

The species of four genera of Metopiinae (Hymenoptera: Ichneumonidae) in Britain, with new host records and descriptions of four new species

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Abstract

Two genera of Metopiinae are recorded for the first time from the British Isles, *Ischyrocnemis* Holmgren and *Synosis* Townes. An account is also given of a further two genera, *Apolophus* Townes and *Stethoncus* Townes, that have been recently recorded from Britain but remain little known. *Apolophus* and *Synosis* are shown to be koinobiont endoparasitoids of Lepidoptera larvae of the families Schreckensteiniidae and Yponomeutidae, respectively. Four species are described as new: *Stethoncus monopricida* sp. nov., *Synosis caesiellae* sp. nov., *Synosis fieldi* sp. nov., and *Synosis parenthesesellae* sp. nov. A key to the Western Palaearctic species of *Synosis* is provided.

Keywords: *Apolophus*, *British Isles*, *Ischyrocnemis*, *Metopiinae*, *Stethoncus*, *Synosis*

Introduction

Although the British fauna is better known than that of almost any other country, the species composition of certain groups is still far from completely known. Detailed studies of collections of the parasitoid Hymenoptera repeatedly reveal numerous species new to the British fauna and species new to science. For example, Shaw and Hochberg (2001) calculate changes of between 20% and 49% in the British list following the monographing or otherwise detailed study of various ichneumonid and chalcidoid groups. Fitton et al. (1978), in the most recent checklist of British Hymenoptera, include species of nine genera of Metopiinae. Recent collecting and rearing efforts allow us to add two genera (*Ischyrocnemis* Holmgren and *Synosis* Townes) to the British list, representing four species, in addition to the two other genera (*Apolophus* Townes and *Stethoncus* Townes) that have been recorded by others (Owen et al. 1981 and Gauld and Sithole 2002, respectively) since Fitton et al. (1978). Here we describe four new species of Metopiinae (three species of *Synosis* and one of *Stethoncus*) and illustrate the species of *Ischyrocnemis* and *Apolophus* found in Britain. Host data for the genera *Apolophus* and *Synosis* are recorded for the first time. Vikberg (1972) noted that a specimen of *Synosis clepsydra*

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Townes from Canada was reared from a geometrid cocoon but no other details were provided and this must be treated as an uncertain host record.

The Metopiinae comprises 27 genera (Yu and Horstmann 1997; Gauld and Sithole 2002), with a moderate numbers of species. Townes (1971) produced a key to genera which works well for all genera likely to be found in Britain. Fitton (1984) and Gauld and Sithole (2002) provide good introductions to the biology of Metopiinae. Briefly, all species for which the biology is known are koinobiont endoparasitoids, ovipositing into Lepidoptera larvae and emerging as adults from the host pupa. The distinctive appearance of metopiines, most having a strongly convex face, broad pronotum, fairly thick antennae and foreshortened tarsal segments, are presumed to be adaptations to pushing through semi-resistant substrates such as partially silken host retreats.

Methods

Many of the reared specimens of *Apolophus* and *Synosis* were obtained under the careful protocols described by Shaw (1997), and are accompanied by host remains. Because of the small number of specimens available, scanning electron microscopy was conducted only on uncoated specimens, using a Leo 1455VP low vacuum scanning electron microscope at The Natural History Museum, London. Wings or other body parts were not removed. Digital images were edited using Adobe Photoshop® 6.0 and Adobe Illustrator® CS.

Specimens reported here are deposited either in the National Museums of Scotland, Edinburgh (NMS), The Natural History Museum, London (BMNH), or the American Entomological Institute (AEI).

Terminology

Morphological terminology follows Gauld et al. (2002). Figure 1 illustrates the propodeal carinae as seen in the genus *Synosis*. Under the “Material examined” sections of the species descriptions, host species, and collection and emergence dates are prefaced “ex”, “coll.”, and “em.”, respectively.

Apolophus borealis Townes

Diagnosis

In the British fauna, *Apolophus borealis* is recognizable by the clypeus and face forming a continuous, moderately convex surface (Figure 2); thin mandibles with the lower tooth shorter than the upper (Figure 2); lower face elongate, with long malar space (Figures 2, 3); quadrate areolet; triangular, fairly long hypopygium, reaching to the end of the metasoma (Figure 4); and deep glymmae on the first tergite. The habitus of the genus is illustrated in Figure 5.

Biology

1♀ and 2♂ specimens of *A. borealis* were reared from pupae of *Schreckensteimia festaliella* (Hübner) (Lepidoptera: Schreckensteiniidae) collected as larvae on *Rubus*.

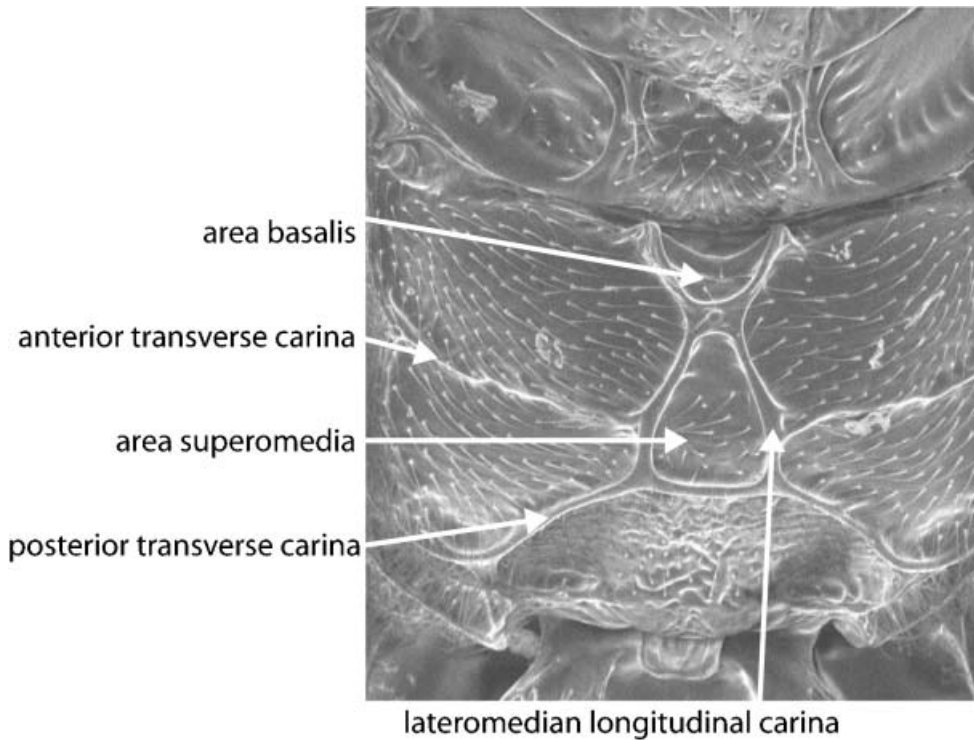


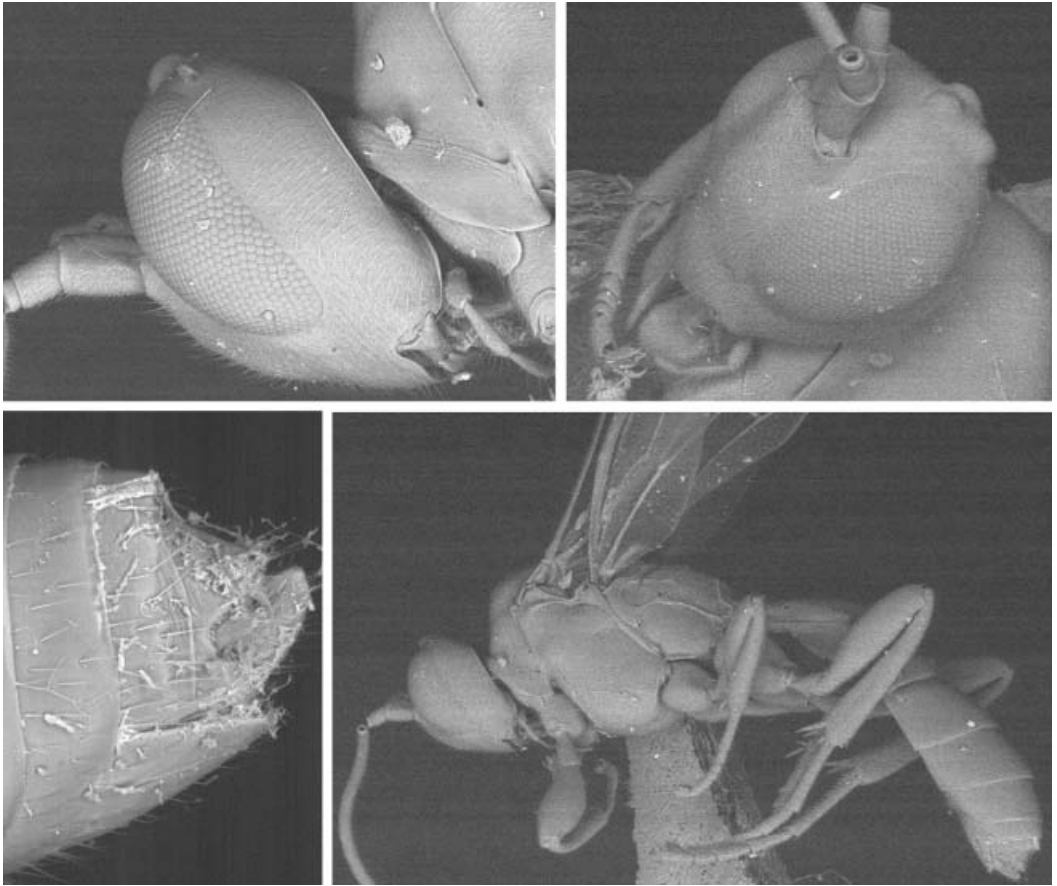
Figure 1. Propodeum of *Synosis parenthesesellae* ♂, with carinae and areas marked.

Material examined

England, UK: 1♀, Leicester, September 1973 (J. Owen) (AEI); 2♂♂, Cornwall, Marsland Mouth, SS2117, ex *Schreckensteinia festaliella* (Hübner), coll. 14 June 1998, em. July 1998 (J. L. Gregory) (NMS); 1♀, Cornwall, Truro/Tregony, SW8844 ex *S. festaliella* on *Rubus fruticosus* agg., coll. 11 October 1998, em. 26 November 1998 (J. L. Gregory) (NMS).

Comments

Although Townes (1971) had tentatively included it in Metopiinae, Porter (1998) suggested that *Apolophus* may belong in the Mesochorinae, and indeed the shape of the hypopygium and areolet are very mesochorine-like, with the configuration of the posterior end of the metasoma closely resembling that of *Varnado* Wahl (illustrated by Wahl 1993). However, as pointed out by Gauld and Sithole (2002), the fore and mid tarsal segments of *Apolophus* are foreshortened (Figure 3), as in Metopiinae, and Gauld and Sithole (2002) suggest that *Apolophus* is a rather plesiomorphic member of the Metopiinae. We can now confirm that *A. borealis* is a primary larval–pupal parasitoid of Lepidoptera, as are other metopiines. In addition to the previous British record (Owen et al. 1981), *A. borealis* has now been recorded from Germany, Austria, Poland, Russia, Ukraine and the USA (Townes 1971; Yu and Horstmann 1997; Horstmann 2001), whilst further, mostly undescribed, species of *Apolophus* are known from South and Central America (Townes 1971; Porter 1998; Gauld and Sithole 2002).

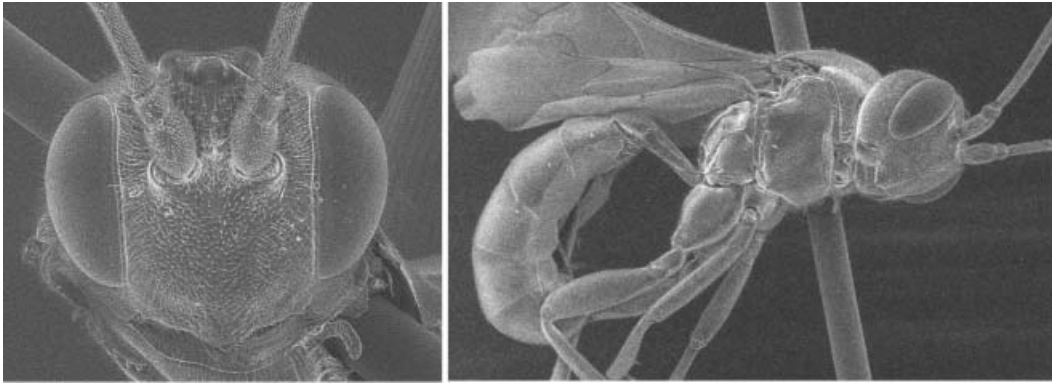


Figures 2–5. *Apolophus borealis* ♀. (2) Head, lateral view, showing narrow mandible. (3) Head and fore leg, showing long malar space and foreshortened tarsal segments. (4) Metasomal apex, showing large hypopygium. (5) Whole insect, lateral view.

Ischyrocnemis goesi Holmgren

Diagnosis

Ischyrocnemis contains two described species, both from Europe. Nothing is known about their biology. The type species, *I. goesi* Holmgren, has been recorded from Austria, Denmark, Lithuania, Russia, Ukraine, Germany, Italy (Yu and Horstmann 1997; Jonaitis 2000; Horstmann 2001; Stoch 2003), China (Sheng and Zhang 1998), and now Britain. *Ischyrocnemis goesi* is readily separated from *I. quadridens* (Perkins) by the absence of glymmae on metasomal tergite 1, the long and strong fore tibial tooth (short and inconspicuous in *I. quadridens*) and the undivided mandibular teeth (mandibles appearing quadridentate in *I. quadridens*) (Perkins 1962). In the British fauna, *I. goesi* can be recognized by the clypeus and face forming a continuous, slightly convex surface; clypeus produced ventrally into a tooth (Figure 6); propodeum with areas superomedia and basalis combined into a long, narrow area demarcated by strong lateromedian longitudinal carinae;



Figures 6, 7. *Ischyrocnemis goesi* ♀. (2) Head, anterior view. (3) Whole insect, lateral view.

all laterotergites broad and laterotergites 3 onwards not separated from their tergites; metasoma clavate, rounded apically with tergites 1–7 visible (Figure 7); ovipositor very short; fore tibia apically with a tooth; and areolet of fore wing roughly triangular and distinctly petiolate.

Material examined

England, UK: 2♀♀, Frilford Heath, Oxon., SU442986, Malaise trap, 18 June to 12 July 1991 (K. Porter) (NMS).

Comments

The correct taxonomic position of this genus is unclear. Townes (1971) placed *Ischyrocnemis* in Metopiinae but with the caveat that this was a very tentative assignment. The relatively slender first tergite of the metasoma and the rather flat, as opposed to distinctly convex, face are unusual features for Metopiinae. Perkins (1962) treated this genus as a member of the Ctenopelmatinae, close to *Rhorus* Förster (now placed in the Pionini). Until this genus (and other aberrant ‘Metopiinae’) can be included in a phylogenetic analysis that treats the varied elements of Ctenopelmatinae, we retain it provisionally in Metopiinae.

Genus *Stethoncus* Townes

Diagnosis

Stethoncus is a small genus with only four previously described species. The genus has a wide distribution, being found in Southern India (*S. indicator* Aubert (Aubert 1965)), the Palaearctic (*S. sulcator* Aubert (Aubert 1965; Kusigemati 1971)), arctic North America (*S. arcticus* Townes (Townes HK and Townes M 1959)) and Costa Rica (*S. auberti* Gauld and Sithole (Gauld and Sithole 2002)). The genus is easily identified, as the upper part of the face ends in a transverse ridge before the antennal sockets (Figures 8, 10) and the upper margin of the pronotum is very wide and swollen (Figures 9, 11). We have found one

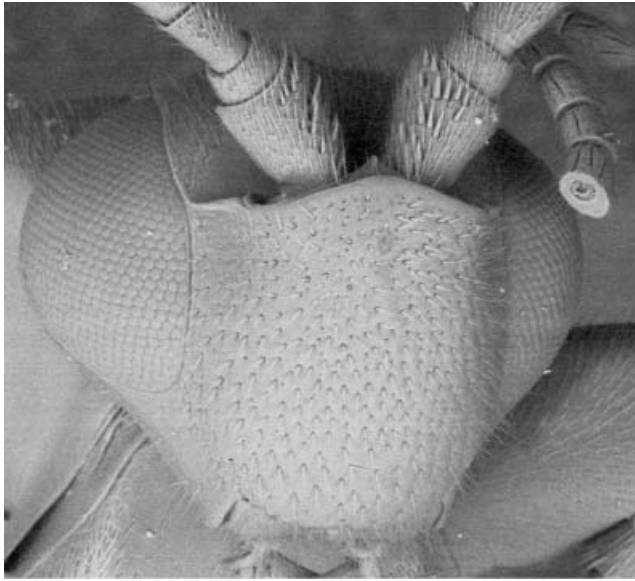


Figure 8. *Stethoncus monoplicida* ♀, head, anterior view.

species in Britain which represents a new species that we describe below. *Stethoncus sulcator*, the only other species known in Europe, is re-described below for comparison.

Comments

Gauld and Sithole (2002) hypothesize that *Stethoncus* may be derived from within *Hypsicera* Latreille. The two genera share the apomorphy of the fore wing vein *M+Cu* having a shallow “bump” (dorsal inflection) at about two-thirds of its length (although hardly

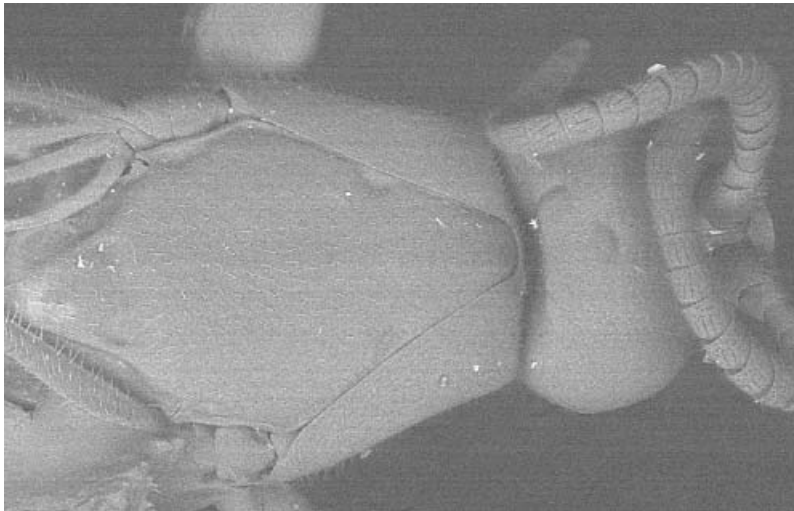


Figure 9. *Stethoncus monoplicida* ♀, mesoscutum, dorsal view.

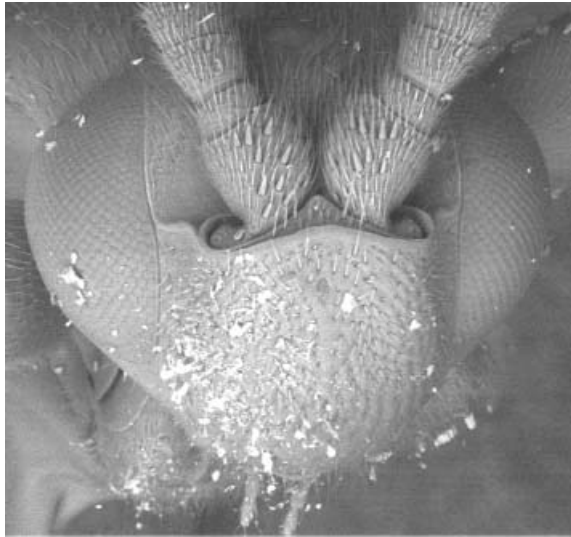


Figure 10. *Stethoncus sulcator* ♀, head, anterior view.

apparent in some species of *Hypsicera*) and the transverse ridge of the upper face can clearly be derived from the form found in *Hypsicera*, which has an inter-antennal projection. However, in the absence of a formal cladistic analysis we prefer to retain *Stethoncus* as a separate genus.



Figure 11. *Stethoncus sulcator* ♀, mesoscutum, dorsal view.

Stethoncus monopricida sp. n.

Stethoncus sulcator Aubert; Gauld and Sithole 2002, p 222, misidentification.

Female

Body length 4.4–5.4 mm. Fore wing length 3.2–3.8 mm. Antenna with 21–25 flagellar segments, shortened and somewhat laterally compressed, F1 averages 0.89 times as long as wide in lateral view, 1.67 times in anterior view; F2 (this and following measurements in lateral view) 0.70; middle flagellomeres 0.75; penultimate flagellomere 0.83. Scape with stout setae ventrally (Figure 8). Mesoscutum approximately 1.25 times as wide as long (width measured at the tegulae and the length from the mid-point of the tegula line to the anterior edge) (Figure 9). Mesosoma and head uniformly, regularly punctate, with rather long setae over much of the dorsum of the body. Propodeum with broadly confluent areas superomedia and basalis, the lateromedian longitudinal carinae straight except for a slight inflection at the point where the areas superomedia and basalis meet and, often, basally. The dorsal longitudinal carinae of the first metasomal tergite end at about the mid-point of the tergite. Black, but with mouthparts, upper edge of face before the antennal shelf, antennae, tegulae and legs (except hind coxae) yellowish brown. Metasoma slightly paler than mesosoma. Pterostigma mid-brown.

Male

Body length 4.8–4.9 mm. Fore wing length 3.5 mm. Similar to female but with antennal flagellum slenderer, not laterally compressed, with 21–27 flagellar segments, F1 averages 1.74 times as long as wide; F2 1.3; middle flagellomeres 1.55; penultimate flagellomere 1.50. The dorsal longitudinal carinae of the first metasomal tergite end at about three-quarters to four-fifths of the length of the tergite.

Comments

This species is separable from *S. sulcator* Aubert by having the pronotum postero-dorsally with more curved sides (compare Figures 9 and 11); the mesoscutum wider (compare Figures 9 and 11); the longer first segment of the female flagellum (compare Figures 8 and 10); and the straighter lateromedian longitudinal carinae of the area superomedia. *Stethoncus arcticus* Townes (one paratype male examined, Mt McKinley, 2°00', 15 August 1954 (D. Townes), in AEI) has an even slenderer mesoscutum than *sulcator* and also a slenderer first tergite.

Material examined

Holotype: ♀, "Scotland [UK], DN, Rhossdu [*sic*] estate, A.F.G. Dixon B.M. 1961.101 Host: *Monophis* [*sic*] *rusticella* Hb. Em. Ex Barn Owl pellet Rossthdu June 1959" (BMNH). Paratypes: Scotland: 1♂, same data as holotype (BMNH). England: 1♀, Silwood Park, Ascot, Berks., 51°24'N, 0°38'W, Malaise trap in wet woodland, 30 August to 6 September 1999 (G. R. Broad) (BMNH); 1♀, Chippenham Fen, Cambs., TL 650693, Malaise trap: carr at reedbed edge, 16–24 June 1983 (J. Field) (NMS); 1♂ and 1♀, as above but 9–22 July 1983 (NMS); 1♂, as above but 8–21 August 1983 (NMS); 3♀♀, as above but 15–27 August 1983 (NMS); 1♀, Wychwood Forest, Oxon., SP 345170, Malaise trap, 17 July to 14

August 1990 (K. Porter) (NMS); 1♀ Monks Wood, Hunts., TL 199797, Rothamsted light trap, 15 June 2004 (N. Greatorex-Davies) (BMNH).

Biology

The holotype female and a paratype male were reared from *Monopis laevigella* ([Denis and Schiffermüller]) (= *rusticella* (Hübner)) (Lepidoptera: Tineidae) in Barn Owl (*Tyto alba* (Scopoli)) pellets; the host pupae are preserved with the specimens. The pellets were collected at the bottom of a chimney below a Barn Owl roost and these were the only parasitoids reared (A. F. G. Dixon, personal communication to M. G. Fitton). These are the specimens referred to as *S. sulcator* by Gauld and Sithole (2002).

Etymology

This species' name is derived from the tineid genus, *Monopis*, from which it has been reared.

Stethoncus sulcator Aubert

Female

Body length 4.0–5.4 mm. Fore wing length 2.8–3.8 mm. Antenna with 22–27 flagellar segments, shortened and somewhat laterally compressed (measurements as for *S. monoplicida*), F1 0.71 times as long as wide (1.2 times in anterior view); F2 0.63; middle flagellomeres 1.00; penultimate flagellomeres 1.10. Mesoscutum (measured as for *S. monoplicida*) approximately (ca 0.95 times) as wide as long. Propodeum with the lateromedian longitudinal carinae widest apart at the mid-length of the area superomedia, the area superomedia noticeably narrowed basally and anteriorly. Black, but with mouthparts, tegulae and legs (except hind coxae) yellowish brown. Antennae yellowish brown but infuscate, especially on inner surfaces of flagellomeres. Pterostigma from dark brown to black, with proximal corner paler, strikingly so when pterostigma very dark. Otherwise similar to description of *S. monoplicida*.

Male

Similar to female but with antennal flagellum slenderer (central segments slightly longer than wide) and with the pronotum not as wide (see illustrations in Aubert 1965). Body length 4.2–5.2 mm. Fore wing length 3.0–3.7 mm.

Comment

Distinguished from *S. monoplicida* by the characters given under the account of that species.

Material examined

France: 1♀, Lot-et-Garonne, Bernac, 12–25 July 1993, Malaise trap (R. R. Askew) (NMS). 5♀♀, 5♂♂, “59.101 Germany, Ruthe Coll., *Stethoncus sulcator* Aub. J.F. Aubert det.” (BMNH).

Biology

Unknown.

Genus *Synosis* Townes*Identification of Synosis species*

Species of *Synosis* have primarily been differentiated on the basis of differences in propodeal carina patterns (e.g. Kusigemati 1968; Tolkanitz 1984). However, *Synosis* is a rarely collected genus, ranging across the Holarctic and into the Neotropics, and the trickle of new species described (Townes HK and Townes M 1959; Kusigemati 1968, 1971; Vikberg 1972; Tolkanitz 1977, 1984, 1986; Gauld and Sithole 2002) suggests that there may be quite a few more species yet to be discovered, or, alternatively, that some species are more variable than has yet been appreciated. The specimens in NMS, collected from across the UK, show quite considerable variation in the propodeal carinae, and this has made species delimitation difficult, some of this variation being sex-related. For the two most similar species treated here (*S. caesiellae* and *S. parenthesesellae*), the number of flagellar segments seems to be a constant specific difference, albeit from only small sample sizes. The most recently collected specimens are 9 years old and an attempt to obtain a 28S D2 rDNA sequence from a leg failed. It is to be hoped that molecular sequences may help clarify species boundaries for specimens preserved in alcohol in the future. We have separated our *Synosis* specimens into three species but the limits of these species would need to be re-assessed if substantial additional material were to be obtained.

We have examined specimens of *S. clepsydra* Townes at the BMNH, the holotype of *S. meridionalis* Tolkanitz, a paratype of *S. orientalis* Tolkanitz, and the holotype and a paratype of *S. karvoneni* Vikberg, which includes all of the described species most likely to be present in Britain (and *S. orientalis*, a very unlikely candidate species, described from the Kuril Islands, in the Russian far east; Tolkanitz 1984). Not one of these species appears to be represented in the British material which we have examined. *Synosis karvoneni* is a smaller species than any of those treated here and is best separated by the larger, angulate lobe at the anterior end of the submetapleural carina (smaller and rounded in the other species) and the presence of a vestigial fore wing vein *3rs-m*. *Synosis clepsydra* differs distinctly in colour pattern, having more extensive yellow on the face that fills the malar space and extends further back towards the occipital carina than in any of the other species examined. Yellow also extends up the frons (i.e. above the antennal sockets) on the inner orbit, which is uniformly dark in other species examined. In addition, *S. clepsydra* has the metasomal tergites with reddish borders. *Synosis meridionalis* has a brighter yellow face (rather dull yellow in all of the British species) with the malar space completely yellow and sharply demarcated from the dark brown of the gena (demarcation ill-defined in British species). The lateromedian longitudinal carinae of the propodeum converge anteriorly to a narrow carina, unlike the British species in which the area of convergence is always as broad as or broader than the thickness of the carinae combined (compare Figures 21 and 22 with Tolkanitz 1977, Figure 4, and Gauld and Sithole 2002, Figure 48). *Synosis orientalis* is relatively distinctive owing to the black flagellum (yellow/brown ventrally in the other species examined), and the raised lateral sections of the posterior transverse carina of the propodeum to form incipient apophyses.

As the species of *Synosis* are so similar we present a generic diagnosis followed by short species accounts emphasizing those features of value in specific identification. Because the ovipositor of females is short and easy to overlook when it is sheathed it is easy to mis-attribute the sex of individuals. Females have a longer last metasomal sternite than males, as illustrated by Gauld and Sithole (2002, p 12). In some species there are distinct sexual differences in the extent of yellow on the face and the number of flagellar segments.

Generic diagnosis for British species

Face and clypeus forming a rather uniformly convex surface, no groove separating the clypeus from the face (Figure 12); frons lacking an inter-antennal lamella and face lacking a transverse ridge before the antennae (Figure 12); mandible narrow with lower tooth shorter than upper tooth; notauli distinct to about half the length of the mesoscutum, mesoscutum punctate; metasoma shallowly punctate, punctures especially obvious on first tergite; first metasomal tergite with a pair of median carinae ending at about two-thirds of the length; body rather evenly covered in setae; propodeum with distinctive pattern of anteriorly converging lateromedian longitudinal carinae; anterior transverse carinae present or absent, sometimes replaced by grooves; posterior transverse carina complete and strong; mid tibia with anterior (outer) spur shorter than posterior spur (the opposite to most metopiine genera); ovipositor short, not projecting beyond apex of metasoma; aedeagus dorso-ventrally flattened; colour: mesosoma and metasoma dark brown, legs and tegulae reddish except for hind coxae which vary from pale reddish to dark brown with red apically, face dull yellow, underside of scape, pedicel and flagellum dull yellow, flagellum becoming brown apically, upperside of antenna dark brown.



Figure 12. *Synosis caesiellae* ♀, head, anterior view.

Synosis parenthesesellae sp. n.*Female*

Body length 4.8–5.2 mm. Fore wing length 3.9–4.3 mm. Antennal flagellum with 29 or 30 segments. Ocellar–ocular distance from 0.72 to 0.84 times maximum diameter of lateral ocellus (Figures 13, 14). Propodeum with a short transverse carina separating the area superomedia from area basalis, area superomedia rather pointed and triangular but with more angulate sides than *S. caesiellae* (Figures 1, 15). Area basalis shorter with carinae forming a wider angle than in *S. caesiellae* and the anterior transverse carinae represented by distinct grooves, usually with a raised anterior edge (three females with a less distinct groove/ridge, very weak on one individual; one female with strong carinae with weak grooves). Malar space yellow, with a rather ill-defined edge.

Male

Body length 4.3–4.7 mm. Fore wing length 3.8–3.9 mm. Flagellum with 31 or 32 segments. Similar to the females but with yellow of the face not extending beyond the anterior tentorial pits. The grooves replacing the anterior transverse carinae of the propodeum are very well developed in the two male specimens known (Figure 1).

Comments

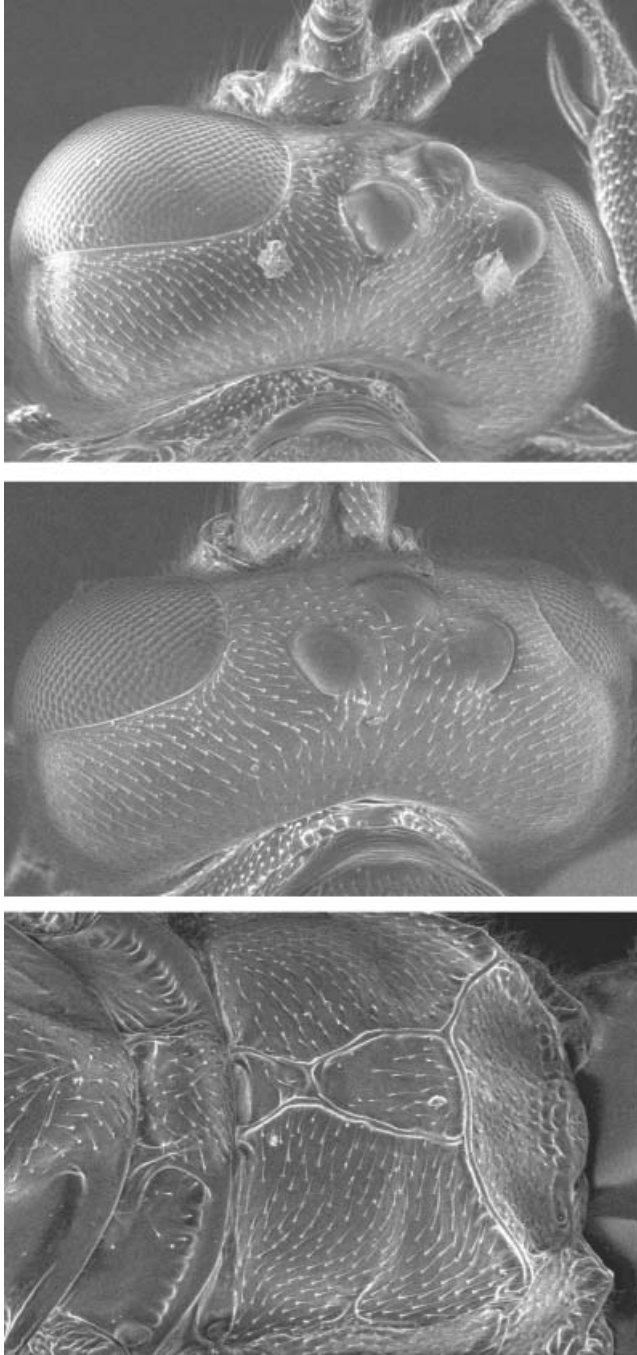
Separated from *S. caesiellae* by the greater number of flagellar segments and rather subtle differences in the shape of the propodeal areas demarked by carinae, as detailed in the description above. One non-reared male (from Savernake, see “Material examined”) differs in that the malar space is yellow, as in females. This specimen is tentatively assigned to *S. parenthesesellae* but is not included in the type series as it differs slightly in appearance and is from a different locality. One reared male, and some males of *S. caesiellae*, have the malar space faintly marked with yellow so the un-reared specimen may be at the extreme of a trend.

Material examined

Holotype: ♀, “Rowardennan, Loch Lomond [Scotland, UK] ex *Ypsolopha parenthesesella*, larva below *Quercus* 27.6.1983, em. 6.6.1984 (M.R. Shaw)” (NMS). Paratypes (all NMS): 3♀♀, same details as above except em. 8 August 1983, 14 August 1983, and 8 June 1984; 2♂♂, same details as above except em. 23 May 1984 and 6 June 1984. Other material: 1♂, England: Savernake Forest, Wilts., SU 229656, Malaise trap, 23 May–13 June 1990 (K. Porter) (NMS).

Biology

All of the type specimens were reared from pupae of *Ypsolopha parenthesesella* (Linnaeus) (Lepidoptera: Yponomeutidae) collected as fully fed larvae by sweeping grasses below *Quercus* in June, at a single site. Four adults emerged in May and June the following year but two emerged in August of the year of collection.



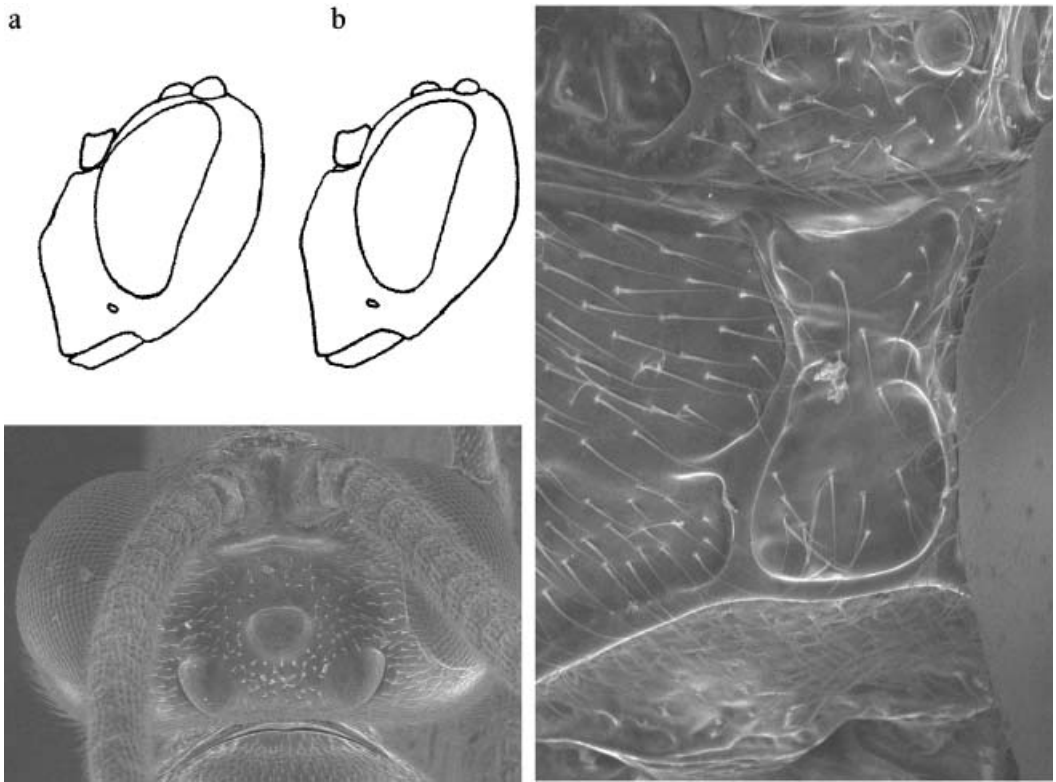
Figures 13–15. *Synosis parenthesesellae*. (13) ♀, dorsal view of head showing ocelli. (14) ♂, dorsal view of head showing ocelli. (15) ♀, propodeum.

Etymology

This species is named after the yponomeutid species from which it has been reared.

Synosis fieldi* sp. n.Male*

Only known from the holotype male. Body length 5.2 mm. Fore wing length 3.7 mm. Antennal flagellum with 30 segments. Face, in lateral view, more bulging than the other species treated here, with a distinct angulation at about the vertical mid-point (Figure 16). Ocelli large, ocellar–ocular distance about 0.68 times the length of a lateral ocellus (Figure 17). Propodeum with a rather distinctive pattern of carinae, resembling the illustrations of *S. nakanishii* Kusigemati (1971), with a short and broad area superomedia, barely longer than wide, which opens widely on to the area basalis (Figure 18). Anterior transverse carinae are present as vestiges. Yellow of face more extensive than males of *S. caesiellae* or *S. parenthesellae*, filling most of the malar space. Hind coxa with basal three-quarters dark, apical quarter reddish.



Figures 16–18. *Synosis fieldi*. (16) ♂, face in lateral view (a), compared to ♂ *S. caesiellae* (b). (17) ♂, dorsal view of head showing ocelli. (18) ♂, propodeum.

Material examined

Holotype: ♂, “Chippenham Fen, Cambs. [England, UK] TL 650693 Malaise trap: carr at reedbed edge. B. 11–22 viii 1985 (J. Field)” (NMS).

Biology

Nothing is known of the biology of this species. The only known specimen was caught in a Malaise trap in a carr at the edge of a reedbed in August.

Etymology

We are pleased to name this species after Jeremy Field, who collected the only known specimen.

Synosis caesiellae sp. n.*Female*

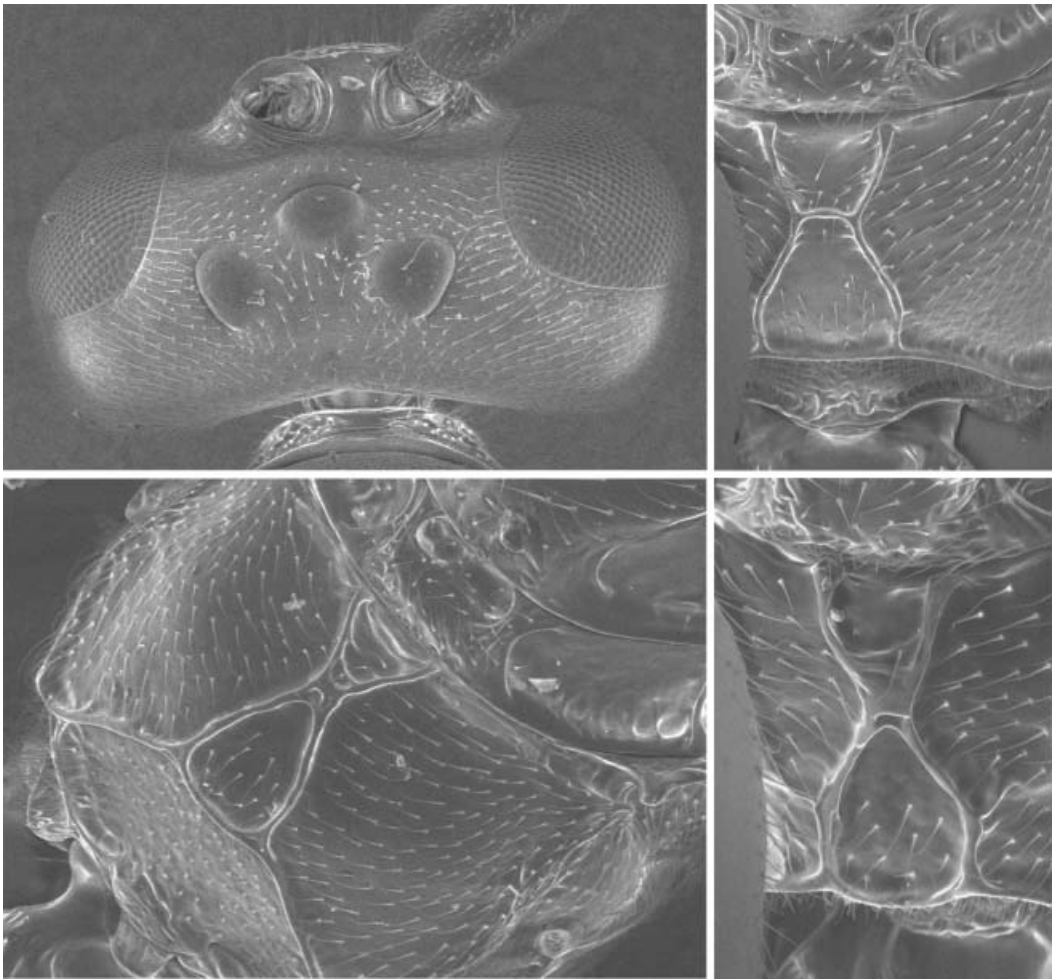
Body length 3.8–4.8 mm. Fore wing length 3.3–4.2 mm. Flagellum with a lower number of segments than other British *Synosis* species, 26–28 in females. Ocelli smaller than in *S. fieldi*, ocellar–ocular distance ca 0.8 times the maximum length of a lateral ocellus (Figure 19). Propodeum with either a clear if short transverse carina separating the area superomedia from the area basalis (Figure 20) or this carina so shortened that the two areas converge in a more or less quadrate raised vestige of the carina (Figure 21, cf. the condition in *S. meridionalis* Tolkantitz). Area basalis longer than in *S. parenthesellae*, carinae meeting at a narrower angle (Figures 20–22). Usually lacking the anterior transverse carina of the propodeum, never with a groove running across. Two specimens (Oxfordshire, May and Port Appin, September) with distinct transverse carinae demarking the anterior side of the area superomedia (Figure 20) but the area superomedia always appears to be rather pointed, with a less conspicuous lateral angulation than in *S. parenthesellae*. Face with yellow malar space, with edge rather ill-defined. Hind coxae of British specimens range in coloration from entirely pale reddish to mid-brown, sometimes with darker patches dorsally and ventrally; one Swedish specimen with the basal three-quarters dark and the apical quarter abruptly paler, as in *S. fieldi* and some *S. parenthesellae*.

Male

Body length 4.0–4.3 mm. Fore wing length 3.1–3.2 mm. Flagellum with 27 or 28 flagellar segments. Yellow of the face not extending beyond the anterior tentorial pits. Propodeum usually with lateral vestiges of anterior transverse carinae (Figure 22).

Comments

Differs from *S. meridionalis* in the broader area of contact of the areas superomedia and basalis (sometimes represented by a transverse carina in *S. caesiellae*); the lower number of flagellar segments (30 in the holotype female of *S. meridionalis*); and the lack of a sharp division between the yellow of the face and dark brown of the gena.



Figures 19–22. *Synosis caesiellae*. (19) ♀, Port Appin, dorsal view of head showing ocelli. (20) ♀, Port Appin, propodeum. (21) ♀, Berrie Dale, ex ?*Carpatolechia*, propodeum. (22) ♂, Burghfield, ex *Swammerdamia*, propodeum.

Material examined

Holotype: ♀, “Burghfield Common, Reading, Berks. [England, UK], ex *Swammerdamia caesiella*, *Betula*, 9/10.1978, em. 29.5.1979 (M.R. Shaw)” (NMS). Paratypes: England: 2♂♂, same details as above except em. 20 May 1979 and 24 May 1979 (NMS); 1♀, Havant Thicket, Hants., ex *Swammerdamia caesiella* on *Betula* 18 October 1980, em. March 1981 (J. R. Langmaid) (NMS); 1♀, Abbots Moss, Cheshire SJ 5868, Malaise trap 2, *Quercus/Betula/Pinus*, 27 June to 23 July 1986 (R. R. Askew) NMSZ 1988.002 (NMS); 1♀, Abbots Moss, Cheshire, ex *Swammerdamia caesiella* on *Betula* 18 October 1976, em. 24 May 1977 (M. R. Shaw) (NMS); 1♀, Nettlebed, Oxon., ex *Swammerdamia caesiella* on *Betula*, 21 October 1995, em 1996 (I. Sims) (NMS); 1♀, Savernake Forest, Wilts., SU 229656, Malaise trap, 31 May to 13 June 1990, NMSZ 1993.033 (K. Porter) (NMS); 1♀, same details as above except 20 September to 11 October 1993 (NMS). Scotland: 1♀, Port Appin, Argyll, 5 September 1954, on *Vaccinium* (E. C. Pelham-Clinton) (NMS); 1♀, 1♂,

Berrie Dale, Hoy, Orkney, ex micro (?*Teleiodes proximella*) on *Betula*, September 1984, em. May 1985 (R. I. Lorimer) (NMS). Sweden: 1♀, Skärälid, 3 July 1938 (D. M. S. and J. F. Perkins) B.M. 1938.414 (BMNH).

Biology

Six specimens were reared from *Swammerdamia caesiella* (Hübner) (Lepidoptera: Yponomeutidae) on *Betula*, collected in four locations in October, emerging from March to May the following year. Two further specimens are labelled as reared from ?*Carpatolechia* [= *Teleiodes*] *proximella* (Hübner) on *Betula* collected in September and emerging in May. The uncertainty in host identification raises the possibility these may also really be from *S. caesiella*. Non-reared specimens have been collected in May/June, July, August, and September/October. The wide geographical and temporal spread of specimens reflects the distribution of the host species, *S. caesiella*, which is widespread and bivoltine.

Etymology

This species is named after the yponomeutid species from which it has been reared.

Key for the identification of Western Palaearctic species of *Synosis*

- 1 Female (last visible metasomal sternite longer than wide, at least the tips of the ovipositor sheaths visible, ovipositor sometimes visible) (female of *fieldi* unknown) 2
- Male (last visible metasomal sternite wider than long, parameres usually visible). 5
- 2 Antennal flagellum with 26–28 segments 3
- Antennal flagellum with 29–30 segments 4
- 3 Fore wing with the anterior section of vein *3rs-m*; propodeum with the lateromedian longitudinal carinae converging narrowly, the combined carinae no wider than the thickness of the two carinae; the anterior lobe of the submetapleural carina angulate *karvoneni* Vikberg
- Fore wing lacking all trace of vein *3rs-m*; propodeum with either a short transverse carina separating the areas basalis and superomedia (Figure 20) or the lateromedian longitudinal carinae converge in a more or less quadrate vestige of the carinae (Figure 21); the anterior lobe of the submetapleural carina rounded *caesiellae* sp. n.
- 4 Propodeum with a short transverse carina separating the areas basalis and superomedia (Figure 15); malar space with an ill-defined division between the yellow of the face and the brown of the gena *parenthesellae* sp. n.
- Propodeum with the lateromedian longitudinal carinae converging narrowly, the combined carinae no wider than the thickness of the two carinae (Tolkanitz 1977, Figure 4); malar space with a sharp division between the yellow of the face and the brown of the gena *meridionalis* Tolkanitz
- 5 Antennal flagellum with 26–28 segments 6
- Antennal flagellum with 30–32 segments 7
- 6 Malar space yellow; fore wing with the anterior section of vein *3rs-m*; propodeum with the lateromedian longitudinal carinae converging narrowly, the combined carinae no

- wider than the thickness of the two carinae, the anterior transverse carinae absent; the anterior lobe of the submetapleural carina angulate *karvoneni* Vikberg
- Malar space brown; fore wing lacking all trace of vein *3rs-m*; propodeum with either a short transverse carina separating the areas basalis and superomedia (Figure 20) or the lateromedian longitudinal carinae converge in a more or less quadrate vestige of the carinae (Figure 22), the anterior transverse carinae usually present as vestiges (Figure 22); the anterior lobe of the submetapleural carina rounded *caesiellae* sp. n.
- 7 Propodeum with area superomedia short and broad, barely longer than wide, and broadly confluent with area basalis (Figure 18); ocelli large, ocellar–ocular distance about 0.68 times the length of a lateral ocellus (Figure 17); face, in lateral view, bulging (Figure 16) *fieldi* sp. n.
- Propodeum with area superomedia longer, obviously longer than wide (Figure 15), separated from the area basalis; ocelli smaller, ocellar–ocular distance about 0.80 times the length of a lateral ocellus (Figure 14); face, in lateral view, smoothly convex, not bulging 8
- 8 Propodeum with a short transverse carina separating the areas basalis and superomedia (Figure 15), the anterior transverse carinae represented by grooves *parenthesellae* sp. n.
- Propodeum with the lateromedian longitudinal carinae converging narrowly, the combined carinae no wider than the thickness of the two carinae (Tolkanitz 1977, Figure 4), the anterior transverse carinae absent *meridionalis* Tolkanitz

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