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Revision of the New World species of *Erythrodolius* (Hymenoptera: Ichneumonidae: Sisyrostolinae), with a key to the world species

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Abstract

The genus *Erythrodolius* previously comprised ten species of ichneumonids: nine from Madagascar and one from Costa Rica. The current study revises the New World species of *Erythrodolius* including descriptions of three new species from Central America which brings the world total to 13 species: *E. incompletus* **sp. n.**, *E. luteus* **sp. n**. and *E. tenebrosus* **sp. n**. A key to the world species is provided. Justification for the preference of the subfamily name Sisyrostolinae instead of Brachyscleromatinae is provided.

Key words: *Erythrodolius*, Ichneumonidae, Sisyrostolinae, Brachyscleromatinae, New World revision, parasitoid, taxonomy, tropical

Introduction

Erythrodolius Seyrig (Hymenoptera: Ichneumonidae: Sisyrostolinae) is a small genus of moderately large parasitoid wasps (fore wing length 7.0 to 19.0 mm) that was thought to be restricted to Madagascar (Seyrig 1932, 1934) until a single species was discovered in Costa Rica (Gauld et al. 1997). Considering undescribed material, the genus is more widespread in central and southern Africa (Gauld et al. 1997) and several species occur in Central America, as detailed in this study. Based on its relatively widespread distribution in both the New World tropics and sub-Saharan Africa, *Erythrodolius* is possibly also present in the Oriental tropics, but to date, no specimens have been collected from this region. The finding of three, all apparently rare, new species from Central America is surprising as no species of the genus have been found during the large-scale and long-term ichneumonid sampling programmes taking place in tropical South America (e.g. Sääksjärvi et al. 2004, Veijalainen et al. 2013). However, these studies have concentrated especially on ichneumonids occurring in tropical lowland rain forests and more intense sampling effort may produce new species of *Erythrodolius* from the tropical Andes. These tropical highlands have produced some interesting new findings of rare and large-sized ichneumonids during the last few years, e.g. the first South American species of Acaenitinae (Castillo et al. 2011). Nothing is known of the biology of any species of *Erythrodolius* (but see generic description below for biology of putatively related taxa). The current paper describes three new species, one each from Mexico, Guatemala and Honduras bringing the total number of described species in the genus to 13. In addition, the study produced some new information on intraspecific variation and distribution of the previously described Central American species, *E. griffithsorum* Gauld. We also provide a key to the world species of the genus and justification for the preference of the subfamily name Sisyrostolinae instead of Brachyscleromatinae.

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Materials and methods

Specimens are deposited in the following institutions: Canadian National Collection of Insects (CNC); Natural History Museum, London (BMNH); Zoological Museum, University of Turku, Finland (ZMUT). In addition to the Neotropical specimens listed below, Afrotropical specimens were examined from the following collections: American Entomological Institute, Gainesville, Florida (AEIC) (D. Wahl), California Academy of Sciences, San Francisco, California (CAS) (R. Zuparko), Texas A & M (TAMU) (R. Wharton) as well as CNC and BMNH.

The new Guatemalan, Honduran and Nicaraguan specimens were collected by the LLAMA project (coordinated by J.T. Longino) with ground-level Malaise traps. Observations at ZMUT were made using an Olympus SZX10 stereomicroscope. Layer photos of holotypes were taken using an Olympus SZX16 with motorized focus drive attached to an Olympus E520 digital camera. Digital photos were combined using the programmes Deep Focus 3.1 and Quick PHOTO CAMERA 2.3. Digital photos at the CNC were made using a Leica MZ16 stereomicroscope with motorized focus drive attached to a Leica DFC420 digital camera. Photos were combined using Leica Application Suites Montage Multifocus software. Morphological terms and forms of description follow those of Gauld et al. (1997) except that the height of the face is measured from the ventral edge of the antennal sockets to the dorsal edge of the clypeus compared to the width of the face which is the shortest distance between the eyes. Note that some characters are fixed among all the four New World species, but these characters are still included in the species descriptions because these characters are not fixed in some Old World species (e.g., the oblique grooves on T2).

Taxonomy

Seyrig (1932) described *Erythrodolius*, placing it within a newly defined tribe Sisyrostolini in the subfamily Pimplinae. Within this tribe, he also placed another newly described genus *Icariomimus* Seyrig as well as *Melanodolius* Saussure, the type genus (based on its junior synonym, *Sisyrostolus* Kriechbaumer). Seyrig (1932) argued that this new tribe belonged to the Pimplinae (in the broad sense) based on the placement of the spiracle of T1 anterior to the middle of the segment (unlike in Ichneumoninae and Cryptinae), the lack of a notch on the ovipositor (unlike Ophioninae), and the long ovipositor (unlike in Tryphoninae). Later, Townes et al. (1961) defined the subfamily Brachyscleromatinae to accommodate the morphologically distinct *Brachyscleroma* Cushman. Subsequent to this study, Townes (1971) grouped *Brachyscleroma* and the genera of Seyrig's Sisyrostolini within the subfamily Phrudinae, which previously comprised the genus *Phrudus* and several other closely related genera and putatively related to Tersilochinae. The latter association was based partly on the shared biology of endoparasitism of Coleoptera larvae in Tersilochinae and in *Brachyscleroma apoderi* (Cushman) and *Earobia paradoxa* (Perkins). The biology of other phrudine genera was, and mostly remains, unknown. This move by Townes (1971) therefore implied that *Erythrodolius* and relatives were more closely related to Ophioninae than Pimplinae (because tersilochines have a notched ovipositor and are therefore thought to be related to ophionines; e.g. Wahl 1991). More recently, Quicke et al. (2009), in a combined molecular and morphological phylogenetic analysis, supported the hypothesis that *Phrudus*, *Brachyscleroma* and *Erythrodolius* were related to Ophioninae (within the Ophioniformes group of subfamilies sensu Wahl 1991), but found that the *Phrudus* group of genera did not cluster with Brachyscleroma and *Erythrodolius*. Instead, the *Phrudus* group formed a grade (along with Neorhacodinae) with the Tersilochinae and consequently, these taxa were moved into an expanded Tersilochinae. *Brachyscleroma*, *Erythrodolius* and relatives were removed from Phrudinae and placed within the resurrected subfamily Brachyscleromatinae Townes, 1961 (Quicke et al. 2009). Unfortunately, Quicke et al. (2009) overlooked the priority of Seyrig's (1932) Sisyrostolinae, based on *Sisyrostolus* Kriechbaumer, 1895, a junior synonym of *Melanodolius* Saussure, 1892. This is a straightforward case of priority of one family-group name over another, with Sisyrostolinae being the valid name.

The Sisyrostolinae, as currently defined, comprises six genera: *Brachyscleroma* Cushman (Afrotropical and Oriental), *Erythrodolius* Seyrig (Afrotropical, including Madagascar, and Neotropical), *Icariomimus* Seyrig (Afrotropical: Madagascar), *Laxiareola* Sheng and Sun (Oriental), *Lygurus* Kasparyan (Eastern Palaearctic and Oriental) and *Melanodolius* Saussure (Afrotropical) (Quicke et al. 2009; Sheng & Sun 2011). Because not all genera of the Phrudinae s.l. were included in the analysis of Quicke et al. (2009), it is possible that some of the

omitted genera (e.g., *Notophrudus* Porter, *Peucobius* Townes) could end up being more closely related to Sisyrostolinae than the *Phrudus* group of genera. Brachyscleromatinae (now called Sisyrostolinae) was distinguished from all other subfamilies of ichneumonids by Quicke et al. (2009) by possession of the combination of the following characters: (1) sternites mostly sclerotized and laterotergites large; (2) scape cylindrical (rather long and narrow); (3) proboscidial fossa strongly narrowed; (4) ovipositor lacking notch; and (5) hind wing vein M+Cu long relative to vein 1-M.

Erythrodolius Seyrig, 1932

Figs 1–16

Erythrodolius Seyrig, 1932, 115. Type species: *Erythrodolius maculosus* Seyrig, 1932 by original designation.

Diagnosis: *Erythrodolius* can be distinguished from other genera of the Sisyrostolinae by the following combination of characters: 1) fore wing with vein 3rs-m absent, so that cell 1+2Rs (areolet) is open; 2) tarsal claws simple (not pectinate); 3) clypeus smoothly convex in profile, lacking a transverse medial ridge; 4) posterior transverse carina of propodeum present; 5) tergite 1 relatively slender, at least 2.5 times as long as posterior width. As the subfamily is currently defined, *Erythrodolius* is the only genus known from the New World.

Description: Fore wing length 7.0 to 19.0 mm. Clypeus well-separated from face by a suture, smoothly convex to almost flat in profile, lacking a transverse ridge medially, with a medial apical tooth (Figs 5–8) or with about six rounded crenulations medially. Frons with a median, longitudinal carina between antennal bases. Occipital carina joining hypostomal carina (not mandible). Pronotum lacking epomia. Mesoscutum with notauli weak to moderately deep, extending posteriorly to less than midpoint of mesoscutum (Fig. 16). Posterior transverse carina of mesosternum incomplete, present medially, but absent anterior to mid coxae. Propodeum with all carinae present (most species) (Figs 9, 11, 12) or in some species, the anterior transverse carina and/or longitudinal carina medially absent (Fig. 10). Pleural carina complete (Figs 13–15). Propodeal spiracle nearly round to narrowly ovoid. Apex of fore and mid tibiae each with a tooth anteriorly. Tarsal claws simple. Fore wing with vein 3rs-m absent, vein 2m-cu with one bulla (Fig. 4). Hind wing with distal abscissa of vein Cu1 present, joining vein cu-a closer to vein 1A than to vein M (Fig. 4). Metasoma with tergite 1 slender anteriorly, at least 2.5 times as long as posteriorly wide, glymmae deep, separated only by a translucent partition, spiracles slightly anterior to midpoint of segment (Fig. 2). Metasomal segment 2 with laterotergites wide and completely separated from tergite by a crease (Fig. 2). Ovipositor 1.0 to 3.5 times as long as length of hind tibia, straight or gently to strongly upcurved (Figs 1–4).

Species included: 13 (see key), including 3 new species described below.

Distribution: Afrotropical (Madagascar, central and southern Africa) and Neotropical (Central America).

Biology: Unknown; the only host record for the subfamily is for a species of *Brachyscleroma* that has been reared from a weevil: *Apoderus quadripunctatus* (Gyllenhal) (Coleoptera: Curculionidae) (Cushman 1940).

Comments: *Erythrodolius* forms a putatively monophyletic group with all other genera of Sisyrostolinae except *Brachyscleroma* based on the synapomorphies of the loss of vein 3rs-m and the presence of an apical tooth on the anterior of the fore tibia. It appears to be most closely related to the monotypic *Icariomimus*, differing only in that the latter genus has a large round protuberance between the antennal bases (absent in *Erythrodolius*) and the propodeal carinae: *Icariomimus* has a complete anterior transverse carina but the posterior transverse carina is lacking except laterally, whereas all species of *Erythrodolius* have a strong posterior transverse carina, at least medially, and the anterior transverse carina may be present or absent. As more species of *Erythrodolius* are described from the Afrotropical region it may be found that *Icariomimus* renders *Erythrodolius* paraphyletic, but for the moment, both genera are maintained. The New World species of *Erythrodolius* all possess an upcurved, relatively short ovipositor (much shorter than the length of the body). In comparison all Old World species have an ovipositor that is equal to or longer than the body, and for the species examined (*E. maculosus* Seyrig, *E. calamitosus* Seyrig and two undescribed species), the ovipositor is straight.

Key to the world species of *Erythrodolius* (Ichneumonidae: Sisyrostolinae)

1. Propodeum with area superomedia not surrounded by carinae, with only the posterior transverse carina present medially (Fig. 10) 2
- Propodeum with area superomedia bordered by at least the posterior transverse carina and strong to weak vestiges of the medial, longitudinal carinae (Figs 9, 11, 12) (anterior transverse carina present or absent medially) 3
2(1). Clypeus medially with a long, strong, sharply pointed tooth that is well-defined by carinae from the lateral parts of the clypeus . . . . . *E. granulosus* Seyrig (Madagascar)
- Clypeus medially with a short, rounded tooth that is not defined laterally by carinae (Fig. 6) . . . . . *E. incompletus* **sp. n.** (Guatemala)
3(1). Mesoscutum predominantly dark brown, either completely or with a small amount of lighter colour near notauli and medioposteriorly (Fig. 16). Fore wing with membrane uniformly coloured, without a dark region apically (Figs 1, 4) 4
- Mesoscutum predominantly light coloured (brownish yellow, orange or brownish red). Fore wing with membrane with or without a dark region apically (Figs 2, 3) 5
4(3). Frons (Fig. 5), scutellum and hind femur (Fig. 1) predominantly brownish yellow. Propodeum with medial abscissa of anterior transverse carina present or absent . . . . . *E. griffithsorum* Gauld (Costa Rica, Nicaragua)
- Frons (Fig. 8), scutellum, and hind femur (Fig. 4) completely dark brown. Propodeum with medial abscissa of anterior transverse carina present. . . . . *E. tenebrosus* **sp. n.** (Mexico)
5(3). Clypeus without a medial tooth on apical edge, but with about six, low crenulations instead. 6
- Clypeus with a medial tooth on apical edge or at least slightly protruding medially, but without crenulations (Figs 5–8) 7
6(5). Fore wing with a well-defined brown spot apically and a second brown region more basally, surrounding veins Rs&M and cu-a . . . . . *E. speciosus* Seyrig (Madagascar)
- Fore wing slightly darkened apically relative to base, but without a well-defined brown spot and lacking any dark area around veins Rs&M and cu-a . . . . . *E. formosus* Seyrig (Madagascar)
7(5). Propodeum with the lateral abscissae of the anterior transverse carina (costula) absent or weak (as in Fig. 10). 8
- Propodeum with lateral abscissae of anterior transverse carina present and strong (Fig. 11). 9
8(7). Fore wing hyaline basally with a well-defined dark region apically (as in Fig. 3). . . . . *E. meticulosus* Seyrig (Madagascar)
- Fore wing completely hyaline, without a well-defined dark region apically (as in Fig. 1) . . . . *E. dolosus* Seyrig (Madagascar)
9(7). Flagellum dark brown to black basally with a well-defined, medial light-coloured band and then dark apically 10
- Flagellum red or yellow basally, darkening apically but without a medial, light-coloured band (Fig. 3) 11
10(9). Fore wing darkened apically and also with two medial infumate bands, one basal to the stigma (around vein Rs&M) and one apical to it including the vein 2rs-m (intercubitus of areolet). . . . . *E. scrupulosus* Seyrig (Madagascar)
- Fore wing with a dark spot apically, but lacking any darkened regions basally or medially (as in Fig. 3) . . . . . *E. calamitosus* Seyrig (Madagascar)
11(9). Tergites 4 to 7 dark brown. Fore wing only vaguely more infumate apically than basally (without a clearly defined dark spot). . . . . *E. dubiosus* Seyrig (Madagascar)
- All metasomal tergites orange (laterotergites 3 and 4 may be brown). Fore wing with a clearly defined dark spot apically (Fig. 3) 12
12(11). Metasomal laterotergites 3 and 4 brown (Fig. 3). Ovipositor strongly upcurved and much shorter than length of metasoma . . . . . *E. luteus* **sp. n.** (Honduras)
- Metasomal laterotergites 3 and 4 orange. Ovipositor straight and about two times as long as metasoma . . . . . *E. maculosus* Seyrig (Madagascar)

Erythrodolius griffithsorum Gauld, 1997

Figs 1, 5, 9, 13

Diagnosis. *Erythrodolius griffithsorum* can be distinguished from all other described species of *Erythrodolius* by the combination of the following characters: 1) mesoscutum predominantly brown, except brownish yellow anterolaterally along length of notauli and medioposteriorly (similar to Fig. 16); 2) scutellum brownish yellow (as in Fig. 16) (not brown as in *E. tenebrosus* **sp. n.**). *Erythrodolius griffithsorum* and *E. tenebrosus* **sp. n.** are the two darkest described species of *Erythrodolius*, all other described species being predominantly yellowish brown or orange.

Description. Female. Fore wing length 7.6 to 13.6 mm. Face about 2.2 to 2.4 times as wide as high, punctate, the punctures separated by about their own diameter. Malar space about 0.6 to 0.7 times as high as basal width of mandible. Clypeus with a low, rounded medial tooth (Fig. 5). Ocellar-ocular distance about 2.0 times as long as maximum diameter of posterior ocellus. Antenna with 27–32 flagellomeres.

Mesoscutum polished and finely punctate, punctures in middle of lateral lobe separated by about 2 times their own diameter, much more coarsely and densely punctate on medial lobe. Scutellum with lateral carinae at base

only. Mesopleuron polished with fine punctures separated by about their own diameter except impunctate on speculum. Metapleuron sparsely punctate ventrally and medially (punctures separated by one to two times their own diameter), densely punctate dorsally and posteriorly (punctures close to touching), juxtacoxal carina incomplete (Fig 13). Propodeum polished and impunctate with all carinae present (Fig. 9), except medial abscissa of anterior transverse carinae weak or absent in some specimens.

Tergite 1 about 3 times as long as posteriorly wide. Tergite 2 without oblique grooves. Ovipositor slightly and evenly upcurved, about 1.0 to 1.1 times as long as length of hind tibia (Fig. 1).

FIGURE 1. Lateral habitus, *Erythrodolius griffithsorum* , female, non-type (ZMUT).

Brownish yellow. Apical 21 or 22 flagellomeres, mandibular teeth, anterior half of medial lobe of mesoscutum, most of lateral lobes of mesoscutum except around notauli and basal 0.6 of ovipositor dark brown. Distal hind tarsomeres, anterior two-thirds of tergite 2, all of tergite 3 except anterior quarter, tergites 4+, laterotergites associated with tergites listed above, hypopygium and ovipositor sheaths medium brown. In addition, many edges

of sclerites and carinae are coloured more brown than yellowish brown (e.g., edges of mesopleuron, occipital, epicnemial and propodeal carinae). Wings tinged uniformly yellow (no darkening at apex of fore wing) (Fig. 1), pterostigma translucent orange brown.

FIGURE 2. Lateral habitus, *Erythrodolius incompletus*, female, holotype.

Male. As female, except fore wing length 7.0 to 8.7 mm; antenna with 26 to 29 flagellomeres; subapical flagellomeres more elongate than in female, none are transverse; tergite 1 3.2 to 4.0 times as long as posteriorly wide. All flagellomeres are dark brown except the basal two. Metasoma is darker than in female, with less contrast between dark base and pale apex of second tergite. Hind tarsus is medium brown at base, darkening to apex, darker brown on dorsal surface. Gonoforceps are medium brown. One male from BMNH (Coto Brus, 1992) is brighter yellow than the other examined specimens, especially on the pleura of the mesosoma, scutellum and propodeum. In addition, the distal fore and mid tarsomeres and posterior nine tenths of tergite 3 of this specimen are darker (medium brown as opposed to brownish yellow).

Distribution. Costa Rica, Nicaragua.

Material examined. Paratypes: COSTA RICA; 9♀, Guanacaste, Guanacaste National Park, Volcán Cacao,

Estacio Cacao [= Mengo], 1000m, v–xii.1988 (Gauld and Janzen) (BMNH); 1♀, as above except, Estacion Pitilla, 680 m, v–vii,1988,ii.1990 (Gauld and Janzen) (BMNH); 1♀, Amistad National Park, 1500 m, iii–iv.1989 (Gauld) (BMNH); 1♀,1♂, Coto Brus, San Vito district, Las Alturas Biological Station, 1500 m, v.1992 (Gaston) (BMNH); 2♀,1♂, as above except iv.1993. New material: NICARAGUA; 1♀, Jinotega: RN Datanli El Diablo, 1330m ± 10m, 13.09662 -85.86970, 18–21 May 2011, Malaise trap, Cloud forest, LLAMA#Ma-D-04-2-02 (Longino et al. leg.) (ZMUT).

FIGURE 3. Lateral habitus, *Erythrodolius luteus*, female, holotype.

Comments. The original description stated that the medial abscissa of the anterior transverse carina was absent, therefore the area basalis and area superomedia are confluent. This is true of some specimens, although in others, the abscissa is present, varying from weak to strong. Whilst most female specimens have the basal five or six flagellomeres pale yellow, one female paratype in BMNH (Guanacaste, 680m, iii.1990) has only the basal three (and partly the fourth) flagellomeres pale, as does the Nicaraguan specimen (Fig. 1). These specimens also have generally darker colouration (pale notaular stripes lacking, extensively dark on the vertex) and blunt mandibular teeth; we presume that this is intraspecific variation. This species has been collected most commonly in wet forest

between 600 m and 1500 m, although it has also been collected in dry forest at 300 m and wet forest at 100 m (Gauld et al. 1997). The species is herein recorded for the first time outside Costa Rica. However, Gauld et al. (1997) had already reported the species to be widely distributed within Costa Rica, ranging from the Nicaraguan border south to the Panamanian border.

FIGURE 4. Lateral habitus, *Erythrodolius tenebrosus*, female, holotype.

***Erythrodolius incompletus* Bennett, Sääksjärvi, & Broad sp. n.**
Figs 2, 6, 10, 14, 16

Diagnosis. *E. incompletus* **sp. n.** may be easily identified from the other species of the genus by the combination of the following characters: 1) mesoscutum with three longitudinal dark stripes (on lateral and central lobes) (Fig. 16), 2) clypeus with a medial tooth on apical edge (Fig. 6), and 3) propodeum with highly reduced carination (Fig. 10).

Description. Female. Fore wing length about 9 mm. Face about 2.4 times as wide as high. Malar space about 0.7 times as high as basal width of mandible. Clypeus with a low, rounded medial tooth (Fig. 6). Ocellar-ocular distance about 2.7 times as long as maximum diameter of posterior ocellus. Antenna with 28 flagellomeres.

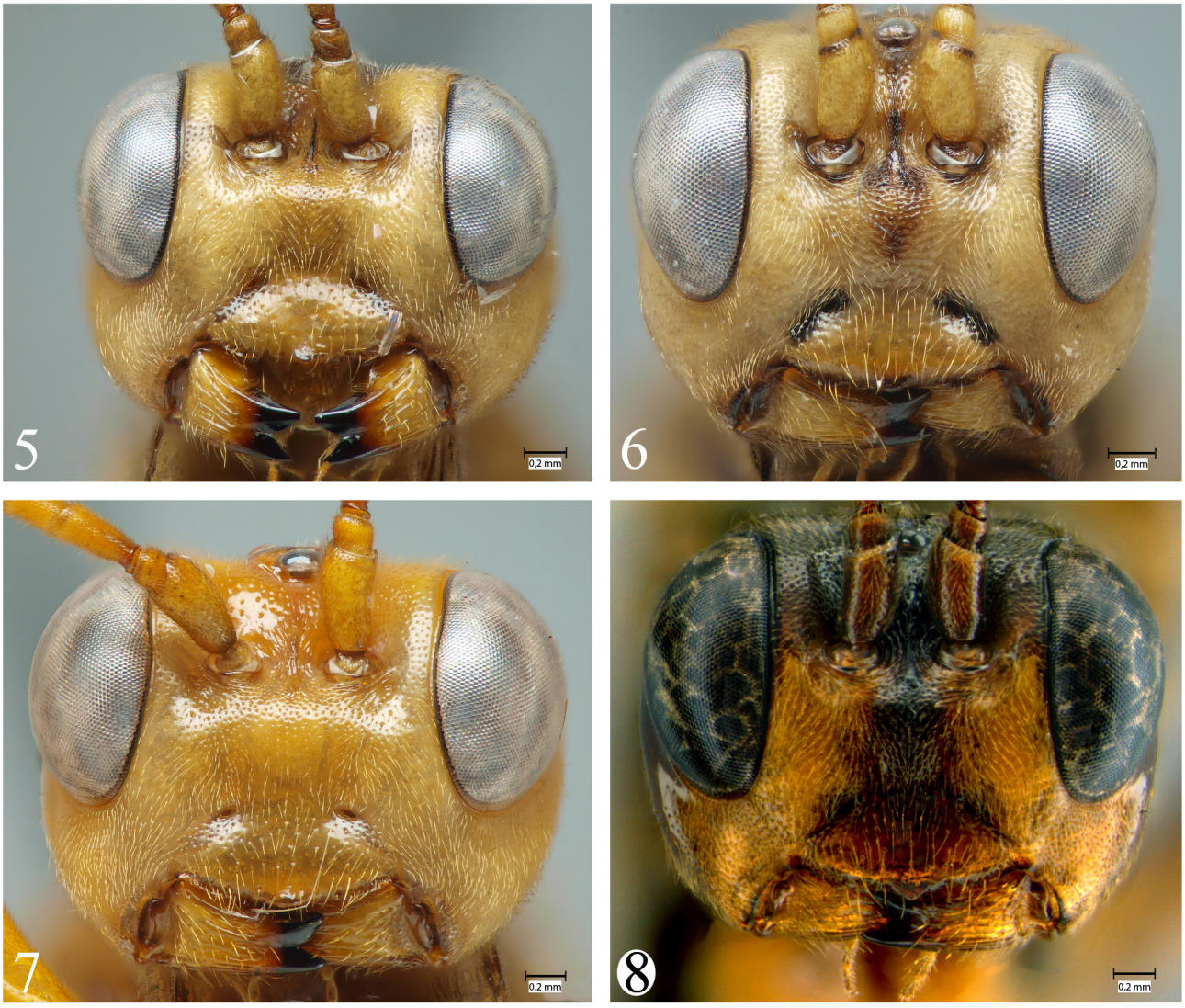
Mesoscutum subpolished and finely punctate, punctures in middle of lateral lobe separated by about their own diameter (Fig. 16). Scutellum with lateral carinae at base only. Mesopleuron dorsally polished, ventrally punctate, punctures separated by about 2 times their own diameter. Metapleuron punctate, juxtacoxal carina complete (Fig. 14). Propodeum with highly reduced carination, posterior transverse carina present, medial and lateral longitudinal carinae present at extreme anterior and posteriorly only (absent medially), anterior transverse carina completely absent, surface subpolished and weakly, transversely rugose (Fig. 10).

Tergite 1 about 2.8 times as long as posteriorly wide. Tergite 2 without oblique grooves. Ovipositor straight in basal third, strongly upcurved medially, then straight apically, about 1 times as long as length of hind tibia.

Yellow with dark brown-black mandibular teeth, markings on occipital area, tips of antennae (first 15 flagellomeres yellowish), edges of pronotum, anterior and posterior edges of mesopleurum, posterior part of mesopleuron, mesosternum, lateral and central lobes of mesoscutum (three longitudinal dark stripes), most carinae of propodeum, hind coxae, tergites 1–4, laterotergites, sternites, ovipositor sheaths and ovipositor (ovipositor lighter apically). Wings slightly yellowish; fore wing with a very faint darker area apically; pterostigma dark brown (Fig. 2).

Male. Unknown.

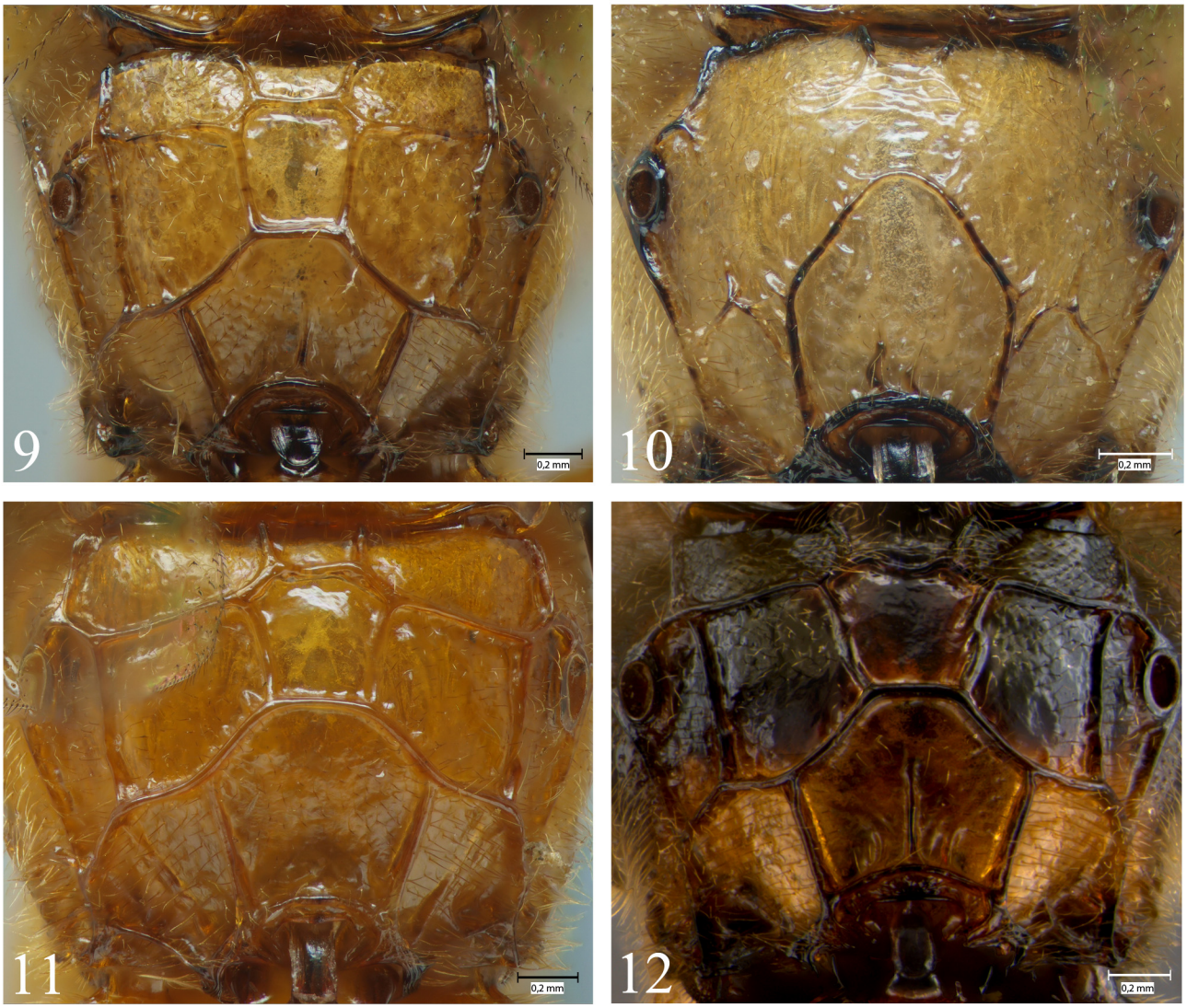
Distribution. Guatemala.



FIGURES 5–8. Head, anterior view, *Erythrodolius* spp. females. 5. *E. griffithsorum*, non-type (ZMUT); 6. *E. incompletus*, holotype; 7. *E. luteus*, holotype; 8. *E. tenebrosus*, holotype.

Material examined. Holotype: ♀: GUATEMALA: Suchitepéq, 4 km S Vol. Atitlán, 1580 ± 7m, 14.54804 °N, 91.19108 °W, cloud forest, 15–18 Jun 2009, Malaise, LLAMA#Ma-B-09-1-01 (Longino *et al.* leg.) (ZMUT).Condition of type: intact except for missing right middle leg beyond trochanter.

Etymology. The specific name refers to the strongly reduced (incomplete) carination of the propodeum.



FIGURES 9–12. Propodeum, dorsoposterior view, *Erythrodolius* spp. females. 9. *E. griffithsorum*, non-type (ZMUT); 10. *E. incompletus*, holotype; 11. *E. luteus*, holotype; 12. *E. tenebrosus*, holotype.

Erythrodolius luteus Bennett, Sääksjärvi, & Broad sp. n.

Figs 3, 7, 11, 15

Diagnosis. *E. luteus* **sp. n.** can be distinguished from all other species of the genus by the following combination of characters: 1) propodeum with complete carination (Fig. 11); 2) mesoscutum orange; 3) clypeus with a medial, apical tooth (without apical crenulations) (Fig. 7); 4) flagellum with basal four segments yellow, the rest dark brown (medial, light-coloured band absent) (Fig. 3); 5) fore wing with a well-defined dark spot apically (Fig. 3); 6) metasomal tergites completely orange (laterotergites of metasomal segments 2 and 3 brown) (Fig. 3); 7) ovipositor strongly upcurved and much shorter than length of metasoma (Fig. 3). *Erythrodolius luteus* **sp. n.** is readily distinguished from other New World species of the genus on account of its apically black spotted fore wings and almost completely orange-yellowish coloration of head, mesosoma and metasoma.

Description. Female. Fore wing length about 10 mm. Face about 2.4 times as wide as high, punctate, punctures separated by about their own diameter. Malar space about 1.0 times as high as basal width of mandible.

Clypeus with a low, rounded medial tooth (Fig. 7). Ocellar-ocular distance 2.0 times as long as maximum diameter of posterior ocellus. Antenna with 30 flagellomeres.

Mesoscutum subpolished and finely punctate, punctures in middle of lateral lobe separated by about their own diameter, posterior part of central lobe less punctate. Scutellum with lateral carinae at base only. Mesopleuron polished, ventrally with close punctures separated by about 2 times their own diameter. Metapleuron irregularly rugose ventrally, sparsely punctate dorsally, juxtacoxal carina complete (Fig. 15). Propodeum with all carinae present and strongly raised, surface impunctate and polished (Fig. 11).

Tergite 1 3.1 times as long as posteriorly wide. Tergite 2 without oblique grooves. Ovipositor straight in basal third, then strongly upcurved, about 1.0 times as long as length of hind tibia (Fig. 3).

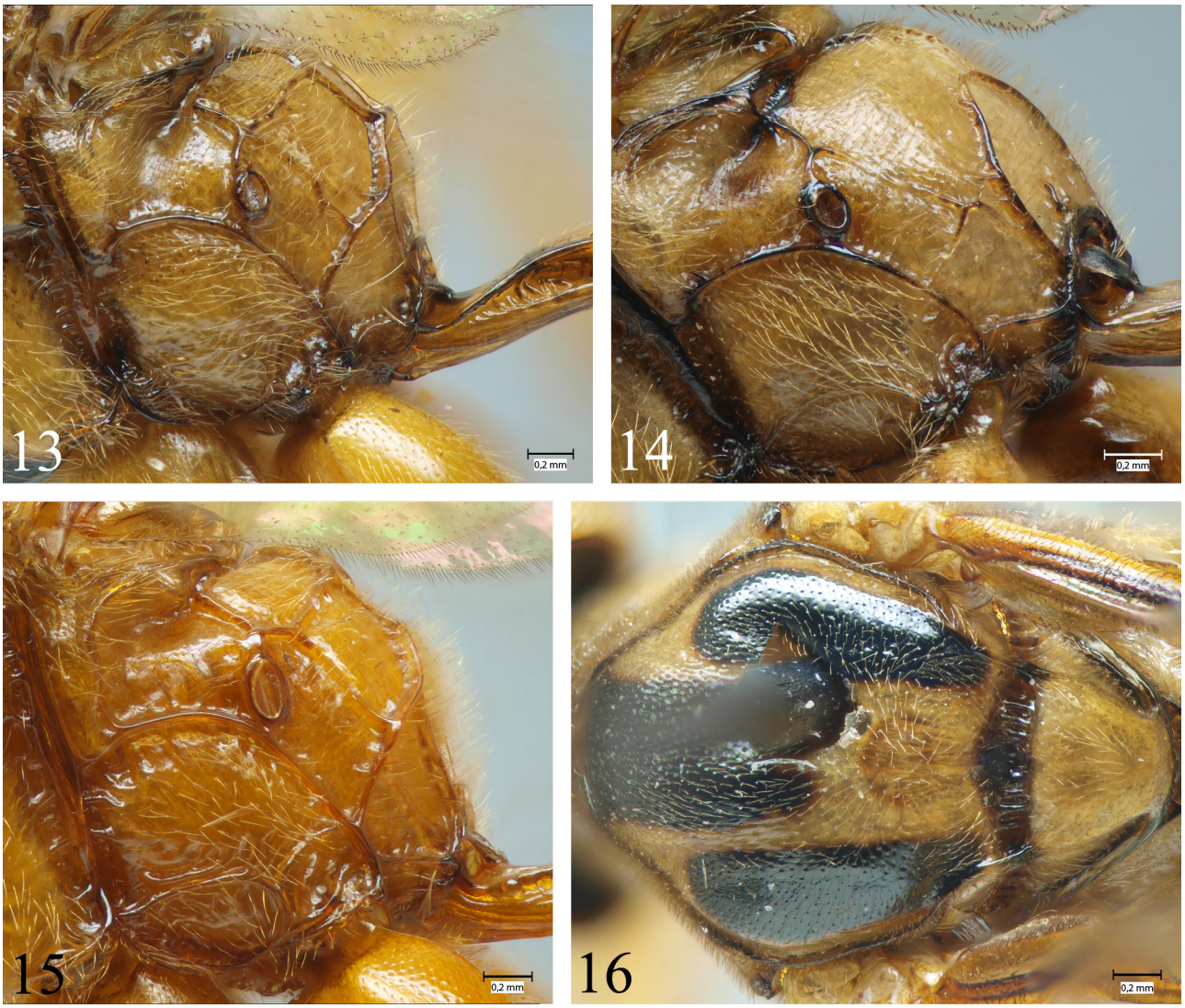
Orange with mandibular teeth and pterostigma black; head and legs slightly more yellowish than other parts of body; apical parts of antennae (first 4 flagellomeres yellowish), ovipositor sheaths and ovipositor dark brown. 2nd and 3rd laterotergites with large rectangular brown areas. Wings more or less hyaline; fore wing with a clearly defined dark area apically; pterostigma black (Fig. 3).

Male. Unknown.

Distribution. Honduras.

Material examined. Holotype: ♀: HONDURAS: Cortés: PN Cusuco, 15.48510 °N, 88.23627 °W, 1260 ± 5m, pine-liquidambar forest, Malaise, 30.V–3.VI.2010, LLAMA#Ma-C-06-2-01 (Longino *et al.* leg.) (ZMUT). Condition of type: intact except for missing right antenna beyond 5th flagellomere.

Etymology. The specific name refers to the beautiful orange-yellowish coloration of the species.



FIGURES 13–16. *Erythrodolius* spp. females. 13–15. Propodeum, lateral view, 16. Mesoscutum, dorsal view. 13. *E. griffithsorum*, non-type (ZMUT); 14. *E. incompletus*, holotype; 15. *E. luteus*, holotype; 16. *E. incompletus*, holotype.

***Erythrodolius tenebrosus* Bennett, Sääksjärvi, & Broad sp. n.**
Figs 4, 8, 12

Diagnosis. *E. tenebrosus* **sp. n.** is the darkest species of *Erythrodolius* thus far described. Almost the entire dorsal surface of this species is dark brown (Fig. 4). It is the only described species in which the scutellum and frons are predominantly dark brown. These areas are completely yellow to brownish yellow in the next darkest described species (*E. griffithsorum*).

Description. Female. Fore wing length 9.8 mm. Face about 2.4 times as wide as high, punctate, the punctures separated by about their own diameter. Malar space about 0.8 times as high as basal width of mandible. Clypeus with a low, rounded medial tooth (Fig. 4). Ocellar-ocular distance 2.1 times as long as maximum diameter of posterior ocellus. Antenna with 30 flagellomeres.

Mesoscutum polished and finely punctate, punctures in middle of lateral lobe separated by 1 to 2 times their own diameter, medial lobe only slightly more coarsely and densely punctate. Scutellum with lateral carinae at base only. Mesopleuron polished with fine punctures separated by 1 to 2 times their diameter, except impunctate on speculum. Metapleuron irregularly rugose ventrally, sparsely punctate dorsally, punctures separated by one to two times their diameter, juxtacoxal carina incomplete. Propodeum with all carinae present (Fig. 12), surface impunctate and polished.

Tergite 1 3.1 times as long as posteriorly wide. Tergite 2 without oblique grooves. Ovipositor slightly upcurved basally and medially, straight apically, about 0.8 times as long as length of hind tibia (Fig. 4).

Dark brown. Entire dorsal surface of insect dark brown except lateral surfaces of scutellum, area posteroexterna, petiolaris and posterior parts of area dentipara and superomedia of propodeum, anterior quarter of tergite 1 of metasoma and a band on extreme posterior of tergite 2 and extreme anterior of tergite 3 brownish yellow. Scape and pedicel medium brown, basal 4 flagellomeres yellow, flagellomeres 5+ blending from yellowish brown to dark brown at apex of antenna. Face yellow except a narrow vertical medial dark brown stripe. Clypeus medium brown. Gena dark brown dorsally blending to yellow ventrally. Palpi brownish yellow. Pronotum dark brown in dorsal half and brownish yellow in ventral half. Tegula medium brown. Mesosomal pleura mostly dark brown except propleuron medium brown, irregular patches of mesopleuron especially near subtegular ridge, anterior to epicnemial carina and speculum brownish yellow; metapleuron medium brown dorsally and yellowish brown ventrally. Fore and mid legs yellow except femora (except basally on ventral surface) and distal tarsomere medium brown. Hind leg medium brown except tibia and basal four tarsomeres yellow, apex of coxa and trochanter slightly paler than base of coxa and femur. Dorsal surface of metasoma dark brown except as noted above. Laterotergites dark brown except on segment 1, edges of segment 2 and base of segment 3 yellow. Hypopygium medium brown. Ovipositor sheaths and ovipositor dark brown except ventral valve of ovipositor light brown in apical half. Wings tinged uniformly yellow (no darkening at apex of fore wing), pterostigma brown at edges, translucent orange brown medially (Fig. 4).

Male. Unknown.

Distribution. Mexico (Quintana Roo).

Material examined. Holotype: ♀: MEXICO: Quintana Roo, Cobá. 11.xii.1993. L. Masner (CNC). Condition of type: intact except missing right fore leg beyond basal trochantellus.

Etymology. The specific name refers to the dark colour of this species, darker than in other New World *Erythrodolius*.

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