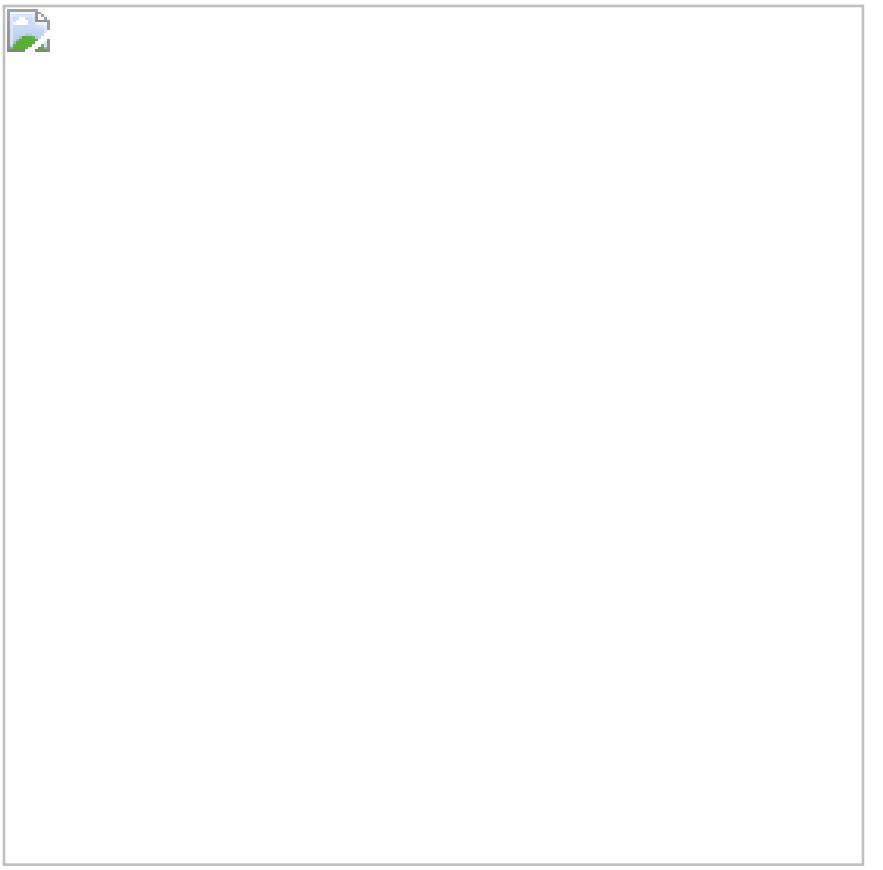

Redescription of Archaeoscelio Brues and Description of Three New Genera of Scelionidae (Hymenoptera): A Challenge to the Definition of the Family

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Redescription of *Archaeoscelio* Brues and Description of Three New Genera of Scelionidae (Hymenoptera): A Challenge to the Definition of the Family

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ABSTRACT

Four genera—*Archaeoscelio* Brues; *Cobaloscelio* Johnson and Masner, new genus; *Plaumannion* Masner and Johnson, new genus; and *Huddlestonium* Polaszek and Johnson, new genus—lack laterotergites and laterosternites in the metasoma, one of the synapomorphies of the superfamily Platygastroidea. The Baltic amber species *Archaeoscelio rugosus* Brues and *Archaeoscelio filicornis* Brues are diagnosed and figured, and two species from Baltic amber are described in *Cobaloscelio—C. cuspidatus* Johnson and Masner, new species and *C. speculifer* Johnson and Masner, new species. *Plaumannion fritzi* Masner and Johnson, new species (Brazil) and *Plaumannion yepezi* García, new species (Venezuela) are described. *Huddlestonium exu* Polaszek and Johnson, new species is described from São Tomé and the Ivory Coast. The wing venation of Scelionidae is reinterpreted, and the marginal vein of Scelionidae and Chalcidoidea is considered to be a convergent feature.

INTRODUCTION

The superfamily Platygastroidea is a common and widespread group of parasitic Hymenoptera comprising 240 valid genera and 4666 species. The group traditionally was classified within the portmanteau concept of Proctotrupoidea, but support for its separate recognition has grown (for example, Masner *in* Goulet and Huber, 1993; Naumann, 1991). The monophyly of the Platygastroidea was first proposed by

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Masner (Goulet and Huber, 1993). The current evidence supporting this hypothesis comes primarily from two character systems: the modified structure of the abdomen in relation to function of the ovipositor, and the unique sensilla of the female antenna (Austin et al., 2005).

Two families are currently recognized: Scelionidae and Platygastridae. All scelionids are egg parasitoids of insects and spiders, attacking insects in the orders Orthoptera, Mantodea, Embiidina, Odonata, Hemiptera, Neuroptera, Coleoptera, Diptera, and Lepidoptera. Platygastrids are primarily larval or egg-larval parasitoids of Cecidomyiidae (Diptera), but also are known as egg parasitoids of Coleoptera and Hemiptera and nymphal parasitoids of sternorrhynchous Hemiptera. No known synapomorphies define the family Scelionidae (Masner and Huggert, 1989).

Platygastrids are generally distinguished from scelionids by the smaller number of antennomeres (7–10) and their reduced wing venation (Goulet and Huber, 1993). The forewing has, at most, a single tubular vein (e.g., fig. 41), the submarginal vein (R), and perhaps most species have no wing venation at all. Scelionids, in contrast, generally have 11 or 12 antennomeres, although a number of genera, including some common and speciose groups, have fewer. The wing venation is usually somewhat more elaborate, typically consisting of the submarginal (R), marginal (C+R), stigmal (r-rs), and postmarginal veins (R_1) (figs. 42–47, venational homology following Goulet and Huber, 1993).

Within the Scelionidae, one living genus, *Nixonia* Masner, and two fossil genera, *Proteroscelio* Brues and *Archaeoscelio* Brues, have 14-merous antennae. This was considered by Masner (1976) to be a plesiomorphic character, and he treated *Nixonia* as the most archaic of living Scelionidae. This hypothesis is supported by the plesiomorphic 1-2-2 tibial spur formula in *Nixonia*; that is, with 1, 2, and 2 spurs on the fore-, mid-, and hindtibia, respectively. This tibial spur formula is shared with (1) the four genera of the tribe Sparasionini (sensu Masner, 1976): *Sceliomorpha* Ashmead, *Sparasion* Latreille, *Electroteleia* Brues, and *Archaeoteleia* Masner; and (2) the putatively gryonine genus *Neuroscelio* Dodd. Kozlov and Kononova (1990) placed the monobasic Nixoniini and the Sparasionini as a monophyletic group at the base of their scelionid phylogeny.

This view of scelionid relationships is very linear, dominated by the trend toward reduction in character states. This picture is disrupted by the four taxa that are the subject of this paper. Two genera, *Archaeoscelio* and *Huddlestonium,* n. gen., have more than 12 antennomeres, yet they have a tibial spur formula of 1-1-1. All four genera share modifications of the metasoma that distinguish them from all other platygastroids: (1) a deep, basally compressed S1 and S2; (2) the anterior protrusion of S2 between the hindcoxae; and (3) a fundamentally different articulation between terga and sterna in which both laterotergites and laterosternites are missing. The forewing venation also requires a different interpretation of groundplan character states and homology. Whether these character states should be considered as synapomorphies is a question that we cannot yet answer. We defer this to a comprehensive analysis of platygastroid relationships.

The authorship accorded to the new taxonomic names proposed herein varies because of the independent work involved. Dr. José Luis García (MIZA, Venezuela) is credited with the description of *Plaumannion yepezi*; in addition, he collected the only known specimen. The characters used in the descriptions also vary somewhat because of the small number of specimens available and the difficulty in observing some features in the fossils.

MATERIALS AND METHODS

This work is based on specimens in the following collections:

BMNH	M. Fitton: The Natural History Museum, London, England
CNCI	A. Bennett: Canadian National Collection of Insects, Agriculture and Agri-Food Canada, Ottawa, Canada
GMUG	M. Reich: Geowissenschaftliches Zentrum, Universität Göttingen, Göttingen, Germany
MCZC	P. Perkins: Entomology Department, Museum of Comparative Zoology, Harvard University, Cambridge, MA

MIZA	J.L. García: Museo de Instituto de Zoología Agricola, Maracay, Venezuela
OSUC	N.F. Johnson: The Ohio State University Insect Collection, Columbus, OH

Abbreviations and terms used in text are as follows: A1, A2, … A14: antennomeres 1, 2, … 14; claval formula: distribution of the large, multiporous basiconic sensilla on the underside of apical antennomeres of the female, with the segment interval specified followed by the number of sensilla per segment, for example, A12–A8, 1-2-2-2-2 (Bin, 1981); LOL: lateral ocellar line, being the shortest distance between inner margins of median and lateral ocelli (Masner and Huggert, 1989); OOL: ocular ocellar line, being the shortest distance from inner orbit and outer margin of posterior ocellus (Masner and Huggert, 1989); POL: posterior ocellar line, being the shortest distance between inner margins of posterior ocelli (Masner and Huggert, 1989); epomial carina: the vertical portion of epomium on the pronotum; pronotal humeral carina: the horizontal portion of epomium on the pronotum; S1, S2, … S6: metasomatic sterna 1, 2, … 6; T1, T2, … T7: metasomatic terga 1, 2, … 7.

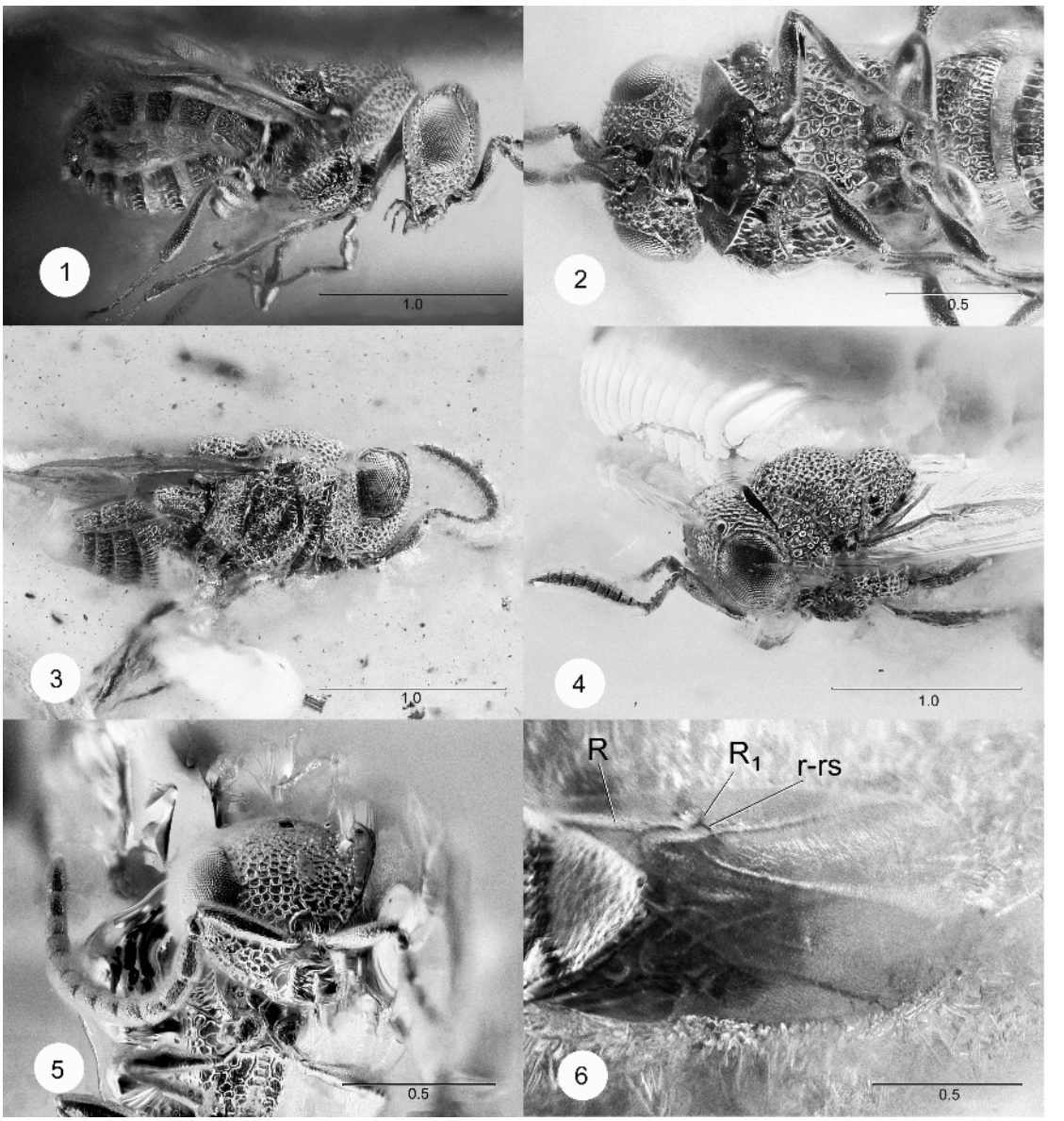
Archaeoscelio Brues
figures 1–12

Archaeoscelio Brues, 1940: 88. Original description. Type: *Archaescelio rugosus* Brues, by original designation. For subsequent taxonomic literature, see Johnson (1992).

DISTRIBUTION: Baltic amber.

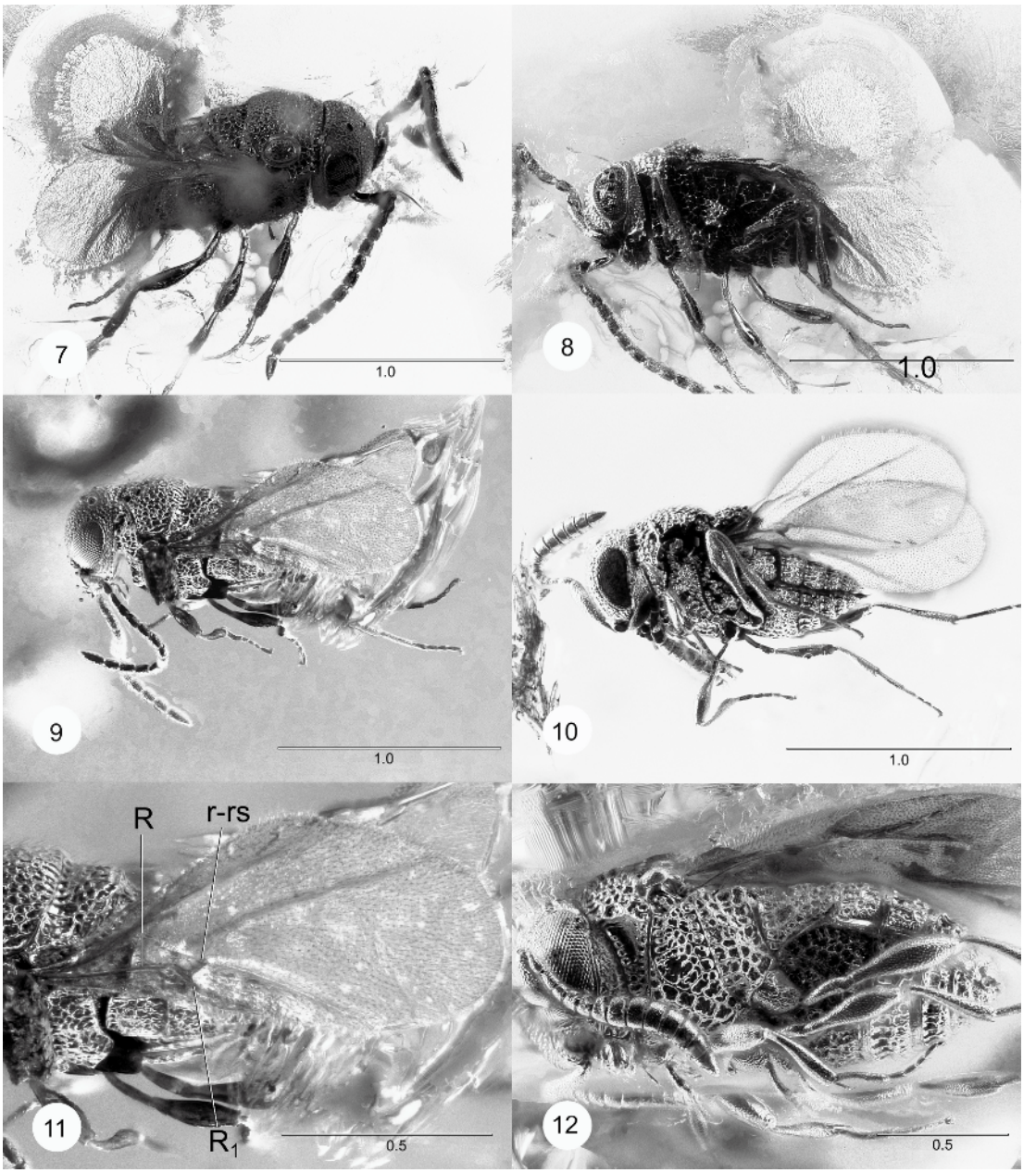
DESCRIPTION: Length: 1.2–2.2 mm. Body robust, compact; head and metasoma closely appressed to mesosoma. Head moderately transverse (fig. 5); hyperoccipital carina absent (figs. 4, 7, 9); occipital carina hidden dorsally; vertex and frons coarsely areolate-rugose (figs. 2, 5, 12); lateral ocellus variable in position, equidistant between median ocellus and inner orbit (fig. 9) or separated from inner margin by at most one ocellar diameter (fig. 4); frons convex, without distinct antennal scrobe, medial carina absent; interantennal process weakly produced anteriorly; submedial carina absent; orbital carina absent; cheek above mandible without fanlike striae; eye setae absent or indistinct; interocular space broad, approximately equal to eye height; inner orbits parallel to subparallel, not diverging ventrally; torulus contiguous with upper margin of clypeus, opening ventrally, rim produced dorsally and medially, overhanging antennal articulation; postclypeus strongly transverse, flat; anteclypeus elongate, longer than postclypeus; malar sulcus absent (*A. rugosus*, figs. 1–3, 5) or present (*A. filicornis*, figs. 8, 10, 12); gena convex, areolate-rugose, without antennal depression; mandible massive, tridentate; mandibular teeth arrayed transversely, deeply incised, acute; maxillary palpus four-segmented, segment 2 weakly expanded medially; labial palpus not observable; female antenna with 14 antennomeres (figs. 3, 4, 10, 12), male antenna with 14 antennomeres (figs. 5, 7, 9); longitudinal axes of radicle and scape nearly perpendicular to one another (fig. 5); scape more or less cylindrical, weakly expanded medially, weakly excavate dorsally for reception of pedicel and base of flagellum; female A3 not distinctly elongate, slightly longer than A2; female antenna with non-abrupt clava composed of 8–10 antennomeres; claval formula 1-2-2-2-2-2-1; male sex segment not apparent.

Mesosoma (figs. 25, 26, 31, 32) short, squat, about as high as wide, viewed from above nearly quadrate; pronotum, in dorsal view, abruptly truncate anteriorly, anterolateral corners sharply pointed, not protruding anteriorly; transverse pronotal carina present (figs. 1, 4); pronotal humeral carina present; dorsal surface of pronotum coarsely areolate; anterior face of pronotum nearly vertical; lateral surface of pronotum convex above, coarsely areolate, deeply concave below, longitudinally costate; epomial carina present, extending ventrally to forecoxa; netrion/epicnemium linear (figs. 2, 12); pronotal–mesoscutal suture concave laterally (figs. 4, 9), exposing large dorsal surface of pronotal humeri; anterior margin of mesoscutum meeting pronotum dorsally (figs. 4, 7); mesoscutum trapezoidal, moderately convex, anteriormost point broadly separated from transverse pronotal carina; skaphion absent; notauli and parapsidal lines absent; mesoscutum coarsely areolate; transscutal articulation very broad,



Figs. 1–6. *Archaeoscelio rugosus* Brues. **1,** Holotype male, lateral habitus. **2,** Holotype male, ventral view. **3,** Lateral habitus, female (OSUC 67887). **4,** Head and mesosoma, female, dorsolateral view (OSUC 67073). **5,** Head, male, frontal view (OSUC 90315). **6,** Scutellum and forewing, dorsal view (OSUC 83620). Scale bars in millimeters.

deep; scutellum triangular, strongly convex, coarsely areolate, medially elongate, apex weakly bidentate (figs. 4, 6, 11), anterior margin with deep lacunae; axilla clearly defined; dorsellum in form of simple, central swelling; propodeum not visible dorsally, posterior surface vertical, setation not observable; mesopleuron not narrowed, mesepisternum and mesepimeron not differentiated by suture or line of foveae; mesopleural depression shallow, mesopleural pit absent; mesopleural carina present, flanked on both sides



Figs. 7–12. *Archaeoscelio filicornis* Brues. **7,** Holotype male, dorsolateral view. **8,** Holotype male, ventrolateral view. **9,** Lateral habitus, male (OSUC 67821). **10,** Lateral habitus, female (OSUC 67397). **11,** Forewing, female, dorsal view (OSUC 67821). **12,** Ventrolateral view, female (OSUC 64198). Scale bars in millimeters.

by large areolae; upper mesepisternum coarsely areolate rugose; sternaulus not developed; anterior margin of ventral portion of mesepisternum strongly extended anteriorly between forecoxae (fig. 2); posterodorsal corner of mesopleuron rounded; mesopleuron and metapleuron separated by distinct suture (figs. 1, 3, 12); metapleuron large, rectangular,

posterior margin straight, sparsely setose throughout; metapleural pit absent; upper angles of posterior margin of metapleuron weakly produced; propodeum with anterodorsal face setose; posterolateral corners of propodeum strongly produced posteriorly (figs. 3, 12); legs relatively slender; posterior surface of hindcoxa smooth; trochantellus present on all legs; hindfemur weakly enlarged apically, without lamellae flanking base of tibia; tibial spur formula 1-1-1; tarsi 5-5-5, tarsomeres gradually tapering in width toward apex; pretarsal claws small, simple; forewing (figs. 6, 9–11) very broad, marginal cilia short; R (submarginal vein) tubular, pigmented, rather short, not extending beyond basal half of wing, distinctly remote from costal margin, width of cell gradually expanding apically; no bulla in R basad of apical fork; R_1 very short, not reaching wing margin as tubular vein; r-rs longer but ending blindly as tubular vein; Rs extending beyond apical fork as nearly straight nebulous vein to costal margin; first free segment of M (basal vein) present as nebulous vein, arising perpendicular to R; hindwing shape not clearly observable in available specimens; R tubular, not observable basally, apically gradually fusing with margin, without distinct angle, marginal vein short; with three hamuli at wing margin.

Metasoma robust, moderately elongate, broadly sessile, laterally without sharp edge or submarginal groove; female (figs. 3, 10, 12) with six visible terga, five sterna; male (figs. 1, 8) with seven visible terga, six sterna; laterotergites, laterosternites absent (figs. 1, 3, 10, 12); terga moderately convex; sterna strongly convex; lateral margins of terga slightly overlapping over upper margins of sterna; terga 1–4 with strongly raised sublateral keels, coarsely sculptured; terga and sterna with basal margins crenulate; T1 moderately transverse, longer than other terga; T2 transverse, coarsely areolate; T6 details not observable; terga beyond T6 not observable; S1 (figs. 2, 10, 12) very deep, strongly convex, anteromedial portion with sharp median keel extending anteriorly between hindcoxa, coxae fitting into basal depressions in sternite; anterior margin of S2 straight; metasomatic felt fields absent; S5 not observed; ovipositor not observable.

DIAGNOSIS: Antenna 14-segmented; tibial spur formula 1-1-1; clava 7-merous, claval formula 1-2-2-2-2-2-1; male A5 not visibly modified; submarginal vein elongate, tubular, apically forked, but not reaching costal margin.

RELATIONSHIPS: *Archaeoscelio* generally has not been included in discussions of scelionid relationships, except to note that the 14-segmented antennae are a plesiomorphic feature. In his original description, Brues (1940) expressed doubts as to whether *Archaeoscelio* was correctly placed within the Scelionidae. He noted a similarity in habitus and the structure of the mandibles with Chalcidoidea, but stated that "the wing venation is not in close conformity with that of any group known to me" (Brues, 1940: 90). The similarity in the mouthparts is, presumably, the fact that the mandibles are large, fairly robust, and bear sharply pointed apical teeth. However, the number and shape of mandibular teeth are extremely variable in both superfamilies, and these characters are commonly used to distinguish among closely related species.

It is indeed difficult to understand the venation on the basis of Brues's published drawings. One problem is that the illustrations fail to distinguish between folds, simple lines of pigmentation (nebulous veins), tubular veins, and artifacts. The veins are also a bit distorted and appear more angular than they are in the fossils or in living scelionids. The true venation is striking in that the submarginal vein does not reach the costal margin of the wing and has an apical bifurcation. A similar configuration, although with the apical branches very much shorter, may be seen in basal platygastrid genera such as *Proplatygaster* Kieffer (fig. 41) and *Metaclisis* Förster (Masner and Huggert, 1989), as well as in the new genera *Huddlestonium* (fig. 39) and *Cobaloscelio* (fig. 18).

KEY TO SPECIES OF *ARCHAEOSCELIO*

1. Malar sulcus well developed; lateral ocelli broadly separated from inner orbits, LOL > 1 ocellar diameter . . . *A. filicornis* Brues
– Malar sulcus absent; lateral ocelli nearly contiguous with inner orbits: LOL < 1 ocellar diameter. . . . . *A. rugosus* Brues

Archaeoscelio rugosus Brues
figures 1–6

Archaeoscelio rugosus Brues, 1940: 89; Masner, 1958: 103.

MATERIAL EXAMINED: Holotype male: "Mus. Comp. Zool. No. 5225, *Archaeoscelio rugosus* Brues, type, CTB, Baltic amber." 1 female ("allotype"), no. 8164 in MCZC. 5 males, 4 females (OSUC 0090314, 0067875, 0067842, 0083620, 0090315, 0064198, 0067073, 0067887, 0067893) in OSUC.

Archaeoscelio filicornis Brues
figures 7–12

Archaeoscelio filicornis Brues, 1940: 90.

MATERIAL EXAMINED: Holotype male: "Mus. Comp. Zool. No. 8165, *Archaeoscelio filicornis* Brues, Holotype, Baltic amber." 3 males, 1 female (OSUC 0067397, 0040409, 0067821, 0067878 in OSUC; 2 males (OSUC 77501, 77502) in MCZC.

Cobaloscelio Johnson and Masner, new genus
figures 13–24

TYPE SPECIES: *Cobaloscelio cuspidatus* Johnson and Masner, n.sp.

DISTRIBUTION: Baltic amber.

DESCRIPTION: Length: 0.9–1.5 mm. Body more gracile, head not closely appressed to mesosoma, metasoma sessile, closely joined with mesosoma. Head weakly transverse in frontal view; hyperoccipital carina absent (figs. 14, 19, 21); occipital carina complete medially; sculpture of frons and vertex varying from smooth to coarsely areolate; lateral ocellus equidistant between median ocellus and inner orbit (figs. 14, 24); frons convex, without distinct antennal scrobe, frontal sculpture variable, from smooth (fig. 23) to coarsely areolate-rugose (fig. 14), medial carina present (fig. 23), ending ventrally in interantennal process; interantennal process distinctly projecting anteriorly; submedial carina absent; orbital carina present; cheek with fanlike striae between orbital carina and malar sulcus; eye setae absent or indistinct; inner orbits parallel to subparallel, not diverging ventrally; torulus contiguous with upper margin of clypeus, opening laterally, arising from interantennal process; clypeus not observable; malar sulcus present; lower portion of gena obscured in available specimens, no antennal groove visible; mandible very narrow, sickle-shaped, only single apical tooth visible in available specimens; maxillary palpus not observable; labial palpus not observable; female antenna with 12 antennomeres (fig. 17); male antenna with 11 (fig. 20) or 12 antennomeres; longitudinal axes of radicle and scape nearly parallel to one another (fig. 20); scape more or less cylindrical, weakly expanded medially, weakly excavate dorsally for reception of pedicel and base of flagellum; A3 of female not distinctly elongate, slightly shorter than A2; female antenna with non-abrupt 7-segmented clava (fig. 17), details of setae on dorsal surface not observable; claval formula not observable; male sex segment present on A5 (*C. speculifer*, fig. 21) or, possibly, on A4 (*C. cuspidatus*).

Mesosoma (figs. 25, 26, 31, 32) about as high as wide, viewed from above longer than wide; pronotum, in dorsal view, abruptly truncate anteriorly, anterolateral corners sharply angulate, not protruding anteriorly; transverse pronotal carina present (fig. 14); pronotal humeral carina present; dorsal surface of pronotum coarsely areolate; anterior surface of pronotum strongly inclined, but not vertical (fig. 14); lateral surface of pronotum deeply concave, longitudinally costate; epomial carina present, extending ventrally to forecoxa; netrion/epicnemium linear; pronotal–mesoscutal suture straight (figs. 14, 19, 21), exposing large dorsal surface of pronotal humeri; anterior margin of mesoscutum meeting pronotum dorsally (figs. 14, 21); mesoscutum trapezoidal to subtriangular, moderately convex, anteriormost point contiguous with transverse pronotal carina; skaphion absent; notauli present, percurrent (figs. 18, 21); parasidal lines absent; mesoscutal sculpture variable, smooth to coarsely areolate; transscutal articulation relatively narrow, shallow; scutellum variable in shape, convex, smooth to areolate, either rounded posteriorly (figs. 19, 21) or produced into medial prominence (figs. 13, 14, 18), anterior margin lacunate; axilla not clearly defined; dorsellum not produced, details not observable; propodeum immediately behind metanotum not visible;

mesopleuron not narrowed, mesepisternum and mesepimeron not differentiated by suture; mesopleural depression shallow, mesopleural pit absent; mesopleural carina present, flanked posteriorly by large areolae; upper mesepisternum not longitudinally rugose; sternaulus not developed; anterior margin of ventral portion of mesepisternum strongly extended anteriorly between forecoxae (fig. 17); posterodorsal corner of mesopleuron rounded; mesopleuron and metapleuron fused, no suture visible (figs. 13, 14, 16, 20); metapleuron large, rectangular, posterior margin weakly straight (*C. speculifer*) or convex (*C. cuspidatus*), posterior half and ventral margin setose; metapleural pit absent; upper angles of posterior margin of metapleuron not produced; propodeum with anterodorsal face setose; posterolateral corners of propodeum strongly produced posteriorly; legs slender; posterior surface of hindcoxa smooth; trochantellus present on all legs; hindfemur swollen apically, without lamellae flanking base of tibia; tibial spur formula 1-1-1; tarsi 5-5-5, tarsomeres gradually tapering in width toward apex; pretarsal claws small, simple; forewing moderately broad, marginal cilia short; R (submarginal) tubular, rather short, not extending beyond basal half of wing, distinctly remote from costal margin, cell only slightly wider at apex of R; no bulla in R basad of apical fork; R_1 very short, not reaching wing margin as tubular vein; r-rs longer but ending blindly as tubular vein; Rs extending beyond apical fork as arched nebulous vein (course to wing margin not observable); first free segment of M (basal vein) not observable; hindwing not observable.

Metasoma (figs. 15, 20) robust, moderately elongate, broadly sessile, laterally without sharp edge or submarginal groove; female with six visible terga, five sterna; male with seven visible terga, six sterna; laterotergites and laterosternites apparently absent (figs. 15, 20); terga moderately convex; sterna strongly convex; no overlap visible laterally between terga and sterna; at least T1 with sublateral keels, presence of keels on following terga obscured by longitudinal carinate sculpture, surface otherwise areolate-rugose; terga and sterna without distinctly crenulate basal margins; T1 largest tergite, moderately transverse; T2 transverse, longitudinally carinate at least laterally; T6 details not observable; terga beyond T6 not observable; S1 (figs. 15–17, 20, 22) very deep, strongly convex, anteromedial portion with sharp median keel extending anteriorly between hindcoxa, coxae fitting into basal depressions in sternite; anterior margin of S2 produced anteriorly onto S1 keel; metasomatic felt fields absent; S5 not observed; ovipositor not observable.

DIAGNOSIS: Female antenna with 12 antennomeres, male antenna with 11 (*C. speculifer*) or 12 (*C. cuspidatus*) segments; mesopleuron and metapleuron completely fused, without suture separating them; frons with well-developed median longitudinal carina; division between S1 and S2 indicated by carina.

ETYMOLOGY: Constructed from *scelio*, Latin for scoundrel, and a common base for many generic names in this group; and *kobalos*, a Greek word of similar meaning. The name is to be considered masculine.

REMARKS: This genus has some characters reminiscent of Platygastridae, particularly in the shape of the mesopleural scrobe, the shape of the notauli, and the clavate femora. The apex of the radicle inserts into the base and is parallel to the long axis of the scape. This orientation suggests that, despite the similarity in the anterior projection of the mesepisternum and first metasomatic sternite, these two species may not be particularly closely related to the other three genera. However, *Cobaloscelio* shares with *Archaeoscelio* the extension of the mesepisternum and the base of the metasoma anteriorly between the forecoxae and hindcoxae, respectively.

KEY TO SPECIES OF *COBALOSCELIO*

1. Frons with only median longitudinal carina, otherwise smooth and shining; mesoscutum and disk of scutellum smooth, posterior margin broadly rounded (figs. 19, 21; the apparent sculpture in fig. 21 is an artifact, the illustration is mentioned here in regard to the shape of the posterior margin) . . . . . *C. speculifer,* n.sp.
– Frons transversely carinate; mesoscutum and disk of scutellum rugose, posterior margin produced medially into point (figs. 13, 14) . . . . . *C. cuspidatus,* n.sp.

Cobaloscelio cuspidatus Johnson and Masner, new species
figures 13–18

DESCRIPTION: Length 1.4–1.5 mm. Head with hyperoccipital carina absent, vertex and occiput coarsely areolate rugose (fig. 14); lateral ocelli separated from inner orbits by <1 OD; occipital carina crenulate, sculpture continuing across gena to posterior orbit (fig. 13); eyes glabrous; frons with median longitudinal carina, carina arising from dorsal apex of interantennal process and extending to median ocellus, with pair of submedial carinae, lower portion of frons with three to four transverse carinae between submedial and median carinae, with six to seven transverse carinae between submedian carina and inner orbit, without visible microsculpture, frontal scrobe lacking; with distinct fanlike striae arising from base of mandibles in female, one of which forms orbital carina along inner margin of eye, male with smooth area between malar sulcus and orbital carina; malar sulcus present; mandibles obscured; female antenna 12-merous (figs. 16, 17), clava composed of seven antennomeres, loosely articulated, with two sensilla on segments 8–10, others not clearly visible; male antenna with a small tooth possibly present on A4, otherwise sex segment not differentiated from other basal flagellomeres. Mesosoma: pronotum above humeral carina longitudinally rugose (figs. 13, 14); epomial carina strongly developed; pronotal scrobe smooth; netrion/epicnemium narrow, striplike; mesoscutum, scutellum irregularly rugose, with numerous scattered setae (figs. 13, 14, 17); notauli percurrent (fig. 18), widened posteriorly, appearing crenulate; posterior margin of scutellum actuely pointed medially (figs. 13, 14, 18), with longitudinal, submarginal carina converging to that apical point and demarcating axillulae as in many Chalcidoidea; fore- and midcoxae widely separated (fig. 17), ventral portion of mesepisternum areolate-rugose; mesopleural scrobe present, marked anteriorly by irregular crest corresponding to mesopleural carina, areolate-rugose; metapleuron, lateral face of propodeum large, flat, weakly produced posteriorly (figs. 13, 14); metapleuron sparsely setose; posterior apex of mesosoma transverse, closely abutting with anterior edge of metasoma; forewing (fig. 18) with submarginal vein abruptly downturned beyond basal half, radial vein arising obliquely from apex of submarginal, anterior branch of continuing toward costal margin, two branches subequal in length; disk of forewing uniformly setose, with four arching furrows in position of other wing veins. Metasoma (fig. 15) longitudinally strigate, strigae intersecting with transverse ridges marking segmental boundaries to give tagma very coarse areolate appearance; apparent boundary between S1 and S2 marked by transverse ridge.

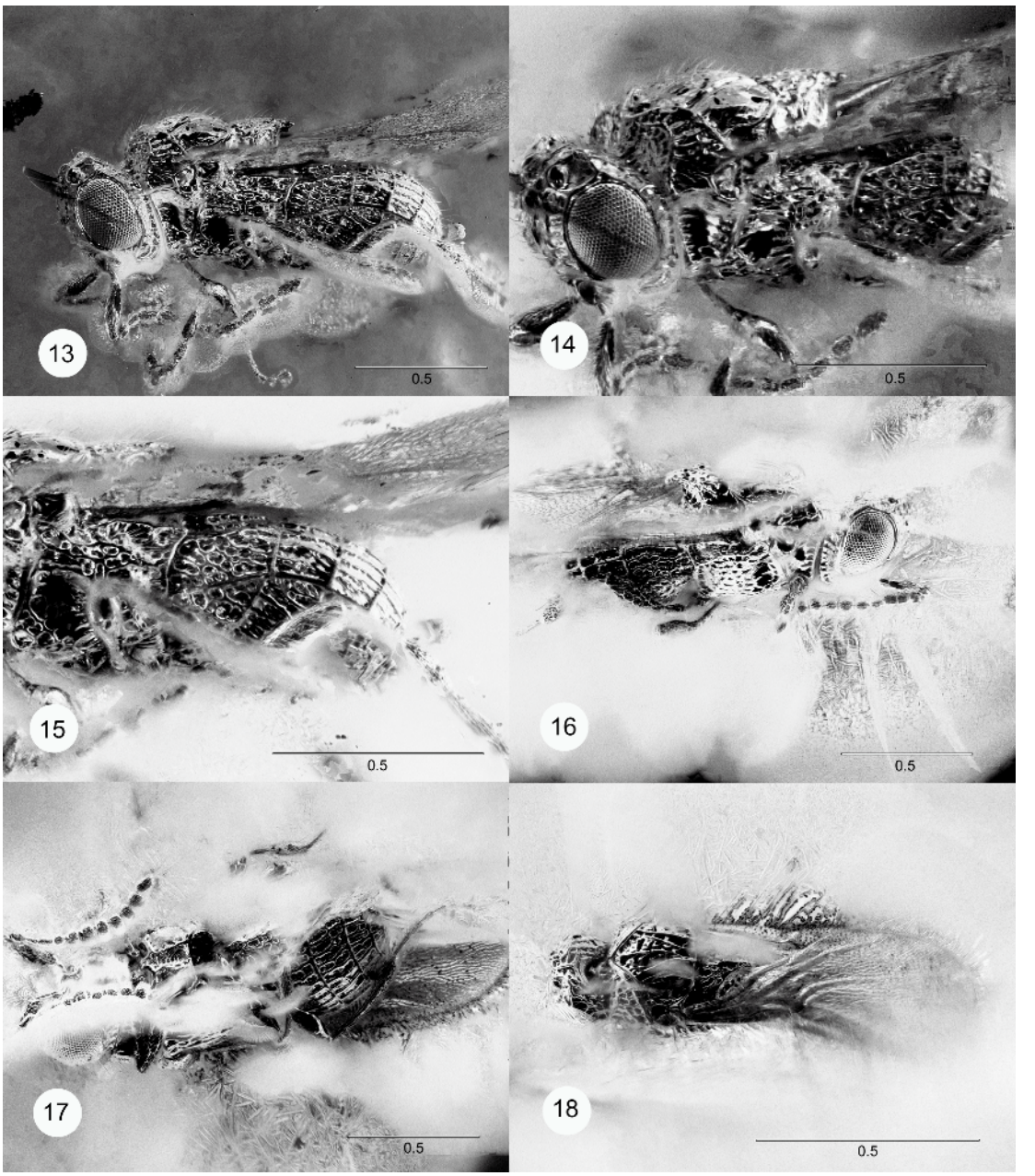
DIAGNOSIS: Posterior margin of scutellum acutely pointed medially; mesoscutum and disk of scutellum rugose; frons with transverse carinae.

ETYMOLOGY: From the Latin *cuspidatus*, meaning pointed, referring to the protruding apex of the scutellum.

MATERIAL EXAMINED: Holotype male: OSUC 0083643; deposited in OSUC. Paratype: 1 female, OSUC 0083621. Both specimens from Baltic amber.

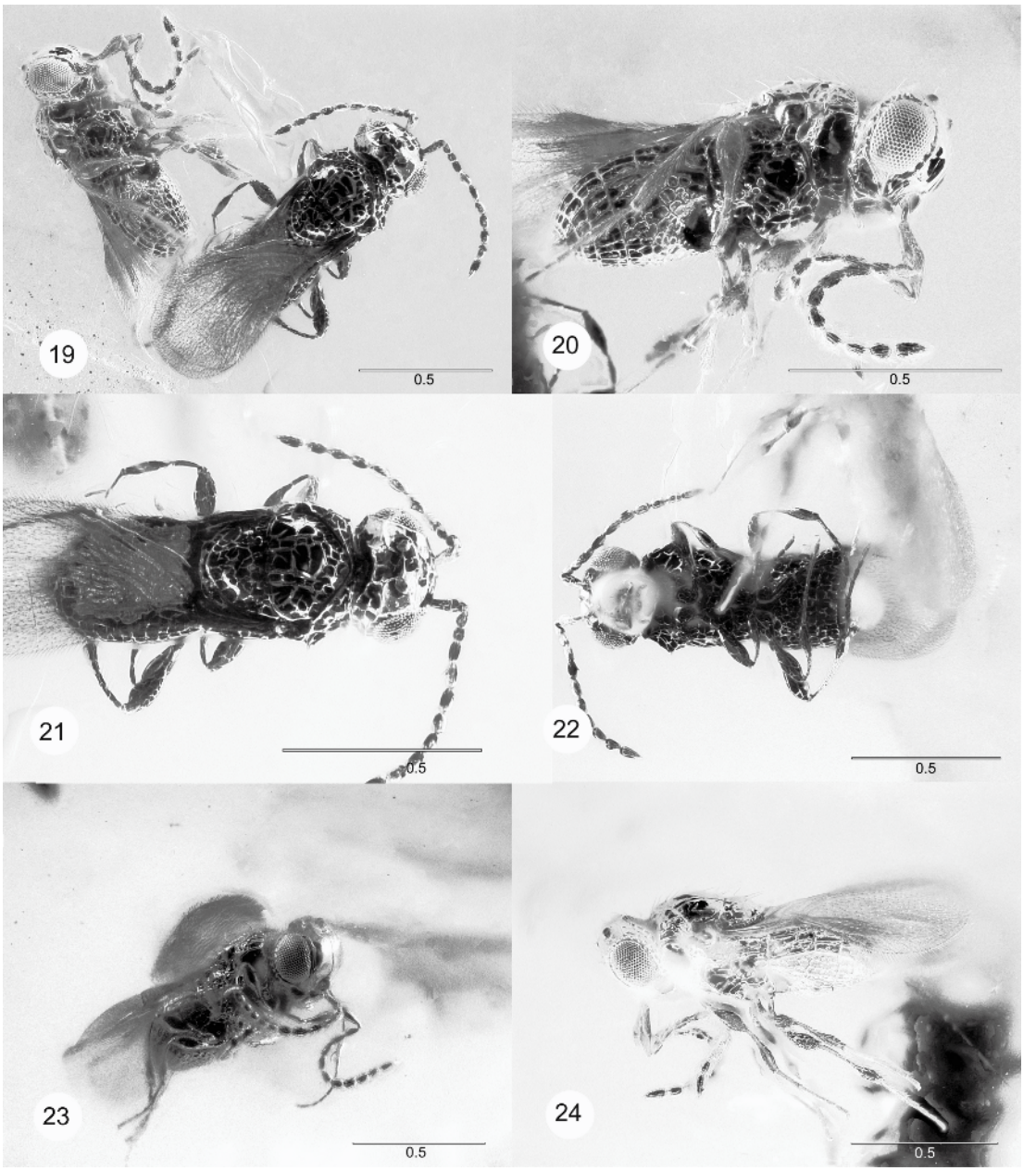
Cobaloscelio speculifer Johnson and Masner, new species
figures 19–24

DESCRIPTION: Length 0.9–1.0 mm. Head with hyperoccipital carina absent (figs. 19, 21); lateral ocelli separated from inner orbits by 1–2 OD; occipital carina crenulate; frons with median longitudinal carina (fig. 23), carina arising from dorsal apex of interantennal process, frons otherwise smooth, convex, without antennal scrobe; no fanlike striae arising from mandibles; malar sulcus present; mandibles obscured, possibly quite narrow apically, unidentate; A5 produced ventrally (fig. 21). Mesosoma: pronotum above humeral carina longitudinally rugose (fig. 20); epomial carina strongly developed; pronotal scrobe smooth; mesoscutum, scutellum largely smooth, with four and two pairs of strong bristles (figs. 20, 21); notauli percurrent, width uniform, not crenulate (figs. 19, 21); posterior margin of scutellum semicircular, not produced (figs. 19, 21); fore- and midcoxae widely separated (fig. 20), ventral portion of mesepisternum areolate-rugose; mesopleural scrobe present, marked anteriorly by irregular crest corresponding to mesopleural carina, areo-



Figs. 13–18. *Cobaloscelio cuspidatus* Johnson and Masner, n.sp. **13,** Holotype male, lateral habitus (OSUC 83643). **14,** Holotype male, frontolateral view. **15,** Holotype male, metasoma, lateral view. **16,** Paratype female, lateral view (OSUC 83621). **17,** Female, ventral view (OSUC 83621). **18,** Female, dorsal view of scutellum, forewing (OSUC 83621). Scale bars in millimeters.

late-rugose; metapleuron, lateral face of propodeum large, flat, weakly produced posteriorly (fig. 24); metapleuron sparsely setose; posterior apex of mesosoma transverse, closely abutting with anterior edge of metasoma; radial vein arising obliquely from apex of submarginal, anterior branch of apical bifurcation not visible; disk of forewing uni-



Figs. 19–24. *Cobaloscelio speculifer* Johnson and Masner, n.sp. **19,** Holotype and paratype males, holotype at upper left (OSUC 83622). **20,** Lateral habitus, holotype male. **21,** Dorsal habitus, paratype male. Apparent sculpture on mesonotum and head is an artifact. **22,** Ventral habitus, paratype male. **23,** Paratype female, frontolateral view (OSUC 67849). **24,** Female, lateral habitus (OSUC 67849). Scale bars in millimeters.

formly setose, with four arching furrows in position of wing veins (fig. 19). Metasoma longitudinally strigate (fig. 20), strigae intersecting with transverse ridges marking segmental boundaries to give tagma very coarse areolate appearance; apparent boundary between S1 and S2 marked by transverse ridge.

DIAGNOSIS: Posterior margin of scutellum rounded; mesoscutum, scutellum, and frons smooth and shining, frons with only median longitudinal carina, without transverse carinae.

ETYMOLOGY: This name, derived from the Latin *speculum,* meaning mirror, refers to the smooth and shining surface of the frons, mesoscutum, and scutellum.

MATERIAL EXAMINED: Holotype male: OSUC 0083622. Paratypes: 1 male in same block as holotype; OSUC 0067849: male in OSUC; OSUC 77503–77505, 3 males in MCZC; BST03102: male in GMUG. All specimens in Baltic amber.

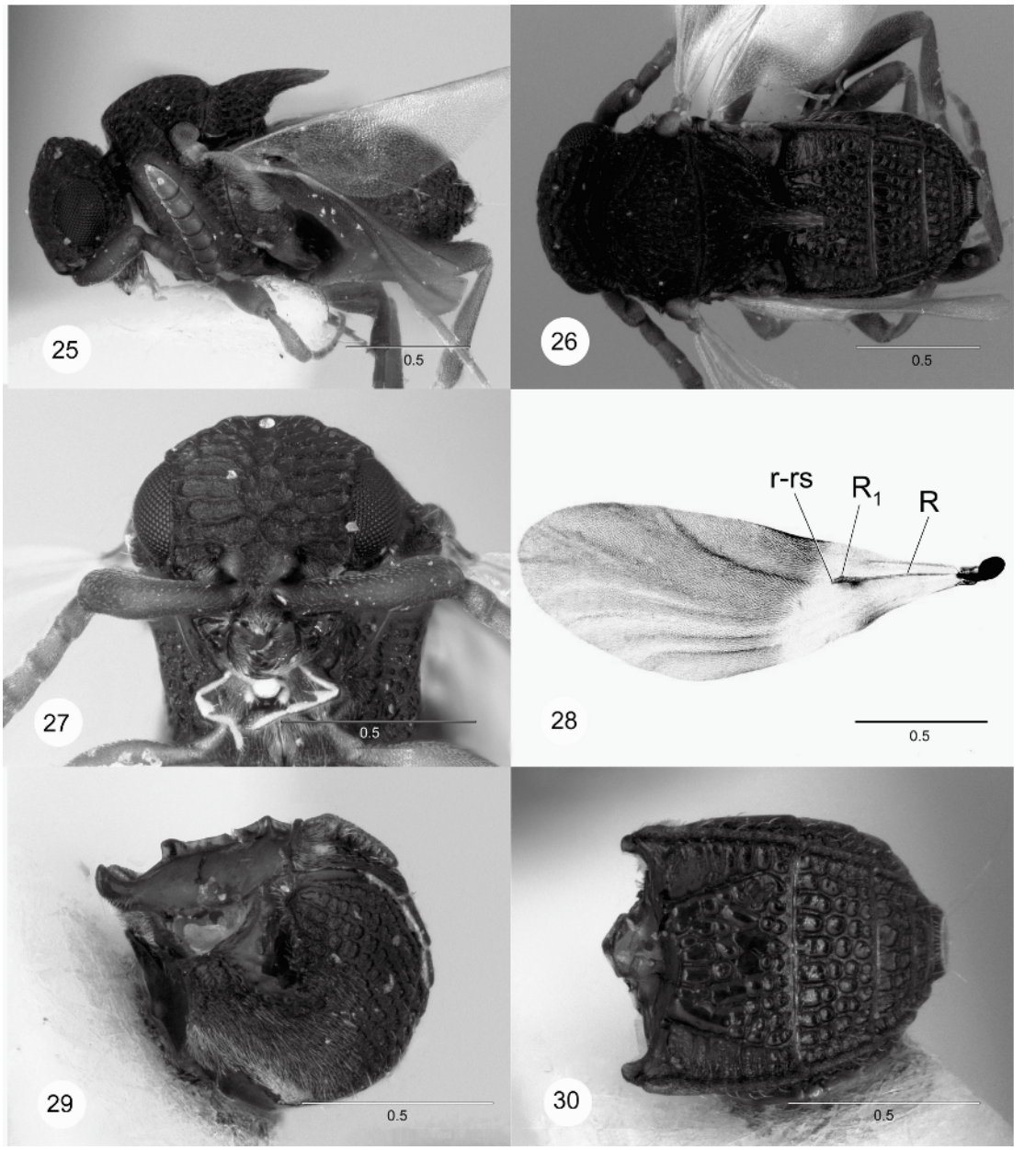
Plaumannion Masner and Johnson, new genus
figures 25–34

TYPE SPECIES: *Plaumannion fritzi* Masner and Johnson, n.sp.

DISTRIBUTION: Brazil, Venezuela.

DESCRIPTION: Length: 1.4–1.9 mm. Body robust; head not closely appressed to mesosoma; metasoma sessile, closely joined to mesosoma. Head subglobular, moderately transverse (figs. 27, 33); hyperoccipital carina absent; occipital carina complete medially; frons and vertex with coarse to moderately fine polygonal rugulosities; lateral ocellus distinctly remote from eye margin, OOL subequal to slightly longer than LOL, shorter than POL; frons strongly convex, without antennal scrobe, median carina absent; interantennal process not developed; submedial carina absent; orbital carina absent; malar region without fanlike striae; eye glabrous, small; interocular space broad, distinctly greater than eye height; inner orbits parallel to subparallel, not diverging ventrally; torulus contiguous with upper margin of clypeus, opening ventrally, with dorsal rim produced and overhanging antennal articulation; clypeus small, convex, finely setose, without protruding anterolateral corners, anterior margin convex anteclypeus and postclypeus subequal in height, distinguished by change in orientation; malar sulcus absent; malar region and gena shallowly concave for reception of antennal scape (figs. 33, 34); mandibles massive, scissorlike, bidentate; mandibular teeth arrayed vertically, acute, deeply incised, right mandible with lower tooth distinctly longer than upper, left mandible with teeth subequal in length; maxillary palpus (fig. 27) long, five-segmented, segment 3 medially lobate; labial palpus two-segmented; female antenna with 12 antennomeres; longitudinal axes of radicle and scape nearly perpendicular to one another (fig. 27); scape cylindrical, widest apically, apex excavate for reception of pedicel and base of flagellum; A3 of female elongate, slightly longer than A2; female antenna with nonabrupt clava composed of seven modified antennomeres, with appressed, white setae on dorsal surface; claval formula A12–A7 2-2-2-2-2-1.

Mesosoma (figs. 25, 26, 31, 32) short, squat, about as high as wide, viewed from above nearly quadrate; pronotum, in dorsal view, abruptly truncate anteriorly, anterolateral corners sharply angulate, protruding anteriorly in *P. yepezi*; transverse pronotal carina present; pronotal humeral carina present; dorsal surface of pronotum finely to coarsely areolate; anterior surface of pronotum nearly vertical, abruptly sloping down to cervical region; lateral surface of pronotum deeply concave (fig. 31), finely sculptured; epomial carina present, acute, extending ventrally to forecoxa; netrion/epicnemium linear; pronotal–mesoscutal suture straight or slightly concave laterally (figs. 26, 32), exposing large dorsal surface of pronotal humeri; anterior margin of mesoscutum meeting pronotum dorsally; mesoscutum trapezoidal to subtriangular, moderately convex, anteriormost point narrowly separated from transverse pronotal carina; skaphion absent; notauli and parapsidal lines absent; mesoscutal sculpture variable, from coarsely to finely areolate; transscutal articulation very broad, deep; scutellum relatively large, subtriangular, areolate-rugose, posteromedially produced into massive, pointed spine, anterior margin with broad, regularly spaced deep lacunae; axilla not clearly defined; metanotum narrow, dorsellum



Figs. 25–30. *Plaumannion fritzi* Masner and Johnson, n.sp. **25,** Holotype female, lateral habitus (OSUC 146569). **26,** Holotype female, dorsal habitus. **27,** Holotype female, head, frontal view. **28,** Forewing. **29,** Metasoma, paratype female, frontal view (OSUC 146570). **30,** Metasoma, paratype female, dorsal view. Scale bars in millimeters.

Figs. 31–34. *Plaumannion yepezi* García, n.sp., holotype female (OSUC 146571). **31,** Mesosoma and metasoma, lateral view. The angulate profile of mesoscutum is an artifact. **32,** Mesosoma and metasoma, dorsal view. **33,** Head, frontal view. **34,** Head, lateral view. Scale bars in millimeters.

unarmed, not projecting, delimited by fine transverse arched line; propodeum with dorsal face extremely narrow medially, shorter than length of dorsellum, rugulose, posterior face above foramen smooth, glabrous; mesopleuron relatively narrow, mesepisternum and mesepimeron not differentiated by suture or line of foveae; mesopleural depression shallow; mesopleural pit absent; mesopleural carina obscured by coarse polygonal sculpture; upper mesepisternum longitudinally carinate; sternaulus not developed; anterior margin of ventral portion of mesepisternum moderately to strongly extended anteriorly between forecoxae; posterodorsal corner of mesopleuron rounded; mesopleuron and metapleuron separated by distinct suture (fig. 31); metapleuron very large, posterior margin weakly concave, with narrow band of dense setae along posterior margin; metapleural pit absent; upper angles of posterior margin of metapleuron weakly produced; propodeum with anterodorsal face densely setose; posterolateral corners of propodeum very strongly developed and projecting; legs robust; posterior face of hindcoxa smooth; trochantellus present on all legs; femora moderately to distinctly incrassate, apices with lateral lamellae flanking base of tibiae; tibial spur formula 1-1-1; tarsi 5-5-5, tarsomeres gradually tapering in width toward apex; pretarsal claws small, simple; forewing (fig. 28) broad, with marginal cilia very short or absent; R (submarginal vein) tracheate, pigmented, rather short, not extending beyond basal half of wing, distinctly remote from

costal margin, width of cell gradually expanding apically; no bulla in R basad of apical fork; R_1 very short, not reaching wing margin as tubular vein; r-rs longer but ending blindly as tubular vein; Rs extending beyond apical fork as arched nebulous vein to costal margin; first free segment of M (basal vein) not indicated; hindwing broad, with posterior margin strongly sinuate, marginal cilia very short; R tubular, basally remote from costal margin, apically gradually fusing with margin, without distinct angle, marginal vein short; with three hamuli at wing margin.

Metasoma (figs. 26, 29, 30, 31) short and robust, broadly sessile, laterally without sharp edge or submarginal groove; female with six visible terga, five sterna; laterotergites and laterosternites apparently absent; terga nearly flat; sterna strongly convex; lateral margins of terga slightly overlapping over upper margins of sterna; terga 1–4 with strongly raised sublateral keels, coarsely sculptured; basal margins of terga and sterna without distinguishable crenulae; T1 moderately to distinctly largest tergite, longer than T2, with very sharp, raised anterior transverse carina; T2 transverse, coarsely areolate rugose; T6 medially with oval, flat, raised field covered with silvery surface, either microtrichiae or a secretion, laterally with two densely pilose fields; tip of cercus visible protruding beyond apex of T6, with two long, apical whitish bristles; T7 diminished, concealed under T6, apparently not extruded with ovipositor; internal details of T7, T8 not examined; S1 (fig. 29) very deep, strongly convex, with zone of dense pilosity on posteromedian margin, anteromedial portion with sharp median keel extending anteriorly between hindcoxa, coxae fitting into basal depressions in sternite; anterior margin of S2 straight; metasomatic felt fields absent; S5 not observed; visible portion of ovipositor robust, internal structure not observed, apices of gonoplacs rounded, setose; details of ovipositor structure and related metasomatic apodemes not observed.

DIAGNOSIS: The genus *Plaumannion* may be distinguished from *Archaeoscelio* by the 12-merous antennae and the arrangement of the mandibular teeth along the length of the mandible (as in many ants). The genus may be separated from *Huddlestonium,* n. gen. by the 12-merous antennae and the single, medial protrusion of the scutellum into a spine.

ETYMOLOGY: Named in memory of Mr. Fritz Plaumann, distinguished German naturalist and philosopher, formerly of Nova Teutonia, Brazil. Plaumann contributed tremendously toward the knowledge of Brazilian insects and spiders by collecting, over the decades, many species, including the type species of this genus. The gender of this name is to be considered neuter.

REMARKS: The genus *Plaumannion* fits nowhere within any of the variations on classification of Platygastroidea. The protruding scutellum, forewing venation, and lack of a malar sulcus are characters commonly encountered in Platygastridae, but are rare or absent in scelionids. Conversely, the 12-merous antennae have never been found in either extant or fossil platygastrids. In the key of Masner (1976), *Plaumannion* will match up to couplet 20, at which point the key fails. The couplet distinguishes between genera in which either T2 is the longest metasomatic tergite, or those in which T2 and T3 are subequal in length and longer than any other. In this new genus, T1 is the longest tergite, thus distinguishing it from almost all previously known scelionids. One apparent exception is females of the genus *Baeus* in which the true first metasomatic segment is reduced in size and largely hidden. *Plaumannion* may be distinguished by the presence of wings (female *Baeus* are micropterous) and by the segmented antennal clava of the female (female *Baeus* have the apical antennomeres fused).

Plaumannion is the "Genus P" used as an outgroup in the phylogenetic analysis of relationships among species of *Nixonia* (Johnson and Masner, 2006).

KEY TO SPECIES OF *PLAUMANNION*

1. T1 distinctly longer (2.9 times) than T2, without submedian longitudinal carinae; body sculpture fine, weakly shining; forewing membrane uniformly hyaline (figs. 31–34); Venezuela . . . . . *P. yepezi,* n.sp.
_ T1 only slightly longer (1.3–1.4 times) than T2, with strong, apically divergent submedian longitudinal carinae; body with coarse areolate sculpture and matte microscupture; forewing membrane weakly infuscate in

apical two-thirds (figs. 25–30); southeastern Brazil . . . . . *P. fritzi,* n.sp.

Plaumannion fritzi Masner and Johnson, new species
figures 25–30

DESCRIPTION: Length 1.8–1.9 mm. Head with occipital carina complete medially (fig. 26); frons width 1.7 times eye height; frons coarsely areolate, with matte microsculpture (fig. 27); malar space above mandible with triangular smooth area; pronotum, seen from above, with anterior margin on each side slightly convex, anterolateral corners weakly projecting (fig. 26); mesoscutum and scutellum coarsely areolate, with matte microsculpture; scutellum in lateral view with apical prominence slightly compressed laterally, arched downward in lateral view (fig. 25); mesopleural scrobe with five to six strong longitudinal carinae and matte microsculpture, posterior margin of mesopleuron bordered by large foveae; metapleuron areolate, upper metapleuron and lateral face of propodeum densely setose, anterior margin of setal field sinuate, over half of surface of upper half of metapleuron/propodeum covered by setae; apical two-thirds of forewing slightly infuscate (fig. 28); medial length of T1 1.3–1.4 times length of T2 (figs. 26, 30); T1 with pair of well-developed, apically diverging, submedian carinae.

DIAGNOSIS: Distinguished from *Plaumannion yepezi,* n.sp. by the coarse sculpture of the head and mesosoma, the dense setation of the posterior metapleuron and lateral face of the propodeum, and the strongly developed submedian carinae on T1.

ETYMOLOGY: Named in honor of its collector, Mr. Fritz Plaumann.

MATERIAL EXAMINED: Holotype female: **BRAZIL**: Santa Catarina, Nova Teutonia, 27°11′S 52°23′W, 300–500 m, X–XI.1972, Fritz Plaumann; OSUC 146569. Deposited in CNCI. Paratype: 1 female, with same data as holotype, OSUC 146570 (CNCI). After this paper was initially submitted for publication, a third specimen was found, a headless female, also from Nova Teutonia, 30.XII.1944, F. Plaumann, B.M. 1957-341, BMNH(E) #790387. Because of its severely damaged condition, we have not designated it as a paratype.

REMARKS: Plaumann (in litt.) noted that the two type specimens were collected by sifting soil litter. The area of Nova Teutonia, although located far inland, was originally covered by the Brazilian Atlantic rainforest. As a consequence of a half millennium of settlement and agriculture, the forest is now greatly reduced in area and highly dissected (see, for example, Galindo-Leal and Câmara, 2003). The scientific community, in collaboration with Brazilian entomologists, should make a focused effort to document the arthropod fauna of this threatened environment. Even with such an effort, however, creatures such as *P. fritzi* will not be encountered often. In over three decades of collecting at sites in and around the town of Nova Teutonia, Plaumann succeeded in capturing only three female specimens.

Plaumannion yepezi García, new species
figures 31–34

DESCRIPTION: Length 1.4 mm. Color: head, mesosoma, metasoma, coxae dark brown; mandibles, legs beyond coxae lighter in color, brown to yellowish-brown; forewing hyaline throughout; A1–A4, base of A5 brownish-yellow, A6–A12 brown. Head with occipital carina interrupted medially; frons width 1.8 times eye height; frons finely areolate, weakly shining (fig. 33); malar area finely areolate throughout; pronotum, seen from above, with anterior margin on each side slightly concave, anterolateral corners strongly projecting forward (fig. 32); mesoscutum and scutellum finely areolate, with reticulate microsculpture, surface weakly shining; scutellum in lateral view with apical prominence dorsoventrally flattened, straight; mesopleural scribe finely longitudinally striate, striae continuing on to metapleuron; lateral face of propodeum and posterior margin of metapleuron setose, surface of sclerites visible through vestiture; most of surface of metapleuron glabrous; forewing without noticeable infuscation; medial length of T1 2.9 times length of T2; T1 lacking submedian carinae (fig. 32).

DIAGNOSIS: Distinguished from *P. fritzi* by the finer, nonmatte body sculpture, particularly on the head, the more restricted distri-

bution of fine hairs on the metapleuron and lateral propodeum, T1 distinctly longer than T2, and the lack of submedian carinae on the basal metasomatic tergite.

ETYMOLOGY: Named in honor of Francisco Fernández Yépez, a prominent Venezuelan entomologist.

MATERIAL EXAMINED: Holotype female: **VENEZUELA**: Aragua, Cuyagua, 50 m, 2.II.1999, J.L. García, R. Montilla, T. amari. [= trampas amarillas, yellow pan traps]; deposited in MIZA.

REMARKS: The only known specimen of this species was collected in a cacao plantation. The tremendous distance between this collecting locality and that of the only other known species of the genus, together with the numerous morphological features that distinguish the two, suggests to us that we may well discover further new species of *Plaumannion* in South America. If so, they must be decidedly rare. After the initial collection of *P. yepezi*, numerous efforts to capture additional specimens were unsuccessful.

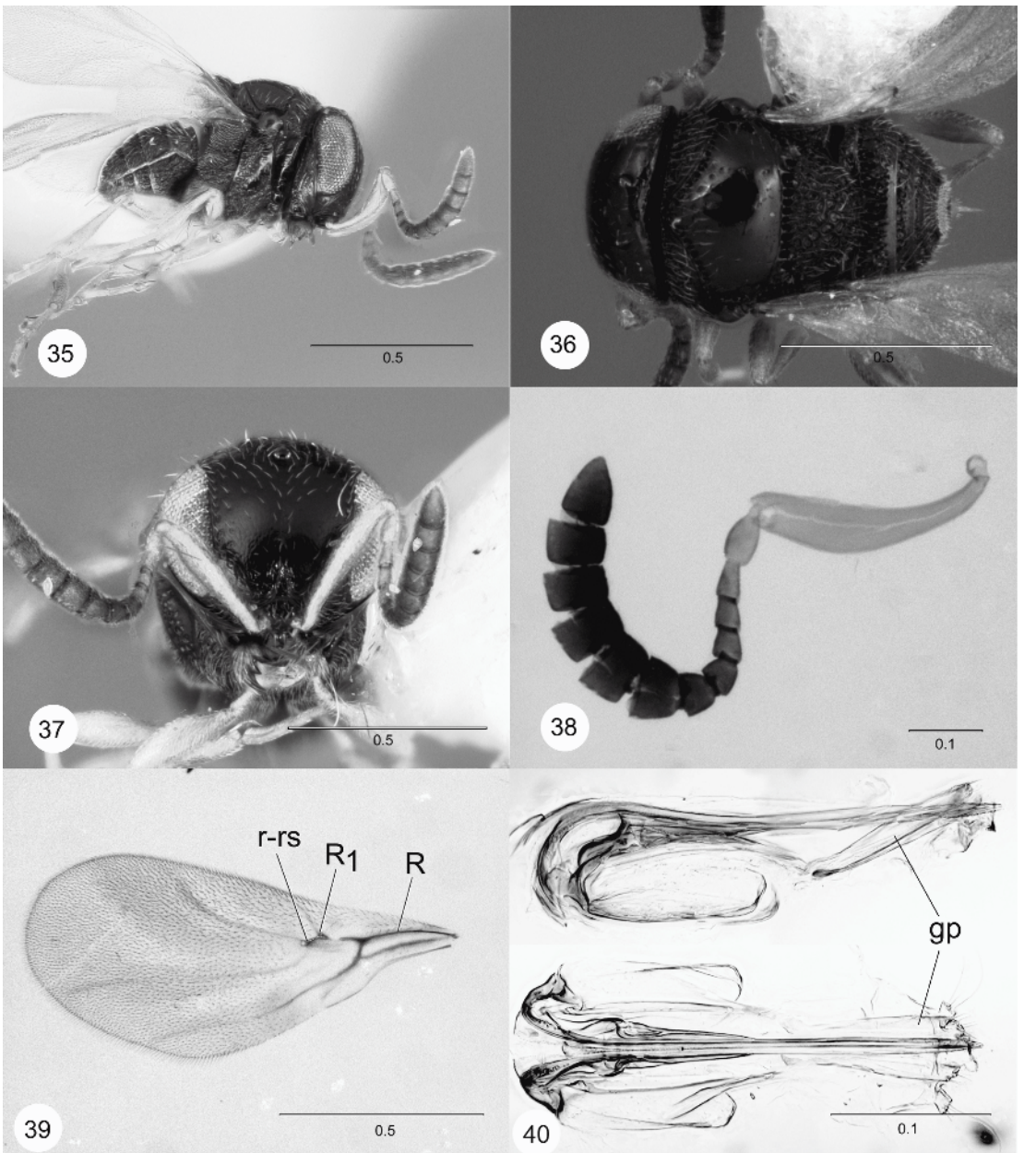
Huddlestonium exu Polaszek and Johnson, new genus and species
figures 35–40

TYPE SPECIES: *Huddlestonium exu* Polaszek and Johnson.

DISTRIBUTION: São Tomé and Principe (island of São Tomé), Ivory Coast.

DESCRIPTION: Length: 0.8 mm. Body compact, head and metasoma closely appressed to mesosoma. Head lenticular, convex anteriorly, nearly flat posteriorly, strongly transverse; hyperoccipital carina absent; occipital carina complete medially; vertex and upper portion of frons lacking coarse surface sculpture, with distinctly separated, shallow umbilicate punctures, these superimposed on shallowly reticulate microsculpture (São Tomé), or microsculpture entirely absent (Ivory Coast); lateral ocellus distinctly remote from eye margin, OOL subequal to slightly longer than LOL, shorter than POL; frons strongly convex, without antennal scrobe, weak median carina present, bifurcating above interantennal process and passing on either side of toruli, extending dorsally one-third distance to median ocellus; interantennal process weakly raised, relatively broad, width subequal to diameter of torulus; submedial carinae absent; orbital carina on frons present, extending from anterior mandibular articulation dorsally to merge with inner orbit; area between orbital carina and malar sulcus smooth, without fanlike striae; eye glabrous, small; interocular space broad, distinctly greater than eye height; inner orbits parallel to subparallel, not diverging ventrally; torulus contiguous with upper margin of clypeus, frons curved so that toruli open facing ventrally, dorsal rim slightly overhanging antennal articulation; clypeus small, flat, setose, without protruding anterolateral corners, anterior margin pointed medially, with median longitudinal carina that continues dorsally from point to merge with interantennal process; differentiation into anteclypeus and postclypeus not apparent; malar sulcus present; gena with oblique carina arising from near anterior mandibular articulation, extending posteriorly to merge with occipital carina, anterior to this oblique carina surface depressed, possibly serving as depression for antennal scrobe; mandibles massive, scissorlike, tridentate; mandibular teeth arrayed vertically, acute, deeply incised, right mandible with lower tooth distinctly longer than upper teeth, left mandible with teeth subequal in length; maxillary palpus long, four-segmented, segments 2 and 3 medially expanded into weak lobe; labial palpus two-segmented; female antenna with 13 antennomeres (fig. 38); longitudinal axes of radicle and scape nearly perpendicular to one another; basal half of scape cylindrical, narrow, apical half flattened anteroposteriorly, distinctly expanded; A3 of female not distinctly elongate, shorter than A2; female antenna with nonabrupt clava composed of seven antennomeres, with appressed, white setae on dorsal surface; claval formula 1-2-2-2-2-1.

Mesosoma (figs. 35, 36) short, squat, about as high as wide, viewed from above nearly quadrate; pronotum, in dorsal view, abruptly truncate anteriorly, anterolateral corners strongly angled but not protruding; transverse pronotal carina present; pronotal humeral carina present; dorsal surface of pronotum coarsely areolate-rugose; anterior face of prothorax nearly vertical; lateral surface of



Figs. 35–40. *Huddlestonium exu* Polaszek and Johnson, n.sp. **35,** Holotype female, lateral habitus (OSUC 148692). **36,** Paratype female, dorsal habitus (OSUC 148693). **37,** Holotype female, head, frontal view. **38,** Antenna, lateral view. **39,** Wings. **40,** Ovipositor, lateral (top) and ventral view (bottom). **gp,** gonoplacs. Scale bars in millimeters.

pronotum concave, with weakly developed longitudinal carinae; epomial carina strongly developed and acute, extending down to forecoxa; netrion/epicnemium linear; pronotal–mesoscutal suture concave laterally, exposing large dorsal surface of pronotal humeri; anterior margin of mesoscutum meeting pronotum dorsally; mesoscutum trapezoidal

to subtriangular, moderately convex, anteriormost point contiguous with transverse pronotal carina; skaphion absent; notauli and parapsidal lines absent; anterior half of mesoscutum with umbilicate setigerous punctures, density of punctures decreasing posteriorly, posterior half of sclerite with few scattered umbilicate punctures sublaterally, otherwise shallow reticulate to smooth; transscutal articulation broad, deep; scutellum very large, subtriangular, coarsely areolate-rugose, posterior margin produced into pair of submedial rounded points, anterior margin with broad, regularly spaced deep lacunae; axilla clearly developed; metanotum narrow, dorsellum unarmed, not projecting, delimited by fine transverse carina; propodeum not visible dorsally, posterior surface glabrous, vertical, foramen transversely oval, opening between hindcoxal cavities; mesopleuron relatively narrow, mesepisternum and mesepimeron not differentiated by suture; mesopleural depression shallow; mesopleural pit absent; mesopleural carina indicated by arched line of coarse punctures; upper mesepisternum smooth; sternaulus not developed; anterior margin of ventral portion of mesepisternum moderately extended anteriorly between forecoxae; posterodorsal corner of mesopleuron rounded; mesopleuron and metapleuron separated by distinct suture (fig. 35); metapleuron large, rectangular, posterior margin weakly concave, setose throughout, setae denser in posterior dorsal half; metapleural pit absent; upper angles of posterior margin of metapleuron weakly produced; propodeum with anterodorsal face setose; posterolateral corners of propodeum distinctly projecting posteriorly; legs slender; posterior face of hindcoxa smooth; trochantellus present on all legs; all femora slightly to moderately incrassate, apices with lacking distinct lateral lamellae; tibial spur formula 1-1-1; tarsi 5-5-5, tarsomeres gradually tapering in width toward apex; pretarsal claws small, simple; forewing broad (fig. 39), with marginal cilia short; R (submarginal vein) tracheate, pigmented, rather short, not extending beyond basal 0.4 of wing, broadly remote from costal margin, width of cell gradually expanding apically; no bulla in R basad of apical fork; R_1 very short, not reaching wing margin as tubular vein; r-rs longer but ending blindly as tubular vein; Rs extending beyond apical fork as arched nebulous vein to costal margin; first free segment of M (basal vein) present as nebulous vein, inclined with lower end farther apicad than upper end arising from R; hindwing broad, posterior margin strongly sinuate, marginal cilia short; R tubular, basally remote from costal margin, apically gradually fusing with margin, without distinct angle, marginal vein short; with three hamuli at wing margin.

Metasoma (figs. 35, 36) unusually short and robust, broadly sessile, laterally without sharp edge or submarginal groove; female with six visible terga, five sterna; laterotergites and laterosternites absent; terga nearly flat; sterna strongly convex; lateral margins of terga slightly overlapping over upper margins of sterna; terga 1–4 without sublateral keels, coarsely sculptured; basal margins of terga and sterna crenulate; T1 narrow, striplike, longitudinally costate; T2 strongly transverse, but longer than T1 or T3, basally costate, sculpture becoming areolate-rugose laterally; T6 medially with oval, flat, raised field covered with silvery surface, either microtrichiae or a secretion, laterally with two densely pilose fields; T7 diminished, concealed within metasoma, apparently not extruded with ovipositor, lateral apodemes very short, length 0.10 times length of ovipositor, free in body cavity, length of proximal arms 0.42 times length of ovipositor; cercus short, articulated, truncate, with one pair of long setae and one short seta; T8 not differentiated; S1 very deep, strongly convex, anteromedial portion with sharp median keel extending anteriorly between hindcoxa, coxae fitting into basal depressions in sternite; anterior margin of S2 straight; metasomatic felt fields on S2 absent; apical sternite (S5) without median apodeme; ovipositor (fig. 40) 0.93 times length of metasoma, gonoplacs (gp) 0.36 times length of ovipositor, apex with only four short setae.

DIAGNOSIS: Distinguished from all other extant scelionids and platygastrids by the 13-segmented antennae; very similar to the fossil genus *Archaeoscelio*, but may be distinguished from it by the short and strongly transverse T1 and T2.

ETYMOLOGY: Named in honor of Mr. Tom Huddleston, braconid specialist at the Natural History Museum. The gender of this name is to be considered neuter. The specific epithet refers to Exu, the West African messenger spirit.

MATERIAL EXAMINED: Holotype female: **SÃO TOMÉ**: Bom Successo, ECOFAC compound, 7–13.vi.1999, A. Polaszek, Malaise (OSUC 148692, deposited in BMNH). Paratypes: Three females with same data as holotype (OSUC 148694–148696). **IVORY COAST**: Bouaflé, Degbézéré, 6–9.iii.1984, M. Matthews, 1 female (OSUC 148693). Deposited in BMNH, CNCI.

REMARKS: The mainland specimen differs from the series from São Tomé in lacking the shallowly incised reticulate microsculpture and the umbilicate punctures on the head.

KEY TO GENERA RELATED TO *ARCHAEOSCELIO* BRUES

The most current key for the identification of world genera of Scelionidae (Masner, 1976) begins by separating the three subfamilies. The genera treated here clearly do not belong to either the Teleasinae or Telenominae, but they do not match the characters used to distinguish the Scelioninae. Nevertheless, if one tries to identify the two extant genera *Plaumannion* and *Huddlestonium*, the key fails at couplet 60 in which the relative length of the stigmal vein is evaluated. Neither genus has a classical stigmal vein and so fits neither half of the couplet. The key may be modified as follows to accommodate these two new genera:

60. Scutellum produced medially into elongate spine or weakly bidentate process . . . 60a
– Scutellum rounded medially 60b
60a. Antenna 12-merous; apex scutellum with elongate medial spine; T1 moderately to distinctly longer than T2; basal metasomatic tergites with well-developed submarginal longitudinal keels. . . *Plaumannion,* n. gen.
– Antenna 13-merous; apex of scutellum with weakly bidentate process; T1 shorter than T2; basal metasomatic tergites without submarginal longitudinal keels. . . . . *Huddelstonium,* n. gen.
60b. As in existing couplet 60

The following key may be used to distinguish the taxa treated in this paper, all of which have the mesepisternum produced anteriorly between the forecoxae, S1 produced anteriorly between the hindcoxae, and, depending on one's perspective, either lack laterotergites or have a different mechanism locking together metasomatic terga and sterna. This short key mixes fossil and extant taxa and is presented as a means of summarizing the diagnoses for each.

1. Notauli well developed, percurrent (figs. 18, 21, 24); mesopleuron and metapleuron fused, suture separating the two sclerites absent (fig. 16); radicle inserted at basal apex of scape, parallel to long axis of scape (fig. 20) . . . . . *Cobaloscelio,* n. gen.
– Notauli absent (figs. 4, 9, 26, 32, 36); mesopleuron and metapleuron separated by distinct suture (figs. 3, 12, 25, 31, 35); radicle inserted subbasally into scape, more or less perpendicular to long axis of scape (figs. 2, 27, 38) 2
2. T1 moderately to distinctly longer than T2 (figs. 26, 30, 32); apex of scutellum produced into elongate, medial point (figs. 25, 31); antenna 12-merous . . *Plaumannion,* n. gen.
– T1 subequal in length to T2 or shorter (figs. 1, 3, 10, 35); apex of scutellum produced medially, weakly bidentate (figs. 6, 36); antenna with 13 or 14 antennomeres (figs. 4, 7, 10, 38) 3
3. Mesoscutum coarsely rugose-reticulate throughout (4, 9); antenna 14-merous (figs. 4, 5, 7, 10, 12). . . . . *Archaeoscelio*
– Mesoscutum smooth and polished posteriorly (fig. 36); antenna 13-merous (fig. 38). . . . . *Huddlestonium,* n. gen.

DISCUSSION

It is tempting to ascribe some biogeographic significance to the apparently complementary distributions of *Huddlestonium* and *Plaumannion* in Africa and South America, respectively. The superfamily Platygastroidea is well represented in fossils from the mid-Cretaceous (Grimaldi et al., 2002), predating the final physical separation of those two continents. Among other scelionids, *Chromoteleia* Ashmead is found in the Neotropics as well as West Africa. In addition, a few living taxa, with relatively good numbers of collections, exhibit transantarctic distributions, for example, *Archaeoteleia* Masner (Chile and New Zealand) and *Proplatygaster* Kieffer (Chile and Australia). The two extant

genera treated here may yet be another case to add to this list, but the level of ignorance concerning their real geographic distributions mandates that this should be done only with extreme caution.

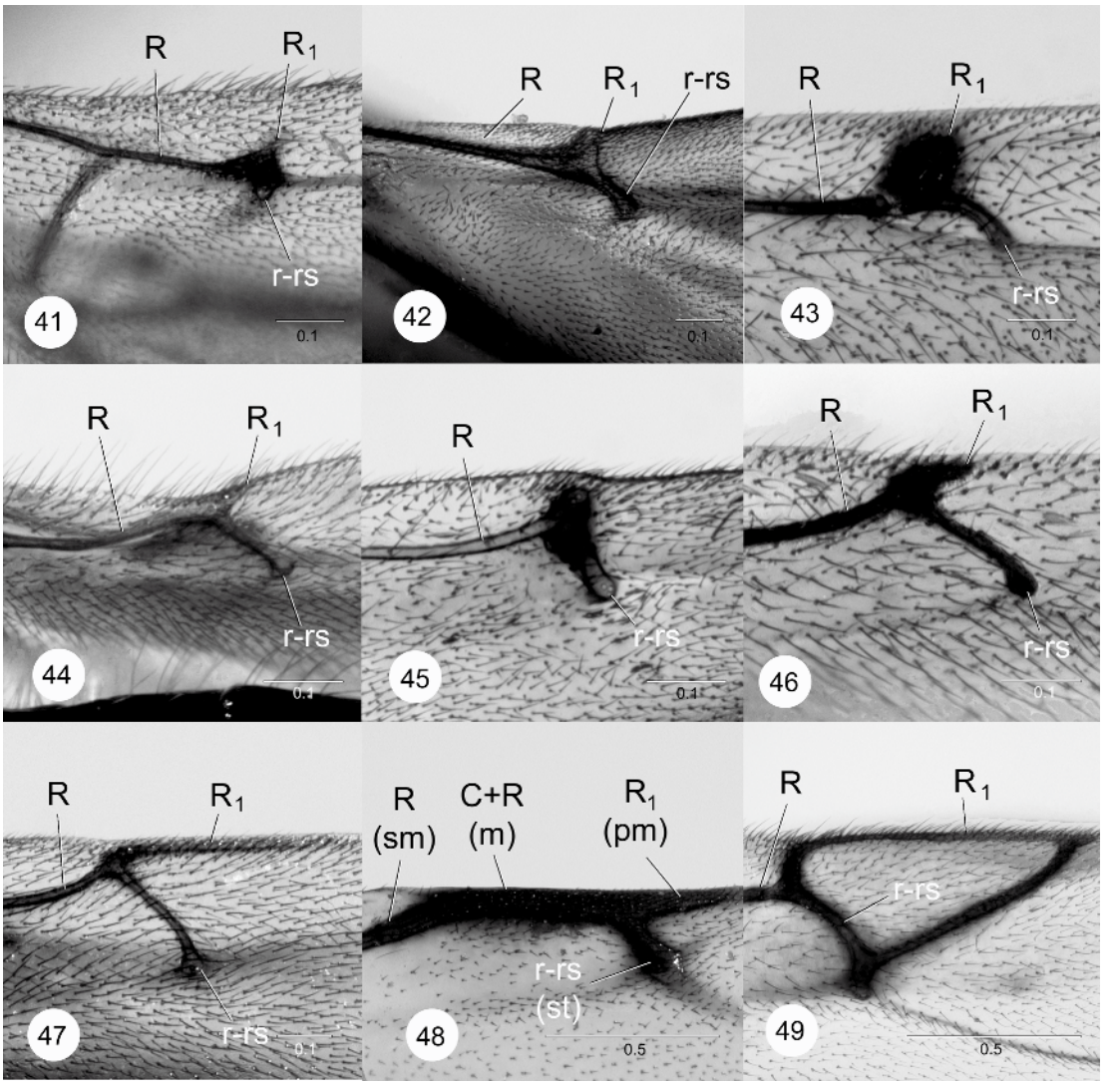
Even less information is available concerning host relationships. *Plaumannion fritzi* was collected by sifting litter; the series of *Huddlestonium exu* from São Tomé was captured in a Malaise trap in grassland with tall shrubs. The robust body of the adult wasps suggests that the host, presumably an egg, is probably a prolate spheroid in shape. The short, *Ceratobaeus*-type ovipositor implies that the parasitoid is capable of coming in close contact with the egg.

When we first began studying this group of genera, one troubling issue was how the reduced venation could be reconciled with that found in other members of the family. In the typical interpretation of the tubular veins of scelionids (figs. 41–47) and chalcidoids (fig. 48), there is a more or less elongate submarginal vein (figs. 41–47, R, venational homologies from Goulet and Huber, 1993, Sharkey and Roy, 2002; fig. 48, sm) that curves toward the costal margin apically. As the vein meets and then runs toward the apex along this margin it is referred to as the marginal vein (fig. 48, C+R; also fig. 44). Somewhere along its length the stigmal vein (fig. 48, st; figs. 42–47, r-rs) branches off obliquely. The vein that continues along the margin beyond the origin of the stigmal vein is called the postmarginal vein (fig. 48, pm; figs. 44, 46, R_1).

One problem with this interpretation is that there are a number of scelionids (figs. 43, 45, 46, 47) in which the stigmal vein arises from the submarginal vein and not the marginal; that is, r-rs arises basad of any possible fusion of R with C. In such a case, the marginal vein is absent or ''punctiform'' (fig. 47). We suggest that platygastroid wing venation may be better understood and homologized by comparison with the wings of Cynipoidea, in particular, with the wings of Liopteridae (fig. 49, Ronquist 1995: fig. 39). Such a comparison may be useful only in that cynipoids may retain some plesiomorphic characteristics in the layout of their wing venation. We are not asserting that Platygastroidea and Cynipoidea are sister groups. The relationships of platygastroids with other Apocrita are not at all resolved, and the true sister group may be any one or a combination of several other groups (see summary in Austin et al., 2005).

We hypothesize that in the platygastroid groundplan, the stigmal vein (r-rs) arises from R_1 before the latter reaches the costal margin of the wing. Such a condition is found in all Platygastridae in which veins are present, as well as most of the putatively basal clades in Scelionidae, viz., Nixoniini (fig. 42), Sparasionini (fig. 43), Scelionini (fig. 45), and some Baryconini (figs. 46, 47). The illustration of the wing venation in the sparasionine genus *Archaeoteleia* in Dangerfield et al. (2001: fig. 5.18) shows that what appears to be a marginal vein is in fact merely pigmentation between the apex of the submarginal vein and the costal wing margin. *Neuroscelio*, however, has a well-developed marginal vein (fig. 44; fig. 5.21 *in* Dangerfield et al., 2001). In other groups (e.g., many Baeini), the stigmal vein arises at the point where R_1 reaches the costal margin and there is no marginal vein per se. The published illustrations of the venation in the fossil species *Brachyscelio cephalotes* Brues (Brues, 1940; Dangerfield et al., 2001) are misleading. We have reexamined the holotype of this species upon which these illustrations are based. The depiction of R_1 as distant from the costal margin is an artifact of preservation: the wing is surrounded by a slightly larger pocket, of exactly the same shape, as if the wing shrunk away after the amber hardened around it. Thus, the wing venation, clearly visible because of its darker color, appears to be distinctly separated from the apparent costal margin. In fact, R_1 runs along the costal margin of the wing in a completely normal manner.

If the plesiomorphic condition is that r-rs branches from R behind the costal margin, then there seems to be no reason to postulate that C is involved in the formation of the marginal vein. Rather, it would be entirely composed of R_1, and this is the homology used in Dangerfield et al. (2001). It appears to us that the development of a marginal vein occurred as an event within the family Scelionidae, perhaps on more than one occa-



Figs. 41–49. Detail of forewing venation; apex of wing to right. **41,** *Proplatygaster* sp. (Platygastridae). **42,** *Nixonia watshami* Johnson and Masner (Scelionidae: Nixoniini). **43,** *Sceliomorpha* sp. (Scelionidae: Sparasionini). **44,** *Neuroscelio doddi* Galloway, Masner, and Austin (Scelionidae: putatively Gryonini). **45,** *Heptascelio* sp. (Scelionidae: Scelionini). **46,** *Oxyscelio* sp. (Scelionidae: Baryconini). **47,** *Chromoteleia* sp. (Scelionidae: Baryconini). **48,** *Phasgonophora* sp. (Chalcidoidea: Chalcididae). **49,** *Liopteron* sp. (Cynipoidea: Liopteridae). **m**, marginal vein; **pm**, postmarginal vein; **sm**, submarginal vein; **st**, stigmal vein. Scale bars in millimeters.

sion. Thus, if a marginal vein is present in the groundplan of Chalcidoidea, this feature would not be homologous with the similar vein in Platygastroidea.

The family Scelionidae is generally recognized by the possession of a so-called "submarginal ridge", a feature formed by the narrow interlocking laterotergites and laterosternites. This is characteristic of most Scelioninae and all Teleasinae. However, many species, for example, in the Telenominae, Aradophagini, some Thoronini, and some Baeini, have a somewhat different structure, with broad laterotergites that exten-

sively overlap the sterna beneath; telenomines, moreover, lack laterosternites. In the four genera described in this paper an entirely different metasomatic structure is found: the terga and sterna abut closely and tightly, but no subdivisions are found. The terga and sterna do not appear to be fused, as demonstrated by dissections of *Huddlestonium* and the postmortem inflation of the metasoma in some specimens of *Archaeoscelio* (e.g., fig. 1).

These results suggest that we should reconsider the characters that have been used to define the family Scelionidae. Austin and Field (1997) have already suggested that Sparasionini and Platygastridae form a monophyletic, basal branch of the platygastroid phylogeny. Our results are consistent with the hypothesis that the family Scelionidae is not monophyletic, but they do not resolve the questions that flow from that proposition. We could reasonably argue that the four genera discussed here should be recognized as a new higher taxon, at least at the tribal level and perhaps even representing a new family. To do so, however, begs the question of defining other monophyletic groups within the superfamily and documenting their relationships. A formal reclassification requires a broadly based phylogenetic analysis, a goal toward which we are presently working.

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