fronto-orbital region black, silvery pruinose. Lunule black; length about 3x width of antennal base. Antenna mainly black; base of pedicel brown; ratio of segment lengths: 1:1.8:3.8; base of pedicel without transverse dorsal keel; first flagellomere with slight dorsal swelling on basal half. Stylus (Fig. 306) black; segment 1 short, disc-shaped; segment 2 with short ventral projection; segment 3 elongate, pointed; length about 0.25x length of first flagellomere. Face with fine, pale brown setulae. Parafacial densely silvery pruinose; narrowly dark brown dorsally as continuation of fronto-orbital colour, otherwise pale yellow. Facial ridge, facial carina and frontoclypeal tubercle yellow. Antennal fovea shiny yellow. Cheek pale yellow. Postgena pale yellow, silvery pruinose; setae fine. Haustellum brownish black, base brown; 1.4x head length.

Thorax. Postpronotal lobe black, posterior half densely white pruinose, with numerous long black setae. Mesonotum mainly black, postalar callus dark brown; densely white pruinose medial of postpronotal lobe, on notopleuron and supra-alar region. Scutellum with two pairs of convergent bristles. Postnotum white pruinose. Pleura dark brown, mainly densely white pruinose. Two prepst (1 short) and 2 kepst bristles present. Coxae brown. Femora mainly brown, white pruinose; ventroapical half of fore and mid femora yellowish brown; fore and mid femora with dorsal and ventral rows of black setae, otherwise bare. Tibiae white pruinose, fore and mid tibiae yellowish brown except for dark brown band on distal half; hind tibia entirely brown. Tarsi dark brown; microsetae golden brown. Wing with Sc ending mid length. R_{4+5} and M (Fig. 307) evenly

curved before fusing; petiole length 0.4x length of dm-cu. CuA_2+A_1 about equal to length of petiole. Haltere pale yellow, base yellowish brown.

Abdomen. Tergites mainly brownish black, finely white pruinose, especially laterally and posteriorly; with short black setae on T1–3, longer on T4–6. T1 not wider than T2. T2 and T3 about equal length. T4 about 0.75x length of T2; with posterior and lateral margins brown. S1 dark brown. S2–4 not visible.

Female. T5 with posterior and lateral margins brown. T6–8 shiny; T6 black; T7–8 dark brown. Female genital plate yellowish brown, projecting ventrally further than genitalia; setose anteriorly; with 8 rows of spicules apically. S6 with spicules closely arranged, in defined rows only posteriorly.

Male. Unknown.

Measurements. Total length = 8.4 mm; wing length = 5.3 mm.

Distribution. Western Australia.

4.5.18 *Tanyconops* gen. nov.

Introduction

This genus is similar to *Heteroconops* and can be distinguished most easily by the narrow, bare section of the costa adjacent to the apex of the petiole, the compacted postabdomen, the elongate, flattened female genitalia and by the male epandrium which is longer than wide.

Genus TANYCONOPS, gen. nov. (Figs 320, 322, 323, 325, 326)

TANYCONOPS sp. nov. Type species: *Tanyconops longicaudus*, sp. nov.

Diagnosis

Ocelli absent; frons spongy-looking, not distinctly rugose; eyes relatively small, cheek broad; antennal pedicel without dorsobasal keel; first flagellomere very long; stylus short, two-segmented; postgena swollen; palpus absent, haustellum shorter than head. Anepisternal bristles usually present; costa abruptly weak and bare a short distance before apex of petiole; petiole long; vena spuria absent. Postabdomen anteroposteriorly compacted in both sexes. Female T6 with posterior margin deeply emarginate mid-dorsally; T7 dorsoventrally flattened, greatly prolonged; T8 very flat; female genital plate broad, spatulate distally, with 2 rows of spicules and apex membranous. Male epandrium longer than wide.

Description

Head. Occiput blackish brown dorsally, pale whitish yellow ventrally; dorsal half of occiput convex and sloping anteriorly (Fig. 322); occipital setae fine, moderately dense and short; row of setae across dorsum of occiput longer and stronger than more ventral setae; setae brown on dorsal half, whitish on ventral half. Median occipital sclerite blackish brown; not extending laterally to eye margin. Vertex bare or with few setae posteriorly, smooth, short, not differentiated from occiput; slightly raised above plane of frons; slightly curving forward medially and laterally. Ocelli, ocellar tubercle and bristles absent. Frons somewhat spongy-looking, not distinctly rugose; bare except for some minute setae along fronto-orbital region. Fronto-orbital forming a narrow rounded, smooth ridge; without differentiated setae. Lunule very narrow. Eyes ovoid, relatively small, high on head so that cheek broad (Fig. 323). Antenna long, slightly shorter than head height; scape slightly dorsoventrally flattened and apex slightly wider than base; pedicel base shiny but without transverse dorsal keel; distally only slightly expanded, pruinose, with minute setae; first flagellomere very long, laterally compressed, tapered distally; stylus very short, two-segmented; segment 1 projecting ventromedially, segment 2 short, pointed apically. Face with shallow median carina, frontoclypeal tubercle, and long, deep narrow, parallel antennal foveae. Parafacial narrow. Facial ridge long. Cheek concave, lower margin meeting

ventral end of facial ridge at about 90°. Postgena pale yellowish, swollen, expanded below eye. Palpus absent. Haustellum not strongly sclerotised; shorter than head length; labellum lobe-like, broader than haustellum.

Thorax. Mainly brownish black with moderately long, fine setae; differentiated mesonotal bristles absent or weak. One moderately strong prepst bristle; anepisternal bristles usually present; dorsal and ventral kepst setae present. Prosternum lightly sclerotised. Mid femur without longer setae on posterodorsal margin; fore femur with dorsal and posterior setae longer than those of mid femur. Apical, oval, densely pruinose patch on tibiae absent; preapical, dorsal tibial bristles absent; anteroventral surfaces of fore tibia and tarsus and posterior surface of hind tibia and tarsus with dense microsetae. Wing completely hyaline; R_1 extending along costa to end a little before R_{2+3}; R_{2+3} ending at about half distance between apices of Sc and petiole; C weakening, and costal spicules ending abruptly, a short distance before apex of petiole (Fig. 320); cell r_{4+5} short so that petiole long; vena spuria absent; discal cell relatively narrow.

Abdomen. Mainly dull blackish brown; more or less parallel sided, slightly tapered posteriorly in female. Postabdomen anteroposteriorly compacted in both sexes (Figs 325,326). Dense pruinose bands absent. T1 not wider than T2. T2 at most 1.5x length of T1. T3 longer than T2; in female expanded posterolaterally. T2 and T3 fused laterally. T4 of female short, prolonged ventrolaterally. S1–4 well developed, relatively broad so that obvious even in dried specimens.

Female. T5 short dorsally, mainly concealed beneath T4. T6 short dorsally, expanded laterally; posterior margin deeply emarginate mid-dorsally. T7 shiny, short dorsally; dorsoventrally flattened distally, greatly prolonged and directed ventrally. T8 very flat. Female genital plate long, apical half expanded, spatulate, with few rows of spicules; apex membranous. S6 without spicules.

Male. T5 and protandrium short; protandrium broadly rounded. S8 short, not clearly demarcated from anterior part of protandrium. Epandrium longer than wide. S5 relatively large; spicules absent.

Measurements. Total length = 4.5–6.5 mm; wing length = 3.3–4.3 mm.

Etymology. The prefix *tany* means ‘long’ and refers to the genitalia of both sexes. The name is masculine.

Key to Australian species of *Tanyconops*

1. Postpronotal lobe entirely yellow; frons, except narrow fronto-orbital region, yellowish brown; M meeting R_{4+5} at right angles; R_{4+5} almost straight, not arching before apex of M. . . . . ***luteus*** sp. nov.
-. Postpronotal lobe brown at least anteriorly; frons usually brown at least posteromedially; M meeting R_{4+5} at slightly less than right angles; R_{4+5} arching before apex of M (Fig. 320). . . . . 2.
2. Eye length less than height; femora mainly yellow . . . . . ***longicaudus*** sp. nov.
-. Eye length greater than height (Fig. 323); femora extensively dark brown dorsally . . . . . ***ocellatus*** sp. nov.

***Tanyconops longicaudus*, sp. nov. (Figs 320–322, 325–332, 341)**

Type material. Holotype. ♂, Western Australia: 15 km N of Eyre HS, 32°15’S 126°18’E, 28.ii–4.iii.1984, T. F. Houston, 566-4 (WAM). Paratypes. **South Australia**: 1♀, Seal Bay, Kangaroo Island, 4.xii.1977, D.K. McAlpine and M. A. Schneider, sand dunes (AM). **Western Australia**: 1♂, 65 km NNE Neale Junction, 28°47’S 126°07’E, 17–18.ix.1982, B. Hanich and T. F. Houston, 468-6 (WAM); 1♀, 28 km ESE Cervantes, 30°33’S 115°21’E, 26.xi.1966, A. Baynes and L. J. Charlton (WAM); 1♂, Weebubbie Cave area, WNW Eucla, 31°39’S 128°46’E, 22.i.1987, G. and A. Daniels, ex. *Melaleuca* (UQIC).

Diagnosis

Frons mainly yellow; diffusely brown posteromedially and along fronto-orbital ridge, weakly rugose; antenna mainly dark brown. Postpronotal lobe usually yellowish posteriorly, brown anteriorly; femora mainly yellow; hind tibia with basal and apical brown areas; apex of cell r4+5 curved (Fig. 321).

Description

Head. Occipital setae, except most dorsal ones, somewhat appressed on dorsal half of occiput; dorsal setae upright, moderately strong; median pair may represent weak postocellar setae. Vertex shiny brown anteriorly, blackish brown posteriorly confluent with median occipital sclerite and dorsum of occiput. Frons mainly yellow; diffusely brown posteriorly and along fronto-orbital ridge; weakly rugose; width slightly more than 2x length (Fig. 322). Lunule mainly yellowish brown. Eye length less than height; height 0.6–0.7x head height. Antenna mainly mid to dark brown, first flagellomere ventrobasally pale brown; ratio of segment lengths: 1:1.3:4.7; stylus dark brown. Face with fine, short, pale yellowish setae. Parafacial shiny yellow; narrow, widest ventrally level with anteroventral margin of eye. Facial ridge smooth, yellow. Antennal foveae, facial carina, frontoclypeal tubercle and cheek yellow. Cheek almost bare, some short, fine, pale yellowish setae around epistoma. Postgena with short, fine, whitish setae. Haustellum slightly shorter than head length; pale to mid brown, base of labellum paler than apex; setae of labellum about same length as those of haustellum.

Thorax. Postpronotal lobe mainly yellowish brown, white pruinose posteriorly; shiny, brown anteriorly; setae long, fine, yellowish brown, moderately dense on posterior half. Mesoscutum and scutellum mainly moderately shiny brownish black, dark brown on postalar callus; with moderately long, fine yellowish brown setae over entire surface; differentiated mesoscutal bristles absent. Scutellum with one pair of setae longer than other scutellar setae. Postnotum brownish black, finely white pruinose. Pleura blackish brown, finely white pruinose. Proepisternal bristle moderately strong, directed dorsally. Anepisternum with numerous fine, pale bristles on dorsal half. Katepisternal bristles fine, pale yellowish. Prosternum pale yellow. Coxae yellowish; hind coxae usually infuscated with pale brown. Trochanters yellow. Femora yellow; apex of hind femur light brown. Tibiae mainly yellow; hind tibia distinctly brown apically and on basal half; mid tibia less distinctly with brown areas. Tarsi yellowish brown; microsetae pale yellow on fore tibia and tarsus, golden brown on hind tibia and tarsus. Wing (Fig. 320) with Sc ending slightly before mid wing length; apex of r4+5 curved, M meeting R4+5 at slightly less than a 90° angle; petiole 2.6x length of dm-cu. CuA2+A1 slightly more than half length of petiole. Haltere pale yellow, base and most of pedicel light brown.

Abdomen. T1 and T2 blackish brown, narrowly and finely white pruinose across posterior margin. Lateral setae of T1 not especially long, about same length as those on T2 and T3. T2 about 1.5x length of T1 in male and 1.3x length in female. T3 blackish brown; narrowly and finely white pruinose across posterior margin in male; female with narrow posterior whitish membranous band; about 1.3x length of T2 in male; in female, T3 expanded posterolaterally so that 1.4x length of T2 dorsally and 1.6x laterally (Fig. 325). T4 mainly blackish brown; yellowish brown laterally; narrowly and finely white pruinose across posterior margin in male; female with narrow posterior whitish membranous band; with transverse row of longer setae in female; as long as T3 in male; about half length of T3 in female. S1–4 blackish brown.

Female (Fig. 325). T5 mainly blackish brown; yellowish brown laterally; mainly concealed beneath T4. T6 brownish black; expanded ventrolaterally so that margins are approximated ventrally. T7 shiny blackish brown dorsally, becoming yellowish brown apically. T8 shiny mid to light tan. Female genital plate (Fig. 327) yellowish brown, bare anteriorly; with short yellow lateral setae; apex wide, membranous, whitish; posterior surface composed of interlocking hexagonal plates (Fig. 328); margin of apex with minute dense conical processes (Figs 329,330); 3 rows of spicules present; spicules of basal row (Fig. 331) longer and thinner than those of distal rows (Fig. 332).

Male (Fig. 326). T5 mainly brownish black; light brown along posterolateral and lateral margins; short; about 0.5x length of T4; entirely short setose. Protandrium shiny brownish black; entirely short setose; short, broad; dorsal length about 0.6x length of T5; broadly rounded. S8 shiny brown; short; slightly concave dorsally. Epandrium yellowish brown, moderately densely short-setose. S5 dark brown anteriorly, yellowish posteriorly.

Variation. Frons sometimes not rugose. Mid tibia sometimes without brown markings. Crossvein bm-cu missing in one female specimen.

Measurements. Total length = 6.5 mm (5.5–5.6 mm); wing length = 4.3 mm (3.9–4.1 mm).

Distribution. Southern central Australia and southern Western Australia (Fig. 341).

Etymology. The specific name is from the Latin words *longus* (= long) and *cauda* (= tail) and refers to the elongate genitalia of both sexes of this species.

Tanyconops luteus, sp. nov. (Fig. 342)

Type material. Holotype. ♀, **Queensland**: 15 km W Windorah, 24.ix.1983, S. R. Monteith, on *Eucalyptus terminalis* (UQIC).

Diagnosis

Frons, except narrow fronto-orbital region, yellowish brown. Postpronotal lobe entirely yellow; legs almost entirely yellow; apex of r4+5 angulate.

Description

Similar to *T. longicaudus*; differing as follows:

Head. Vertex not curving forward medially; with a distinct median longitudinal groove. Frons not grooved; width 1.9x length. Antennal scape pale brown, pedicel brown; first flagellomere pale brown basally and ventrally, otherwise dark brown. Haustellum damaged; apparently mainly yellow.

Thorax. Postpronotal lobe entirely yellow. Hind femur only faintly brown on dorsum of apex; tibiae entirely yellow except for light brown lateral patch on apex. Tarsal segments 3 and 4 light brown; tarsi otherwise yellow. Crossvein bm-cu missing; apex of r4+5 angulate, M not forming a continuous curve before meeting R4+5 at right angles; R4+5 and petiole almost straight, not arching down at apex of M.

Abdomen. T3 only slightly longer than T2.

Measurements. Total length = 5 mm; wing length = 3.7 mm.

Distribution. Central western Queensland (Fig. 342).

Comments. The single known specimen is damaged so that the female genital plate is missing and the postabdomen is misshapen. T6 and the ovipositor do not show any obvious differences from *T. longicaudus*.

Etymology. The specific name is the Latin adjective *luteus* (= yellow) and refers to the yellow frons and postpronotal lobe of this species.

Tanyconops ocellatus, sp. nov. (Figs 323, 324, 343)

Type material. Holotype. ♂, **Tasmania**: 14 km ESE Cranbrook, 42°04’S 148°13’E, 28.i.1983, I. D. Naumann and J. C. Cardale, ex. ethanol (ANIC). Paratype. **Tasmania**: 1♂, 1 km SSE Gladstone, 40°58’S 148°01’E, 29.i.1983, I. D. Naumann and J. C. Cardale, ex. ethanol (ANIC).

Diagnosis. Eye length greater than height; haustellum broad and very short. Postnotum and pleura, except ventral half of katepisternum, densely white pruinose; femora extensively dark brown dorsally; hind tibia and tarsus dark brown.

Description. Similar to *T. longicaudus*; differing as follows:

Head. Vertex black, bare. Frons brownish black posteriorly, dark brown laterally, yellowish brown anteromedially. Eye height about half head height; longest axis diagonally across head (Fig. 323). Antenna (Fig. 324) uniformly dark brown. Facial ridge brown dorsally, becoming cream ventrally. Antennal foveae, facial carina, cheek cream. Clypeus represented by small median dark brown sclerite. Haustellum broad, shorter than head length, brown basally; labellum whitish.

Thorax. Postpronotal lobe brown, white pruinose. Mesonotum with npl, pal and apical scutellar bristles moderately well differentiated. Postnotum and pleura, except ventral half of katepisternum, densely white pruinose. Prosternum narrow, white. Anepisternal setae absent. Femora mainly dark brown dorsally and somewhat laterally, otherwise yellowish brown, except base of hind femur pale yellowish. Fore and mid tibiae and tarsi yellowish to brown, hind tibia and tarsus dark brown. Haltere white.

Abdomen. T2 only slightly longer than T1. T3 1.5x length of T2 and slightly longer than T4. Posterior margin of T3 and T4 narrowly white. T4 not yellowish laterally.

Female. Unknown.

Male. T5 and protandrium entirely shiny blackish brown. Epandrium yellowish, densely short-setose. S5 entirely dark brown.

Measurements. Total length = 5 mm (4.5 mm); wing length = 3.7 mm (3.3 mm).

Distribution. Eastern Tasmania (Fig. 343).

Comments. The two known specimens of this species have been extracted from ethanol. Consequently some colours may be paler than would be observed in fresh specimens.

Etymology. The specific name is the Latin adjective *ocellatus* (= having little eyes).

5. Biogeography

5.1 World distribution of Conopidae

Conopidae occur in all biogeographical regions, most subfamilies and many genera having distributions across several or most regions. The monogeneric Stylogasterinae occur in the Oriental, Neotropical, Nearctic, Afrotropical and Australian zoogeographic regions. Smith (1979) provided a world map showing numbers and distribution of species. *Stylogaster* is most speciose in the Neotropical region (about 42 species) and the Afrotropical region (14 species). Dalmanniinae occur in the Oriental, Neotropical, Nearctic, and Palaearctic regions but not in the Afrotropical and Australian regions. Conopinae and Myopinae occur in all regions. Finally Notoconopinae is known only from Australia. This new subfamily shows many plesiomorphic character states for the Conopidae and represents an early divergence from the main stem of radiation of the family within Australia.

5.2 Levels of Endemism

The Australian conopid fauna is unique in many respects. More than 75% of the genera are endemic. Non-endemic genera occur widely in other geographical regions but tend to have few Australian representatives (Table 3). My revision of the family within Australia has revealed that about 90% of species belong in the Conopinae. The Australian fauna seems to have radiated in the more arid areas and specimens are frequently collected on species of *Leptospermum* and *Eucalyptus* (Myrtaceae) in areas of sandy soil or sandstone outcrops. About 100 species of Conopinae are now ecognized in fifteen genera, thirteen of which are endemic. Many species are strikingly different from ‘typical conopids’; species are frequently black, setose and small, some only a few millimeters long.

One striking feature of the Australian fauna is the high level of endemism at the generic level as well as at the species level. Table 2 presents a comparison of the number of genera occurring in the zoogeographic regions and the number of endemic genera in those regions.

TABLE 2. Distribution of world genera.

Region	Total no. of genera	No. of endemic genera
Nearctic	9	0
Neotropical	15	6
Palaearctic	20	5
Afrotropical	16	6
Oriental	20	2
Australian	19	14

The tables below show the high level of endemism demonstrated by Australian Conopidae. The fauna of no other region shows anything like this level. If genera do occur in other regions, then the number of species of those genera occurring in Australia is relatively small (Table 3).

TABLE 3. Distribution of non-endemic Australian genera and number of Australian species.

Subfamily	Genus	Distribution	Number of Australian species
Conopinae	*Conops*	all regions	9
	Physocephala	all regions	3
Myopinae	*Thecophora*	all regions	approx. 4
	Myopa	all regions except Afrotropical	approx. 6
Stylogasterinae	*Stylogaster*	all regions except Palaearctic	3

TABLE 4. Numbers of Endemic Australian genera.

Subfamily	Number of endemic genera	Total number of genera
Conopinae	13	15
Dalmanniinae	0	0
Myopinae	0	2
Notoconopinae	1	1
Stylogasterinae	0	1

Most Australian genera are widely distributed throughout Australia and do not show any particular pattern of distribution according to the recognized zoogeographical or faunal regions (see species distribution maps).

6. Phylogenetic relationships

Hennig (1966) provided the only comprehensive discussion of the evolution of conopid subfamilies to date and presented an interpretation of plesiomorphic and apomorphic states of conopid characters. Preliminary cladistic analyses of the conopid subfamilies and Australian conopid genera carried out in conjunction with the taxonomic study presented above showed very strong support for the monophyly of the new subfamily, Notoconopinae and suggested a relatively basal position in the Conopidae. The analyses also showed very

clear support for the monophyly of the Conopinae but no clear evidence is available for the presence of endemic tribes despite the large number of endemic genera. The tribal classification of Australian Conopinae will have to be studied in conjunction with a world review of the subfamily. However, one further finding from the preliminary cladistic analyses is worth mentioning. *Physoconops* (included in the analyses for comparative purposes) aligned more closely to Australian *Physocephala* than to *Conops*. This suggests that Smith's 1980 understanding of the tribal classification of Conopinae has more support than that of Camras (1965) and Papavero (1971). Smith placed both *Physocephala* and *Physoconops* in the tribe Physocephalini while Camras and Papavero placed *Physoconops* in the Conopini.

Finally, the analyses, together with anatomical features, indicated a need to review the subgeneric classification of *Conops* and its relationship with *Australoconops*. The analyses showed clearly that *C. aureolus* and *C. satanicus*, currently classified as *Conops* (*Asiconops*) because of the absence of ocelli, have a closer affinity with *Australoconops* (that possess ocelli) than with *Conops*. Either *C. aureolus* and *C. satanicus* belong in a separate genus or they should be regarded as a subgenus of *Conops*, together with *Australoconops* and *Asiconops*.

7. Conclusion

The taxonomy of Australian Conopidae has been neglected. Past descriptive work was based on few specimens and, with the exception of the Stylogasterinae, no comprehensive study of any group has been undertaken. My revision of the family within Australia has revealed that about 90% of species belong in the Conopinae with a few species in both Stylogasterinae and Myopinae, one species in the remarkable new subfamily, Notoconopinae and no known species in Dalmanniinae. One hundred species of Conopinae are now recognised in fifteen genera, thirteen of which are endemic. Approximately 30 additional species remain undescribed. Despite the high level of radiation of Conopinae in Australia, distinct monophyletic clades within the subfamily are not evident and genera appear to have tribal affinities on a more global level.

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APPENDIX Catalogue of Australian Conopidae

Family CONOPIDAE
Subfamily CONOPINAE

Genus ATRICHOPARIA gen. nov.

Type species: *Heteroconops curticornis* Kröber 1940, **pres. des.**
curticornis Kröber, 1940: 64 (*Heteroconops*). Australia (WA).

Genus AUSTRALOCONOPS Camras

AUSTRALOCONOPS Camras, 1961: 64. Type species: *Conops splendidus* Kröber, 1916, orig. des.
aequatus Walker, 1849: 675 (*Conops*). "New Holland"; Australia (Qld, NSW, Vic, WA).
piceus Bigot, 1887: 43 (*Conops*). Australia (WA).
aglaos sp. nov. Australia (NSW); Australia (Qld).
aptatus Walker, 1849: 675 (*Conops*). Australia (WA).
aurantius sp. nov. Australia (NSW).
aurosus Newman, 1841: 222 (*Conops*). Australia (NSW); Australia (Qld, NSW, ?Tas).
bulbimus Walker, 1849: 674 (*Conops*). “New Holland”.
aureorufa Macquart, 1851: 134(162) (*Conops*). Australia (Tas) [= ?error].
claviventris Thomson, 1869: 514 (*Conops*). Australia (NSW).
aureomaculatus, error for *aureorufa*.
balteus sp. nov. Australia (Qld).
breviplatus sp. nov. Australia (NSW).
bridwelli Camras, 1961: 65. Australia (Qld); Australia (NSW, Vic).
brunneus sp. nov. Australia (WA).
camrasi sp. nov. Australia (NSW).
cantrelli sp. nov. Australia (NT).
elegans sp. nov. Australia (NSW); Australia (WA).
fulvitarsus sp. nov. Australia (Qld).
furvus sp. nov. Australia (Qld).
inglorior Walker, 1849: 676 (*Conops*). "New Holland"; Australia (Vic, SA).
nebrias sp. nov. Australia (ACT); Australia (Qld).
neuter sp. nov. Australia (WA).
ocellatus de Meijere, 1910a: 163 (*Conops*). Australia (NSW); Australia (Qld, SA, WA). **comb. nov.**
ocellifer, error for *ocellatus*.
pallorivittus sp. nov. Australia (NT).
perbellus Kröber, 1939b: 601 (*Conops*). Australia (WA).
phaeomeros sp. nov. Australia (Qld); Australia (NSW, ACT, Vic, SA).
picus Macquart, 1851: 134(161) (*Conops*). Australia (Tas).
pseudocellifer Kröber, 1939b: 601 (*Conops*). "Neuholland"; Australia (Qld, NSW, SA).
pulcher Camras, 1961: 67. Australia (NSW); Australia (WA).
ruficrus sp. nov. Australia (WA); Australia (SA).
similis Camras, 1961: 67. Australia (Qld); Australia (NSW).
splendidus Kröber, 1916: 63 (*Conops*). Australia (Qld); Australia (NSW, ACT, Vic).
sydneyi Camras, 1961: 69. Australia (NSW); Australia (Vic).
unicinctus Kröber, 1939b: 603 (*Conops*). Australia (WA); Australia (Qld, NSW, ACT, Vic, SA, NT).
vespoides sp. nov. Australia (NSW); Australia (Vic).

Genus CAMRASICONOPS gen. nov.

Type species: *Camrasiconops ater* Camras 1961; **pres. des.**
ater Camras, 1961: 70 (*Microconops*). Australia (NSW); Australia (Qld). **comb. nov.**
rufofemoris Camras, 1961: 71 (*Microconops*). Australia (NSW); Australia (Qld). **comb. nov.**

Genus CHRYSIDIOMYIA Kröber

CHRYSIDIOMYIA Kröber, 1940: 73. Unavailable name; genus-group name proposed after 1930 without type-species designation.
CHRYSIDIOMYIA Kröber *in* Smith, 1989: 460. Type species: *Chrysidiomyia rufa* Kröber, 1940, des. Smith, 1989: 460.
CALLOSICONOPS Kröber, 1940: 75. Type species: *Callosiconops hirsutus* Kröber, 1940, mon. **syn. nov.**
hirsuta Kröber, 1940: 75 (*Callosiconops*). Australia (WA). **comb. nov.**
pulchella Kröber, 1940: 74. Australia (WA); Australia (SA)..
rufa Kröber, 1940: 73. Australia (WA); Australia (Vic).
rugifrons sp. nov. Australia (WA).
setosa sp. nov. Australia (WA); Australia (SA).

Genus CONOPS Linnaeus

CONOPS Linnaeus, 1758: 604. Type species: *Conops flavipes* Linnaeus, 1758, des. Curtis, 1831: 377.

Subgenus ASICONOPS Chen

ASICONOPS Chen, 1939: 171. Type species: *Conops aureomaculatus* Kröber 1933, orig. des.
aureolus sp. nov. Australia (WA).
australianus Camras, 1961: 62. Australia (Qld); Australia (NT).
badius sp. nov. Australia (Qld).
chvalai sp. nov. Australia (Qld).
nigrescens Camras, 1961: 64. Australia (Qld).
satanicus Bigot, 1887: 43. "Australie"; Australia (Vic, SA, WA).
seminiger de Meijere, 1910a: 162. Australia (NSW).
demeijerei Kröber, 1939b: 599. Indonesia (Irian Jaya); "Australien"; Australia (Qld, NSW); PNG. **syn. nov.**
sparsus sp. nov. Australia (Qld).
thoracicus Kröber, 1939b: 597. Australia (NSW); Australia (Qld, Tas).

Genus DELKESKAMPOMYIA Kröber

DELKESKAMPOMYIA Kröber, 1940: 71. Type species: *Delkeskampomyia fasciata* Kröber, 1940, mon.
fasciata Kröber, 1940: 71. Australia (WA).

Genus HETEROCONOPS Kröber

HETEROCONOPS Kröber, 1915a: 80. Type species: *Heteroconops gracilis* Kröber, 1915a, mon.
antennatus Kröber, 1940: 69. Australia (WA).
carnarvonensis sp. nov. Australia (Qld); Australia (NT).
gracilis Kröber, 1915a: 81. Australia (NT); Australia (Qld, WA).
minutus Kröber, 1940: 67. Australia (Vic); Australia (Qld, SA).

tasmaniensis Kröber, 1940: 68. Australia (Tas).

Genus MICROCONOPS Kröber

MICROCONOPS Kröber, 1915a: 77. Type species: *Microconops ornatus* Kröber, 1915a, des. Smith 1989.
atricornis Kröber, 1919a: 143. Australia (Qld).
brunnicornis Kröber, 1940: 78. Australia (WA); Australia (NSW).
fasciatus Kröber, 1915a: 79. Australia (NT); Australia (WA).
nigrithorax Kröber, 1940: 77. Australia (WA).
ornatus Kröber, 1915a: 78. Australia (Qld).
similis Kröber, 1940: 79. Australia (WA).
tasmaniensis Kröber, 1940: 79. Australia (Tas).

Genus NEOCONOPS Kröber

NEOCONOPS Kröber, 1915a: 75. Type species: *Neoconops longicornis* Kröber, 1915a, mon.
brevistylus sp. nov. Australia (Qld).
glaber sp. nov. Australia (Qld).
longicornis Kröber, 1915a: 75. Australia (Qld); Australia (NSW).

Genus PHYSOCEPHALA Schiner

PHYSOCEPHALA Schiner, 1861: 137. Type species: *Conops rufipes* Fabricius, 1782, orig. des.
australiana Camras, 1961: 74. Australia (WA); Australia (Qld, NSW, Vic, SA, NT).
minuta Kröber, 1915b: 131. Australia (Qld).
nigrotestacea Macquart, 1851: 135(162) (*Conops*). Australia (Tas); Australia (Qld, NSW, ACT, Vic, SA, WA, NT).
emarginata Macquart, 1851: 136(163) (*Conops*). Australia (Tas).
sphegiformis Walker, 1853: 256 (*Conops*). Australia (Vic). **syn. nov**.
macer Bigot, 1887: 17 (*Conops*). "Australie". **syn. nov**.
pallipes Kröber, 1915b: 132. Australia (Qld).

Genus PLEUROCERINA Macquart

PLEUROCERINA Macquart, 1850: 164. Type species: *Pleurocerina fasciata* Macquart, 1850, orig. des.
PARACONOPS Kröber, 1915a: 74. Type species: *Paraconops longicornis* Kröber, 1915a, **syn. nov.**
aquila sp. nov. Australia (Tas).
aristalis Camras, 1961: 72. Australia (WA). **comb. nov.**
brevis sp. nov. Australia (Qld); Australia (NSW).
chrysopyga sp. nov. Australia (WA).
fasciata Macquart 1850: 164. Australia (?Tas); Australia (Qld, NSW).
lamellata sp. nov. Australia (NSW); Australia (Qld, SA, NT).
longicornis Kröber, 1915a: 74. Australia (Qld); Australia (NSW, NT). **comb. nov.**
lutea sp. nov. Australia (Qld).
luteiceps sp. nov. Australia (WA); Australia (SA).
nigrifacies Kröber, 1940: 66. Australia (WA). **comb. nov.**
occidua sp. nov. Australia (WA).
saxatilis sp. nov. Australia (Qld); Australia (NSW, Vic).
scutellata sp. nov. Australia (Vic); Australia (Tas).
similis Kröber, 1940: 65. Australia (WA). **comb. nov.**

turneri Camras, 1961: 72. Australia (WA). **comb. nov.**
vespiformis sp. nov. Australia (Qld); Australia (NSW).

Genus SETOSICONOPS gen. nov.

Type species: *Neoconops robustus* Kröber, 1940; **pres. des.**
epixanthus sp. nov. Australia (WA).
robustus Kröber, 1940: 66. Australia (WA). **comb. nov.**
similis sp. nov. Australia (Vic).

Genus SMARTIOMYIA Kröber

SMARTIOMYIA Kröber, 1940: 72. Type species: *Smartiomyia obscura* Kröber, 1940, mon.
arena sp. nov. Australia (Qld); Australia (NSW).
cerina sp. nov. Australia (WA).
danielsi sp. nov. Australia (Qld); Australia (NSW).
macalpinei sp. nov. Australia (SA); Australia (Vic).
obscura Kröber, 1940: 72. Australia (WA). **comb. nov.**

Genus STENOCONOPS Kröber

STENOCONOPS Kröber, 1939b: 606. Type species: *Stenoconops niger* Kröber, 1939b, mon.
niger Kröber, 1939b: 606. Australia (WA).

Genus TANYCONOPS gen. nov.

Type species: *Tanyconops longicaudus* sp. nov.; **pres. des.**
longicaudus sp. nov. Australia (WA); Australia (SA).
luteus sp. nov. Australia (Qld).
ocellatus sp. nov. Australia (Tas).

Subfamily MYOPINAE

Genus MYOPA Fabricius

MYOPA Fabricius, 1775: 798. Type species: *Conops buccata* Linnaeus, des. Curtis, 1838: pl. 677.
ornata Kröber, 1940: 80. Australia (Vic).

Genus THECOPHORA Rondani

THECOPHORA Rondani, 1845: 15. Type species: *Myopa atra* Fabricius, 1782, mon.
OCCEMYA Robineau-Desvoidy, 1853: 130. Type species: *Myopa atra* Fabricius, 1782, orig. des.
OCCEMYIA, *ONCOMYIA*, *ECCEMYIA* errors for *Occemya*.
australiana Camras, 1955: 124 (*Occemyia*). Australia (NSW).

Subfamily NOTOCONOPINAE

Genus NOTOCONOPS gen. nov.

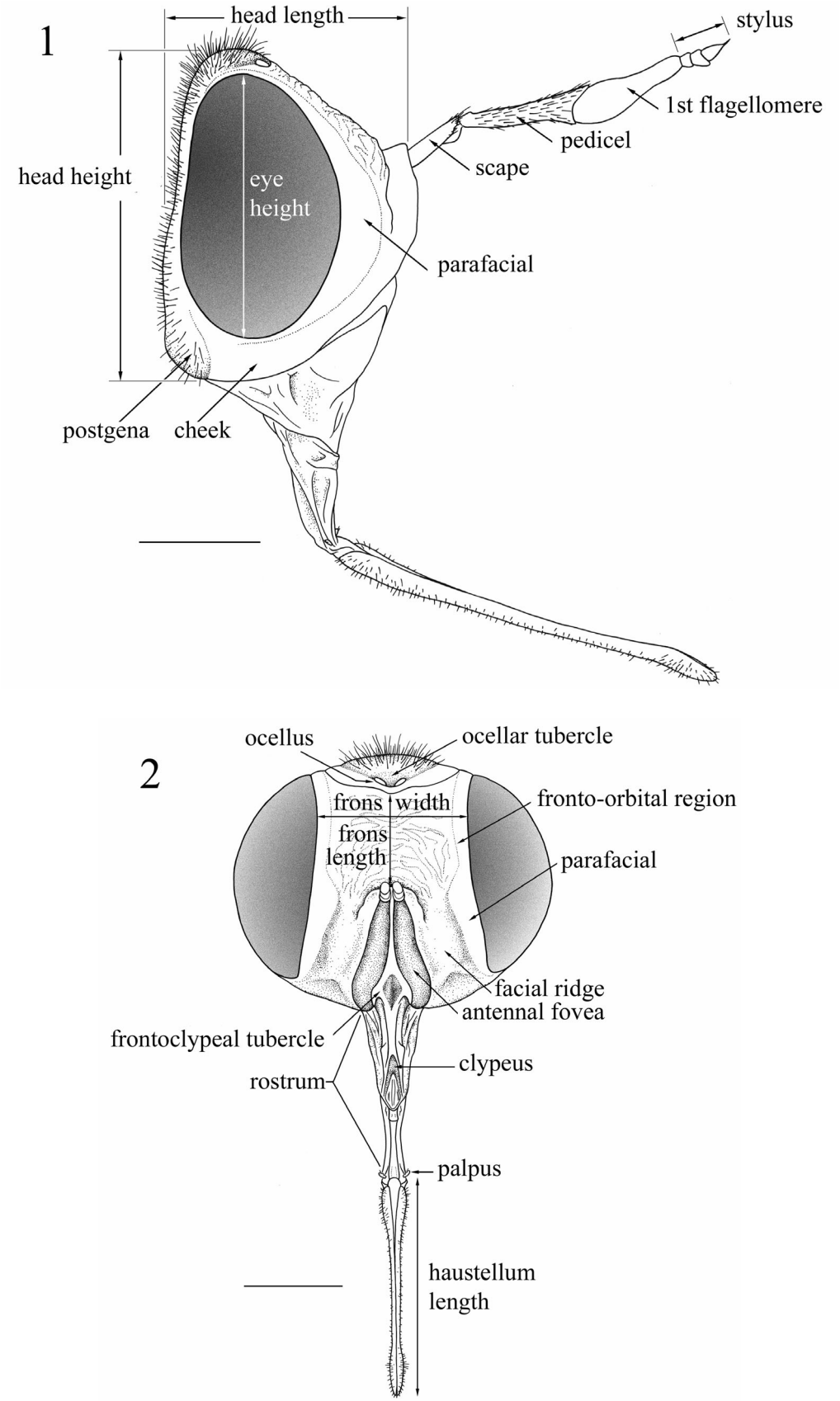
Type species: *Notoconops alexanderi* sp. nov., **pres. des.**

alexanderi sp. nov. Australia (NSW).

Subfamily STYLOGASTERINAE

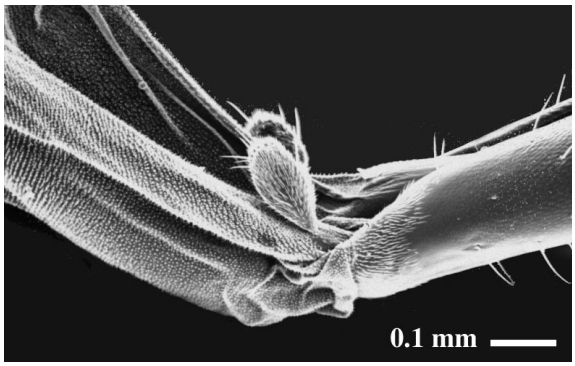
Genus STYLOGASTER Macquart

STYLOGASTER Macquart, 1835: 38. Type species: *Conops stylatus* Fabricius, 1805, mon.
frauci Smith, 1979: 307. Australia (Qld).
liepae Smith, 1979: 304. Lord Howe I.
macalpini Smith, 1979: 307. Australia (Qld); Australia (NSW, Vic, Tas).



FIGURES 1–2. Generalised conopid head illustrating characters used in descriptions: **1.** lateral view. **2.** anterodorsal view. Scale = 1.0 mm.

3



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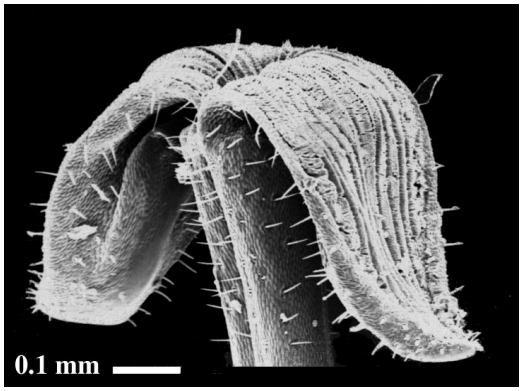

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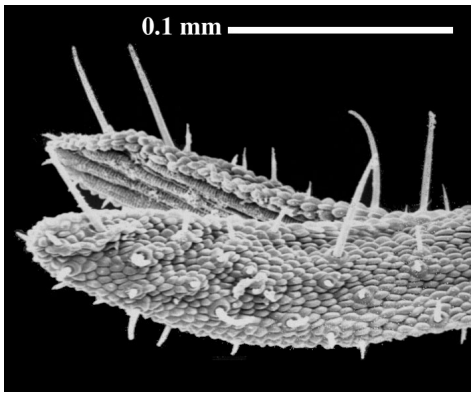

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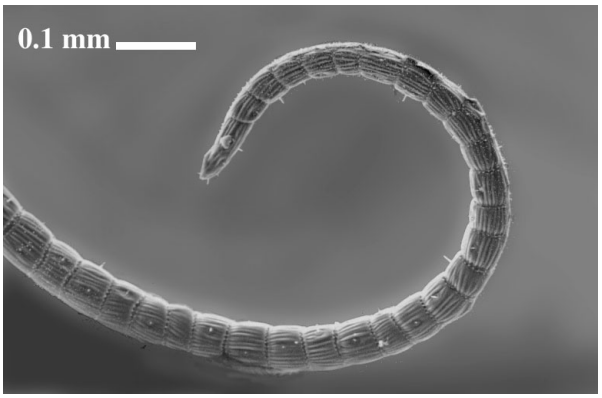

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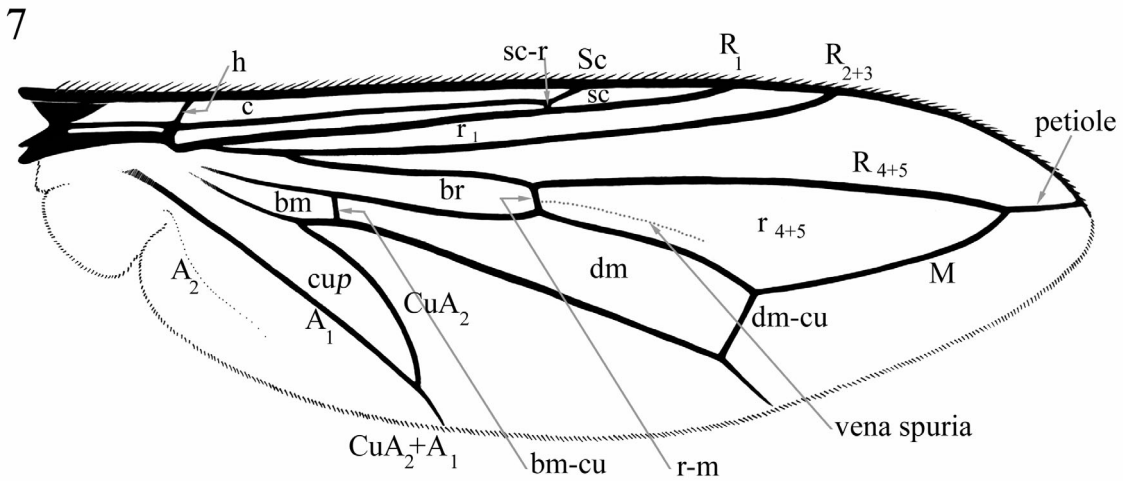
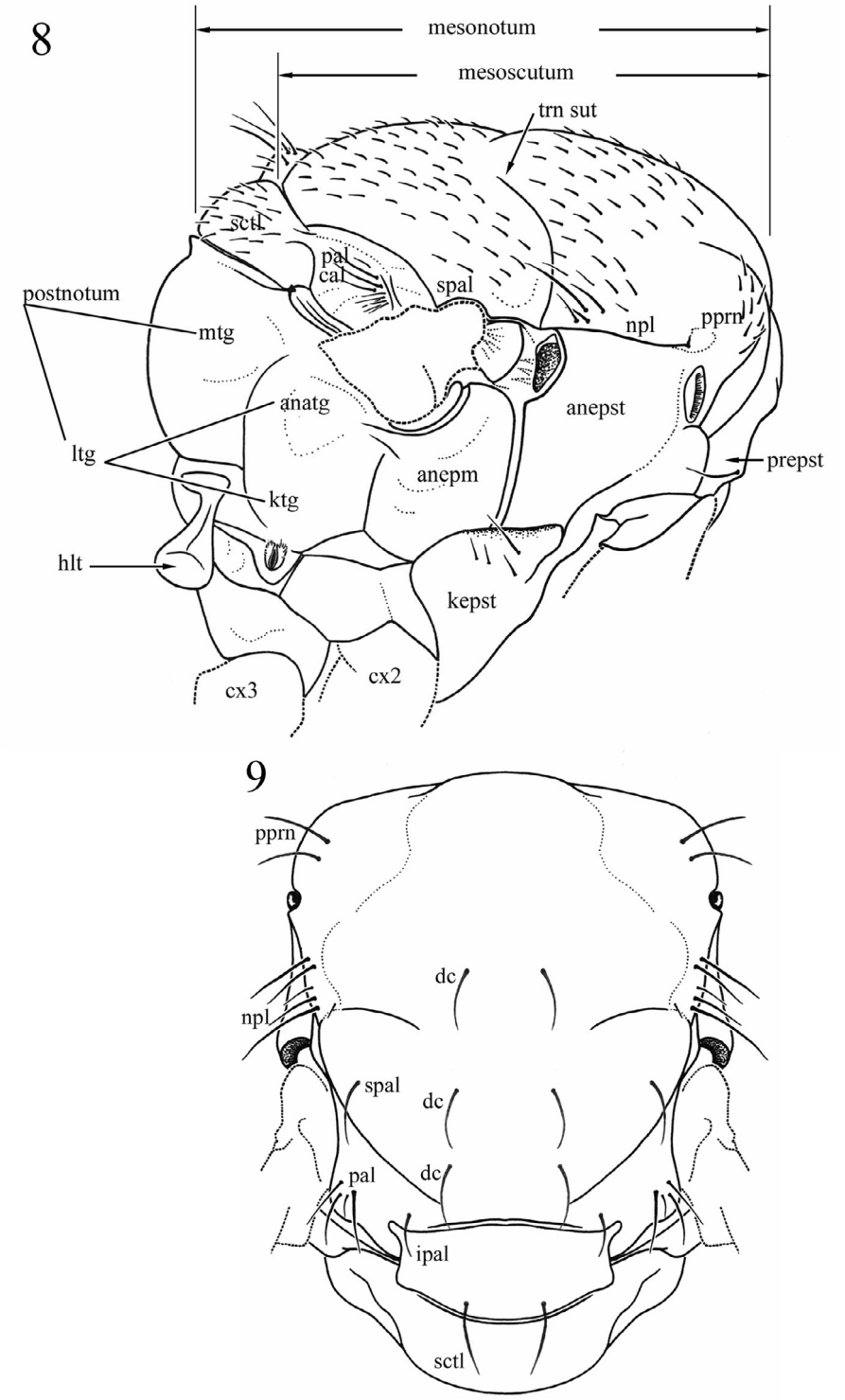
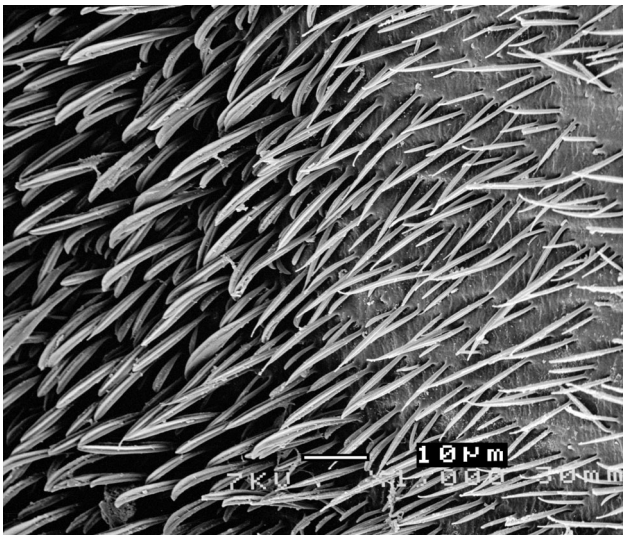


FIGURE 3. Junction of rostrum and haustellum showing palpi (*Australoconops vespoides* sp. nov.). **FIGURES 4–6.** Labella of three conopid subfamilies: **4.** *Australoconops vespoides* sp. nov. (Conopinae). **5.** *Thecophora* sp. (Myopinae). **6.** *Stylogaster frauci* Smith (Stylogasterinae). **FIGURE 7.** Generalised conopid wing showing veins and cells.

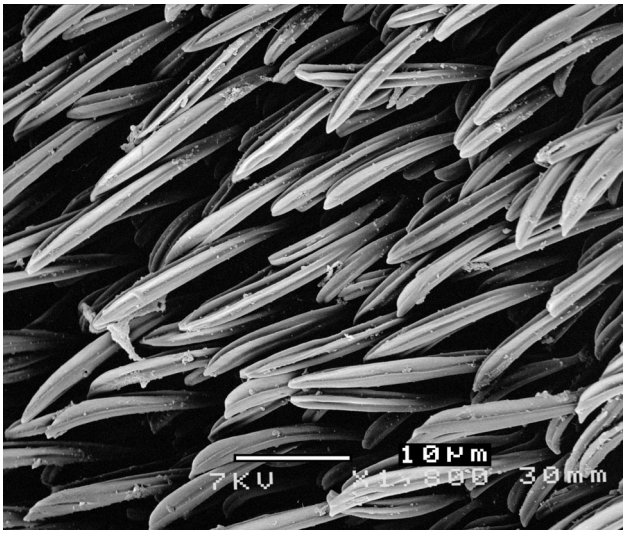


FIGURES 8–9. Generalised conopid thorax illustrating characters used in descriptions: **8.** lateral view. **9.** dorsal view. Abbreviations: anatg, anatergite; anepm, anepimeron; anepst, anepisternum; cx, coax; dc, dorsocentral bristle; hlt, haltere; ipal, intrapostalar bristle; kepst, katepisternum; ktg, katatergite; ltg, laterotergite; mtg, mediotergite; npl, notopleuron; pal cal, postalar callus; pal, postalar bristle; pprn, postpronotal lobe; prepst, proepisternum; sctl, scutellum; spal, supra-alar region/bristle; trn sut, transverse suture.

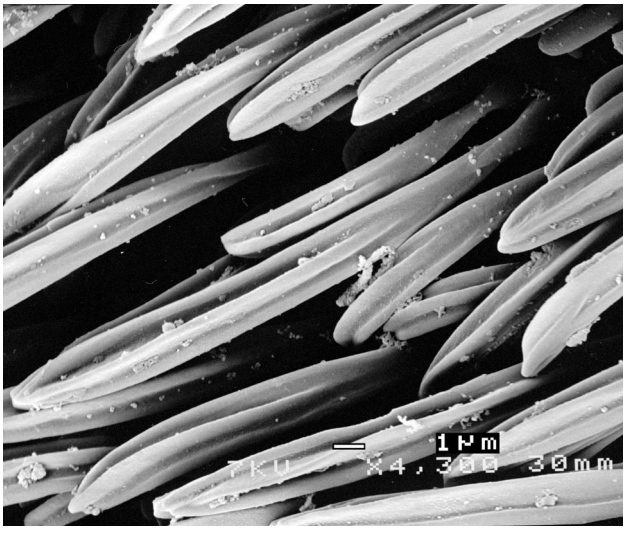
10



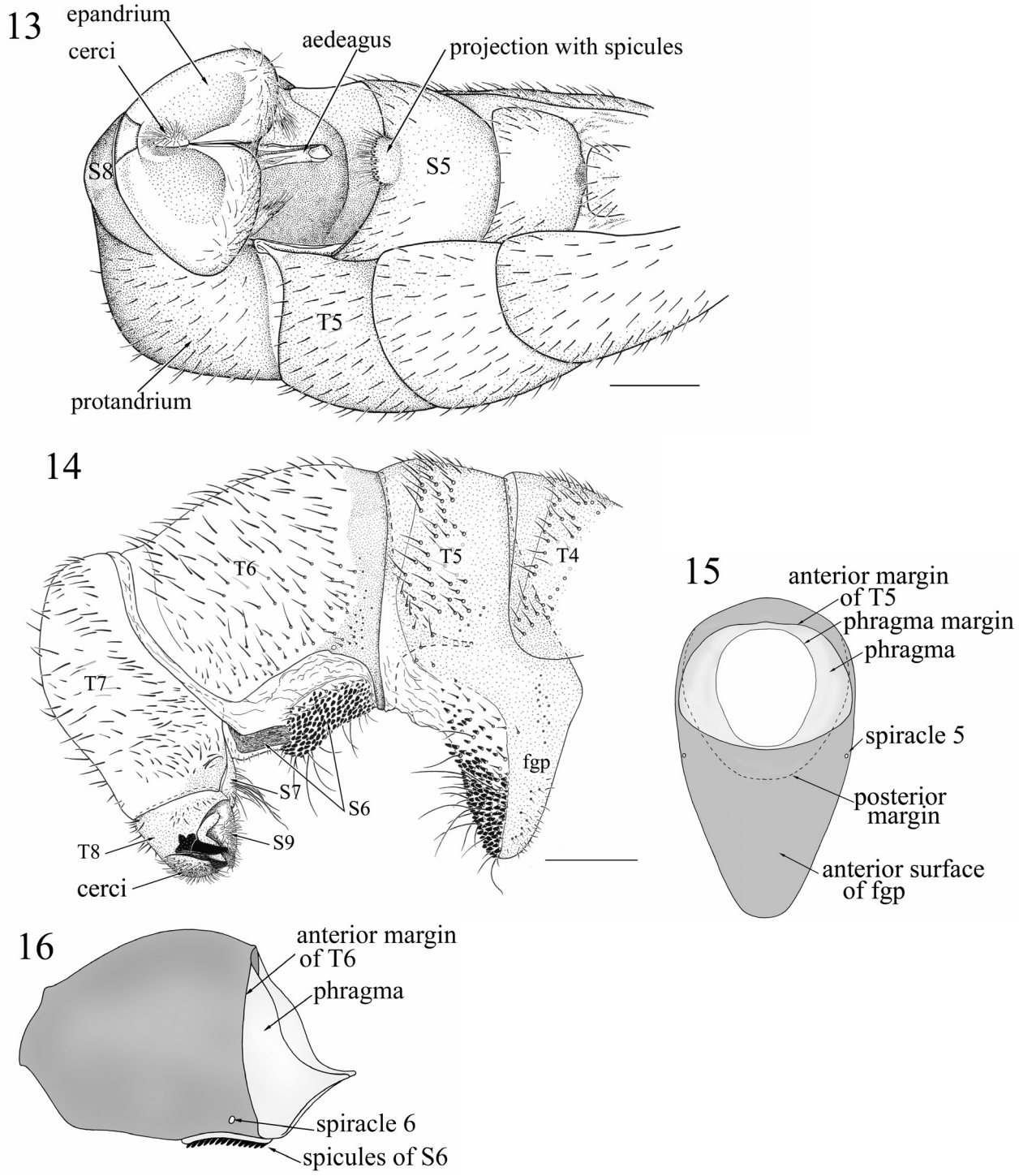
11



12

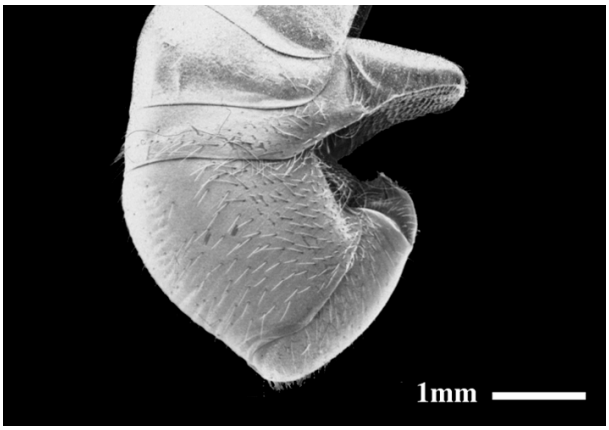


FIGURES 10–12. Cuticular vestiture on thorax (*Australoconops ocellatus* (de Meijere)). **10.** transition between finely pruinose (right side) and densely pruinose (left side) areas. **11–12.** microtrichia of densely pruinose area.

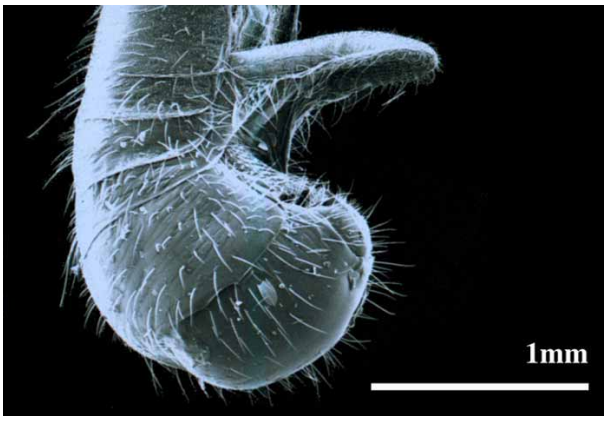


FIGURES 13–14. Generalised conopid abdomens: **13.** male. **14.** female. Scale = 0.5mm. **FIGURES 15–16.** Internal skeletal structures of female segments 5 and 6: **15.** anterior view segment 5 showing narrowed opening and surrounding phragma. **16.** right lateral view segment 6 showing phragma that protrudes into segment 5. Abbreviations: fgp, female genital plate; S, sternite; T, tergite.

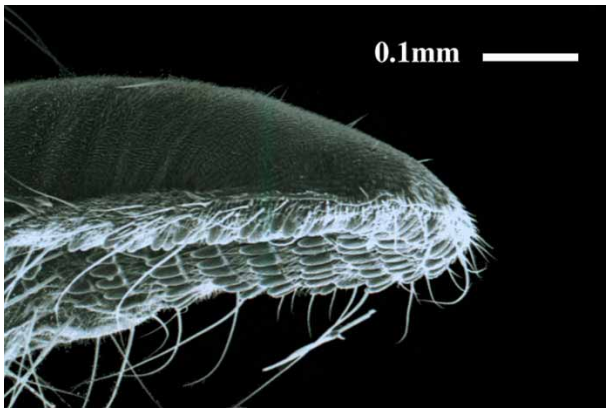
17



18a



18b



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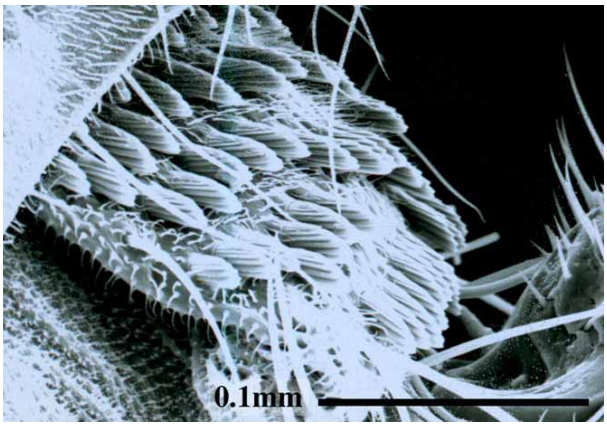
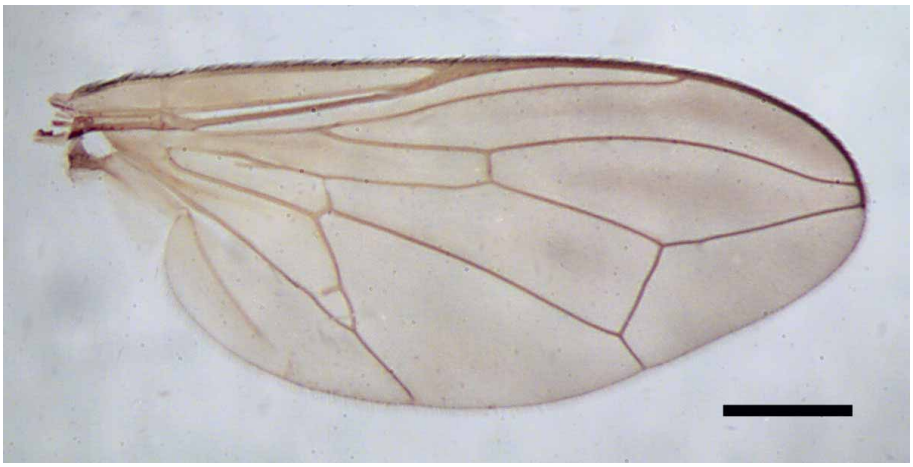
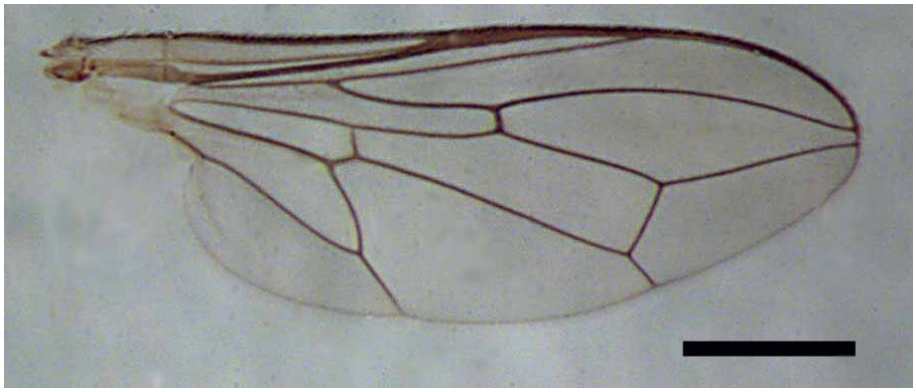


FIGURE 17. Female genital segments (*Conops australianus* Camras). **FIGURES 18 a–c.** Female *Heteroconops* sp.: **a.** genital segments. **b.** spicules on genital plate. **c.** spicules on female sternite 6.

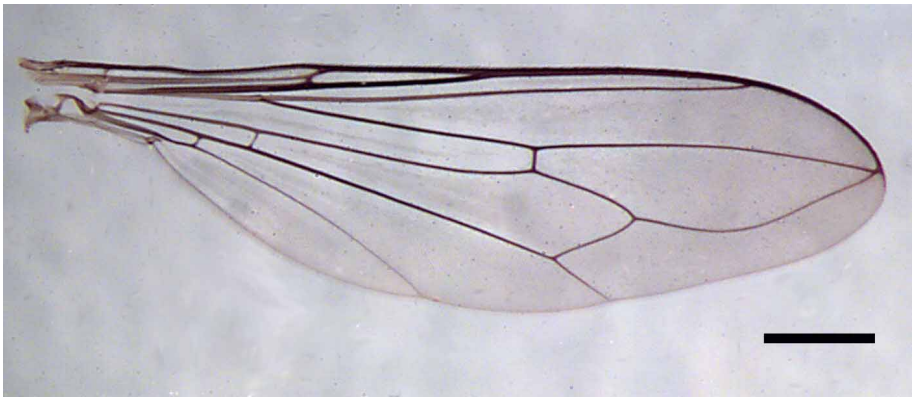
19 *Myopa* sp.



20 *Thecophora* sp.



21 *Stylogaster frauci* Smith



FIGURES 19–21. Right wings as named. Scale = 1.0 mm.

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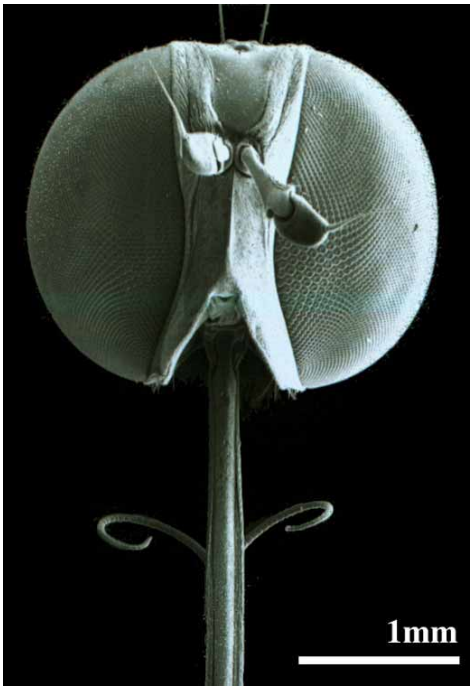
FIGURE 22. *Myopa* sp., lateral view. **FIGURE 23.** *Thecophora* sp., lateral view. **FIGURE 24.** *Stylogaster frauci* Smith, lateral view. **FIGURE 25.** *Stylogaster frauci* Smith, dorsal view. **FIGURE 26.** *Stylogaster macalpinei* Smith, lateral view.

27



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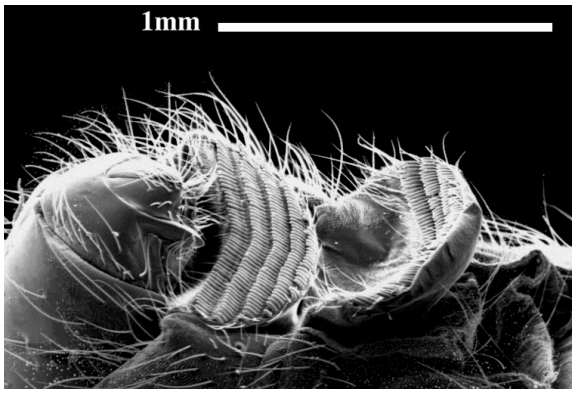

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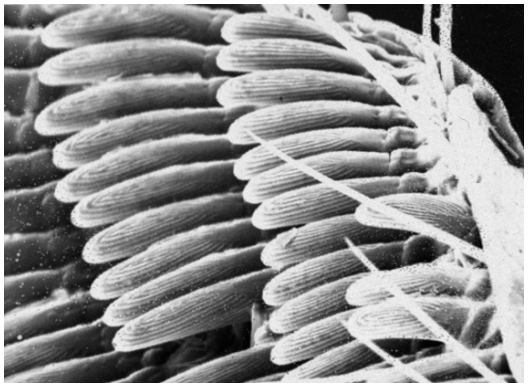

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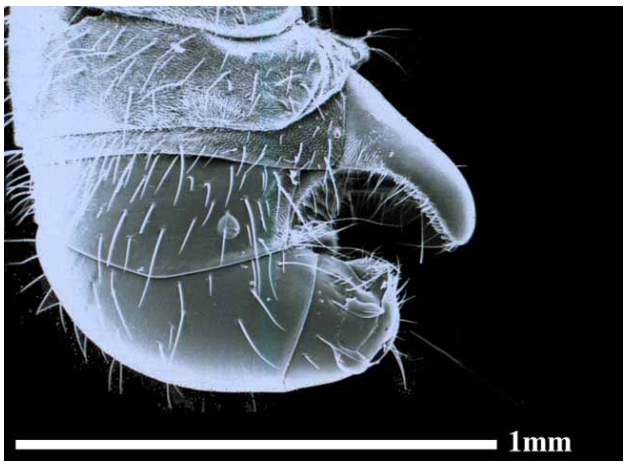
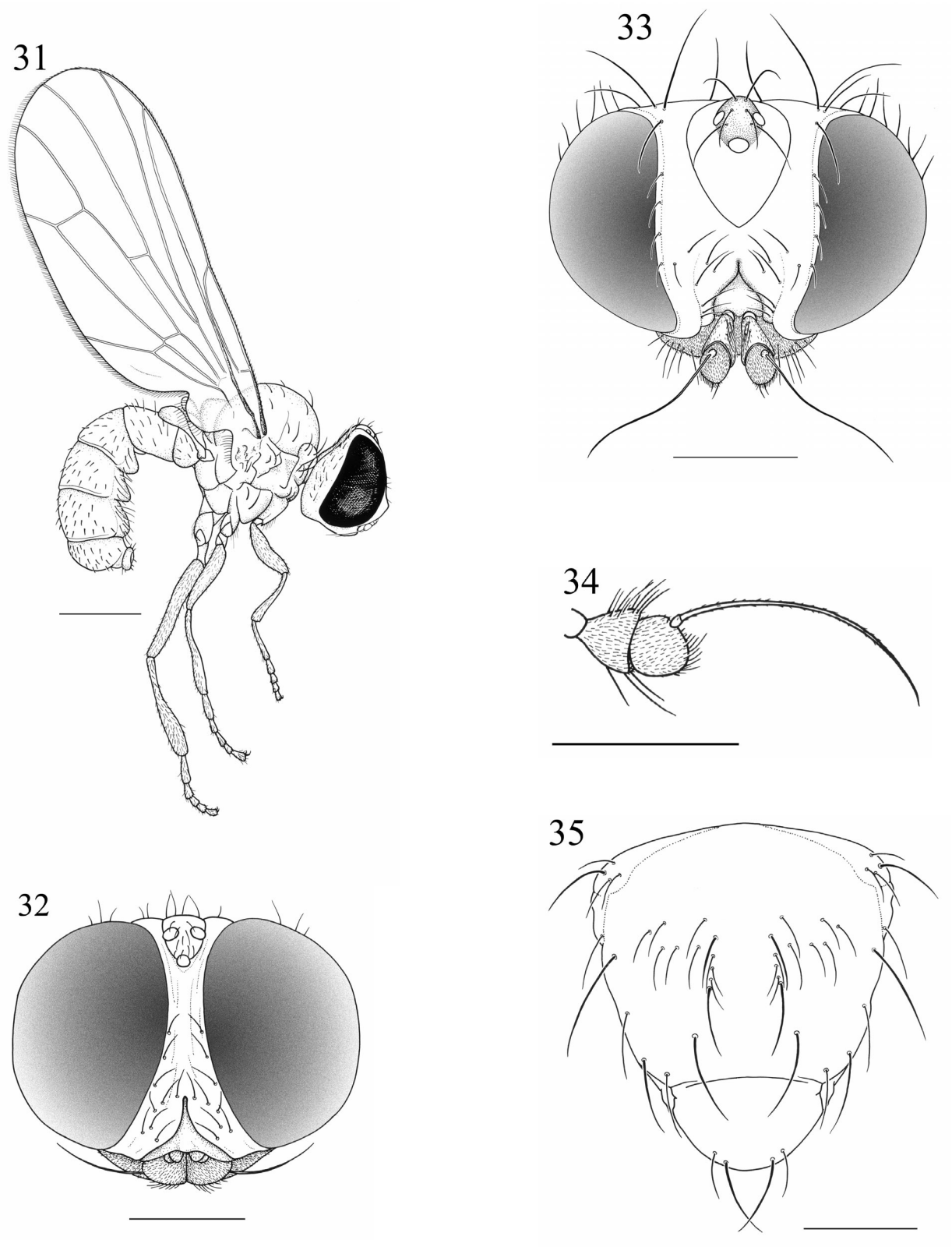
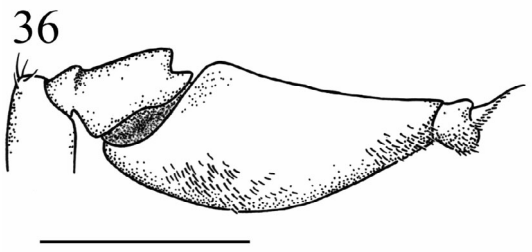
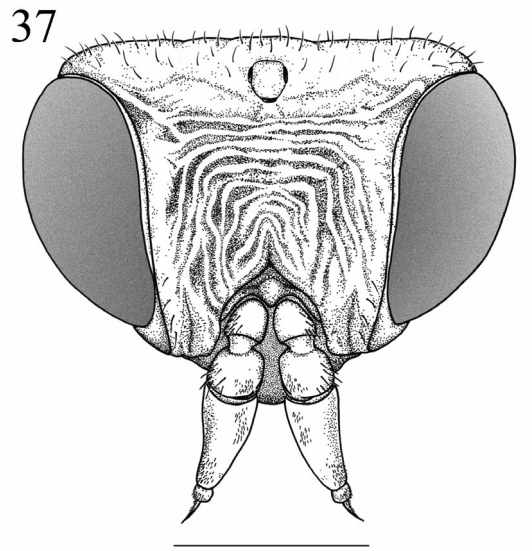


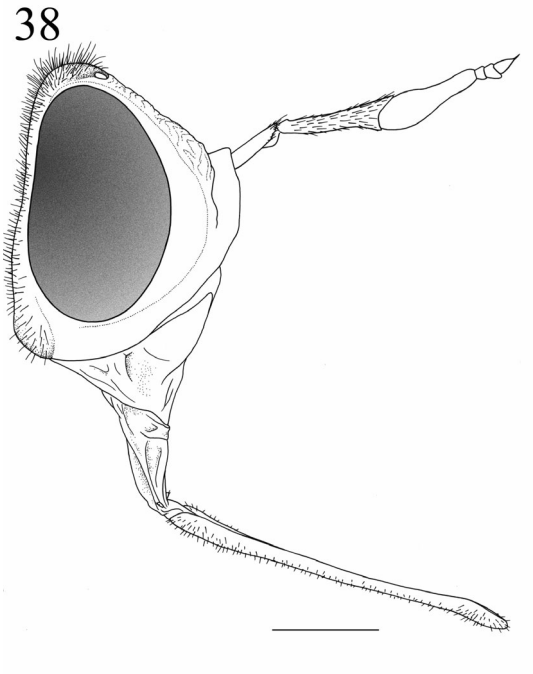
FIGURE 27. *Stylogaster frauci* Smith: anterior view head (middle section of haustellum excluded). **FIGURES 28–29.** Female *Myopa* sp.: **28**. genital segments. **29**. spicules on genital plate. **FIGURE 30.** *Thecophora* sp.: female genital segments.

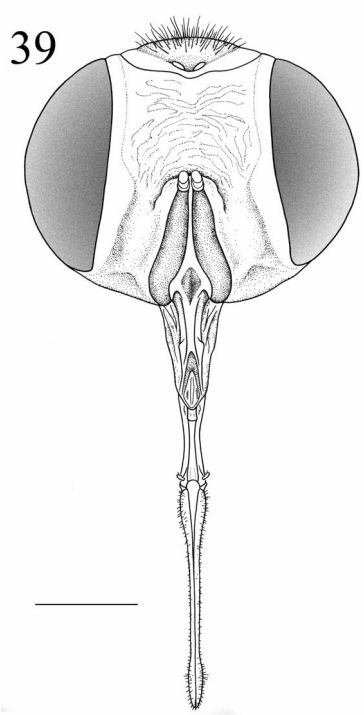


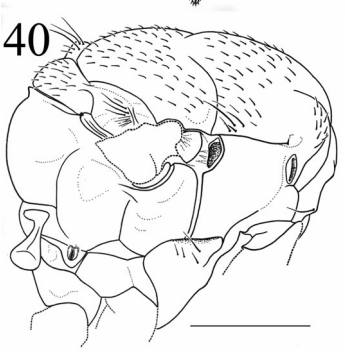
FIGURES 31–35. *Notoconops alexanderi* sp. nov.: **31.** male, right view. Scale = 0.5 mm. **32.** anterodorsal view male head. **33.** anterodorsal view female head. **34.** antenna. **35.** dorsal view thorax. Scale for Figures 32–35 = 0.25 mm.

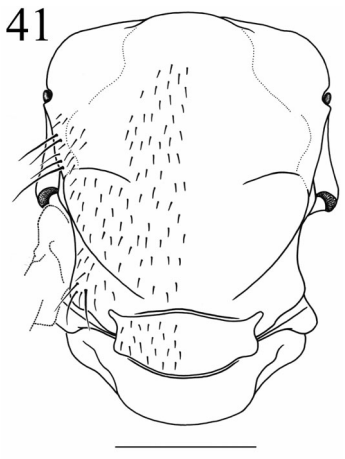






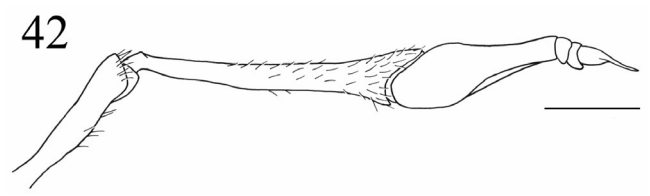


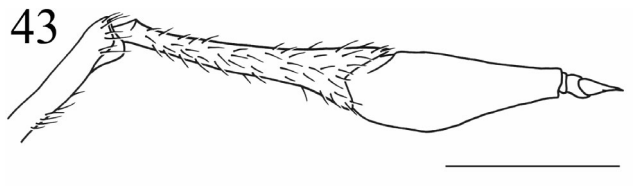


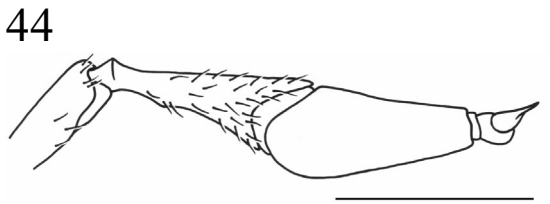


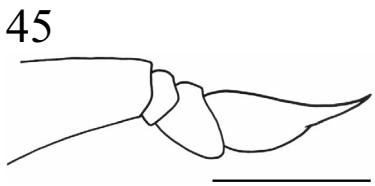
FIGURES 36–37. *Atrichoparia curticornis* (Kröber): **36.** lateral view antenna. Scale = 0.25 mm. **37.** anterodorsal view head. Scale = 0.5 mm.

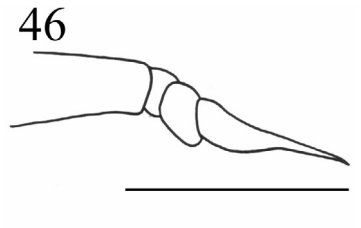
FIGURES 38–41. *Australoconops aequatus* (Walker). **38**. lateral view head. **39**. anterodorsal view head. **40.** lateral view thorax. **41**. dorsal view thorax. Scale for Figures 38–41 = 1.0 mm.

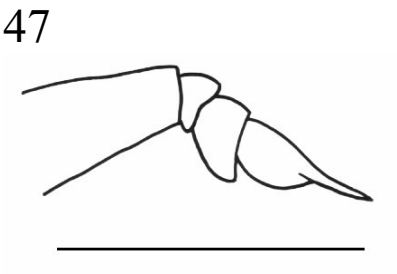


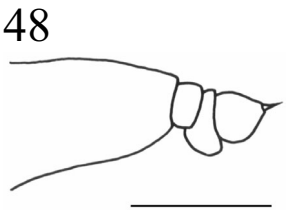


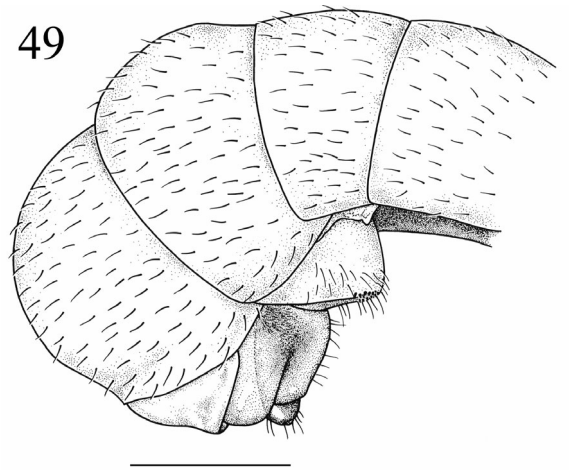


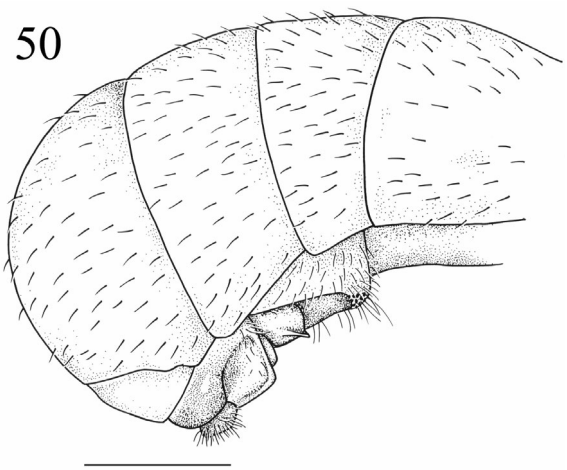




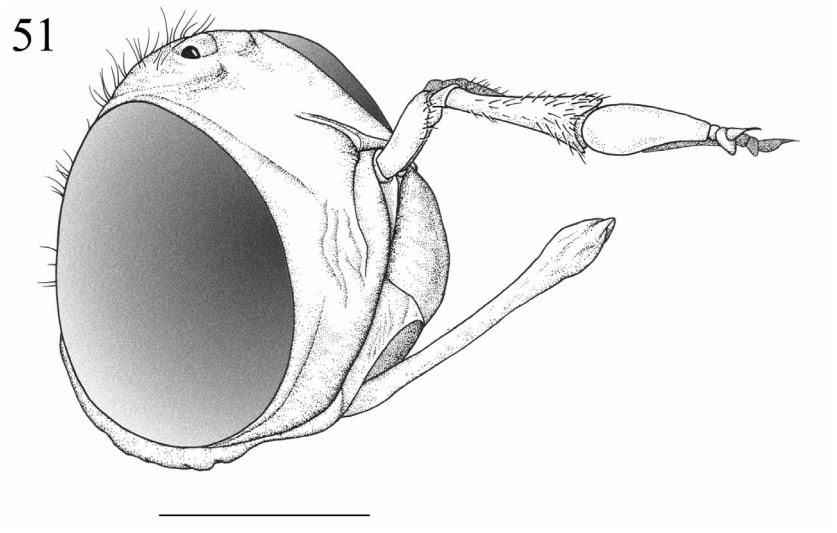


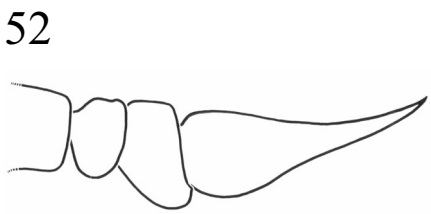


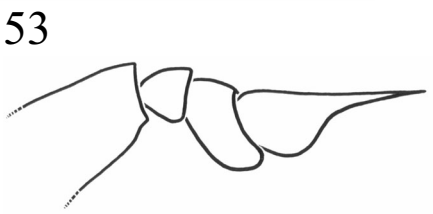


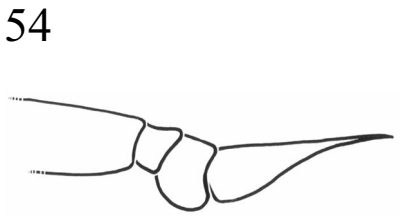


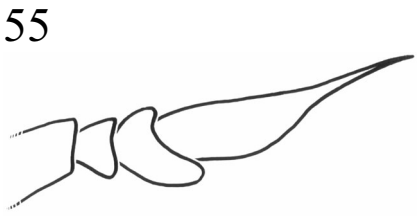
FIGURES 42–50. *Australoconops* spp. **42–44.** Antennae: **42**. *A. bridwelli Camras*. **43**. *A. cantrelli* sp. nov. **44.** *A. pallorivittus* sp. nov. **45–48.** Antennal styli: **45**. *A. aglaos* sp. nov. **46**. *A. elegans* sp. nov. **47.** *A. perbellus* (Kröber). **48.** *A. phaeomeros* sp. nov. Scale for Figures 42–48 = 0.5 mm. **49–50.** Male postabdomens: **49.** *A. bridwelli* Camras. **50.** *A. elegans* sp. nov. Scale for Figures 49–50 = 1.0 mm.

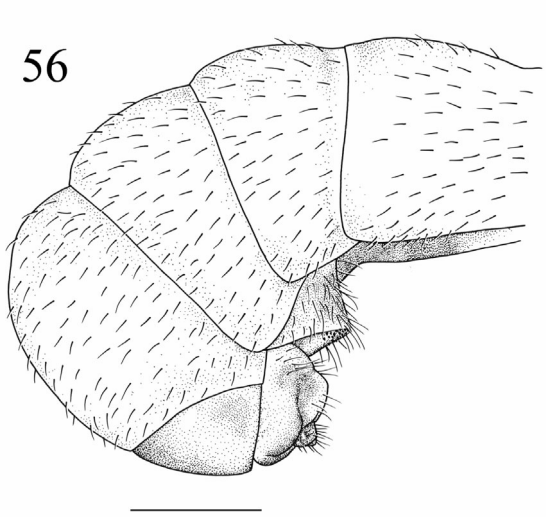






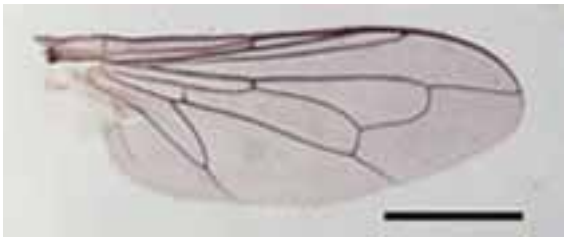






FIGURES 51–56. *Australoconops* spp. **51.** *A. ruficrus* sp. nov., head. Scale = 1.0 mm. **52–55.** Antennal styli, scale unknown: **52**. *A. picus* (Macquart). **53**. *A. similis* Camras. **54.** *A. splendidus* (Kröber). **55.** *A. sydneyi* Camras. **56.** *A. vespoides* sp. nov., male postabdomen. Scale = 1.0 mm.

57 *Atrichoparia curticornis* Kröber



58 *Australoconops aequatus* (Walker)

59 *Australoconops aptatus* (Walker)

60 *Australoconops aurosus* (Newman)

61 *Australoconops bridwelli* Camras

62 *Australoconops brunneus* sp. nov.

63 *Australoconops camrasi* sp. nov.

64 *Australoconops cantrelli* sp. nov.

65 *Australoconops inglorior* (Walker)

66 *Australoconops nebrias* sp. nov.

67 *Australoconops ocellatus* de Meijere

68 *Australoconops pallorivittus* sp. nov.

FIGURES 57–68. Wings as named. Scale = 1.0 mm.

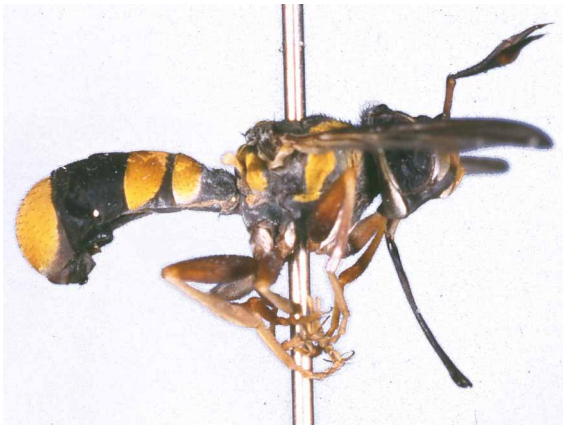
69 *Australoconops phaeomeros* sp. nov.

70 *Australoconops pseudocellifer* (Kröber)

71 *Australoconops ruficrus* sp. nov.

72 *Australoconops vespoides* sp. nov.

73



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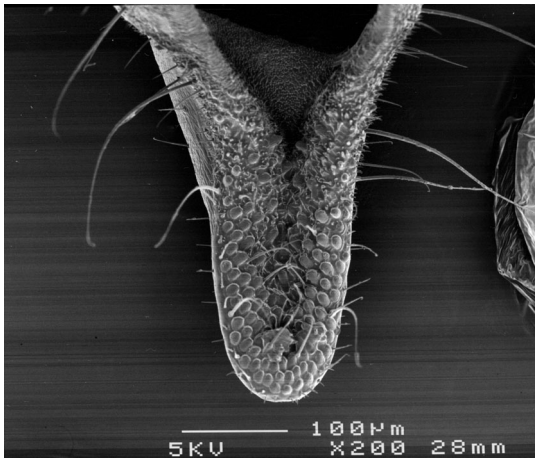
FIGURES 69–76. *Australoconops* spp.: **69–72**. wings as named. Scale = 1.0 mm. **73–74**. *A. ocellatus* (de Meijere): male. **73**. lateral view. **74**. dorsal view. **75**. *A. fulvitarsus* sp. nov.,` female lateral view. **76**. *A. vespoides* sp. nov., male lateral view.

77



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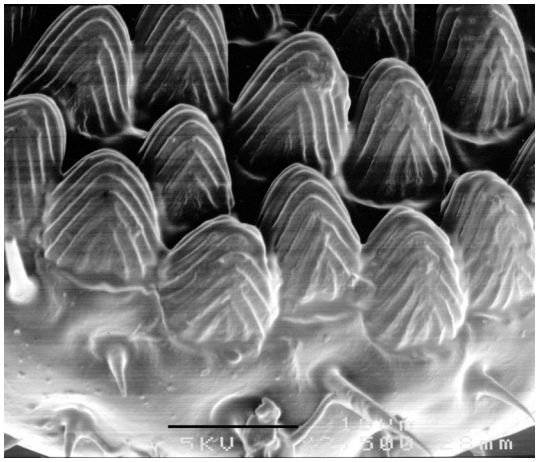

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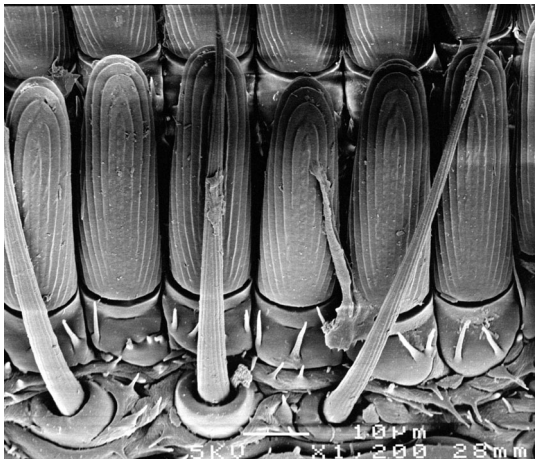

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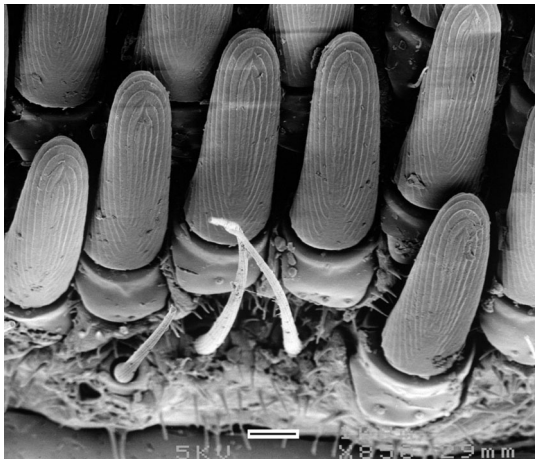

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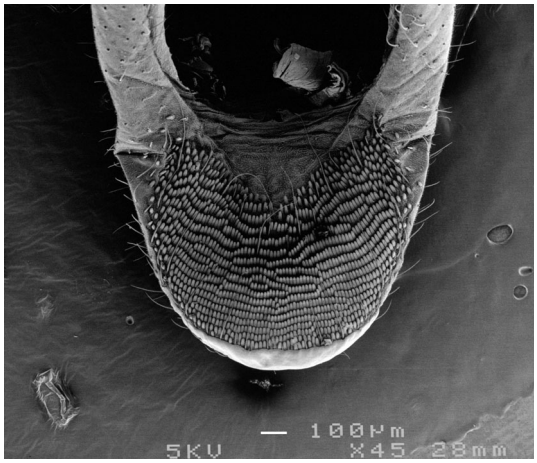

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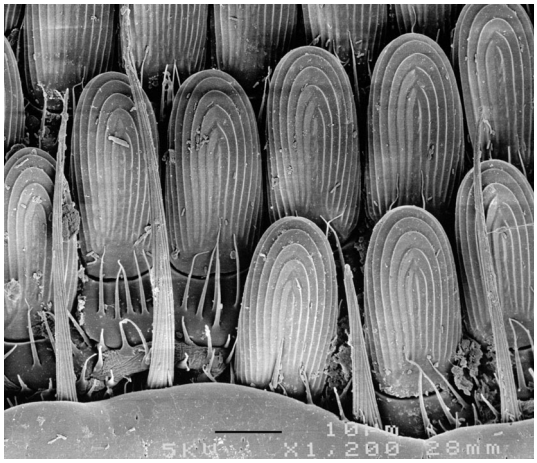
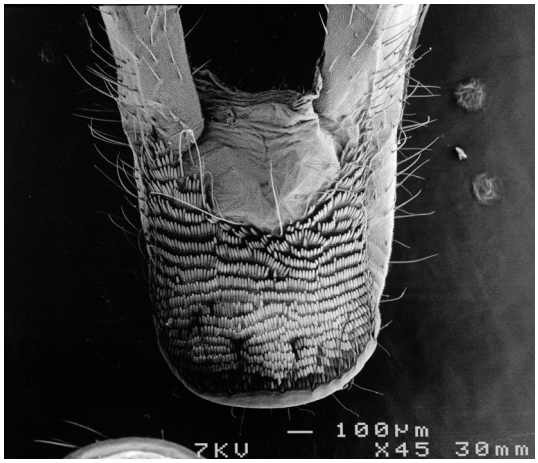


FIGURE 77. *Atrichoparia* sp., female genital plate. **FIGURE 78**. *Atrichoparia curticornis* (Kröber), spicules at apex of female genital plate. **FIGURES 79–82.** *Australoconops* spp. **79**. *A. aequatus* (Walker), spicules at apex of female genital plate. **80**. *A. aurosus* sp. nov., spicules at apex of female genital plate. **81–82**. *A. bridwelli* Camras: **81**. female genital plate. **82**. spicules at apex of female genital plate.

83



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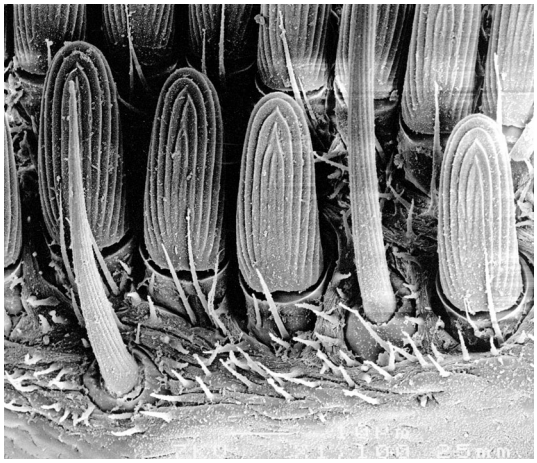

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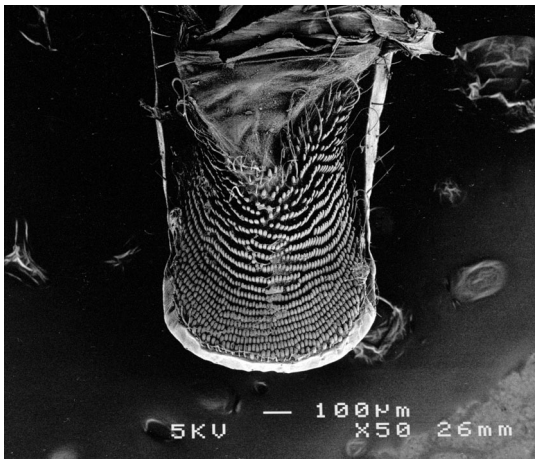

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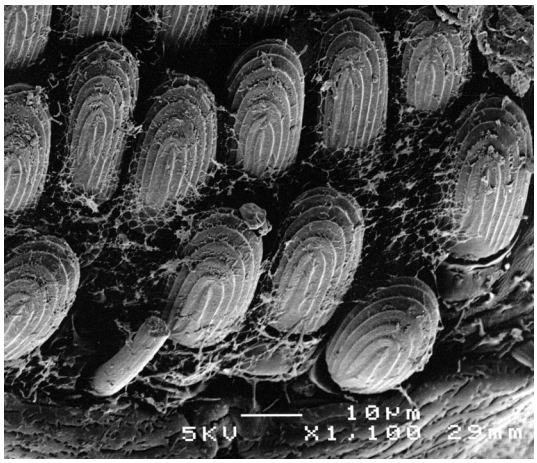

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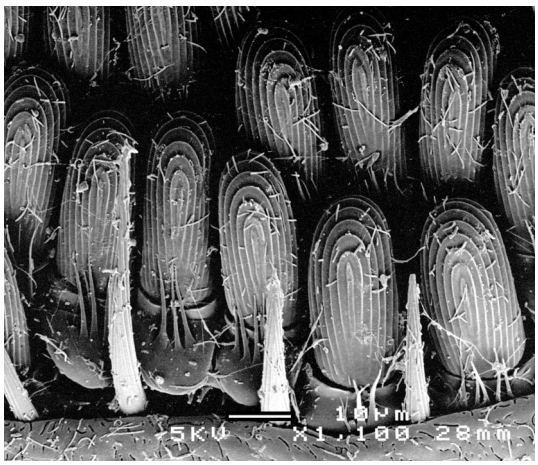

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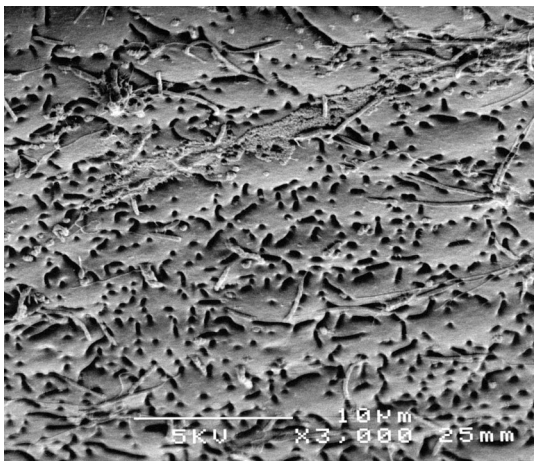
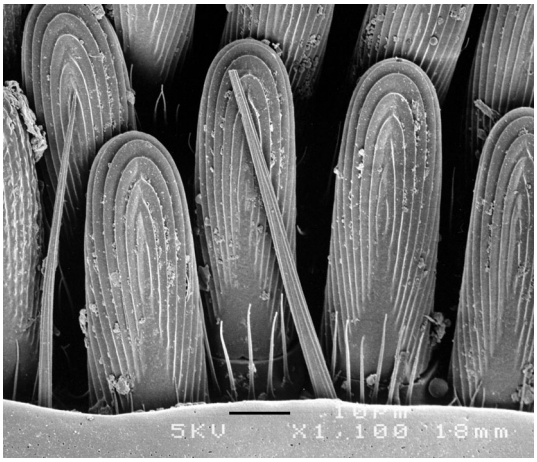


FIGURES 83–88. *Australoconops* spp. **83–84**. *A. camrasi* sp. nov.: **83**. female genital plate. **84**. spicules at apex of female genital plate. **85–86**. *A. fulvitarsus* sp. nov.: **85**. female genital plate **86**. spicules at apex of female genital plate. **87–88**. *A. furvus* sp. nov.: **87**. spicules at apex of female genital plate. **88**. cuticle at apex of female genital plate.

89



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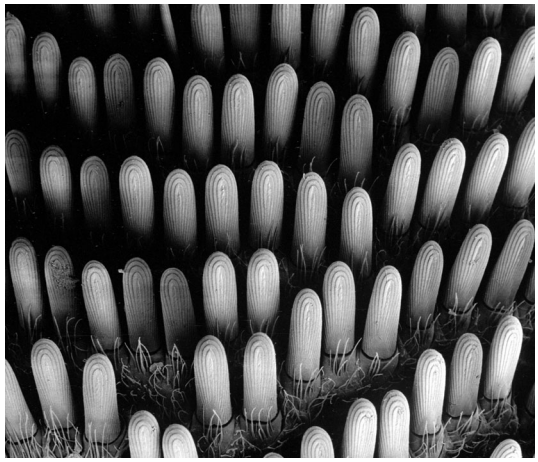

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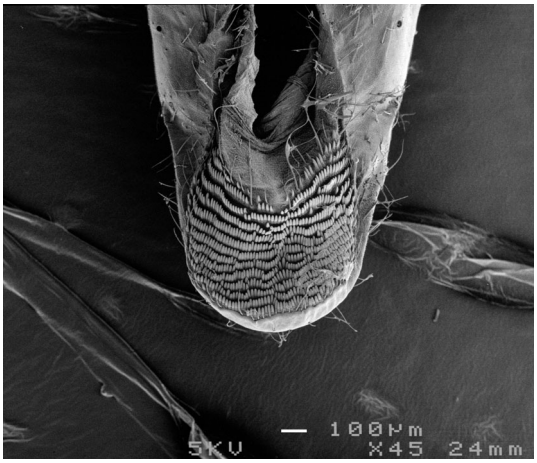

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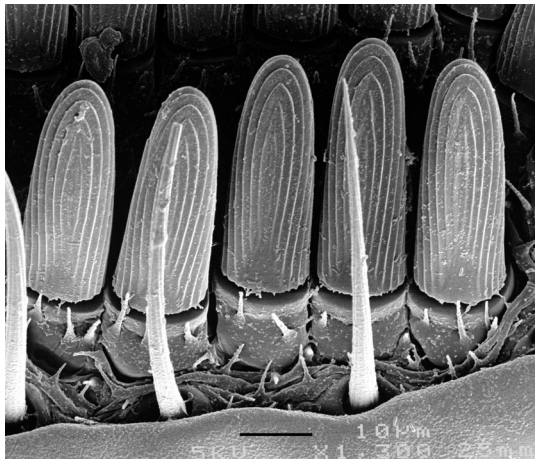

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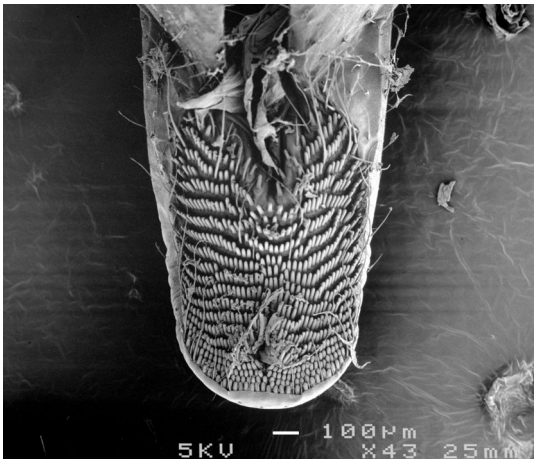
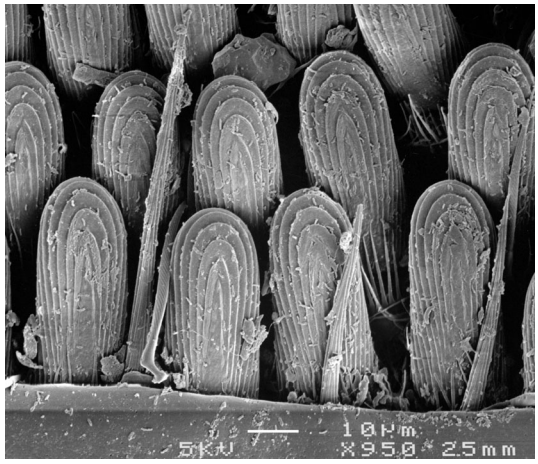
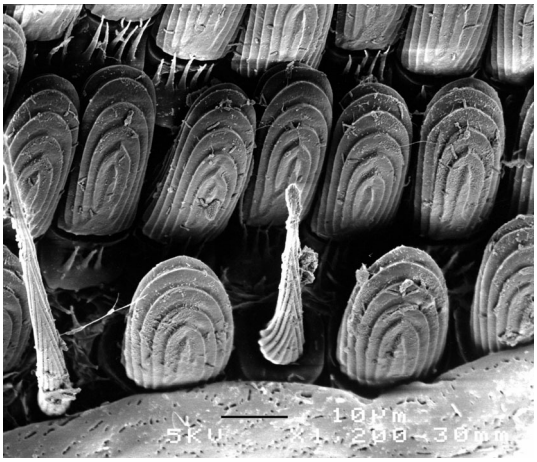


94



FIGURES 89–94. *Australoconops* spp. **89–90**. *A. ocellatus* (de Meijere): **89**. spicules at apex of female genital plate. **90**. spicules on female sternite 6. **91–92**. *A. perbellus* (Kröber): **91**. female genital plate. **92**. spicules at apex of female genital plate. **93–94**. *A. pseudocellifer* (Kröber): **93**. female genital plate. **94**. spicules at apex of female genital plate.

95



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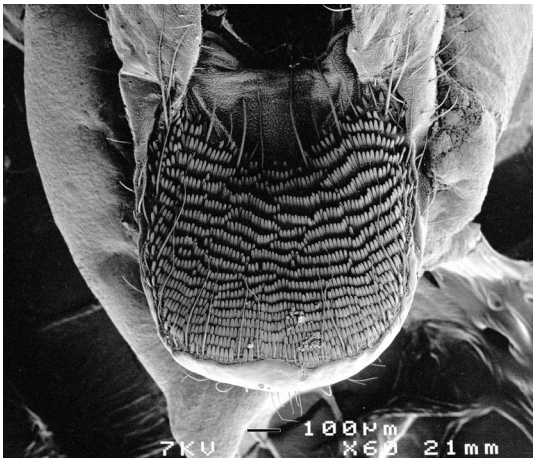

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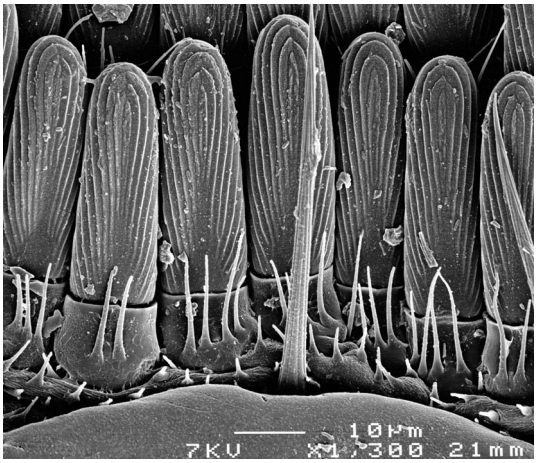

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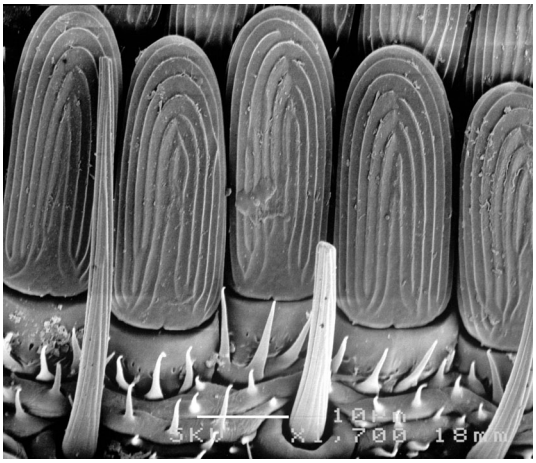

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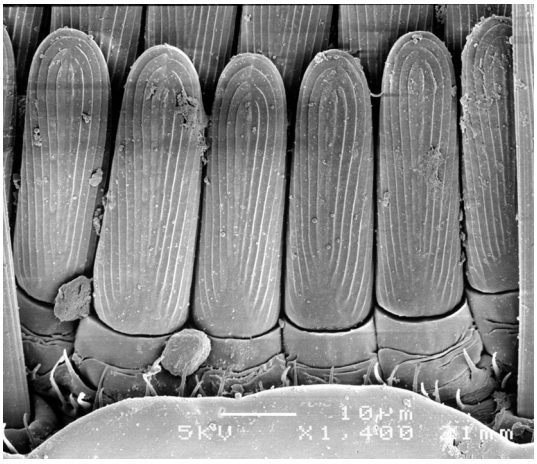

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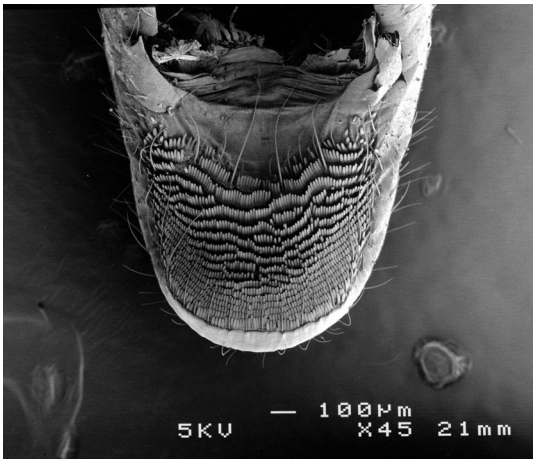
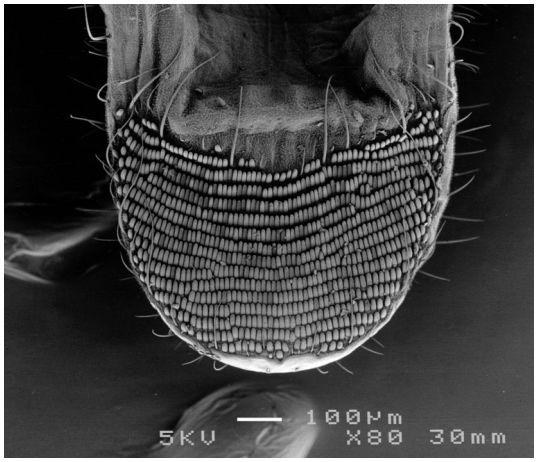


FIGURES 95–100. *Australoconops* spp. **95**. *A. pulcher* Camras, spicules at apex of female genital plate. **96–97**. *A. similis* Camras: **96**. female genital plate. **97**. spicules at apex of female genital plate. **98**. *A. splendidus* (Kröber), spicules at apex of female genital plate. **99–100**. *A. sydneyi* Camras: **99**. spicules at apex of female genital plate. **100**. female genital plate

101



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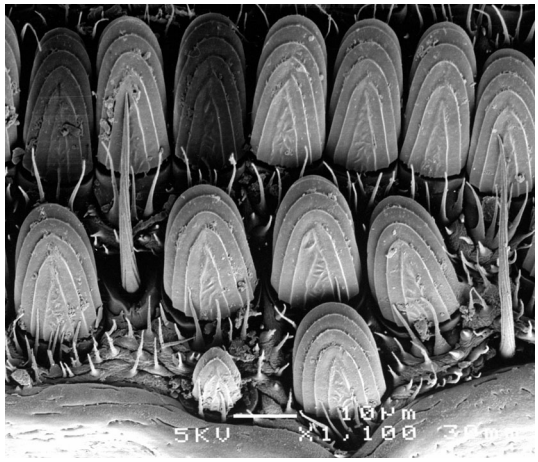

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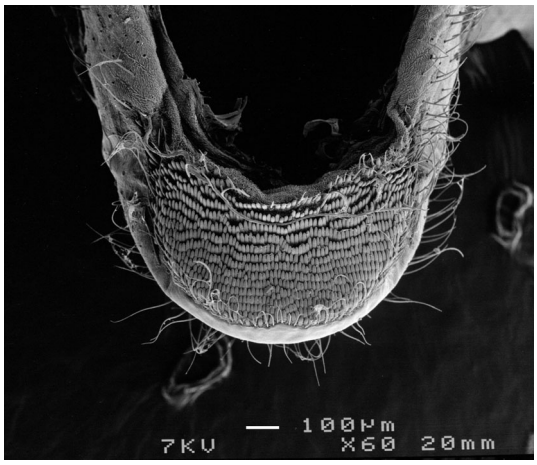

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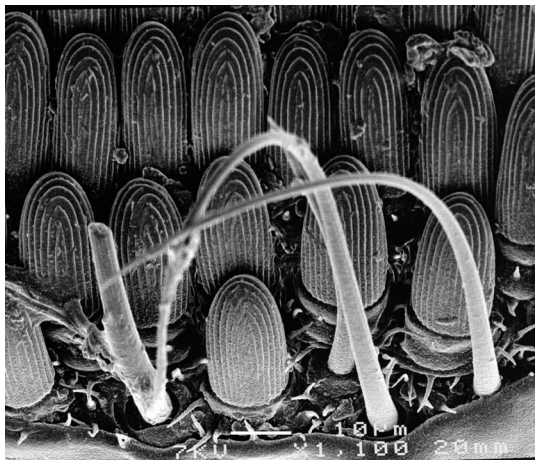
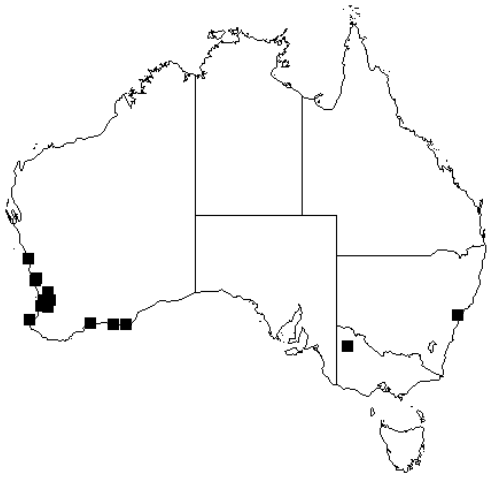


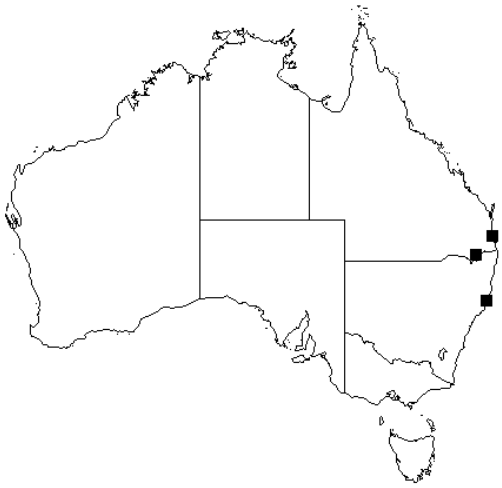
FIGURES 101–104. *Australoconops* spp. **101–102**. *A. unicinctus* (Kröber): **101**. female genital plate. **102**. spicules at apex of female genital plate. **103–104**. *A. vespoides* sp. nov.: **103**. female genital plate. **104**. spicules at apex of female genital plate.

105



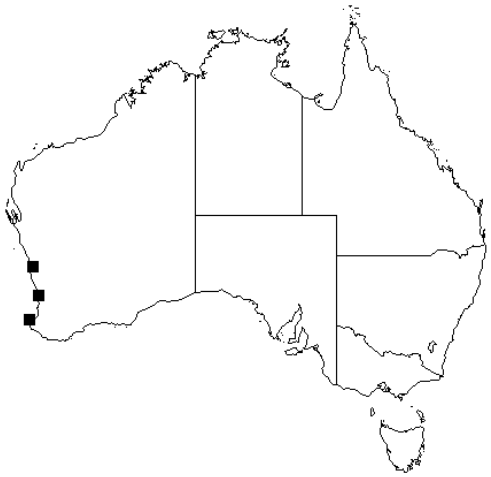
Australoconops aequatus

106



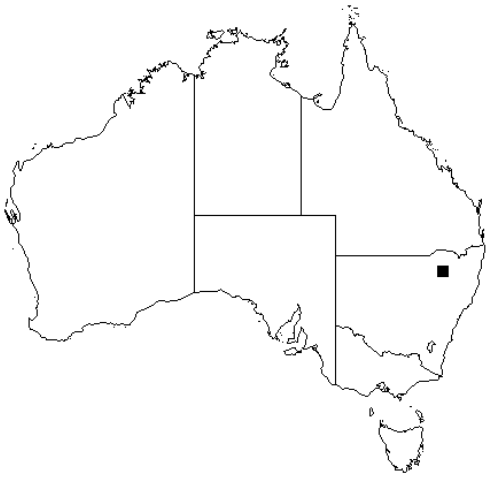
Australoconops aglaos

107



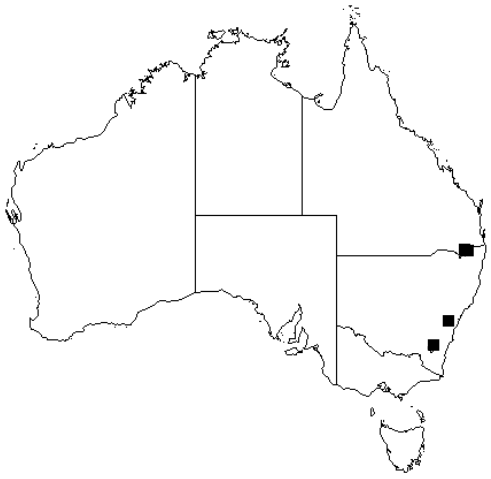
Australoconops aptatus

108



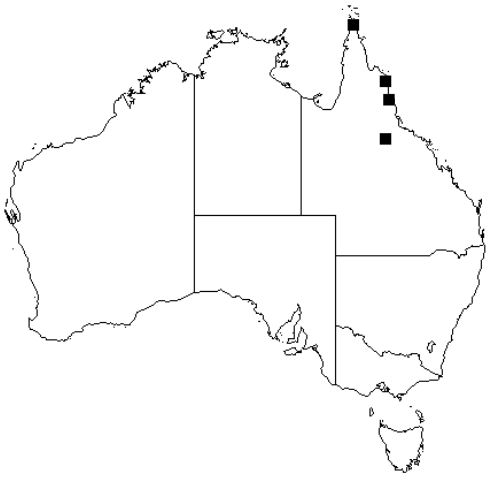
Australoconops aurantius

109



Australoconops aurosus

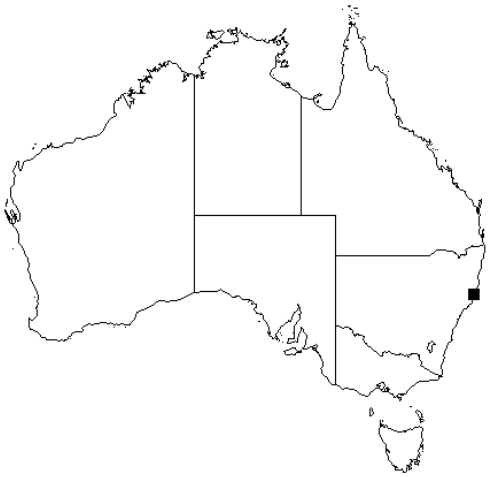
110



Australoconops balteus

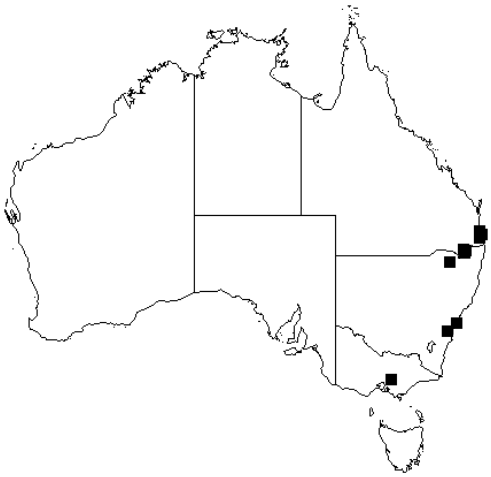
FIGURES 105–110. Distributions of *Australoconops* spp.

111



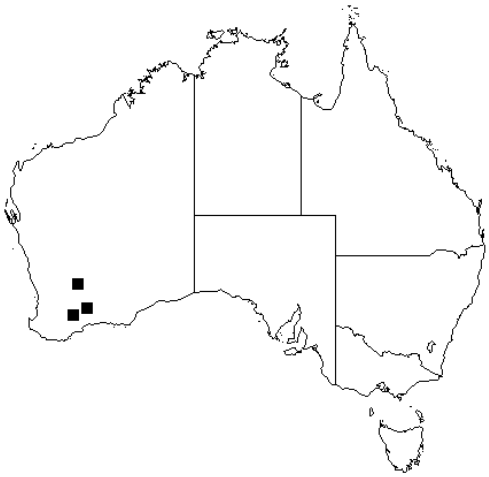
Australoconops breviplatus

112



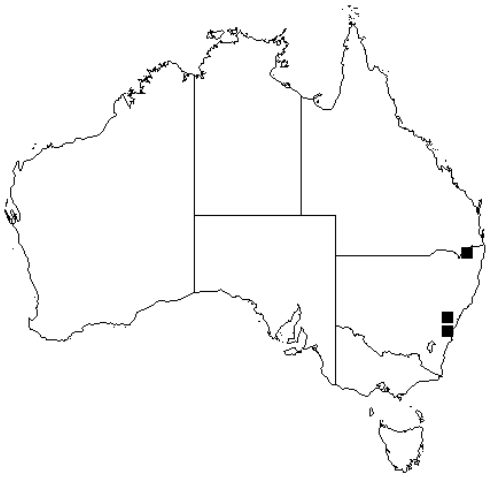
Australoconops bridwelli

113



Australoconops brunneus

114

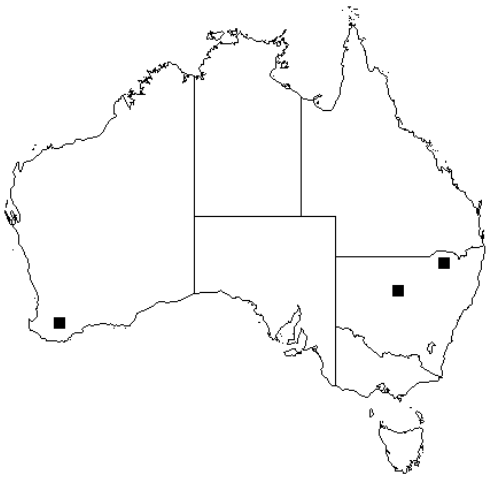


Australoconops camrasi

115

Australoconops cantrelli

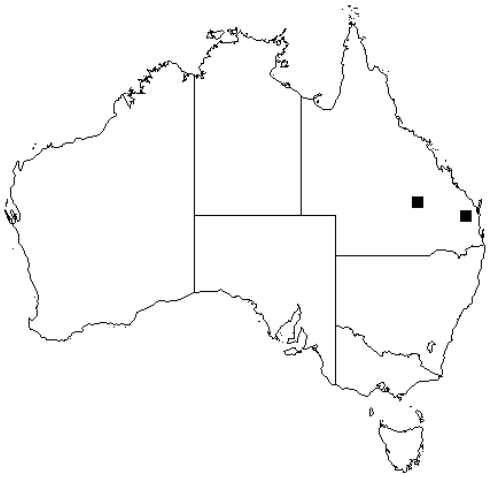
116



Australoconops elegans

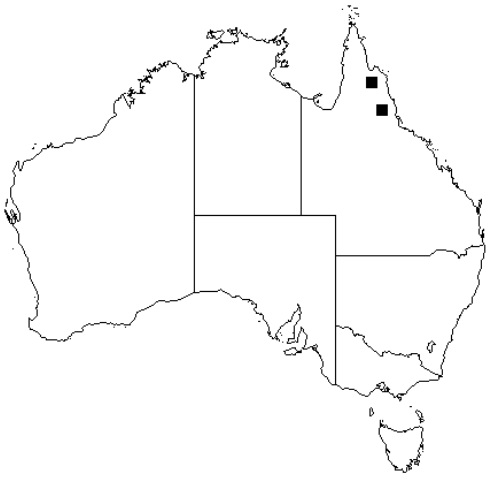
FIGURES 111–116. Distributions of *Australoconops* spp.

117



Australoconops fulvitarsus

118



Australoconops furvus

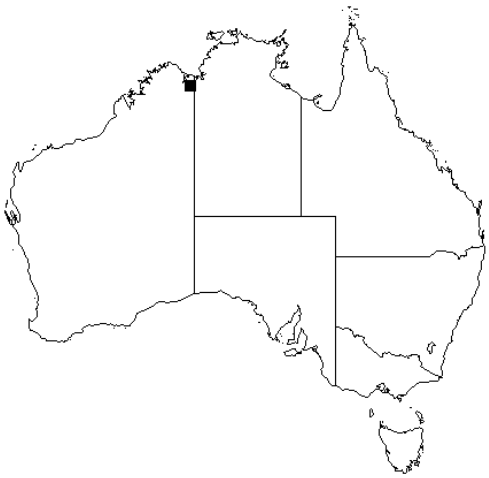
119

Australoconops inglorior

120

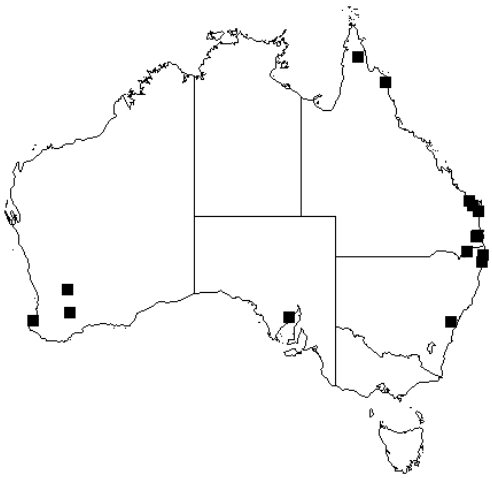
Australoconops nebrias

121



Australoconops neuter

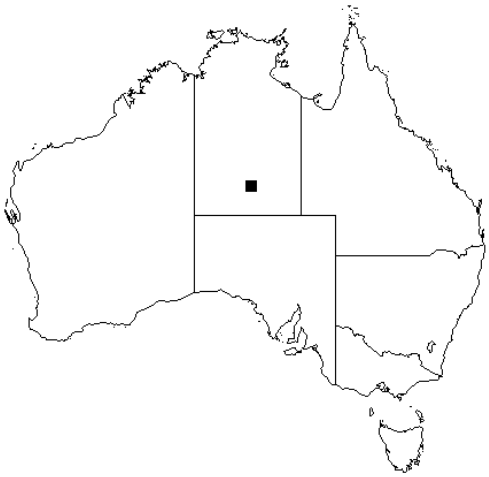
122



Australoconops ocellatus

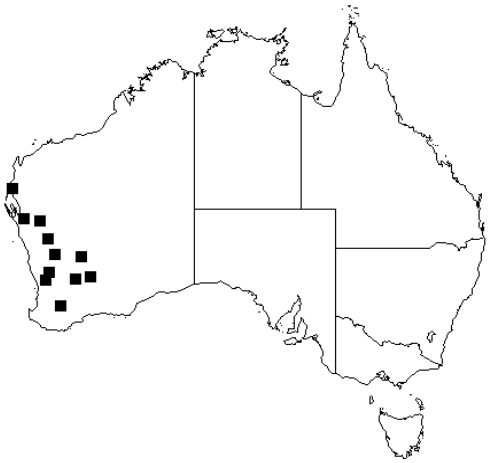
FIGURES 117–122. Distributions of *Australoconops* spp.

123



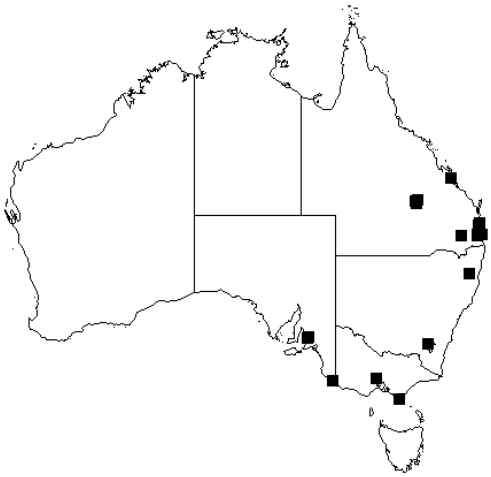
Australoconops pallorivittus

124



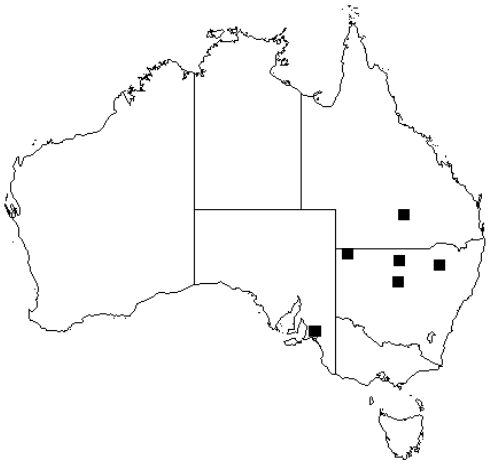
Australoconops perbellus

125



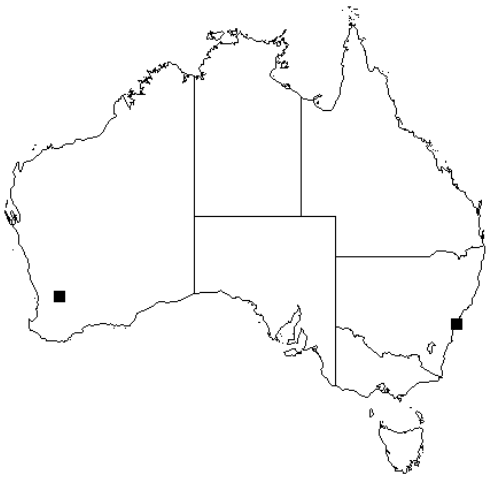
Australoconops phaeomeros

126



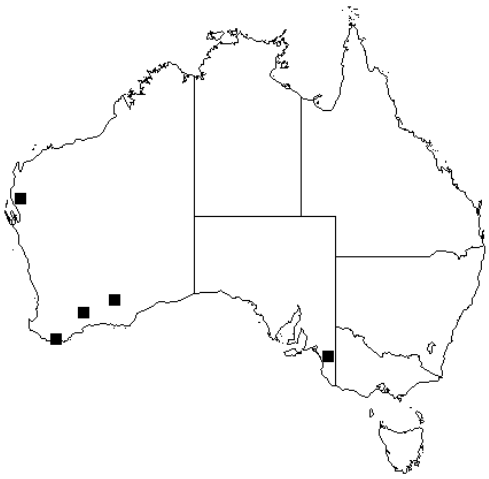
Australoconops pseudocellifer

127



Australoconops pulcher

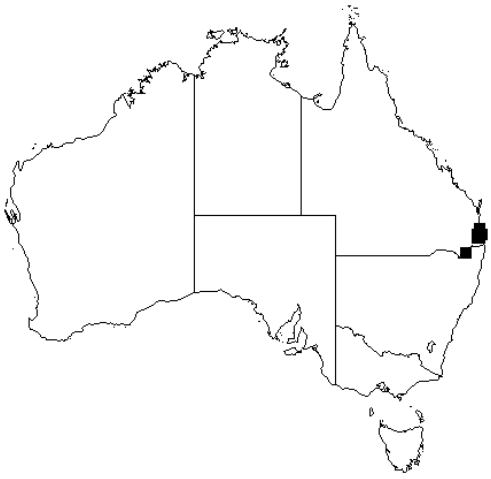
128



Australoconops ruficrus

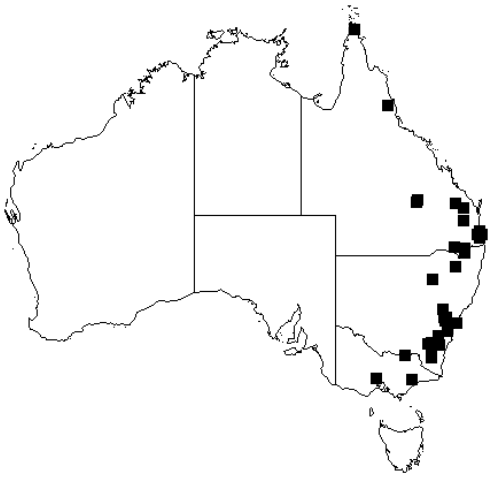
FIGURES 123–128. Distributions of *Australoconops* spp.

129



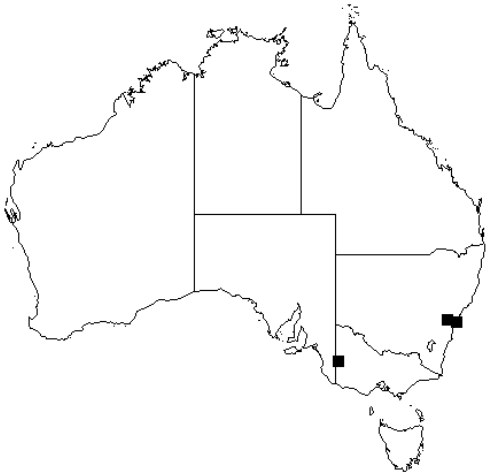
Australoconops similis

130



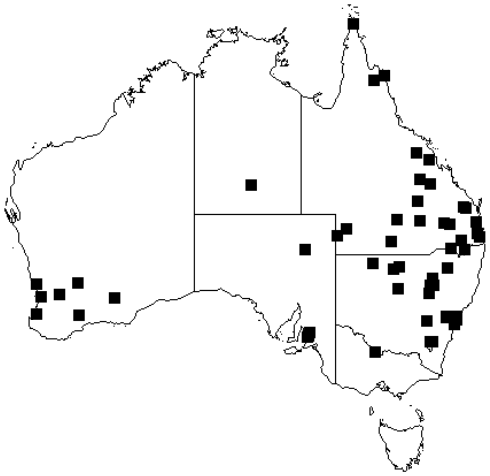
Australoconops splendidus

131



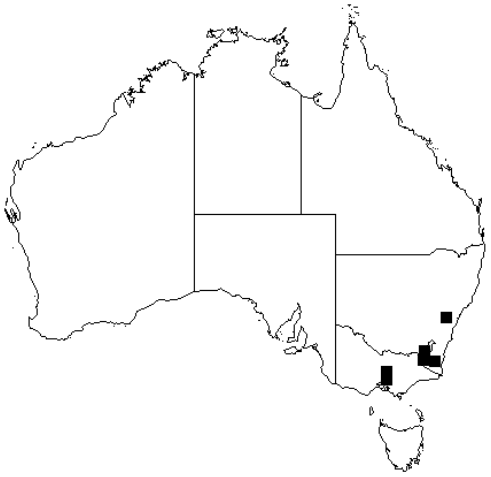
Australoconops sydneyi

132



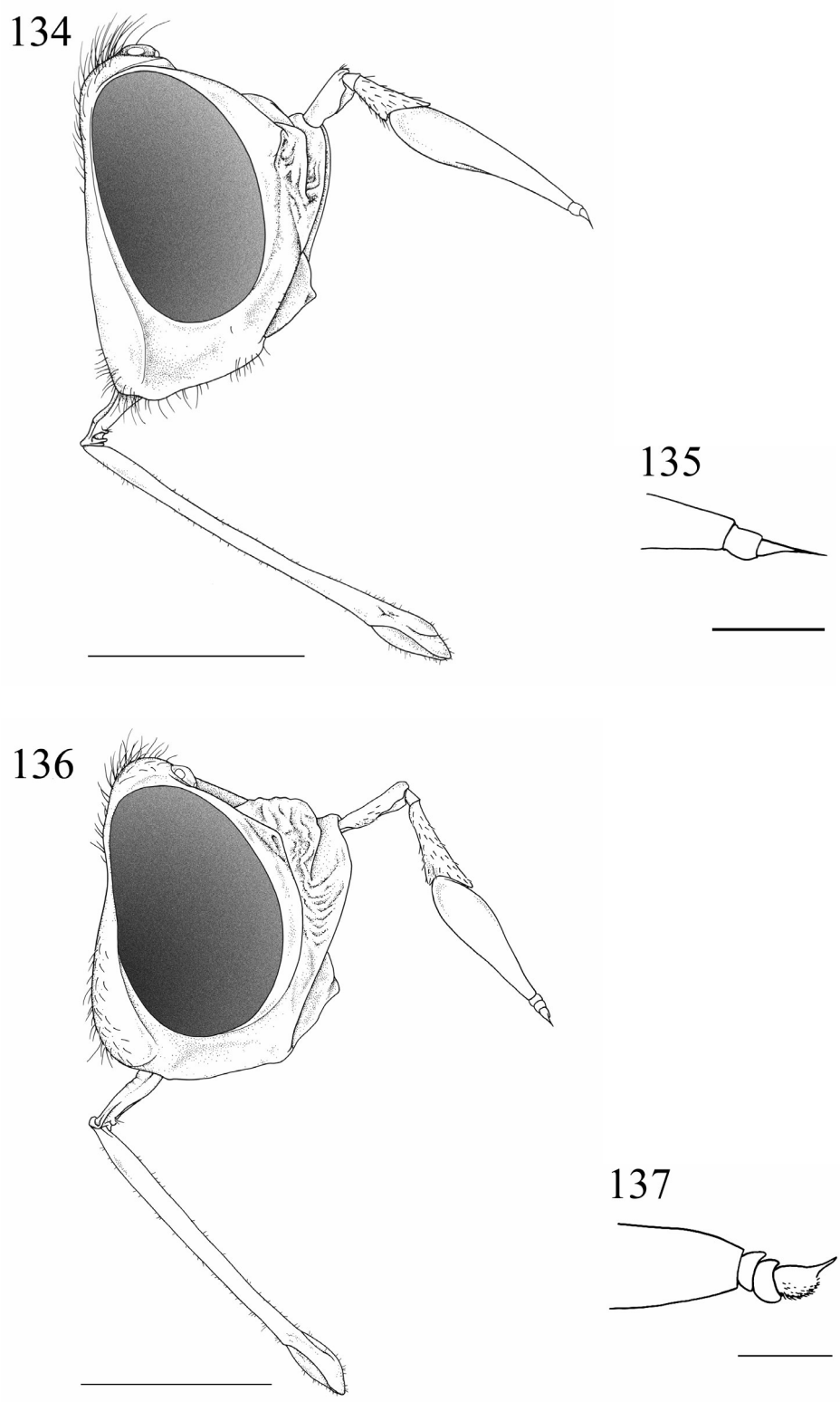
Australoconops unicinctus

133



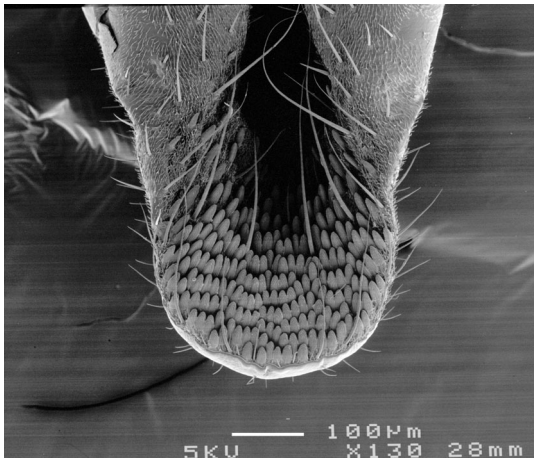
Australoconops vespoides

FIGURES 129–133. Distributions of *Australoconops* spp.



FIGURES 134–137. *Camrasiconops* spp. **134–135**. *C. ater* (Camras): **134**. head, lateral view. Scale = 1.0 mm. **135**. stylus: dorsal view. Scale = 0.25 mm. **FIGURES 136–137**. *C. rufofemoris* (Camras): **136**. head, lateral view. Scale = 1.0 mm. **137**. stylus: dorsal view. Scale = 0.25 mm.

138



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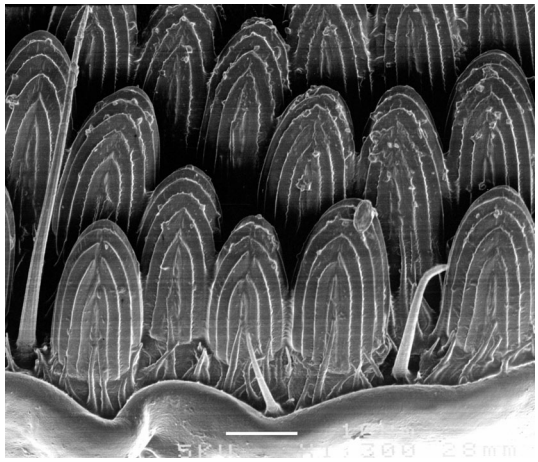

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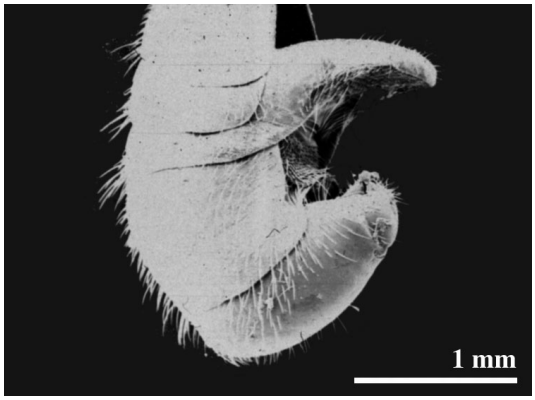

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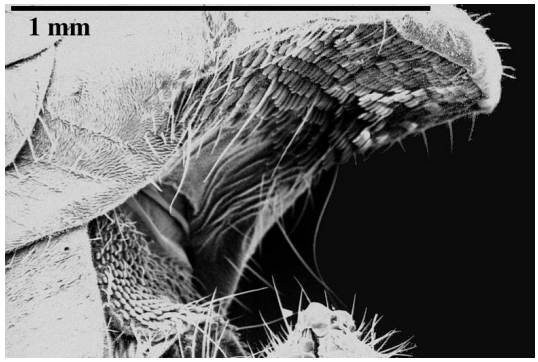

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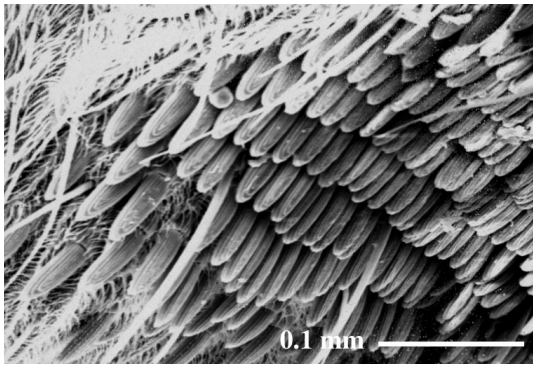
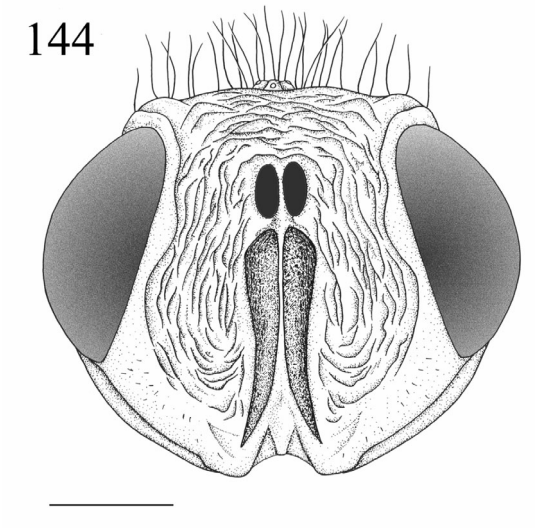
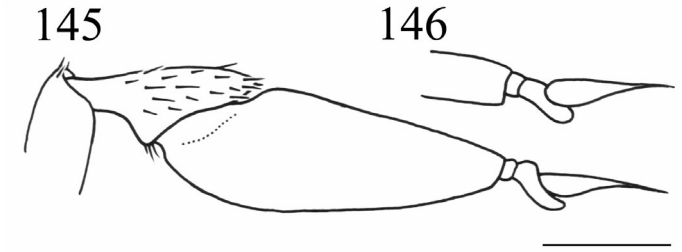
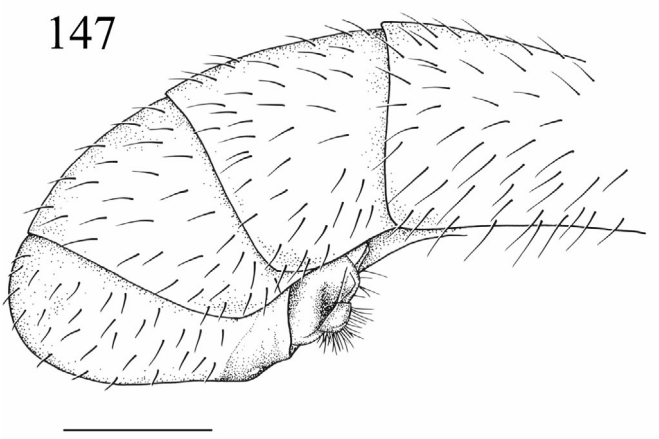


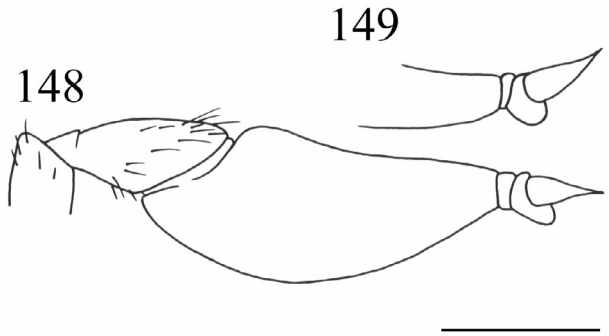
143

FIGURES 138–143. *Camrasiconops* spp. **138–139**. *C. ater* (Camras): **138**. female genital plate. **139**. spicules at apex of female genital plate. **140–143.** *Camrasiconops* sp.: **140**. female postabdomen: right lateral view. **141**. female genital plate and sternite 6. **142**. spicules on female genital plate. **143**. spicules on female sternite 6.

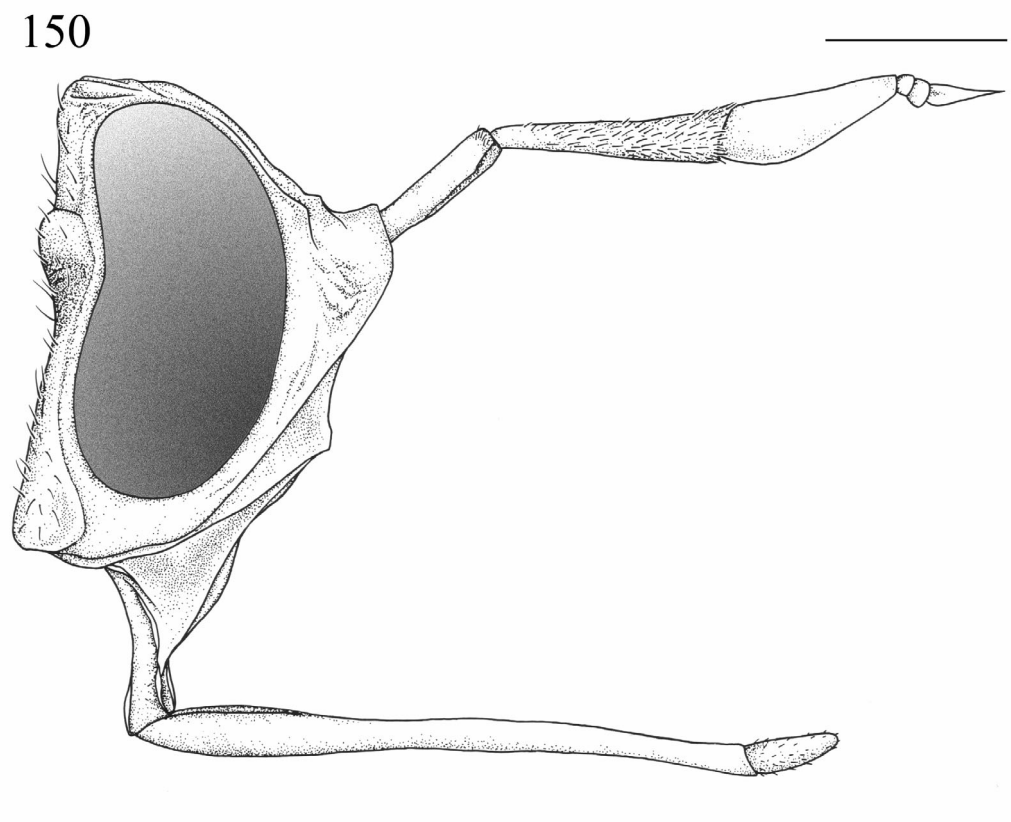


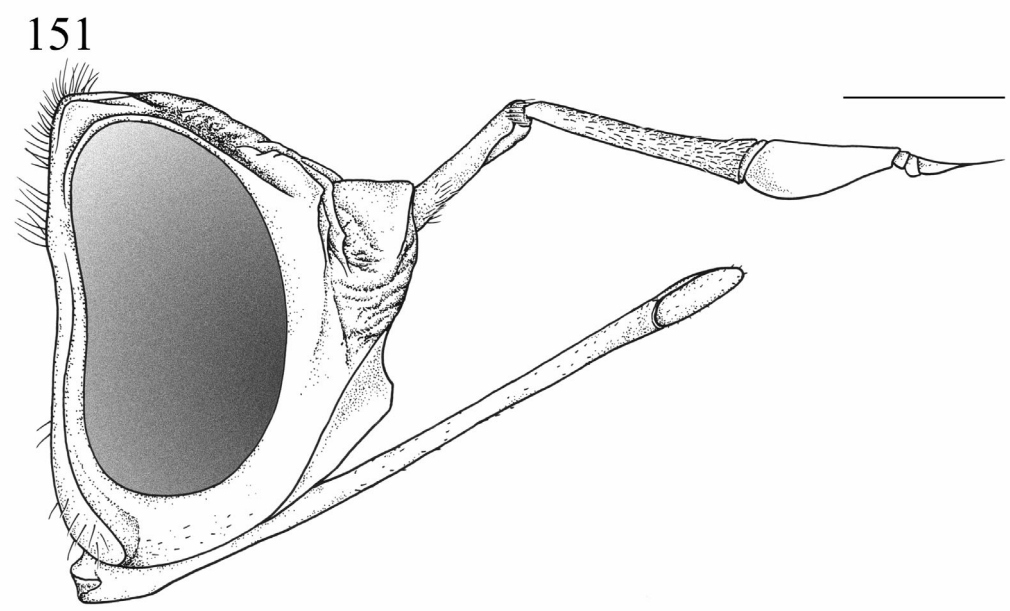






FIGURES 144–149. *Chrysidiomyia* spp. **144–147**. *C. setosa* sp. nov.: **144**. head, anterior view. Scale = 0.5 mm. **145**. antenna: lateral view. Scale = 0.25 mm. **146**. stylus: dorsal view. Scale = 0.25 mm. **147**. male postabdomen, right lateral view. Scale = 0.5 mm. **148–149**. *C. hirsuta* (Kröber): **148**. antenna, lateral view. Scale = 0.25 mm. **149**. stylus, dorsal view. Scale = 0.25 mm.





FIGURES 150–151. *Conops* spp.**,** right lateral view of head. **150**. *C. chvalai* sp. nov. **151**. *C. badius* sp. nov. Scale = 1.0 mm.

152 *Chrysidiomyia hirsuta* (Kröber)

153 *Chrysidiomyia pulchella* Kröber

154 *Chrysidiomyia setosa* sp. nov.

155 *Conops aureolus* Kröber

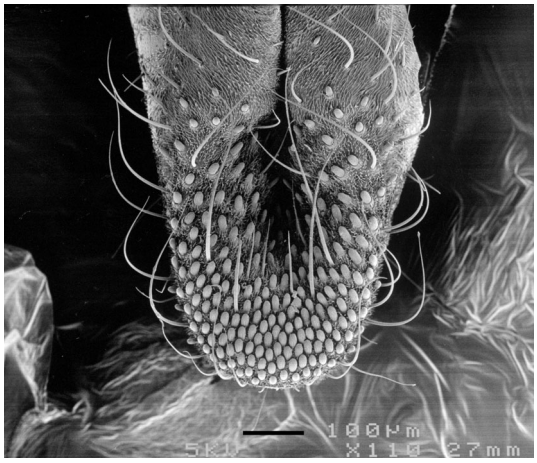
156 *Conops australianus* Camras

157

158

FIGURES 152–156. Wings as named. Scale = 1.0 mm. **FIGURES 157–158.** *Conops* spp., right lateral view. **157**. *C. aureolus* sp. nov. **158**. *C. australianus* Camras.

159



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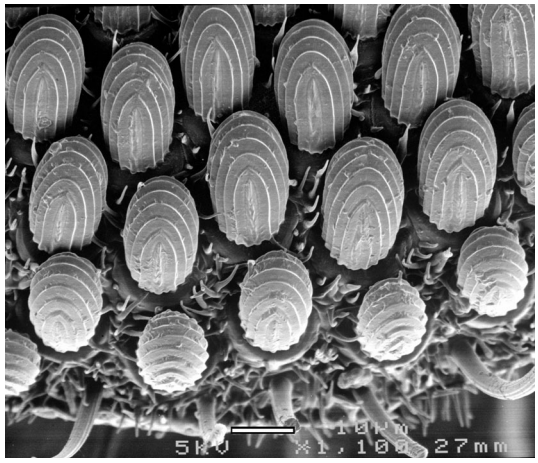

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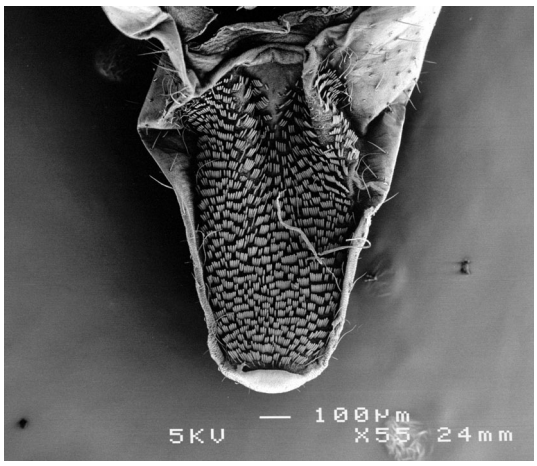

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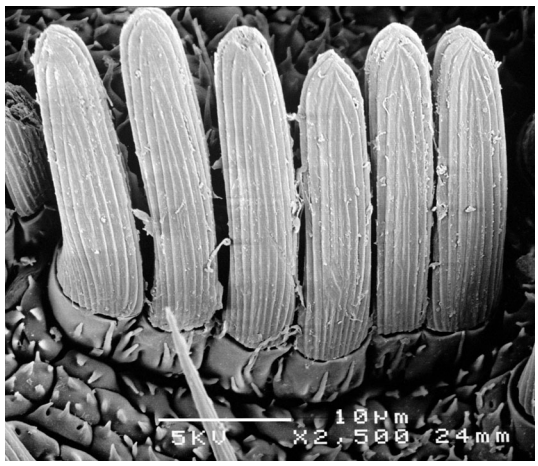
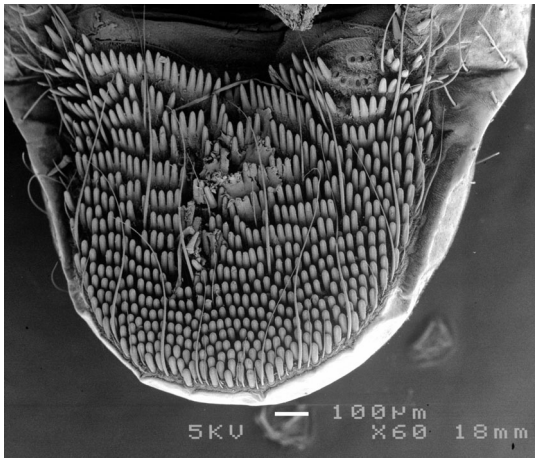


FIGURES 159–160. *Chrysidiomyia setosa* sp. nov.: **159**. female genital plate. **160**. spicules at apex of female genital plate. **FIGURES 161–162.** *Conops flavipes* Linnaeus: **161**. female genital plate. **162**. spicules at apex of female genital plate.

163



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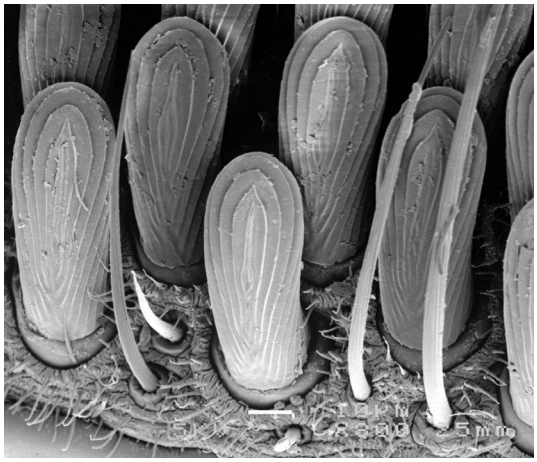

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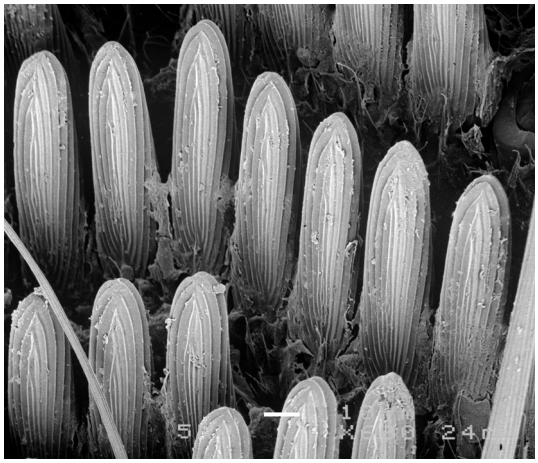

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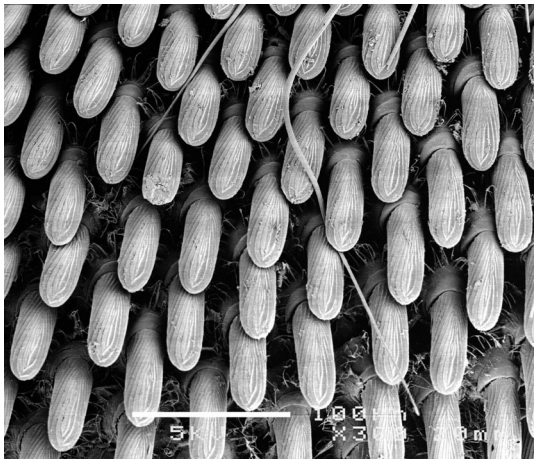

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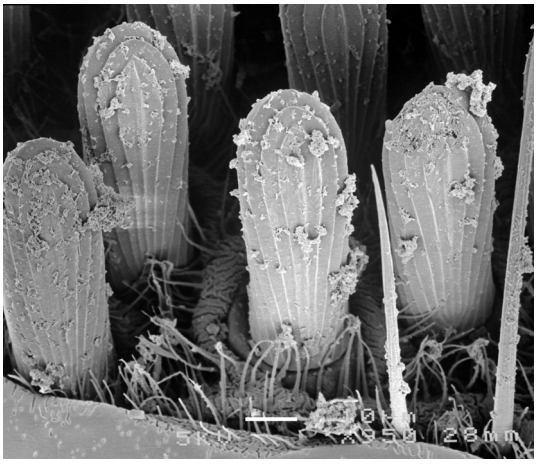
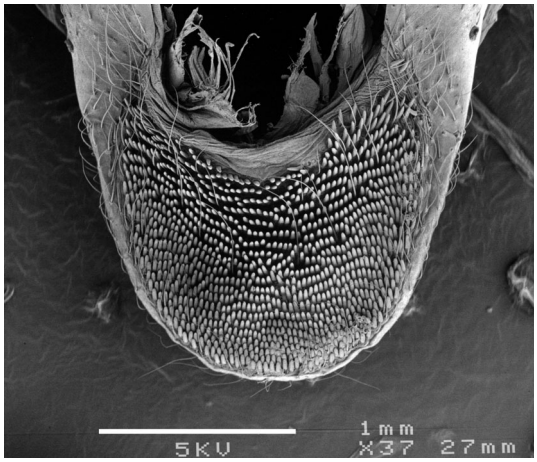


FIGURES 163–167. *Conops* spp. **163–166.** *C. australianus* Camras: **163**. female genital plate. **164**. spicules at apex of female genital plate. **165**. spicules at base of female genital plate. **166**. spicules on female sternite 6. **167.** *C. nigescens* Camras, spicules at apex of female genital plate.

168



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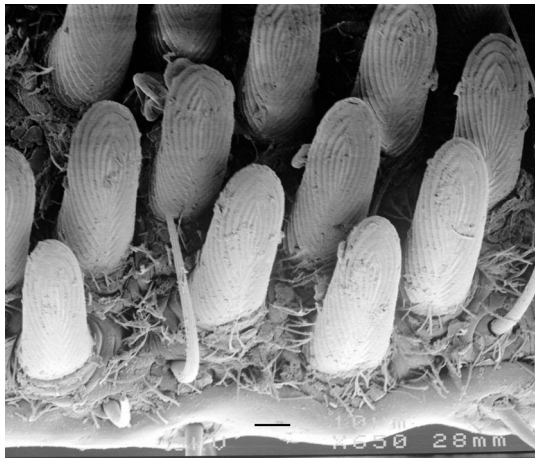

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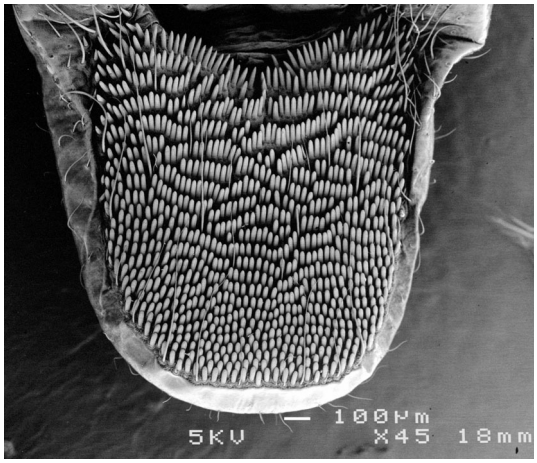

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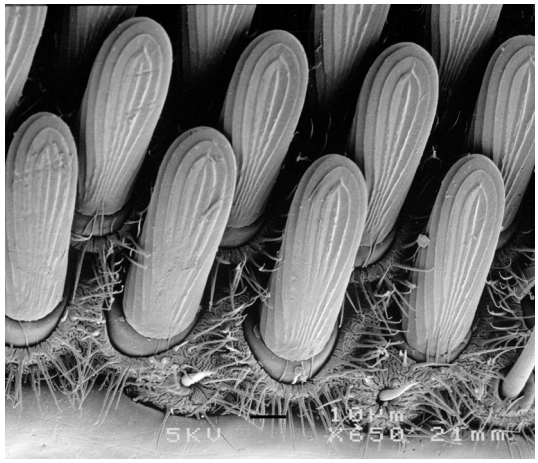

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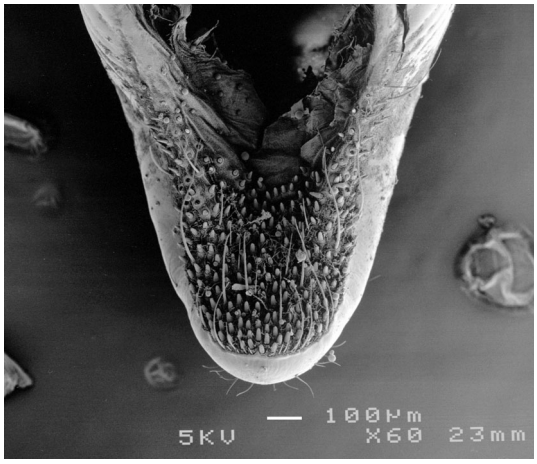
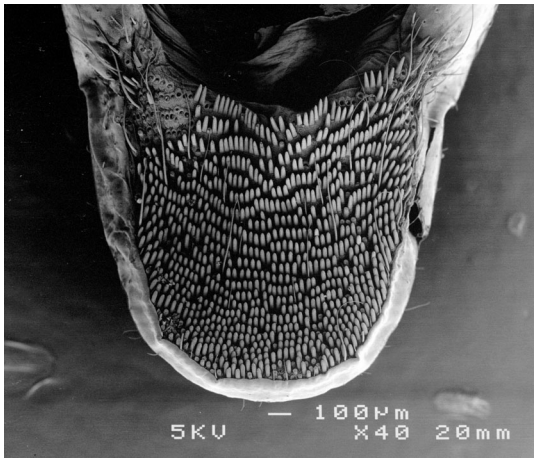


173

FIGURES 168–173. *Conops* spp. **168–169.** *C. satanicus* Bigot: **168**. female genital plate. **169**. spicules at apex of female genital plate. **170–171.** *C. seminiger* de Meijere: **170**. female genital plate. **171**. spicules at apex of female genital plate. **172–173.** *C. sparsus* sp. nov.: **172**. female genital plate. **173**. spicules at apex of female genital plate

174



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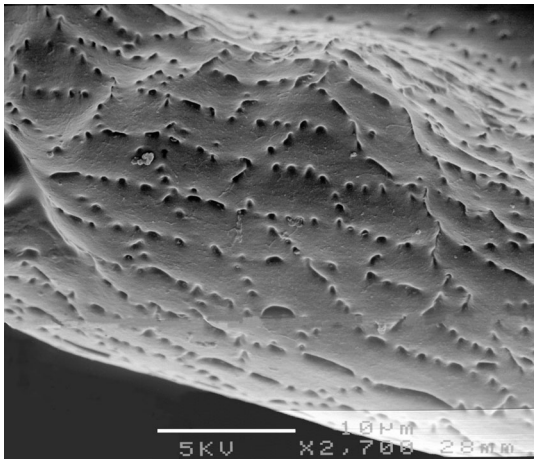

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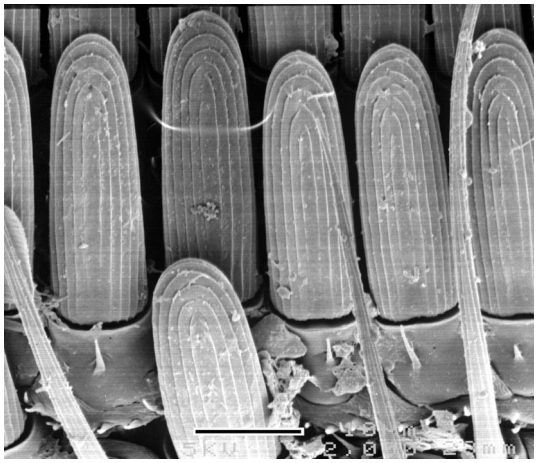

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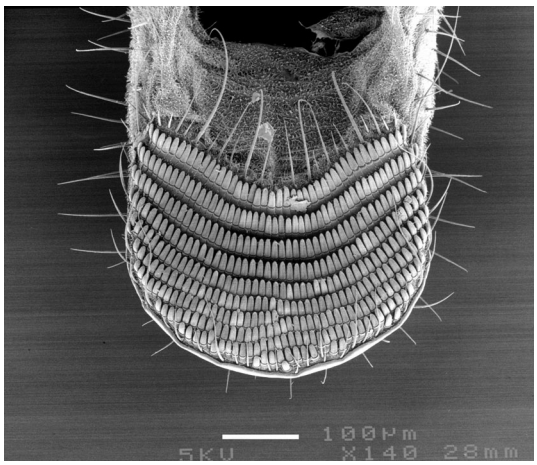

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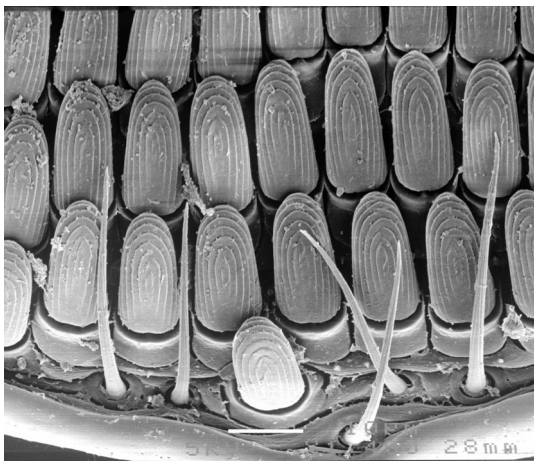
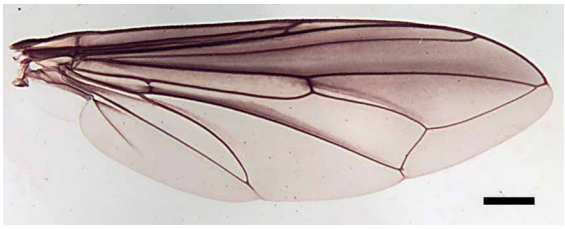


FIGURES 174–175. *Conops thoracicus* Kröber: **174**. female genital plate. **175**. spicules at apex of female genital plate. **FIGURES 176–179.** *Microconops* spp.: **176**. *M. fasciatus* Kröber, cuticle at apex of female genital plate**. 177**. *M. ornatus* Kröber, spicules at apex of female genital plate. **178–179.** *M. tasmaniensis* Kröber: **178**. female genital plate. **179**. spicules at apex of female genital plate.

180 *Conops nigrescens* Camras

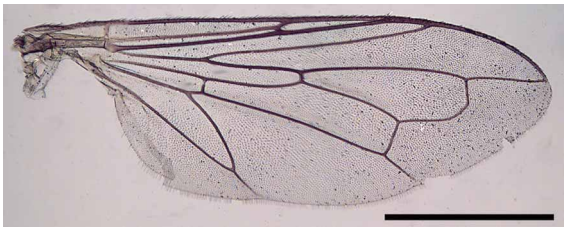
181 *Conops satanicus* Bigot

182 *Conops seminiger* de Meijere

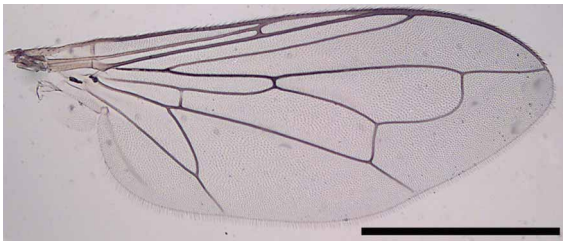


183 *Conops sparsus* sp. nov.

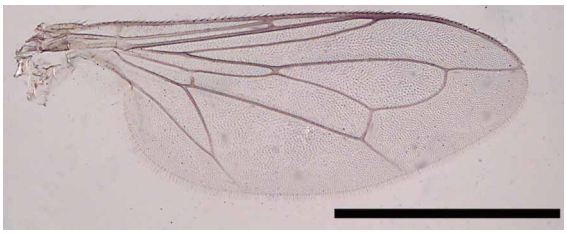
184 *Heteroconops antennatus* Kröber



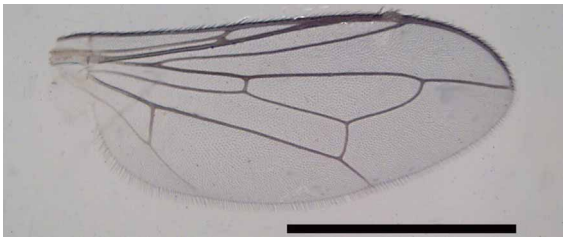
185 *Heteroconops carnarvonensis* sp. nov.



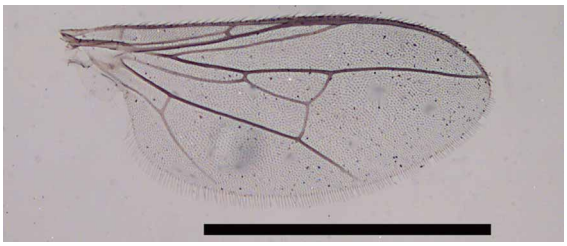
186 *Heteroconops gracilis* Kröber



187 *Heteroconops* sp.



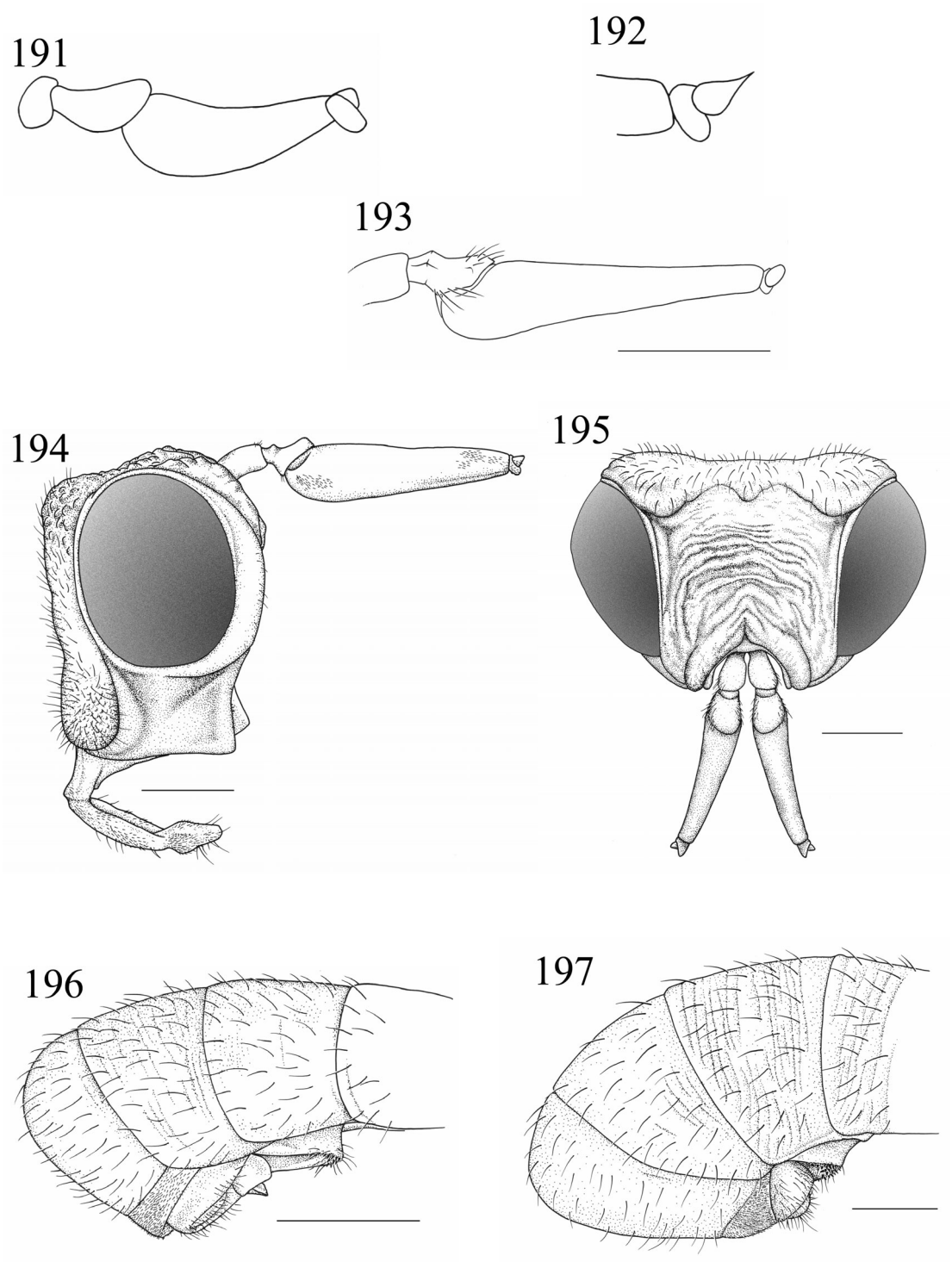
188 *Heteroconops* sp.



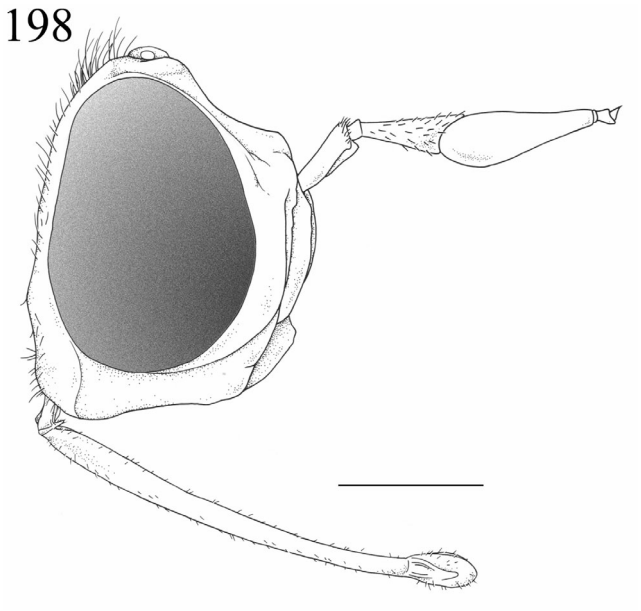
189 *Microconops ornatus* Kröber

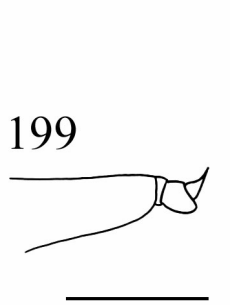
190 *Neoconops longicornis* Kröber

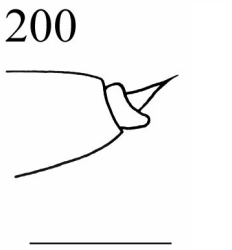
FIGURES 180–190. Wings as named. Scale = 1 mm.

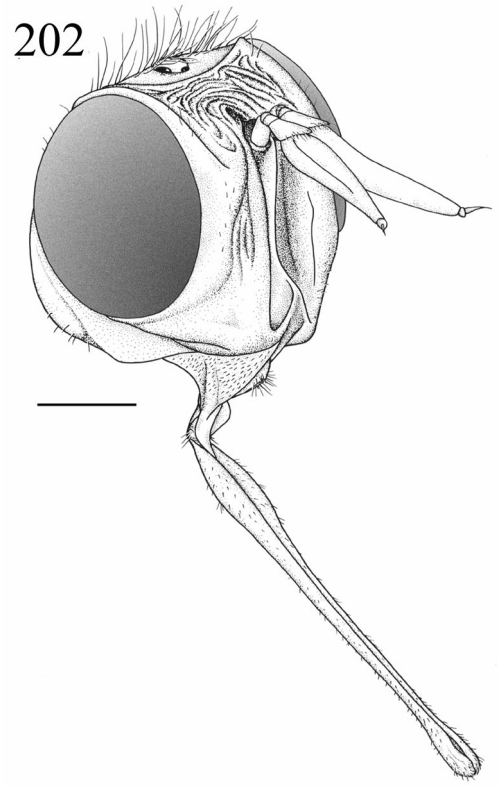


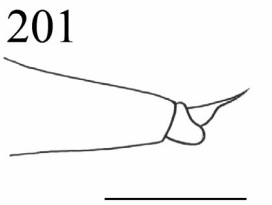
FIGURES 191–192. *Delkeskampomyia fasciata* Kröber (after Kröber, 1940): **191**. antenna: right lateral view. **192**. stylus: dorsal view. **FIGURES 193–197.** *Heteroconops* spp. **193**. *H. carnarvonensis* sp. nov., antenna: right lateral view. **194–195, 197**. *H. gracilis* Kröber: **194**. head, right lateral view. **195**. head, dorsal view. **197**. male postabdomen, right lateral view. **196**. *H. minutus* Kröber, male postabdomen, right lateral view. Scale = 0.25 mm.





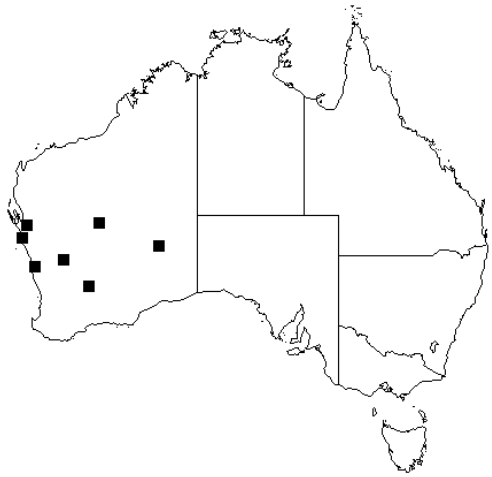






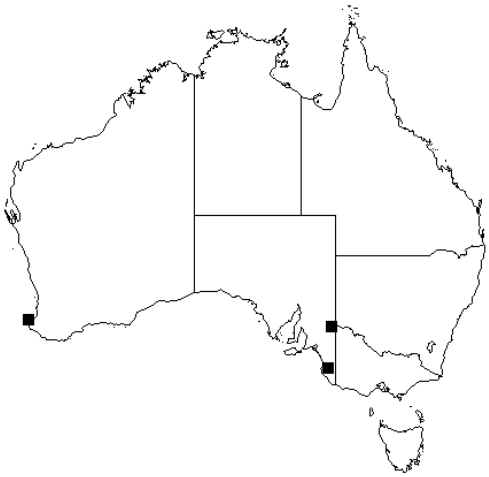
FIGURES 198–199. *Microconops ornatus* Kröber: **198**. head: right lateral view. Scale = 0.5 mm. **199**. stylus: dorsal view. Scale = 0.25 mm. **FIGURES 200–202**. *Neoconops* spp.: **200**. *N. brevistylus* sp. nov., stylus, dorsal view. Scale = 0.25 mm. **201**. *N. glaber* sp. nov., stylus, dorsal view. Scale = 0.25 mm. **202**. *N. longicornis* Kröber, head, right lateral view. Scale = 0.5 mm.

203



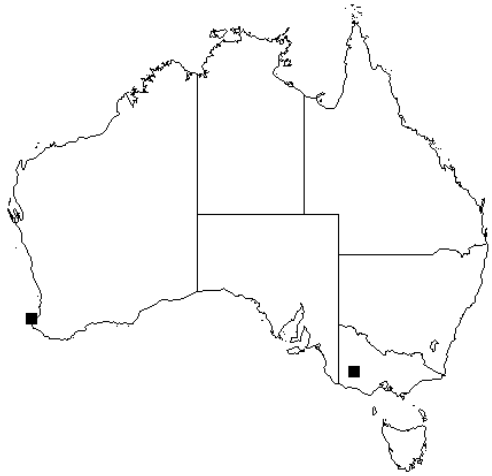
Chrysidiomyia hirsute

204



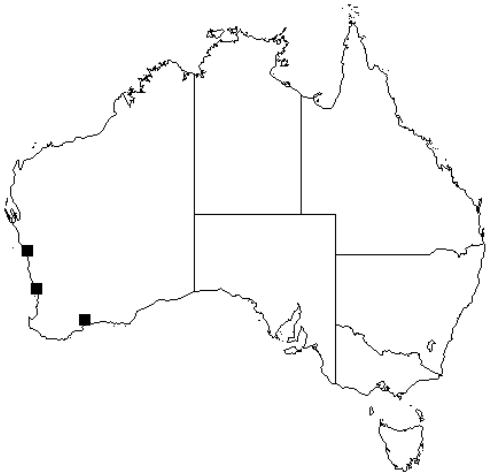
Chrysidiomyia pulchella

205



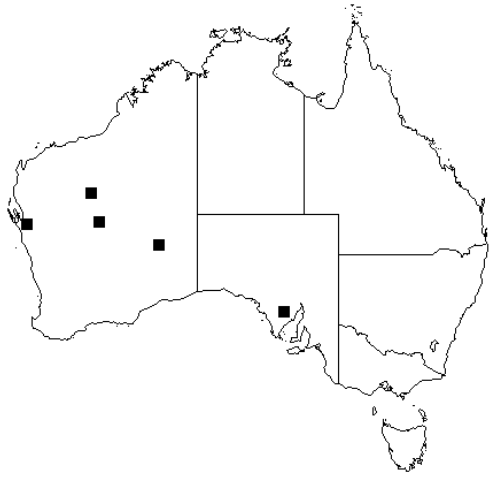
Chrysidiomyia rufa

206



Chrysidiomyia rugifrons

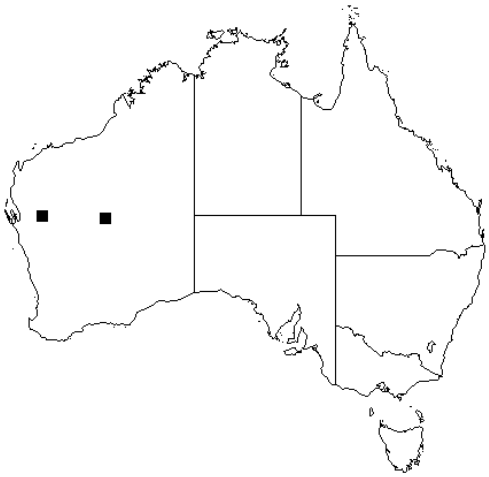
207



Chrysidiomyia setosa

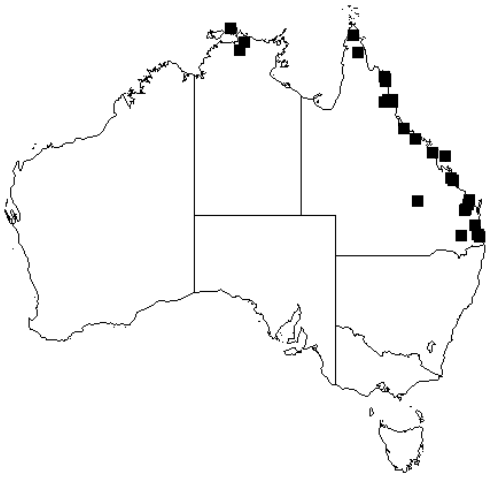
FIGURES 203–207. Distributions of *Chrysidiomyia* spp.

208



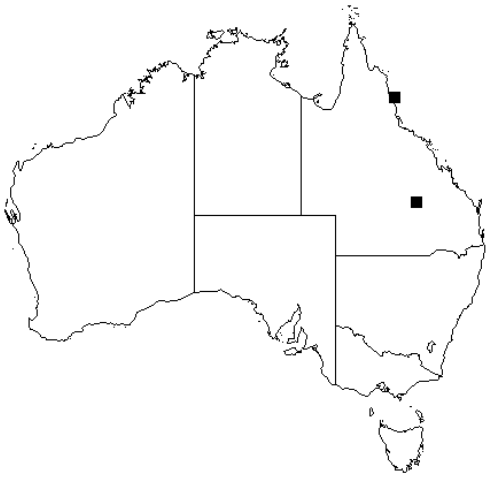
Conops areolus

209



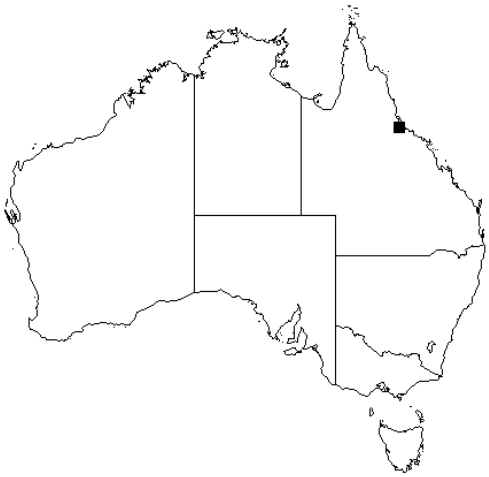
Conops australianus

210



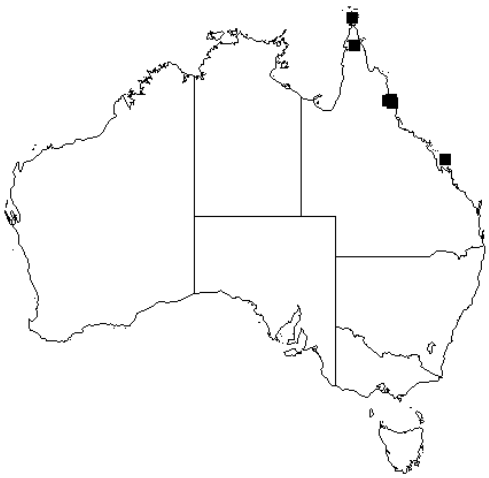
Conops badius

211



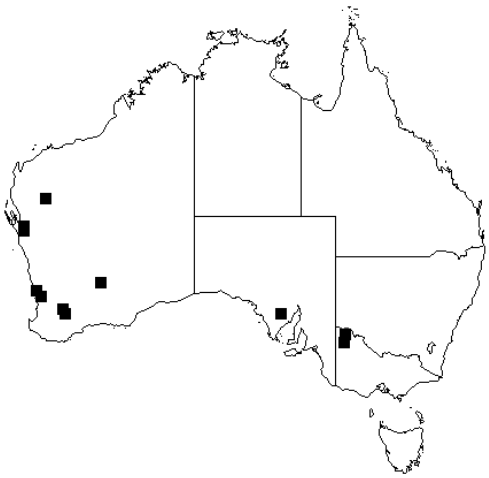
Conops chvalai

212



Conops nigrescens

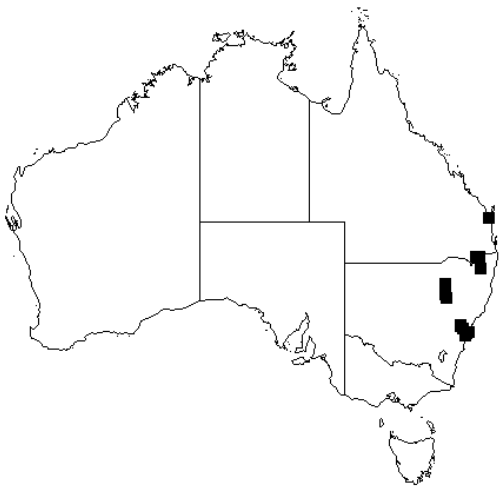
213



Conops satanicus

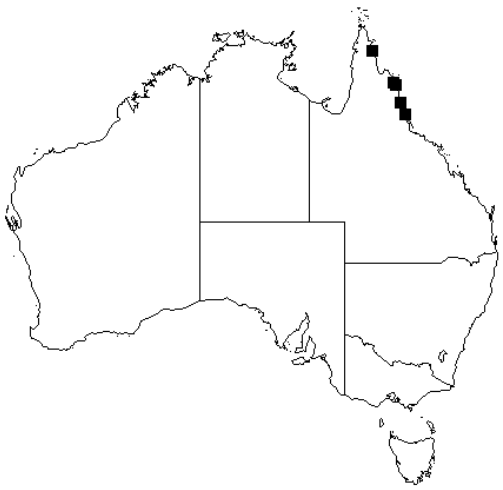
FIGURES 208–213. Distributions of *Conops* spp.

214



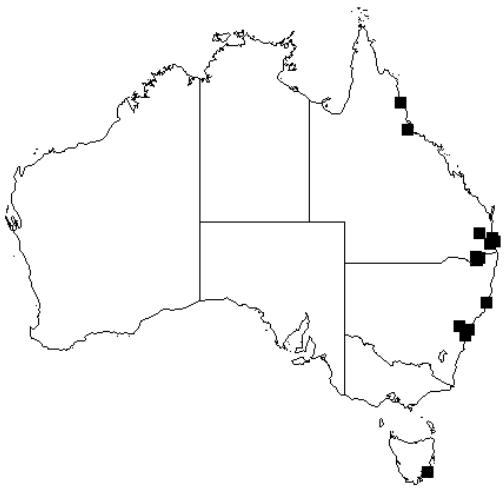
Conops seminiger

215



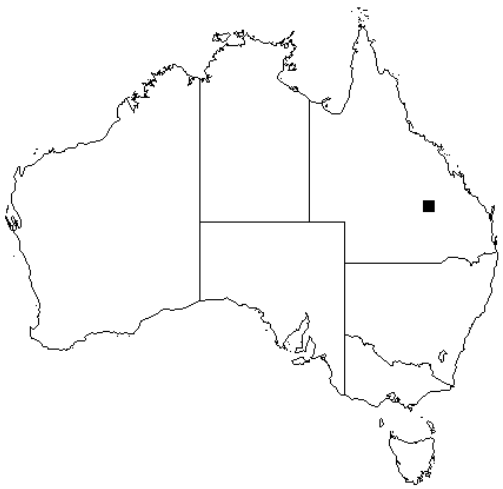
Conops sparsus

216



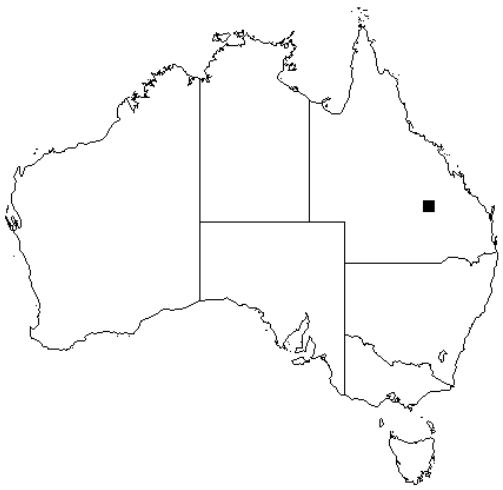
Conops thoracicus

217



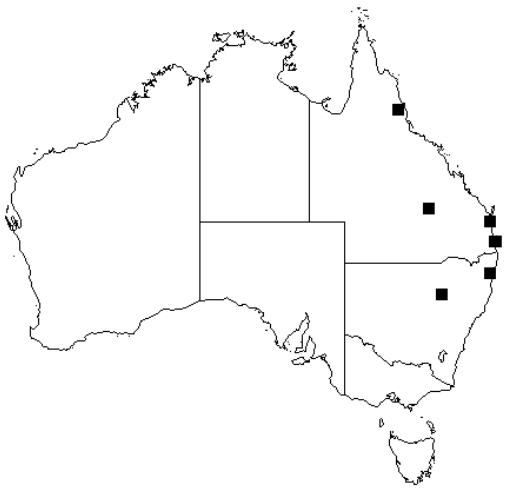
Neoconops brevistylus

218



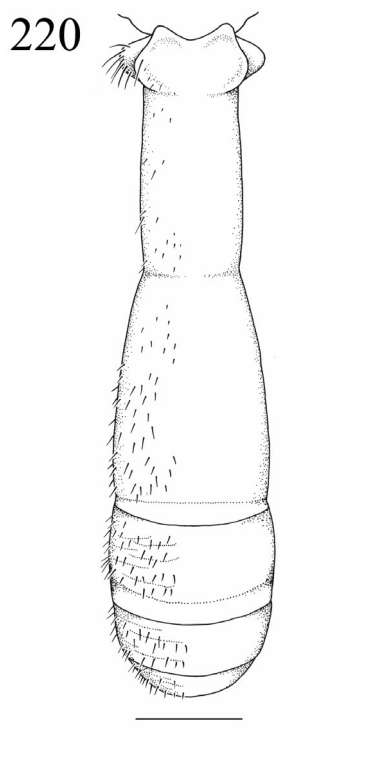
Neoconops glabrus

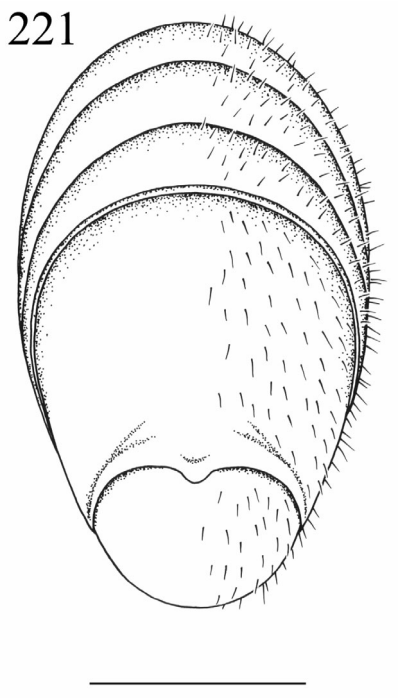
219

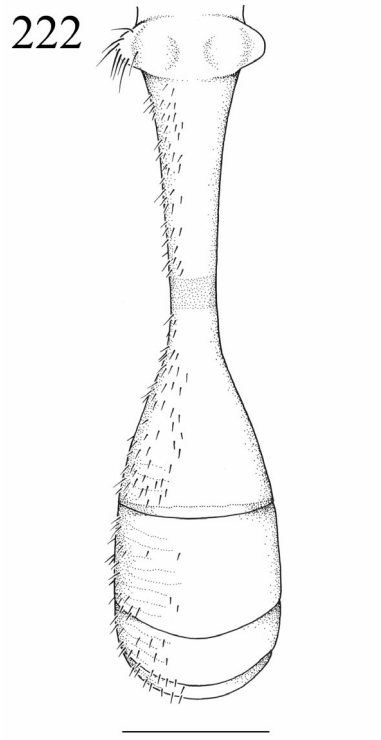


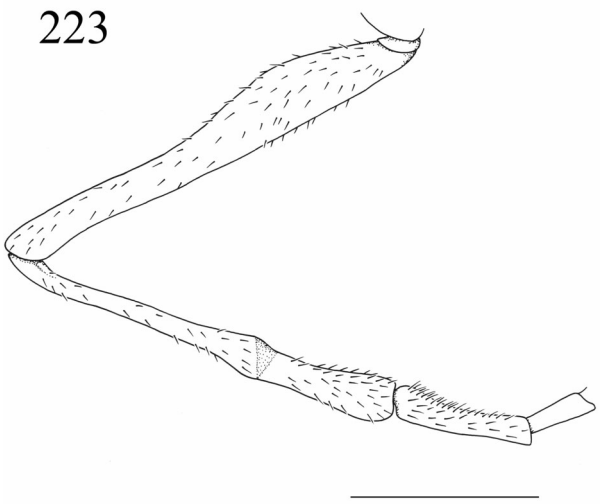
Neoconops longicornis

FIGURES 214–219. Distributions of *Conops* spp. and *Neoconops* spp.





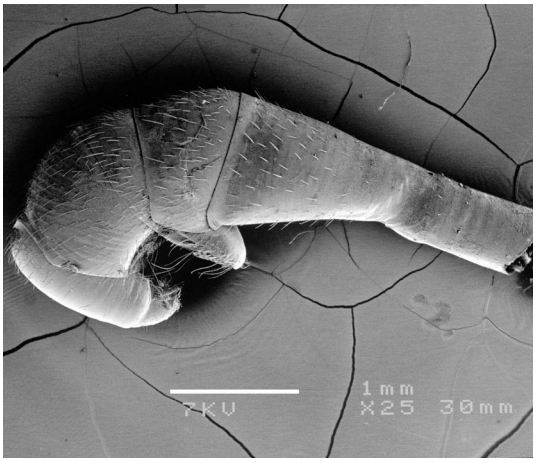




FIGURES 220–223. *Physocephala* spp. **220–222**. *P. australiana* Camras: **220**. female abdomen, dorsal view. **221**. apex of female abdomen showing medial projection of T6. **222**. male abdomen, dorsal view. Scale = 1.0 mm. **223**. *P. nigrotestacea* (Macquart), hind leg. Scale = 0.25 mm.

224

225



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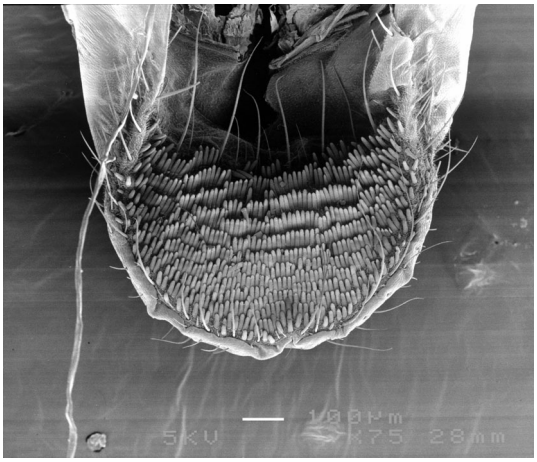

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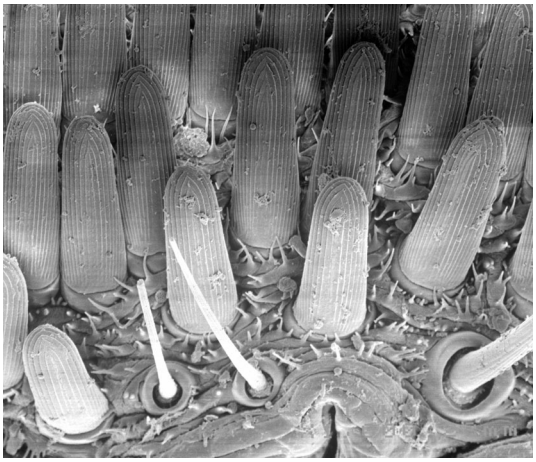

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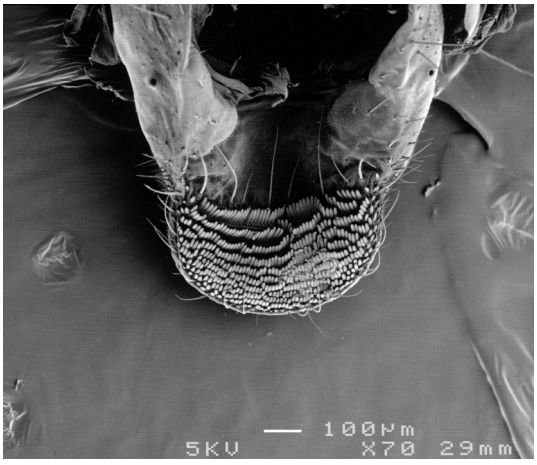

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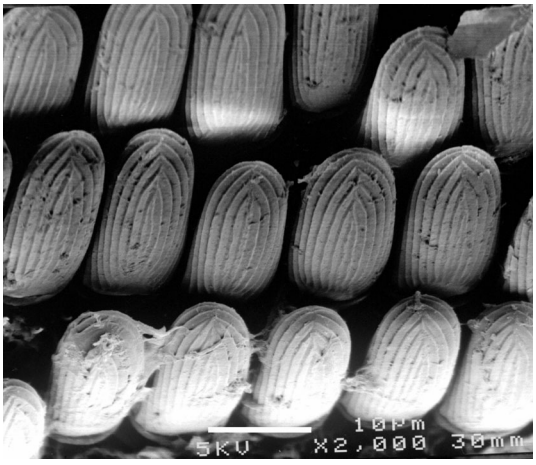


FIGURES 224–229. *Physocephala* spp.: **224–225**. *P. nigrotestacea* (Macquart): **224**. antennae showing characteristic shape and proportions for *Physocephala* spp. **225**. female abdomen (segment 1 removed). **226–227**. *P. australiana* Camras: **226**. female genital plate. **227**. spicules at apex of female genital plate. **228–229**. *P. nigrotestacea* (Macquart): **228**. female genital plate. **229**. spicules at apex of female genital plate.

230 *Physocephala australiana* Camras

231 *Physocephala minuta* Kröber

232 *Physocephala nigrotestacea* Macquart

233 *Pleurocerina brevis* sp. nov.

234 *Pleurocerina fasciata* Macquart

235 *Pleurocerina fasciata* Macquart

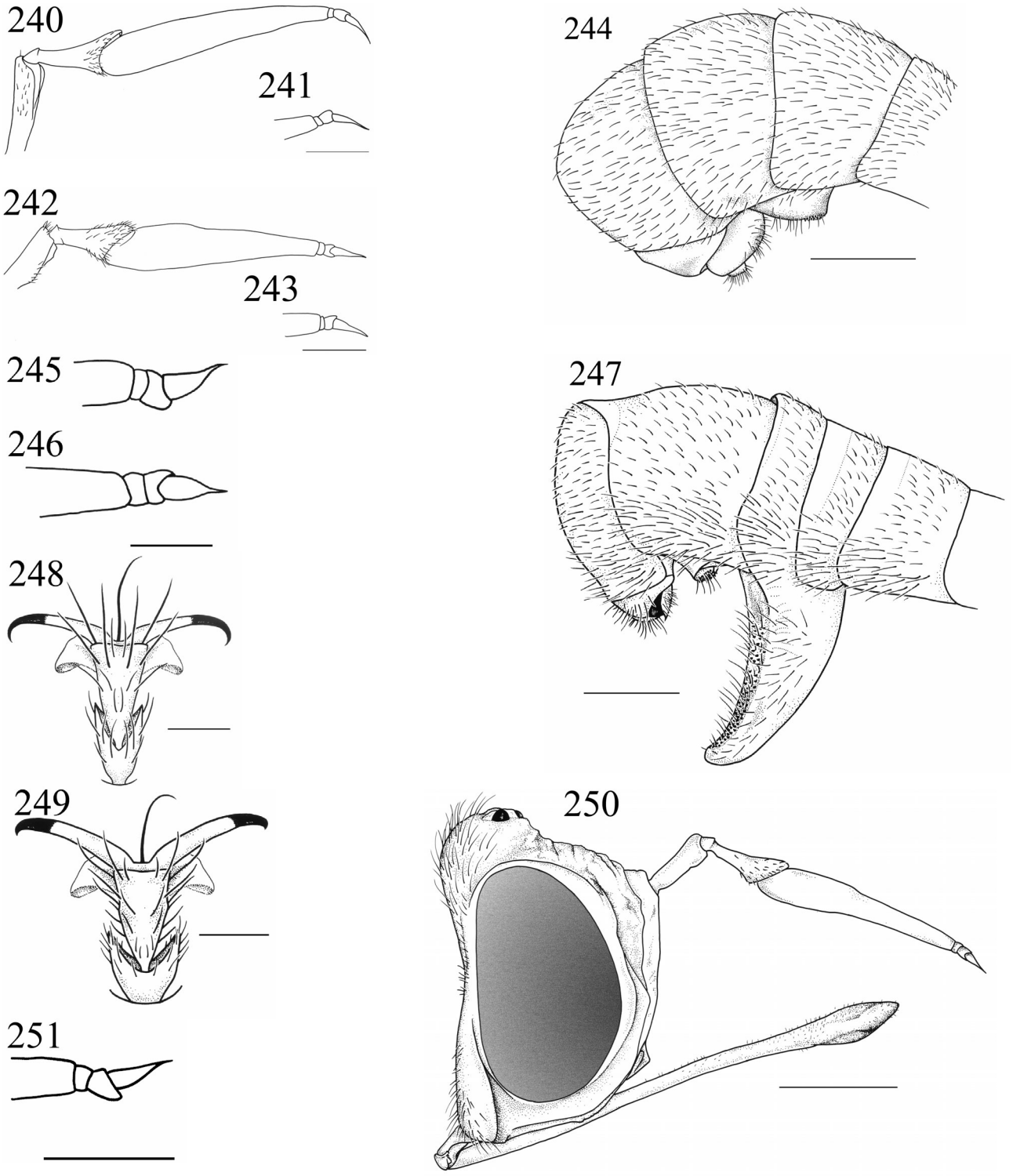
236 *Pleurocerina lamellata* sp. nov.

237 *Pleurocerina luteiceps* sp. nov.

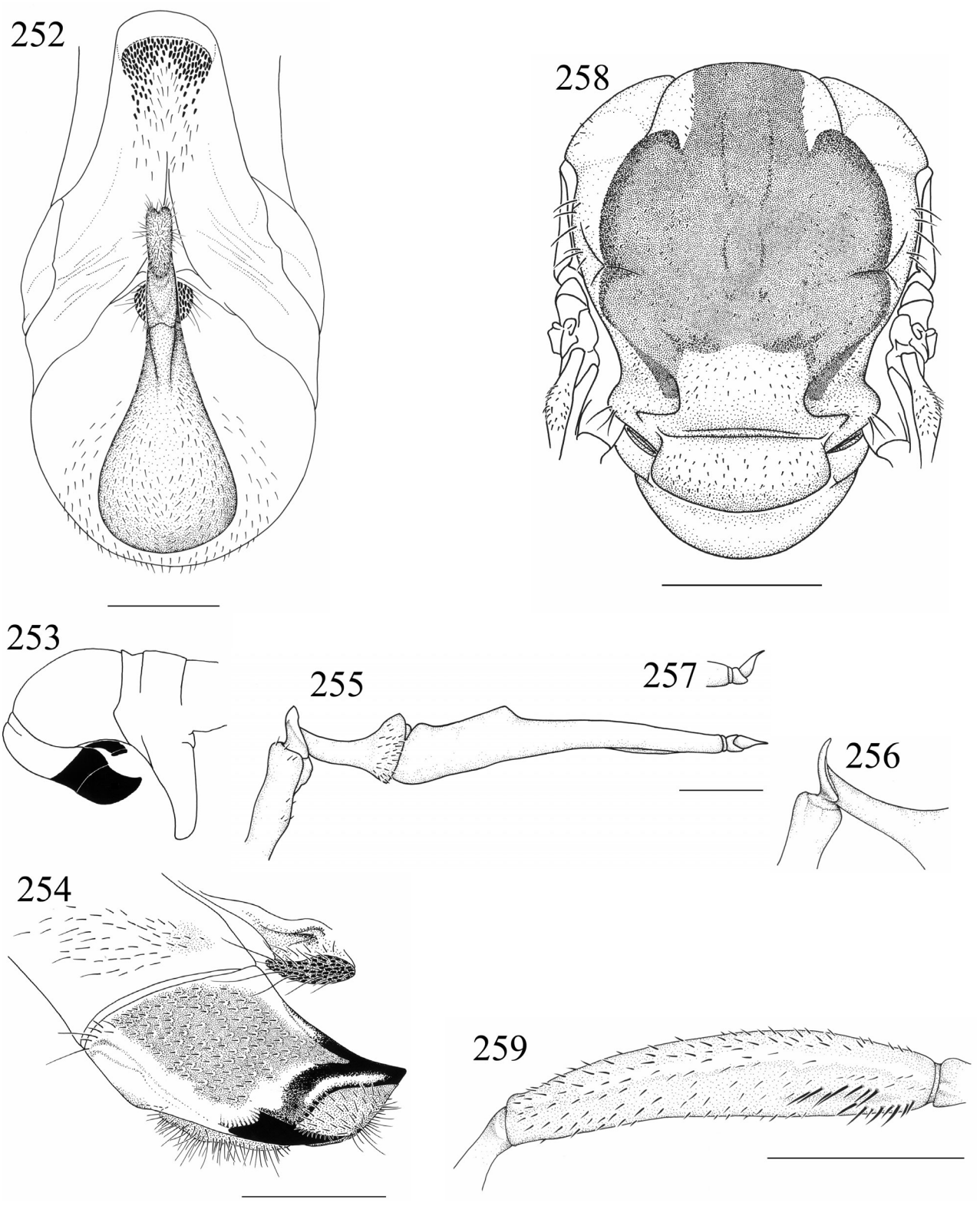
238 *Pleurocerina saxatilis* sp. nov.

239 *Pleurocerina vespiformis* sp. nov.

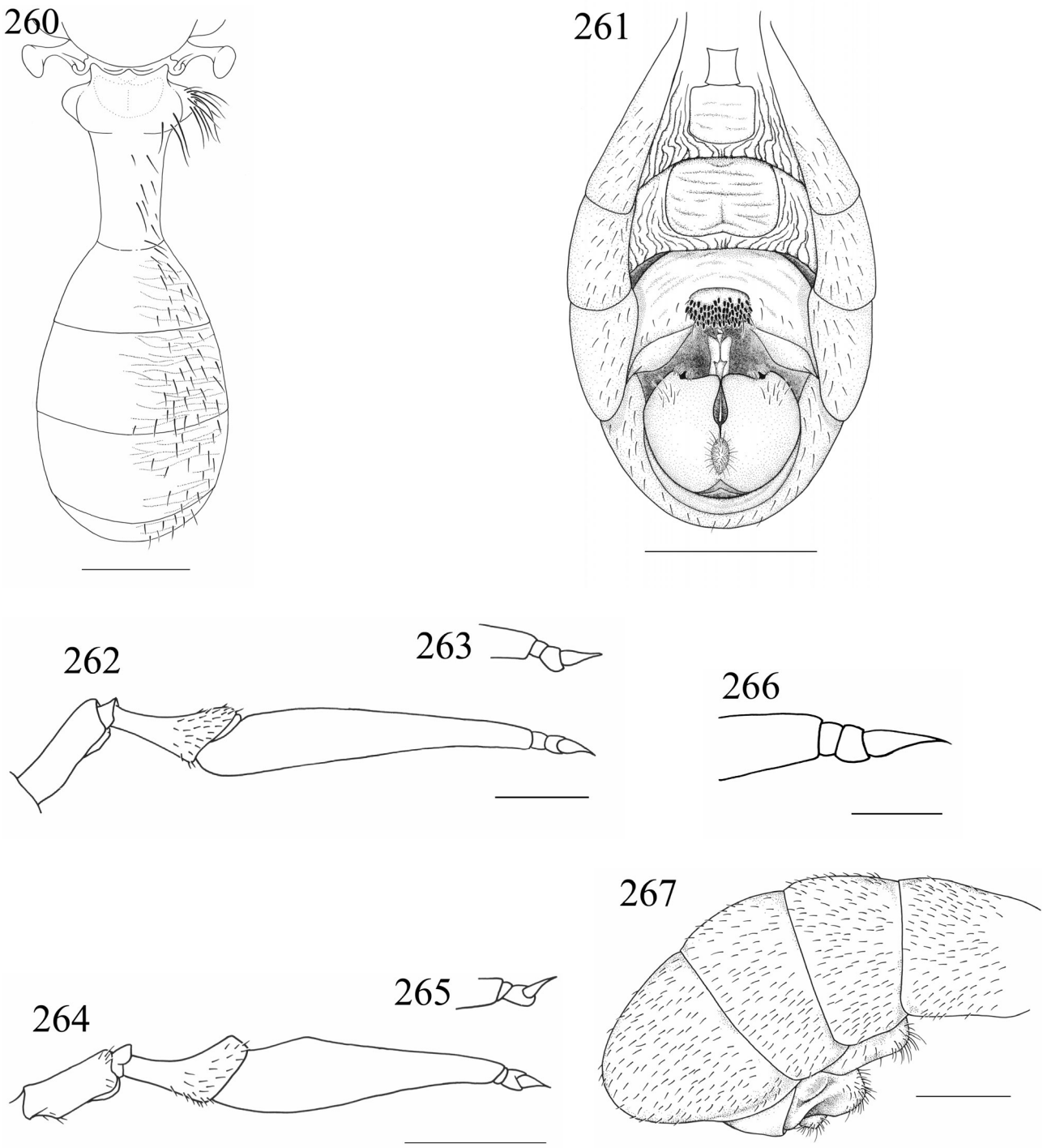
FIGURES 230–234, 236–239. Wings as named. Scale = 1 mm. **FIGURE 235**. *Pleurocerina fasciata* Macquart, female postabdomen.



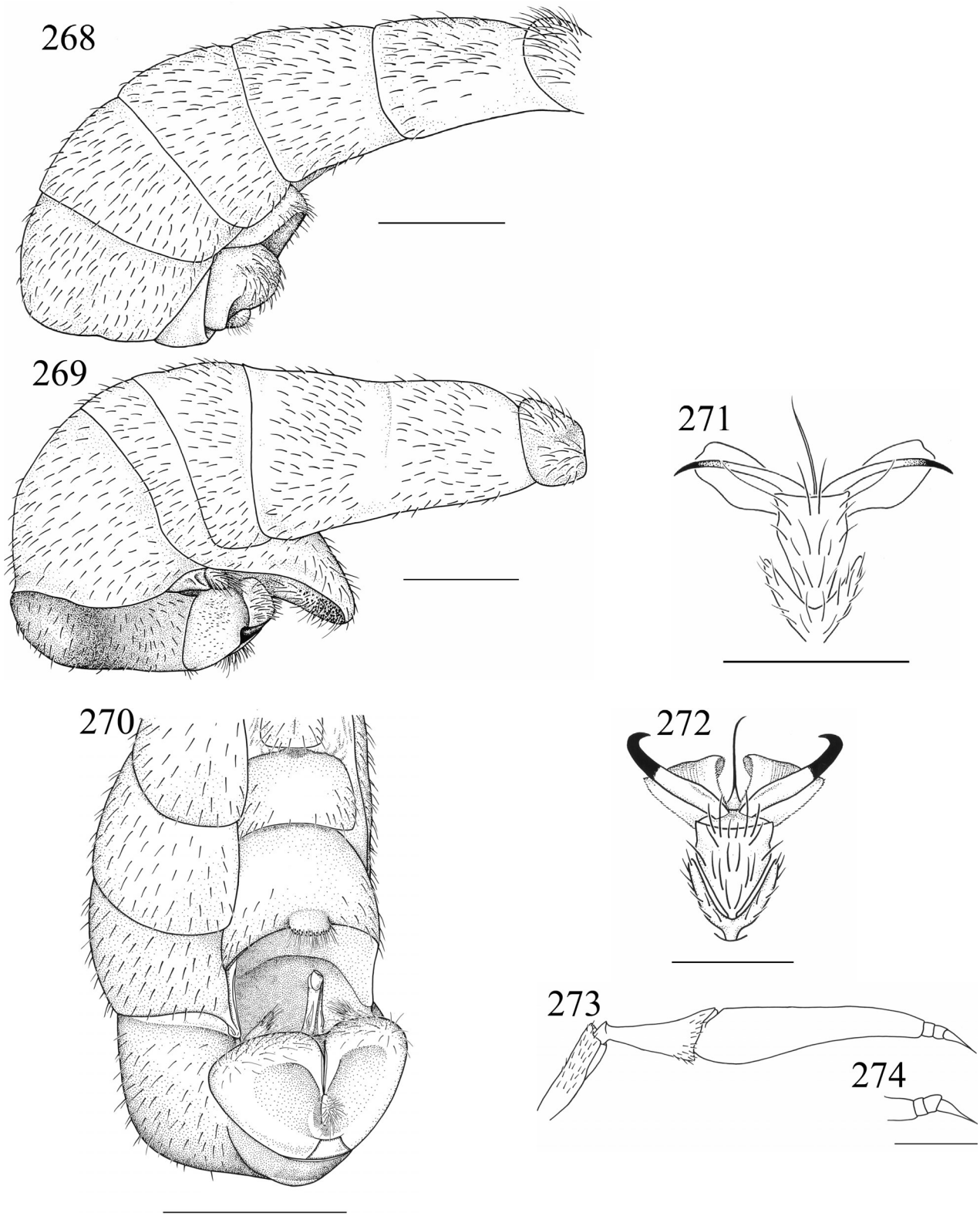
FIGURES 240–251. *Pleurocerina* spp.: **240–241**. *P. brevis* sp. nov.: **240**. antenna, lateral view. **241**. stylus, dorsal view. **242–244**. *P. aquila* sp. nov.: **242**. antenna, lateral view. **243**. stylus, dorsal view. **244**. male postabdomen. **245–247**. *P. chrysopyga* sp. nov.: **245**. stylus, dorsal view. **246**. stylus, lateral view. **247**. female postabdomen. **248–251.** *P. fasciata* Macquart: **248**. male claws. **249**. female claws. **250**. head, right lateral view. **251**. stylus, dorsal view. Scale for Figures 240–243, 251 = 0.5 mm.; scale for Figures 244, 247, 250 = 1.0 mm.; scale for Figures 245–246, 248–249 = 0.25 mm.



FIGURES 252–259. *Pleurocerina* spp. **252–254**. *P. fasciata* Macquart: **252.** female postabdomen, posteroventral view. **253.** female postabdomen: lateral view. **254.** apex of female genitalia, lateral view. **255–258**. *P. lamellata* sp. nov.: **255**. antenna, lateral view. **256**. Flange at base of pedicel, anterolateral view. **257**. stylus, dorsal view. **258**. thorax, dorsal view. **259**. *P. longicornis* Kröber: fore femur, lateral view. Scale for Figures 240–243, 251 = 0.5 mm.; scale for Figures 244, 247, 250 = 1.0 mm.; scale for Figures 245–246, 248–249 = 0.25 mm.

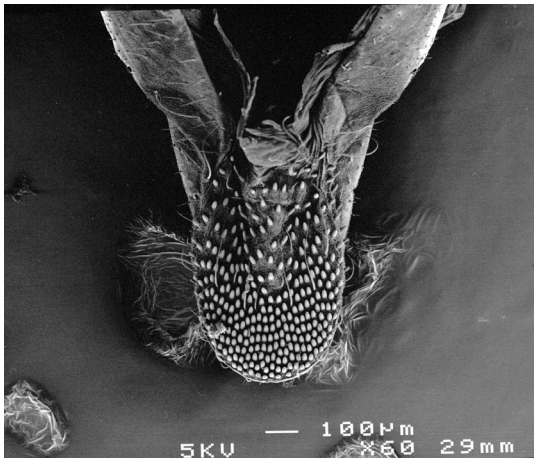


FIGURES 260–267. *Pleurocerina* spp.: **260–261, 266**. *P. lutea* sp. nov.: **260.** male abdomen, dorsal view. **261.** male postabdomen: ventral view. **266**. stylus: dorsal view. **262–263, 267**. *P. nigrifacies* (Kröber): **262**. antenna: lateral view. **263**. stylus: dorsal view. **267.** male postabdomen: lateral view. **264–265**. *P. luteiceps* sp. nov.: **264**. antenna: lateral view. **265**. stylus: dorsal view. Scale for Figures 260–261, 267 = 1.0 mm.; scale for Figures 262–265 = 0.5 mm.; scale for Figure 266 = 0.25 mm.



FIGURES 268–274. *Pleurocerina* spp. **268–269**. *P. occidua* sp. nov.: **268.** male abdomen: lateral view. **269.** female abdomen: lateral view. **270–271**. *P. turneri* (Camras): **270.** male abdomen: ventrolateral view. **271**. male claws. **272–274**. *P. vespiformis* sp. nov.: **272**. male claws. **273**. antenna: lateral view. **274**. stylus: dorsal view. Scale for Figures 268–270 = 1.0 mm.; scale for Figures 271–274 = 0.5 mm.

275



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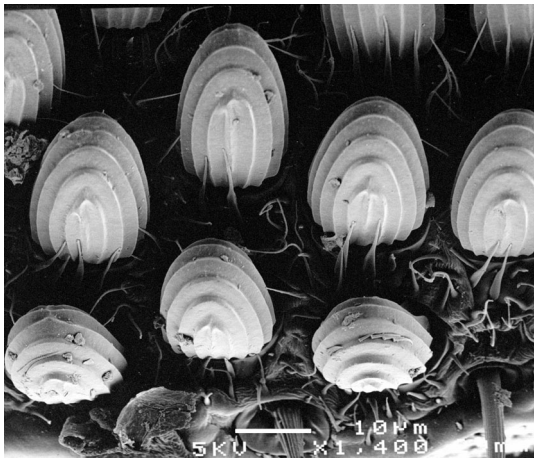

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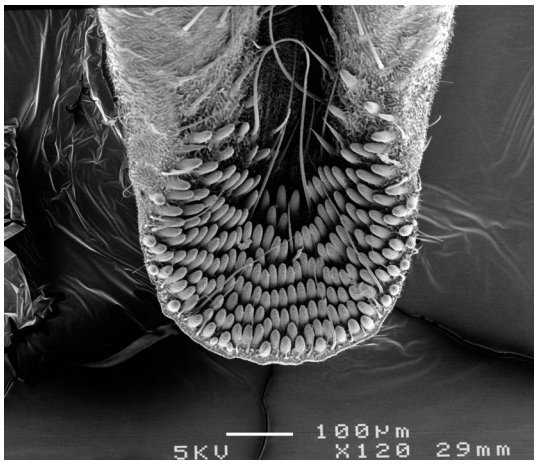

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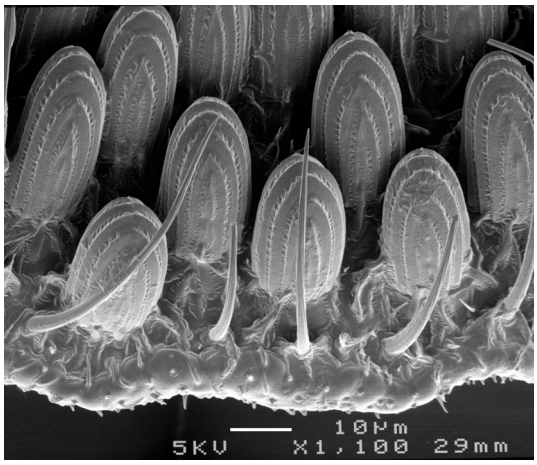

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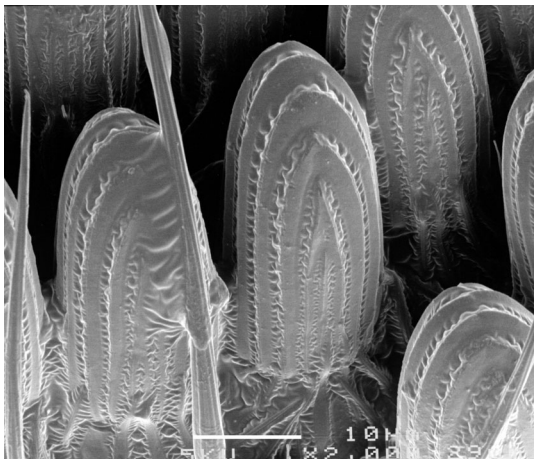
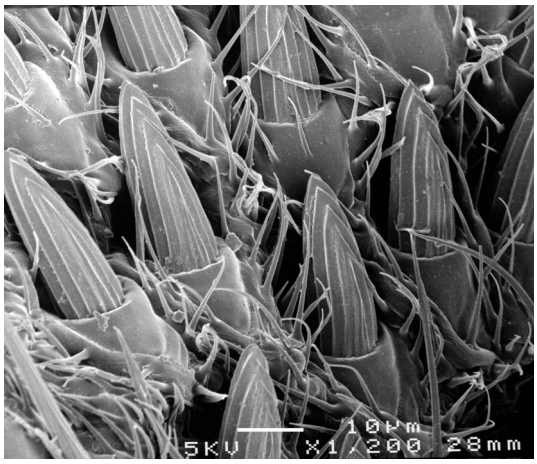
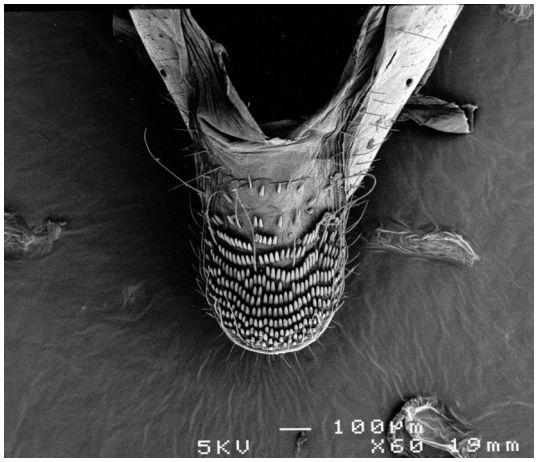


280



FIGURES 275–280. *Pleurocerina* spp. **275–276**. *P. longicornis* (Kröber): **275**. female genital plate. **276**. spicules at apex of female genital plate. **277–280.** *P. scutellata* sp. nov.: **277**. female genital plate. **278–279**. spicules at apex of female genital plate. **280**. spicules on female sternite 6.

281



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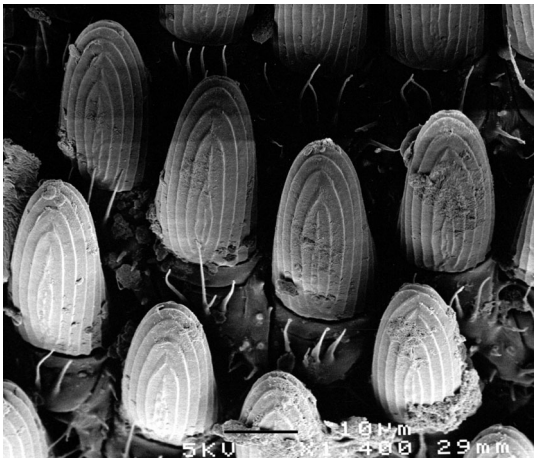

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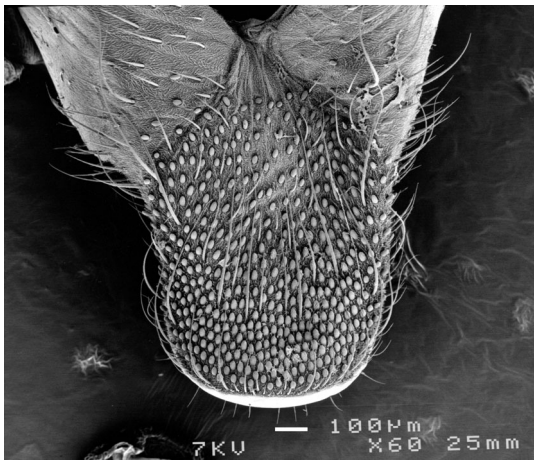

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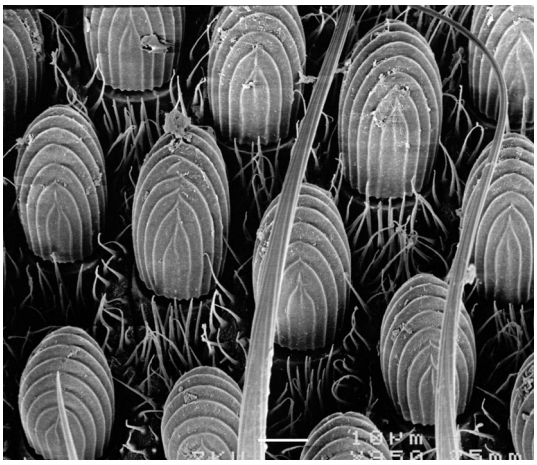
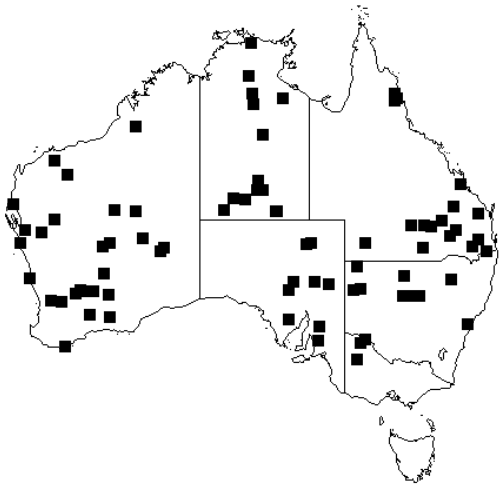


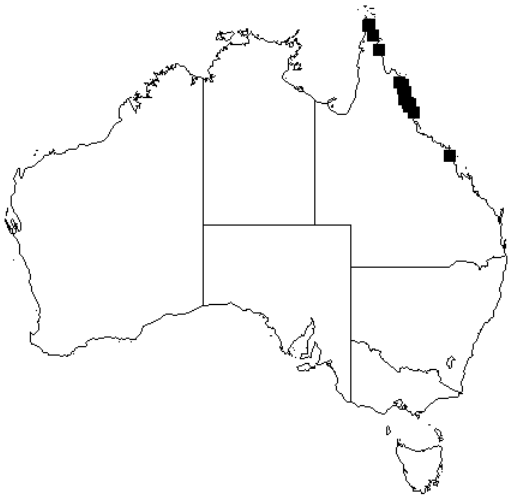
FIGURES 281–284. *Pleurocerina* spp. **281–282**. *P. turneri* sp. nov.: **281**. female genital plate. **282.** spicules at apex of female genital plate. **283–284.** *P. vespiformis* sp. nov.: **283**. female genital plate. **284**. spicules at apex of female genital plate.

285



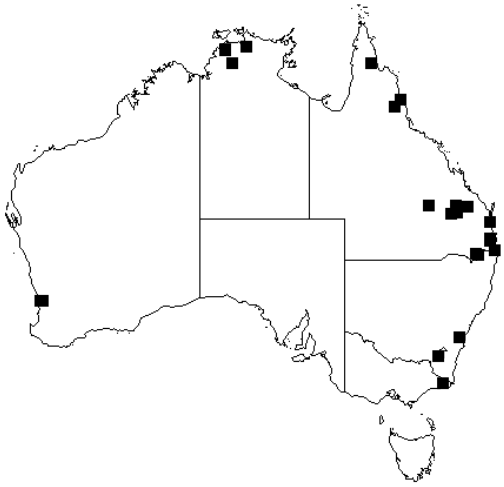
Physocephala australiana

286



Physocephala minuta

287



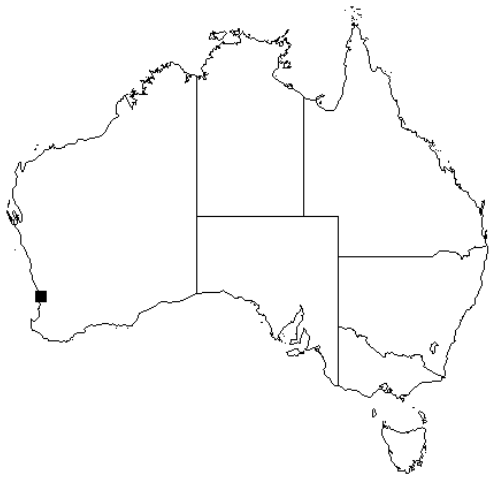
Physocephala nigrotestacea

FIGURES 285–287. Distributions of *Physocephala* spp.

288

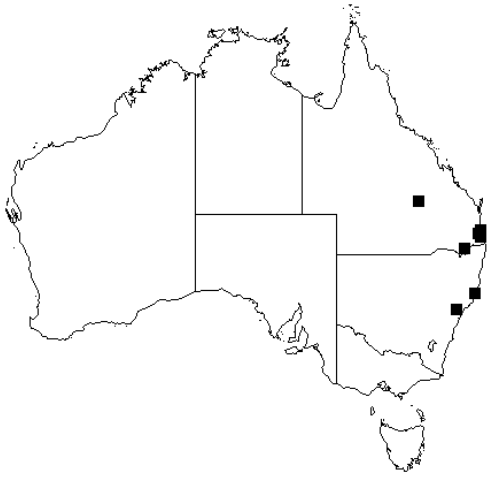
Pleurocerina aquila

289



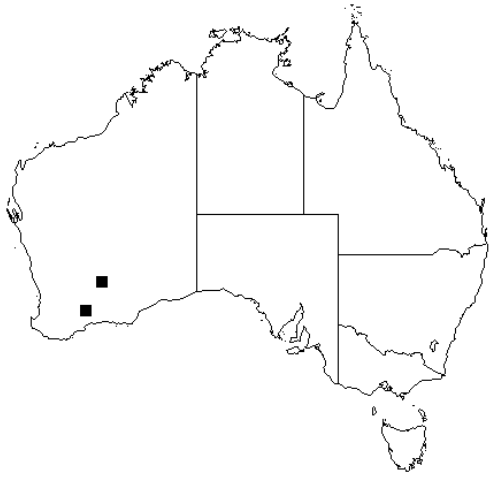
Pleurocerina aristalis

290



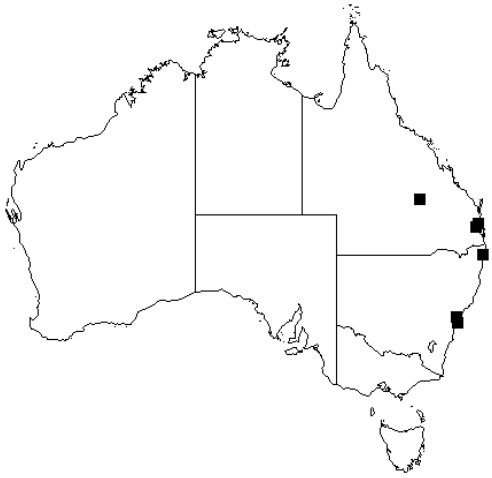
Pleurocerina brevis

291



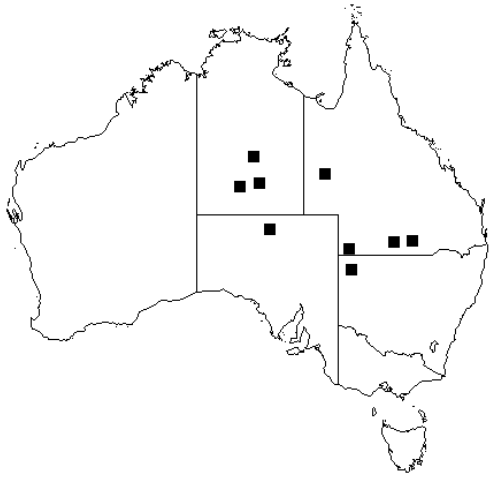
Pleurocerina chrysopyga

292



Pleurocerina fasciata

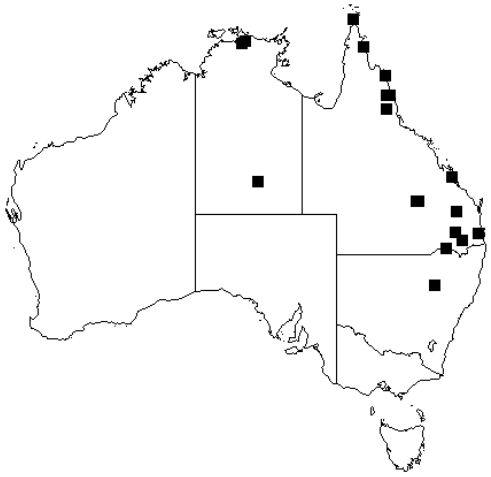
293



Pleurocerina lamellata

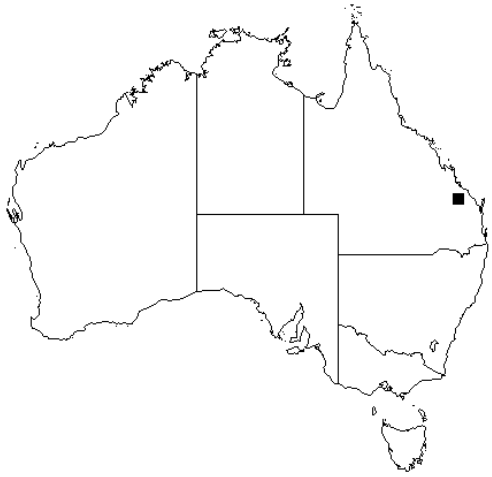
FIGURES 288–293. Distributions of *Pleurocerina* spp.

294



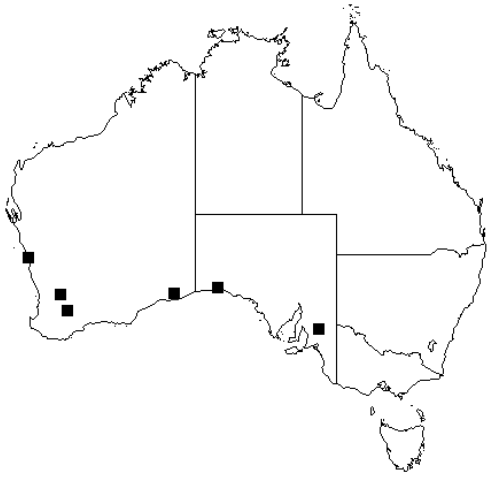
Pleurocerina longicornis

295



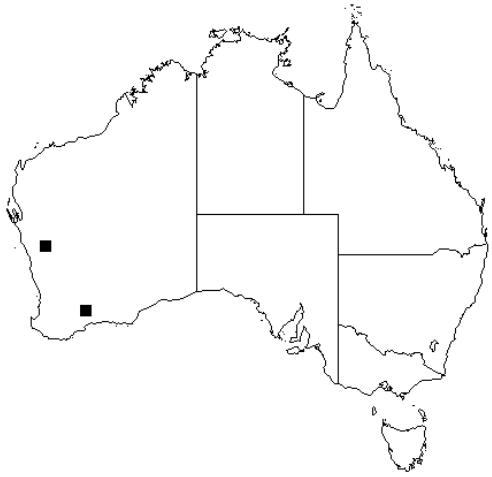
Pleurocerina lutea

296



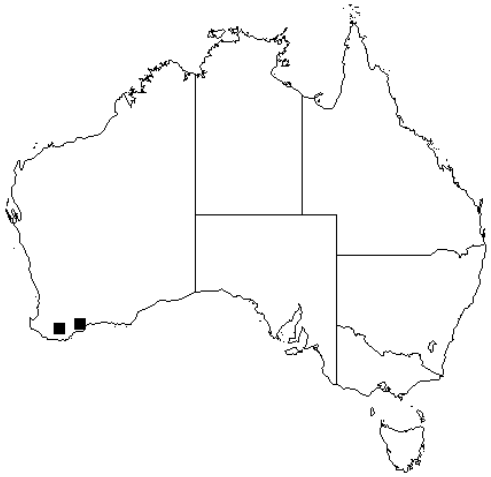
Pleurocerina luteocephala

297



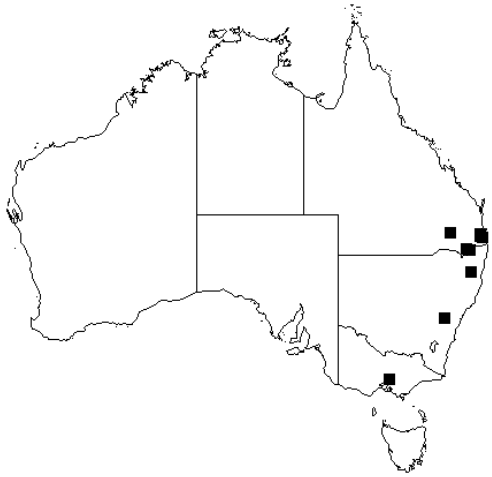
Pleurocerina nigrifacies

298



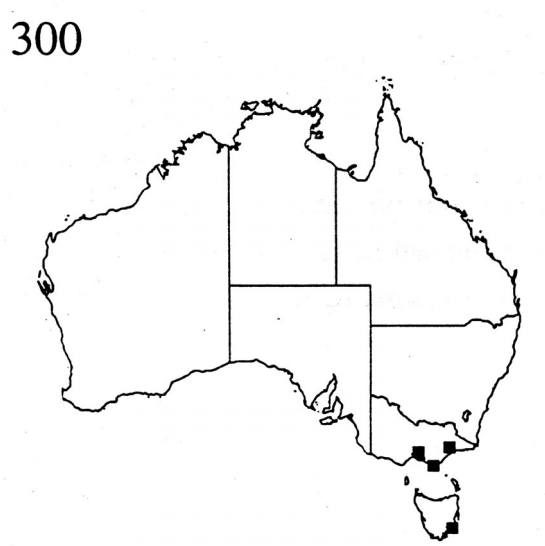
Pleurocerina occidua

299

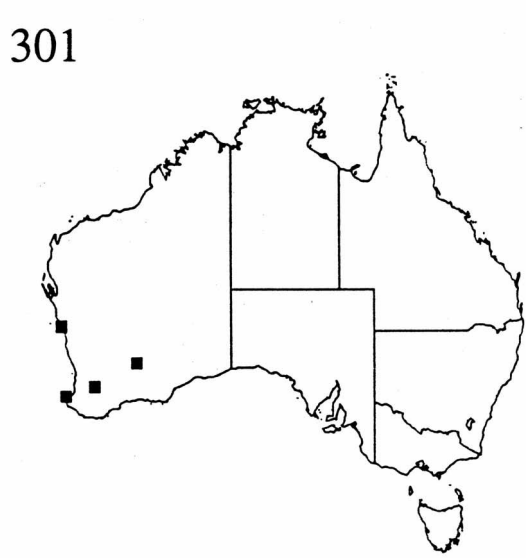


Pleurocerina saxatilis

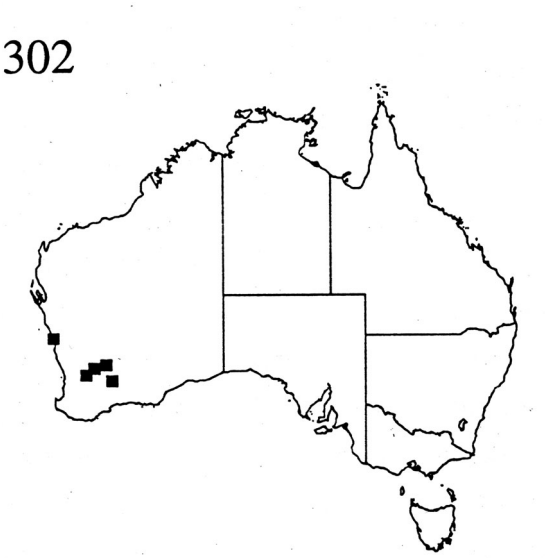
FIGURES 294–299. Distributions of *Pleurocerina* spp.



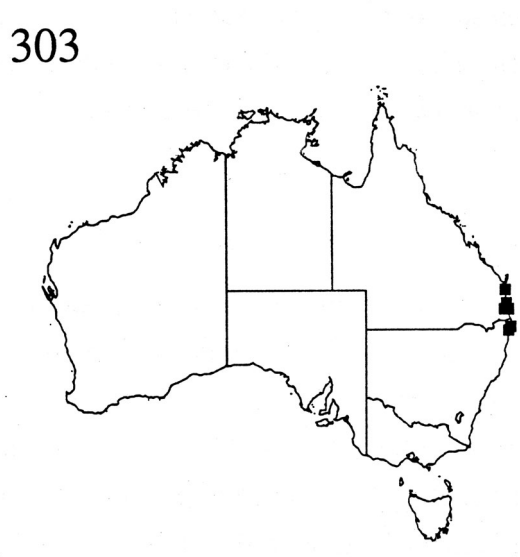
Pleurocerina scutellata



Pleurocerina similis

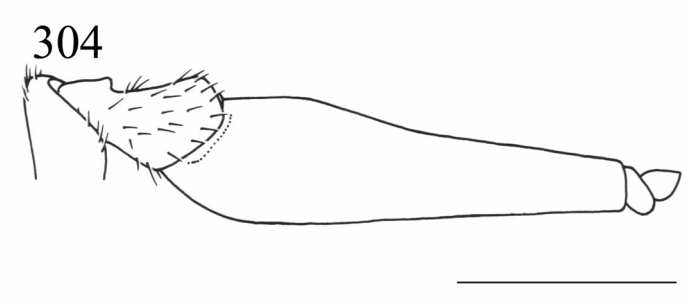


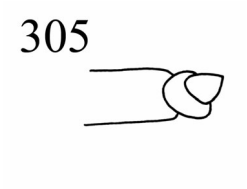
Pleurocerina turneri

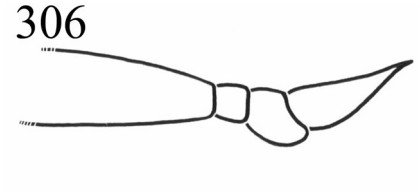


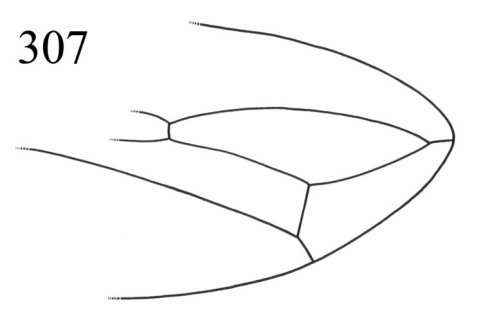
Pleurocerina vespiformis

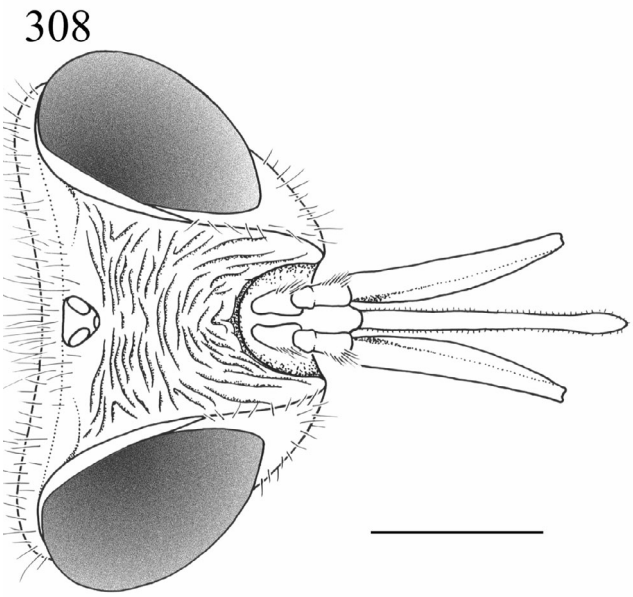
FIGURES 300–303. Distributions of *Pleurocerina* spp.

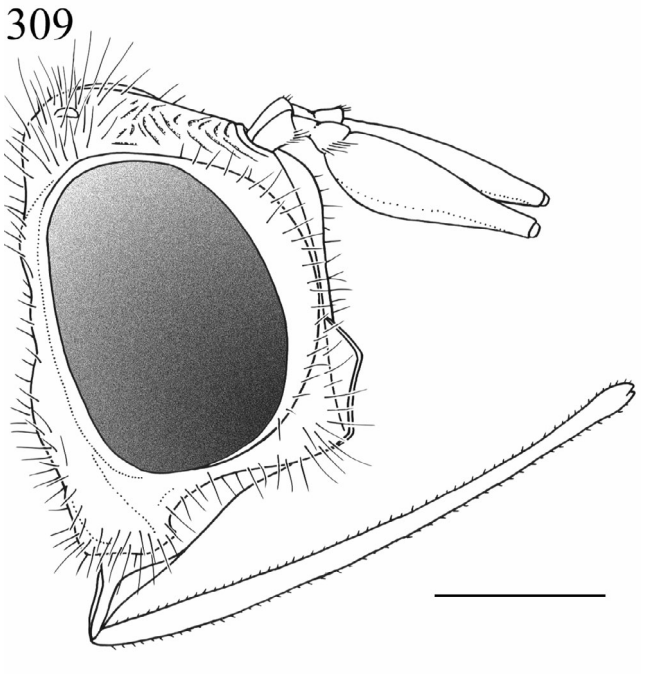






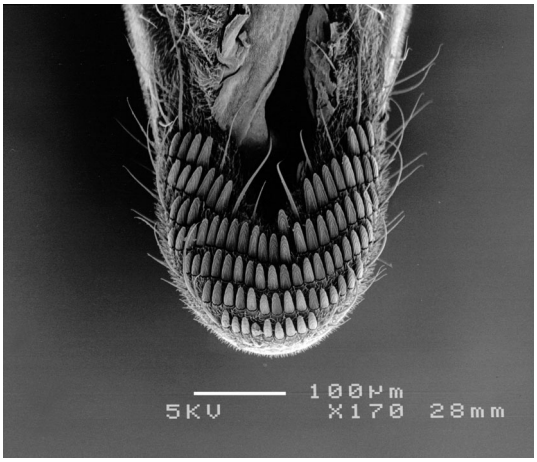






FIGURES 304–305. *Setosiconops robustus* (Kröber): **304**. antenna: lateral view. **305**. stylus: dorsal view. **FIGURES 306–307**. *Stenoconops niger* (Kröber): **306**. stylus: dorsal view. **307**. apex of wing showing shape of cell r4+5. **FIGURES 308–309**. *Smartiomyia obscura* Kröber. **308**. head: dorsal view. **309**. head: lateral view. Scale = 0.5 mm. No scale for Figures 306–307.

310



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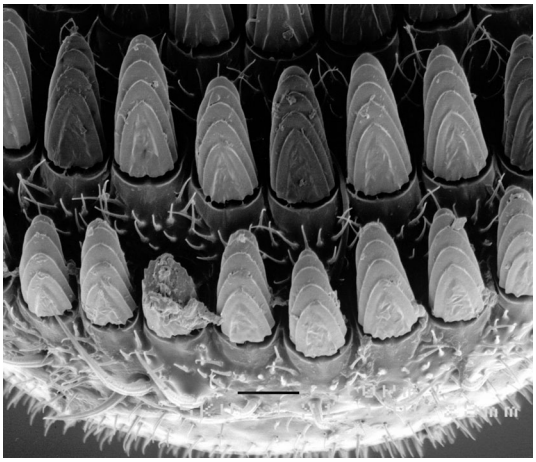

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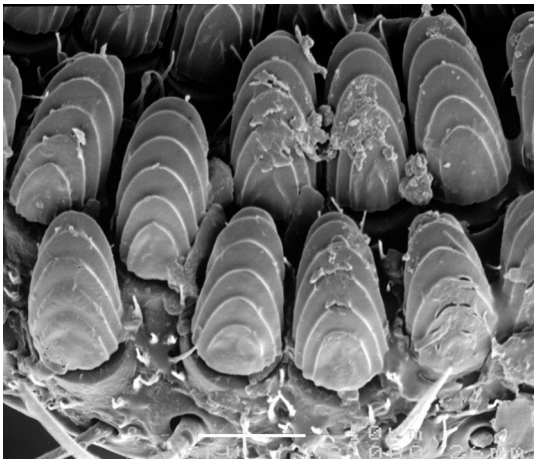

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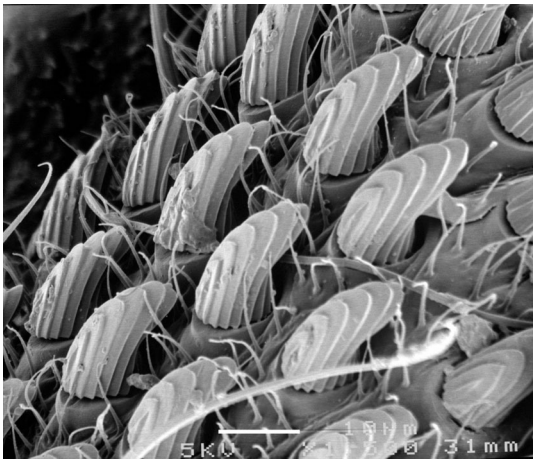

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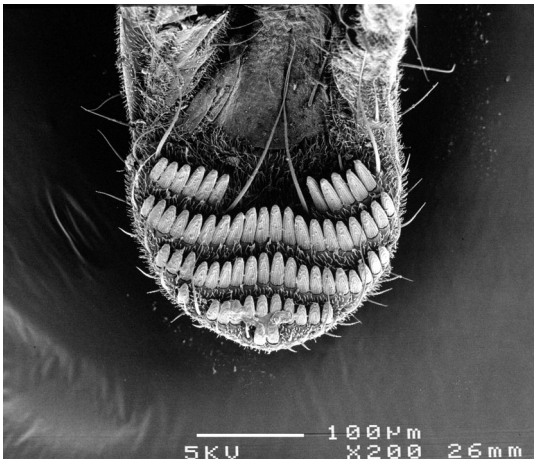

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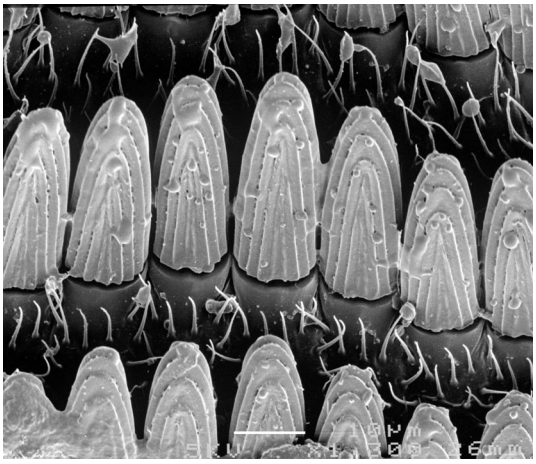
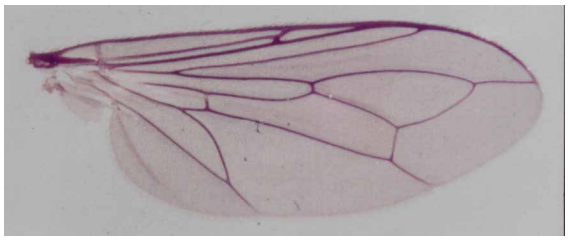


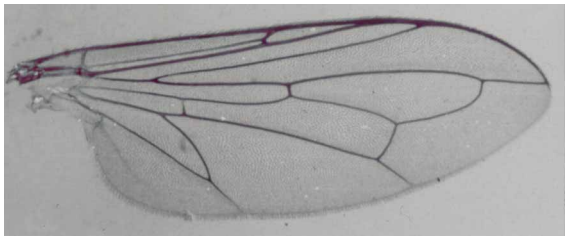
FIGURES 310–315. *Smartiomyia* spp. **310–311**. *S. arena* sp. nov.: **310**. female genital plate. **311.** spicules at apex of female genital plate. **312–313**. *S. danielsi* sp. nov.: **312**. spicules at apex of female genital plate. **313**. spicules on female sternite 6. **314–315.** *S. obscura* Kröber: **314**. female genital plate. **315**. spicules at apex of female genital plate.

316 *Setosiconops robustus* (Kröber)

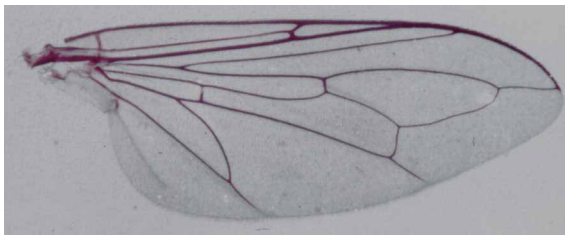
317 *Smartiomyia arena* sp. nov.



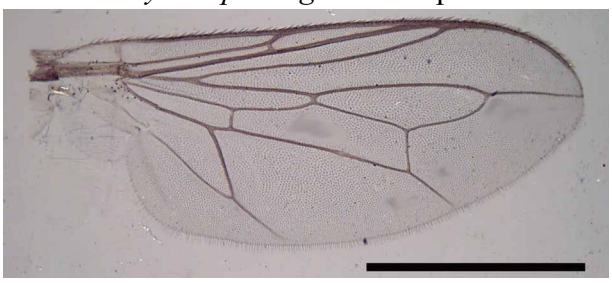
318 *Smartiomyia danielsi* sp. nov.



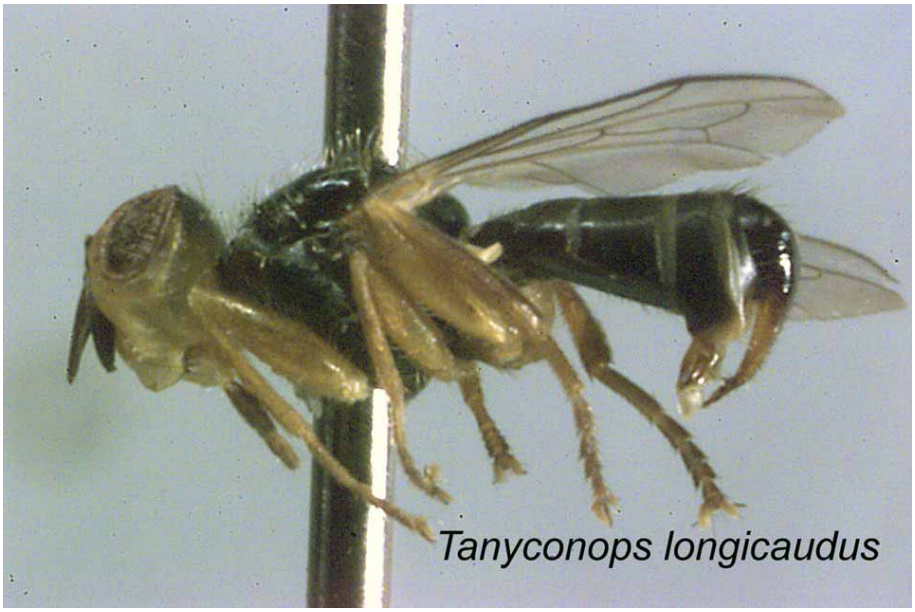
319 *Smartiomyia obscura* (Kröber)



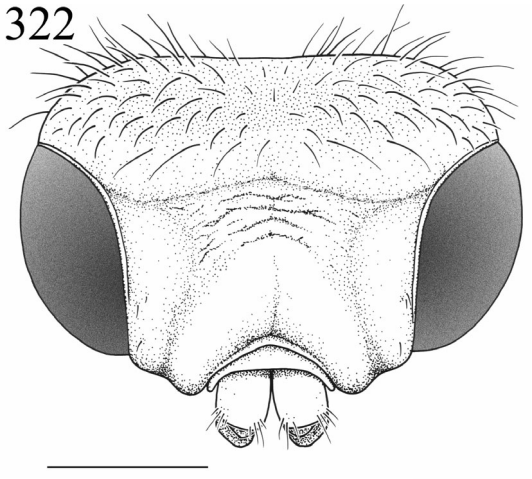
320 *Tanyconops longicaudus* sp. nov.

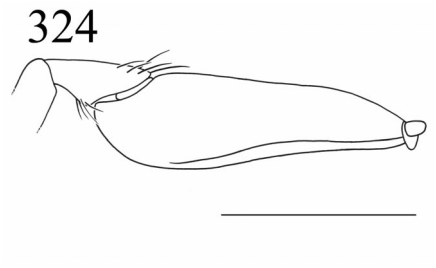


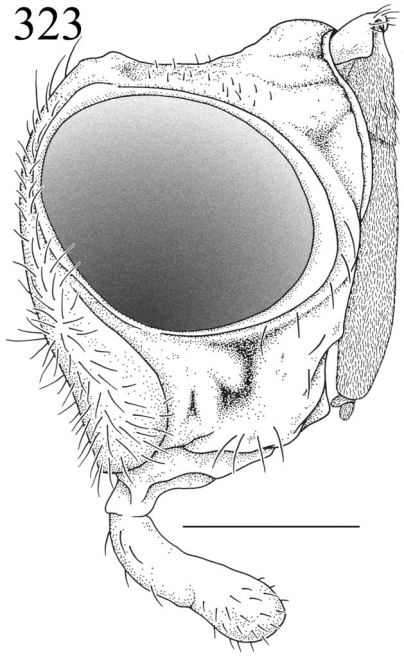
321

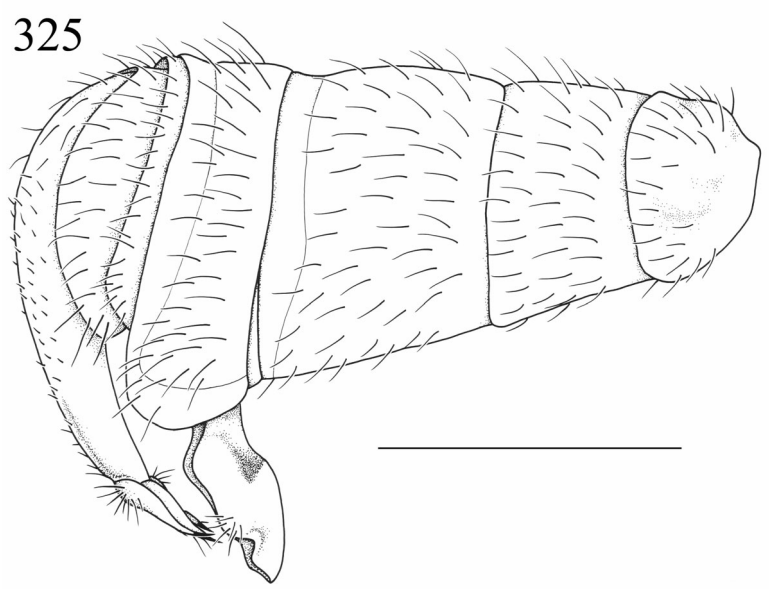


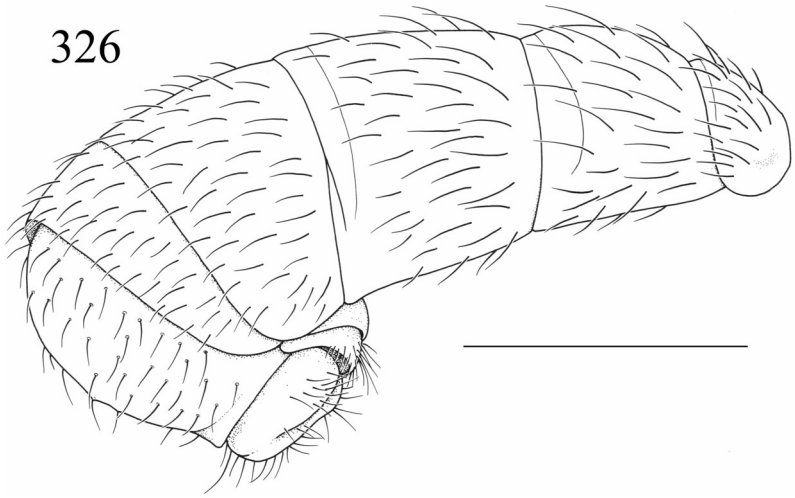
FIGURES 316–320. Wings as named. Scale = 1.0 mm. Scale not available for Figs 317-319 (close to that of Fig. 320).
FIGURE 321. *Tanyconops longicaudus* sp. nov.: female.





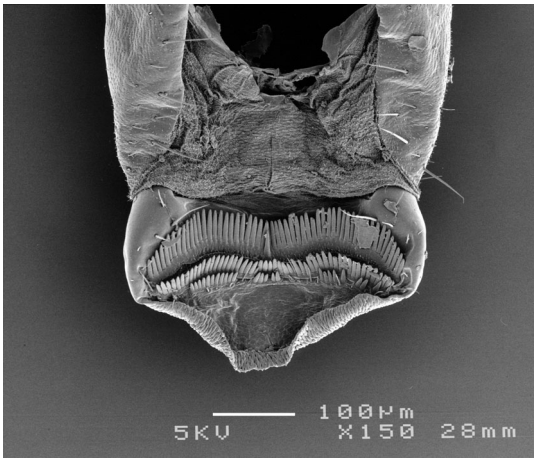




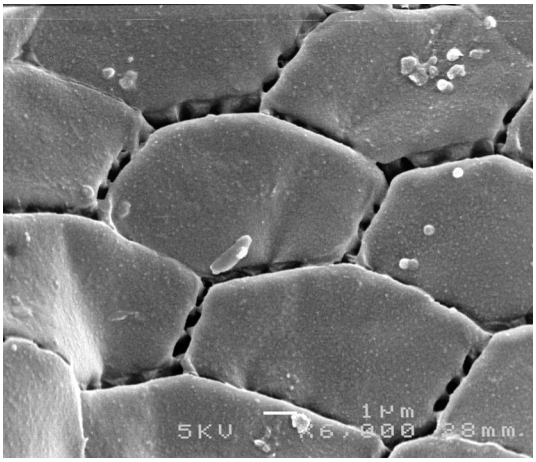


FIGURES 322–326. *Tanyconops* spp. **322, 325–326**. *T. longicaudus* sp. nov.: **322**. head: dorsal view. **325**. female abdomen: lateral view. **326**. male abdomen: lateral view. **323–324**. *T. ocellatus* sp. nov.: **323**. head: lateral view. **324**. antenna: lateral view. Scale for Figures 322–324 = 0.25 mm.; scale for Figures 325–326 = 0.5 mm.

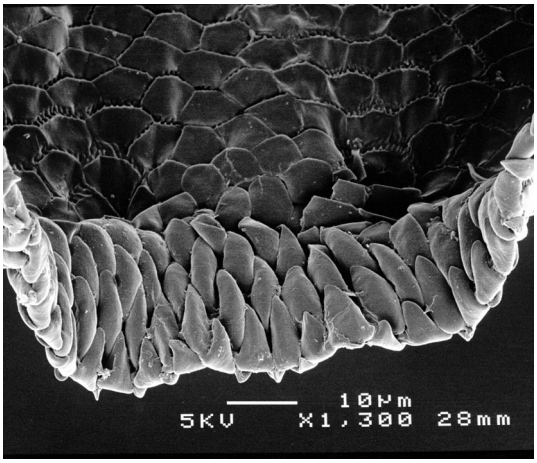
327



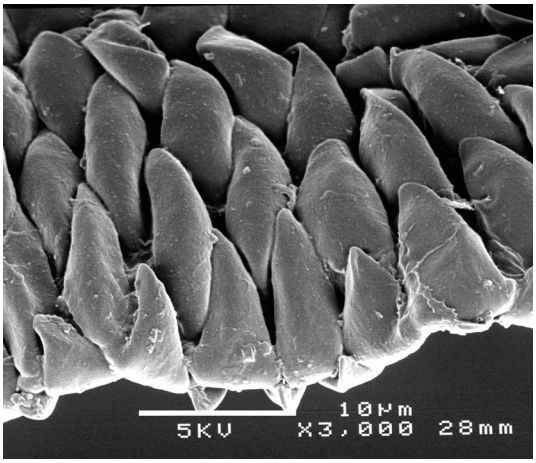
328



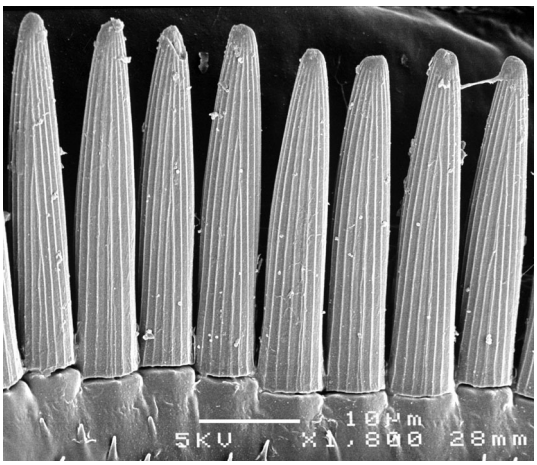
329



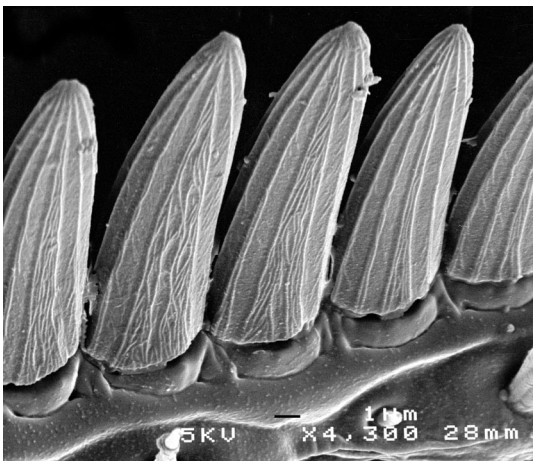
330



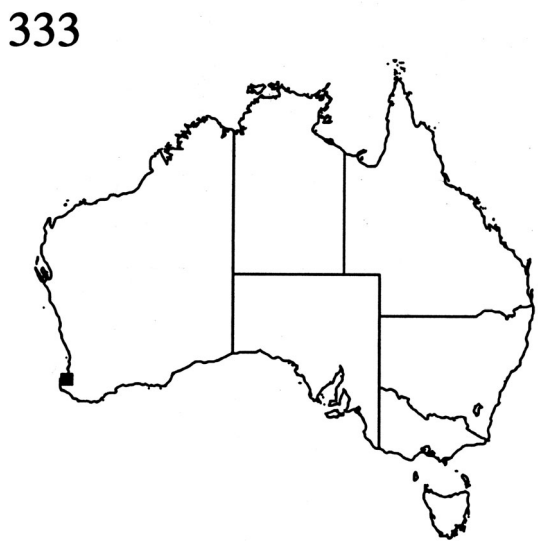
331

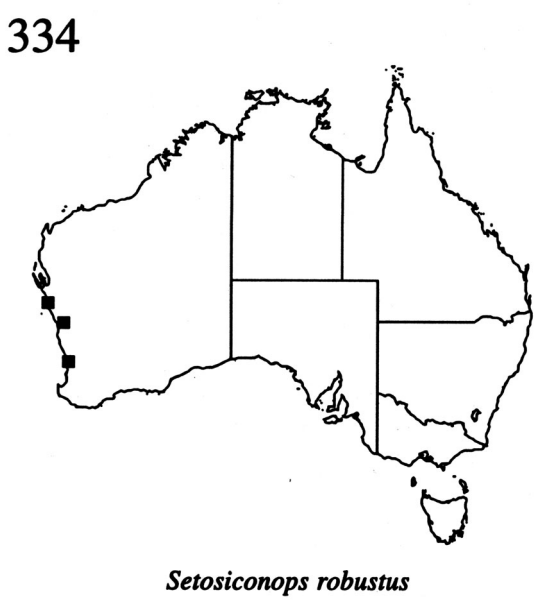


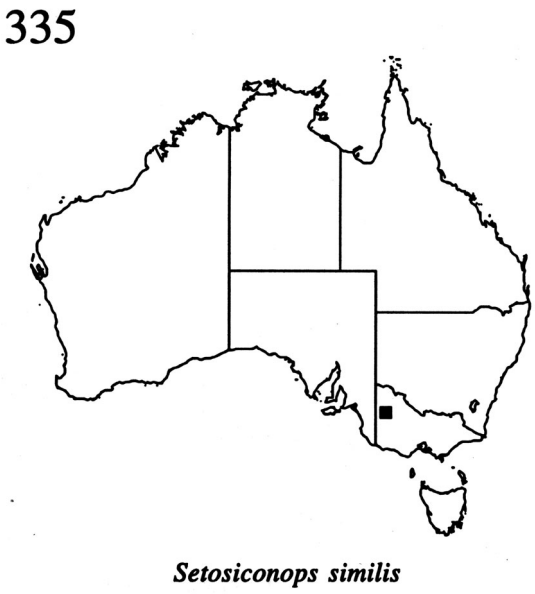
332



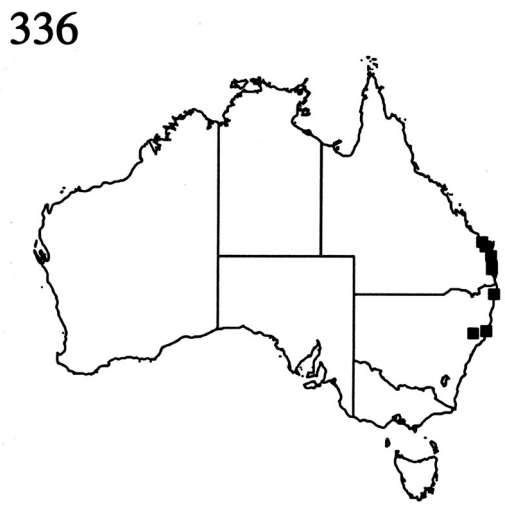
FIGURES 327–332. *Tanyconops longicaudus* sp. nov.: **327**. female genital plate. **328**. surface cuticle near apex of female genital plate. **329**. apex of female genital plate. **330**. cuticular processes at apex of female genital plate. **331**. spicules of basal row on female genital plate. **332**. spicules of distal row on female genital plate.



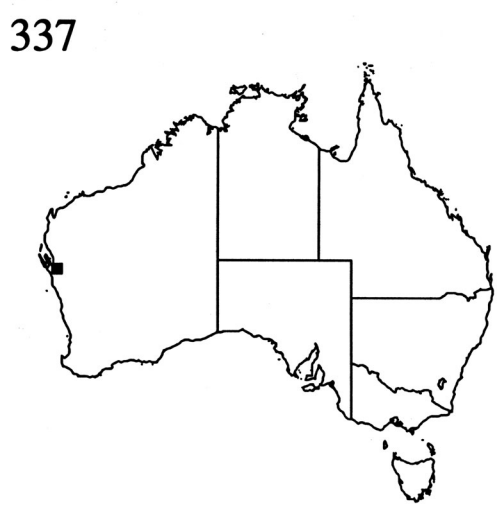




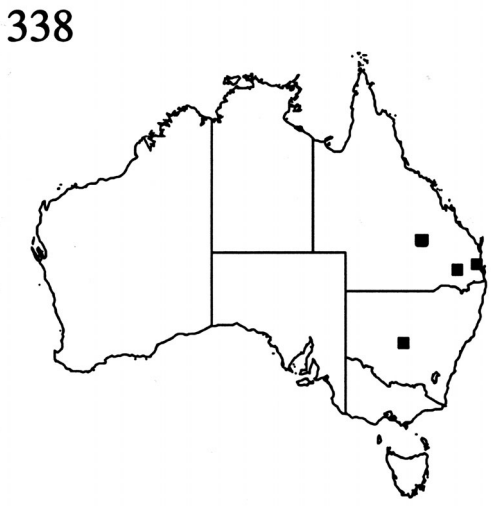
FIGURES 333–335. Distributions of *Setosiconops* spp.



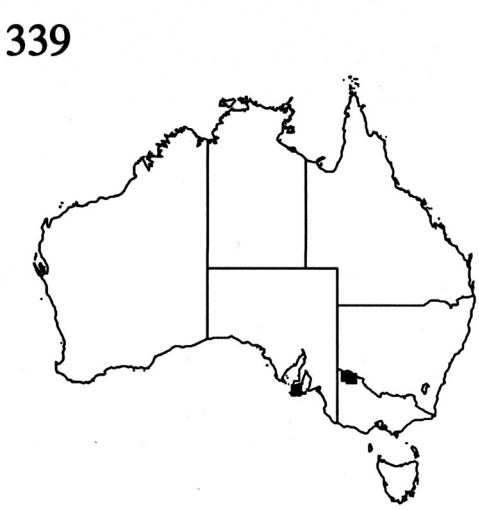
Smartiomyia arena



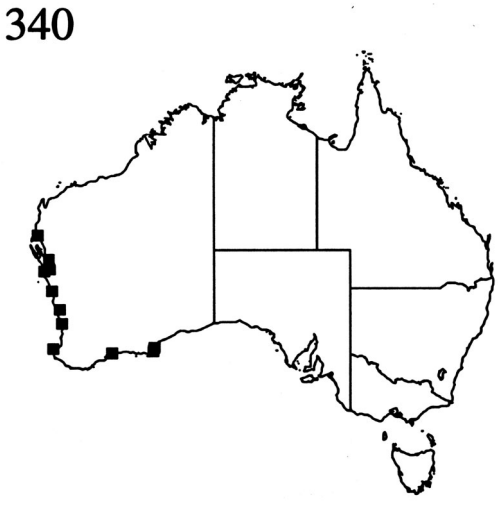
Smartiomyia cerina



Smartiomyia danielsi

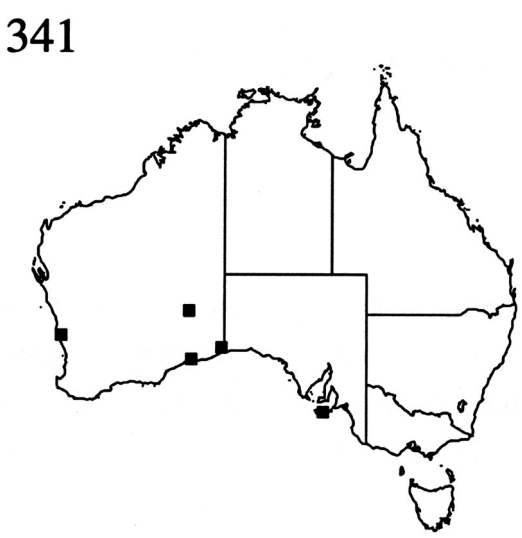


Smartiomyia macalpinei

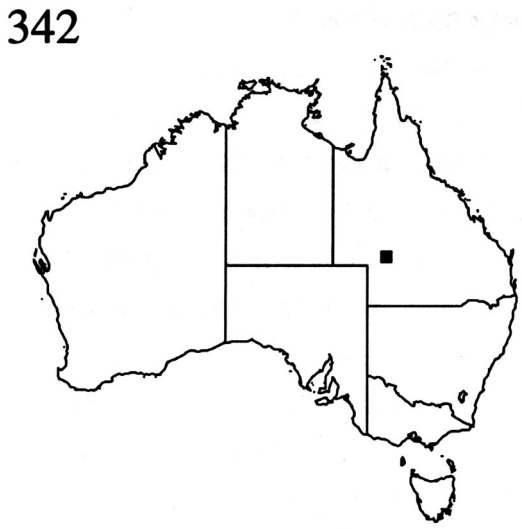


Smartiomyia obscura

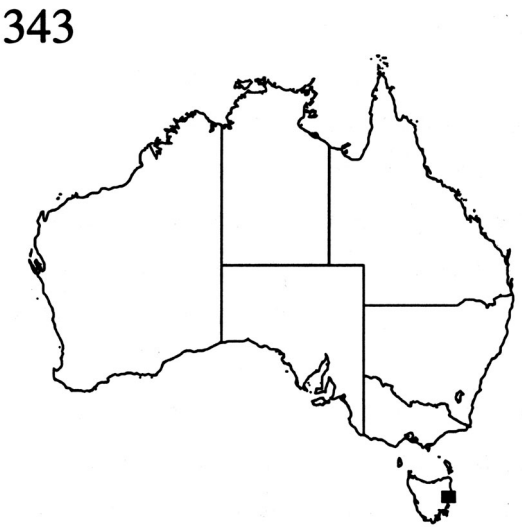
FIGURES 336–340. Distributions of *Smartiomyia* spp.



Tanyconops longicaudus



Tanyconops luteus



Tanyconops ocellatus

FIGURES 341–343. Distributions of *Tanyconops* spp.