JHR 51: 171–185 (2016)
doi: 10.3897/jhr.51.9075
http://jhr.pensoft.net

RESEARCH ARTICLE

JOURNAL OF Hymenoptera RESEARCH
A peer-reviewed open-access journal
The International Society of Hymenopterists

A new species of *Ophrella* Middlekauff, 1985 (Hymenoptera, Orussidae) from French Guiana

Lars Vilhelmsen[1]

1 *Natural History Museum of Denmark, SCIENCE, University of Copenhagen; Zoological Museum, Universitetsparken 15, DK-2100, Denmark*

Corresponding author: *Lars Vilhelmsen* (lbvilhelmsen@snm.ku.dk)

Academic editor: *Marko Prous* | Received 3 May 2016 | Accepted 24 June 2016 | Published 29 August 2016

http://zoobank.org/09799B9B-839C-499C-A531-B1FE299B3ECC

Citation: Vilhelmsen L (2016) A new species of *Ophrella* Middlekauff, 1985 (Hymenoptera, Orussidae) from French Guiana. Journal of Hymenoptera Research 51: 171–185. doi: 10.3897/jhr.51.9075

Abstract

Ophrella seagi **sp. n.** is described and illustrated from a female and a male collected in French Guiana. Additional Orussidae from this country are listed in an Appendix. The new species differs from other members of *Ophrella* in a number of features, and the diagnosis of the genus is revised accordingly. A key to *Ophrella* species is included. The new species is included in a continuously updated morphological data set assembled for the Orussidae and its phylogenetic position discussed.

Keywords

Parasitoid wasps, wood-living insects, taxonomy, phylogeny, biogeography

Introduction

The Orussidae are a small family of parasitoid wasps, currently with about 90 extant described species. They have a worldwide distribution (Vilhelmsen 2003, 2004), but they are very rarely collected, many species being known from only one or a few specimens. Orussidae have a fossil record spanning the Cretaceous and Tertiary, the radiation of the extant members of the family probably occurred in the mid-Cretaceous, approx. 100 Ma ago (Vilhelmsen and Zimmermann 2014). Detailed biological information is lacking for most species, but they are generally associated with dead wood,

targeting woodboring insect larvae (e.g., Buprestidae, Cerambycidae) and completing their pre-adult development inside the wood (Vilhelmsen et al. 2001).

The genus *Ophrella* Middlekauff, 1985 is one of the smallest genera of Orussidae and until recently one of the least frequently collected. The first species was described from a single specimen from Panama as *Ophrella lingulata* by Middlekauff (1985). Smith (1988) transferred *Oryssus amazonicus* Westwood, 1874 (also based on a single specimen, from Brazil) to *Ophrella* as *Ophrella amazonica* (Westwood, 1874), citing the shape of the frontal setae and the position of fore wing cross wing cu-a relative to the discoidal cell as evidence for this taxonomic placement. Vilhelmsen (2003) in his cladistic treatment of the Orussidae confirmed this and added the presence of a longitudinal furrow on top of the head separating the posteriormost coronal teeth as further support for the monophyly of *Ophrella*. Vilhelmsen et al. (2013) cited the presence of only a single short hind tibial apical spur as additional corroboration for the monophyly of *Ophrella*.

Ophrella belongs to the ophrynopine clade (Vilhelmsen and Smith 2002), an assemblage currently comprising six genera and 33 extant species. The monophyly of the clade is usually retrieved as well supported in cladistics analyses of Orussidae, prominent putative autapomorphies being the presence of a triangular protrusion on the posteroventral corner of the hind femur (reversed in *Kulcania* Benson, 1935), the fore wing vein 2r inserting distally on the pterostigma, and the presence of spines or pegs on sternum 9 in the male. More than half the species occur in the Neotropical Region, but ophrynopines are also represented in the Nearctic, Australasian (Australia, New Guinea), Oceanic (Fiji, New Zealand), Oriental (Southeast Asia) and eastern Palaearctic (Japan, South Korea) regions. The ophrynopine clade probably radiated in the Tertiary (Vilhelmsen et al. 2013), but the biographic history of the clade is highly complex and likely involves multiple dispersal events (Vilhelmsen 2004).

The Société Entomologique Antilles Guyane (SEAG; see http://insectafgseag.myspecies.info/en) has for the past decade been inventorying the insect fauna in French Guiana. Various passive and active collecting techniques have been implemented in a series of projects in different localities around the country. These intensive collecting efforts aim, among other things, to produce and update checklists for the country (Brûlé and Touroult 2014). The SEAG efforts have also generated material of otherwise rarely collected insect taxa, including Orussidae (see Appendix and Vilhelmsen et al. 2013). Each of the orussid specimens collected by the SEAG surveys probably represents several thousand trapping hours. Only by an effort of this magnitude is it possible to get a more comprehensive impression of the true diversity of such rare taxa in an area.

Including the material reported in the present paper, about ten specimens of *Ophrella* species have been collected in French Guiana until now. This has led to substantial changes in the taxonomy of the genus. Vilhelmsen et al. (2013) described *Ophrella eldorado* Vilhelmsen as new and placed *O. lingulata* in synonymy with *O. amazonica*. Here, I describe a new species of *Ophrella*. The new species differs substantially from the previously recognized species and the diagnosis of the genus is adjusted accordingly.

Material and methods

All the material treated in the present paper (see also Appendix) is stored in the Natural History Museum of Denmark, University of Copenhagen (NHMD).

Specimens were examined with a Leica M205C dissection microscope both before (in ethanol) and after mounting and scored for the characters in the data set presented in Blank and Vilhelmsen (2016).

The following characters were added to the data set of Blank and Vilhelmsen (2016).

175. Shape of female antennomere 10: less than three times as long as wide = 0; at least three times as long as wide = 1.

State 1 is observed in all species of *Ophrella* (Fig. 4C, green arrow), but elsewhere in Orussidae only in scattered species outside the ophrynopine clade (*Leptorussus africanus* Benson, 1955; *Orussus punctulatissimus* Blank & Vilhelmsen, 2014; *Pseudoryssus henschii* Mocsáry, 1910).

176. Transverse carina dorsally on pronotum: at most weakly developed = 1; well developed, without median incurvation = 1; strongly developed, protruding anteriorly, with median incurvation = 2 (ordered).

Ophrella eldorado has been scored state 1, *Ophrella seagi* sp. n. state 2 (Fig. 5A, yellow arrow); all other Orussidae examined for this character have state 0.

The dataset produced in Mesquite (Maddison and Maddison 2011) was analyzed in TNT (Goloboff et al. 2000). The matrix is available from Figshare [https://figshare.com/articles/DataMatrixOrussidae2016/3458834]. Initial analyses were run with the male and female of *O. seagi* treated as separate terminals, for the final analyses they were merged. The following characters were treated as additive: 12, 19, 24, 31, 34, 35, 46, 65, 66, 70, 75, 77, 87, 96, 103, 104, 111, 113, 114, 119, 124, 125, 126, 137, 146, 147, 149, 152, 156, 157, 159, 160, 161, 164, 167, 173 and 176. Space for 1 000 000 trees was reserved in memory. Traditional searches in equal weights analyses and implied weights analyses with the concavity constant k set in turn to 1-15, 20, 25 and 30 were run. Analyses were run with collapsing rules set to max. length = 0. For each weighting scheme, analyses with 10 000 replications / 100 trees saved pr. replication were conducted.

Digital images were produced with a Visionary Digital imaging setup with flash lightning and P-51 Camlift Driver ver. 2.6.1 to control the camera. A cylinder of semitransparent plastic and a cone of semitransparent paper were placed around the specimen to disperse the light. Images were stored in Adobe Lightroom 2 and composite images were compiled from stacks with the software Zerene Stacker ver.1.04 by implementing the Pyramidal stacking method (PMax).

Phylogenetics

The phylogenetic analyses under various weighting schemes produced variable results, the shortest/most fit trees being retrieved in most in less than 10% of the replications.

The results of the implied weights analyses with concavity constant k set to 7, 10 and 20 are shown in Figs 1–3. In the following, only the results relevant to evaluating the monophyly of *Ophrella* and its placement within the ophrynopine clade will be discussed.

In all the analyses where the male and female of *O. seagi* were included as separate terminals, they were retrieved as a monophylum, corroborated by the presence of a prominent transverse carina dorsally on the pronotum with a median incurvation (char. 176:2). *Ophrella* is retrieved as monophyletic in the implied weighting analyses with k settings 1-15, usually with *Ophrella seagi* as sister to the two other *Ophrella* species (Figs 1, 2). When k = 1, *O. seagi* is the sister to *O. eldorado*; this relationship is supported by the presence of a transverse carina dorsally on the pronotum (char. 176:1/2). *Ophrella amazonica* + *O. eldorado* is corroborated by the presence of dense pilosity posterior to the eyes (char. 23:1) and on the mesoscutum (char. 69:1) and having only one short hind tibial apical spur (chars 108:1; 109:1). The monophyly of *Ophrella* is supported by the presence of a longitudinal groove on the top of the head between the posteriormost coronal teeth (char. 7:1), the insertion of fore wing cross vein cu-a on Cu at least 0.3 the length of the discal cell distal to vein M (char. 123:1) and antennomere 10 in the female being at least three times longer than wide (char. 175:1). When k = 20, 25 or 30, *O. seagi* is the sister to a monophyletic *Ophrynopus* Konow, 1897 (Fig. 3), and under equal weights, *O. seagi* is sister to all *Ophrynopus* species except *Ophrynopus carinatus* Vilhelmsen & Smith, 2002. When *Ophrella* is not monophyletic, *O. amazonica* + *O. eldorado* are sister to *Argentophrynopus* (Fig. 3).

The position of *Ophrella* within the ophrynopine clade is somewhat unstable. When k = 1, 3, or 7-9 (Fig. 1), it is sister to *Ophrynopus*. When k = 2, 4-6 or 10-15 (Fig. 2), *Ophrella* is inside *Ophrynopus*, being sister to *Ophrynopus carinatus*; this is corroborated by the absence of the lateral longitudinal frontal carina (char. 12:0) and the pronotum being of equal length medially and laterally in dorsal view (char. 48:0), but these characters are variable within the ophrynopine clade. *O. seagi* shares some characters with all or some members of *Ophrynopus*, e.g., the presence of a mesepisternal carina (char. 85:1) and the presence of a projection posteriorly on the male sternum 9 (char. 157:2) that are absent in other *Ophrella* species but has the effect of pulling the entire genus inside *Ophrynopus*.

Even with the inclusion of the somewhat aberrant *O. seagi*, *Ophrella* remains well supported and diagnosable (see below for adjustments). Vilhelmsen et al. (2013) synonymized *Stirocorsia* Know, 1897 with *Ophrynopus*, but the latter remains poorly supported and difficult to circumscribe. Some subgroups within *Ophrynopus* are well defined and at some point it might be useful to subdivide the genus, but based on the findings of this study this is premature. *Ophrella seagi* can be accommodated in the current generic classification of the Orussidae without necessitating major adjustments.

Figure 1. Consensus tree of 9 trees of fit 51,39931 produced by implied weighting analysis with k = 7. Only crown group Orussidae shown; genera outside the ophrynopine clade have been collapsed to single terminals.

Figure 2. Consensus tree of 9 trees of fit 41,51167 produced by implied weighting analysis with k = 10. Only crown group Orussidae shown; genera outside the ophrynopine clade have been collapsed to single terminals.

Figure 3. Consensus tree of 9 trees of fit 25,58786 produced by implied weighting analysis with k = 20. Only crown group Orussidae shown; genera outside the ophrynopine clade have been collapsed to single terminals.

Systematics

***Ophrella seagi* sp. n.**
http://zoobank.org/F9659E25-6E4D-4FBF-A329-FEE6F0195029
Figs 4–6

Holotype. Female. 'FRENCH GUIANA, Montagne des Chevaux: 4°44'56"N - 52°26'28"W, alt. 75 m, Window Trap, SEAG leg., 4.ix.2013/*Ophrella seagi* Vilhelmsen, 2016 female det. L. Vilhelmsen 2016/Holotype/NHMD000071774'. NHMD.

Paratype. Male. FRENCH GUIANA, Montagne des Chevaux: 4°44'56"N - 52°26'28"W, alt. 75 m, Window Trap, SEAG leg., 28.xii.2013. NHMD000071775.

Description. Female. Body length 9.2 mm, fore wing length 5.9 mm. Body predominantly black (Fig. 4A). Small brownish spot situated laterally on frons, just median to lower part of eye (Fig. 4B). Antenna and mouthparts dark brown to black, Antennomeres 9-10 slightly paler (Fig. 4C). Fore femur black, fore tibia and tarsus dark brown; mid leg dark brown to black throughout, except for brown trochanters; hind coxa brown, hind femur laterally with large brown area, remainder of hind leg black (Fig. 5B). Fore wing predominantly heavily infuscated, with dense covering of short coarse dark hairs (Fig. 4A); pterostigma with basal half pale; small hyaline spot situated between basal parts of M+Cu and anal veins, narrowing hyaline band extending from pterostigma proximally of vein 2r to hind margin, apex of wing hyaline; venation predominantly dark brown, except for vein M clear in median hyaline band. Hind wing weakly infuscated in anterior and distal parts, otherwise more or less hyaline, venation dark to light brown (Fig. 4A).

Ocellar corona narrow, distance between median ocellus and lateral coronal tooth subequal to ocellar width (Fig. 4B); ocellar teeth raised on low swellings with finely imbricate sculpture forming drop-shaped concavity around median ocellus; swellings converge dorsally, dorsalmost coronal teeth situated dorsal to lateral ocelli, teeth separated medially by narrow longitudinal furrow. Frons coarsely areolate, without dorsal transverse and longitudinal carinae, irregular swelling present in middle; hairs on frons slender, inconspicuous; ventral transverse frontal carina with distinct median notch. Vertex and gena areolate-punctate, dense silvery pilosity on vertex posterior to dorsal part of eyes (Fig. 5A), pilosity on posterior part of head otherwise inconspicuous; postocular carina absent (Fig. 4C), occipital carina well developed, without concavity dorsally. Antennomeres 9-10 slender, antennomere 10 [missing on right antenna] more than three times as long as broad, tapering distally (Fig. 4C).

Pronotum with prominent transverse carina anterodorsally, carina medially with distinct notch (Fig. 5A); pronotum areolate dorsally, glabrous with scattered punctures anterolaterally. Fore femur without ventral carina. Mesoscutum and mesoscutellum areolate, sculpture of equal density, no conspicuous pilosity (Fig. 5A); mesoscutellar sulcus deep, interrupted medially by small triangular projection from mesoscutellum; mesoscutellum raised relative to surrounding sclerites, laterally separated by narrow glabrous strip, posterior margin parallel with anterior margin of metanotum for some

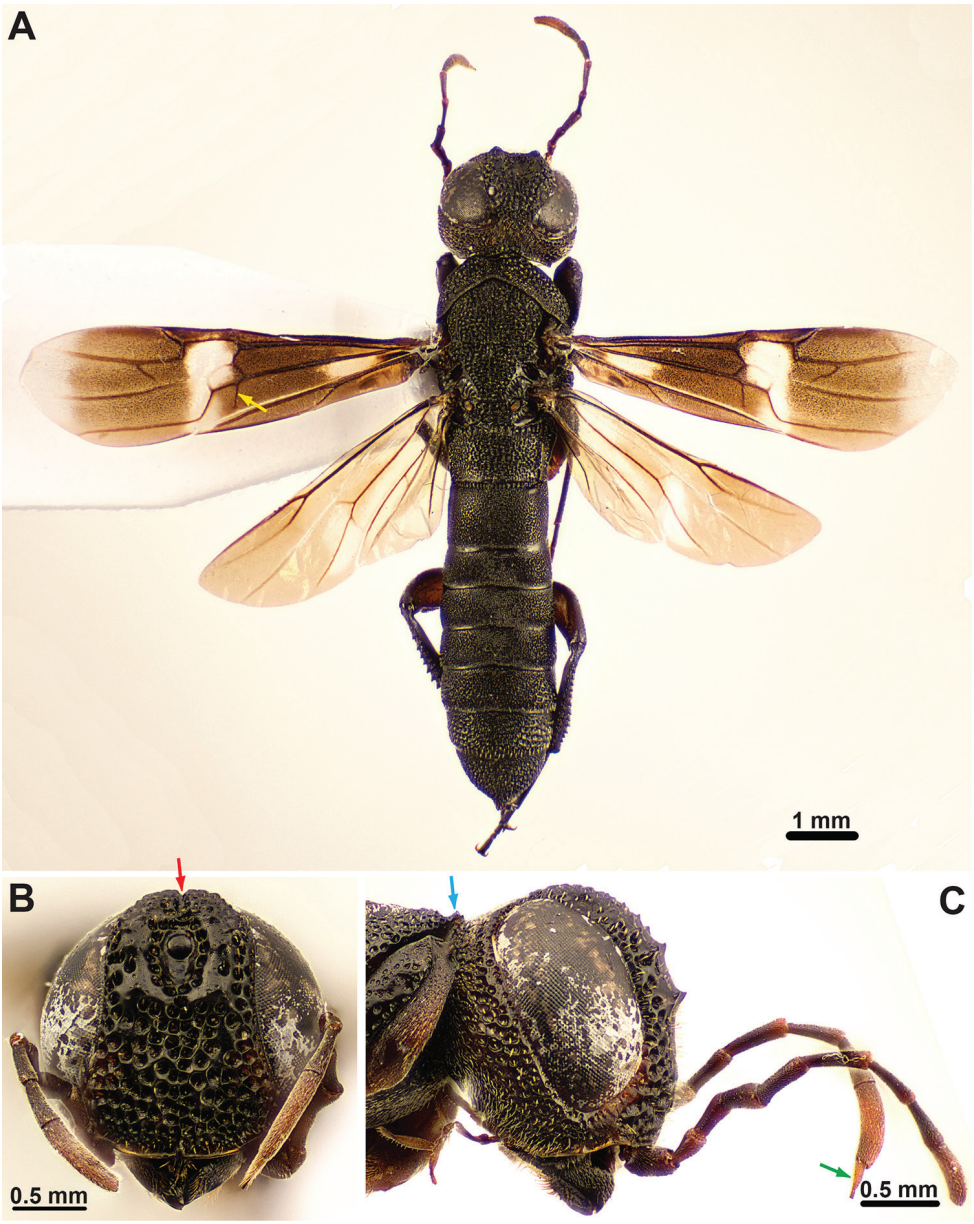

Figure 4. *Ophrella seagi* sp. n., female holotype, NHMD000071774. **A** Habitus dorsal **B** Head, anterior **C** Head and antenna, lateral. Yellow arrow = cross vein cu-a; red arrow = longitudinal furrow on top of head; blue arrow = pronotal transverse carina; green arrow = antennomere 10.

distance. Mesopleuron laterally coarsely areolate-punctate, ventrally micropunctate with slender pilosity; mesepisternal carina situated anterolaterally on mesopleuron. Metanotum coarsely areolate, with median longitudinal carina absent, lateral carina

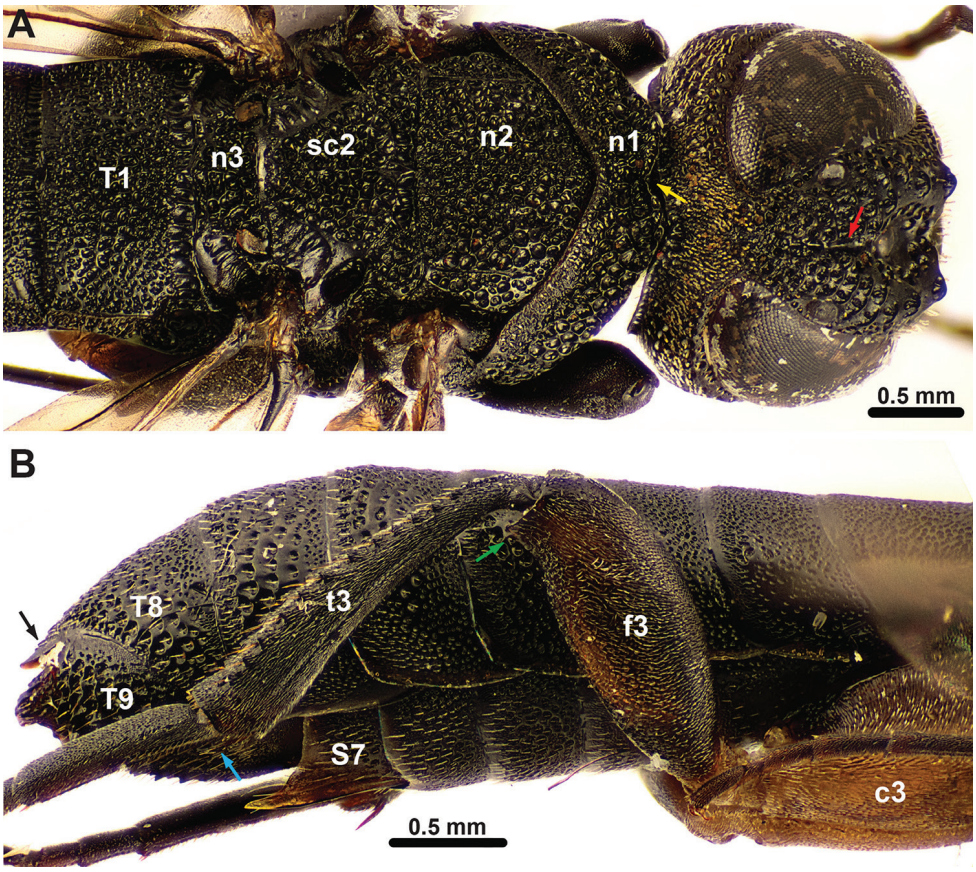

Figure 5. *Ophrella seagi* sp. n., female holotype, NHMD000071774. **A** Head and thorax, dorsal **B** Hind leg and abdomen, lateral. Yellow arrow = notch, pronotal transverse carina; red arrow = longitudinal furrow, top of head; black arrow = projection, tergum 8; blue arrow = hind tibial apical spur; green arrow = triangular projection on hind femur. c3 = hind coxa; f3 = hind femur; n1 = pronotum; n2 = mesoscutum; n3 = metanotum; sc2 = mesoscutellum; S7 = sternum 7; t3 = hind tibia; T[x] = tergum [x].

present; metepisternum predominantly glabrous. Hind coxa with dense pilosity laterally; hind femur with well-developed triangular protrusion laterodistally (Fig. 5B); hind tibia with 22-23 pegs in two rows dorsally, longitudinal carinae laterally and ventrally, and two apical tibial spurs.

Fore wing vein 2r arises 0.7 from base of pterostigma; vein cu-a inserts on Cu1 approx. 0.3 from proximal end of cell M (Fig. 4A).

Tergum 1 areolate (Fig. 5A), laterally with distinct postspiracular and subspiracular carina separated by prominent concavity with elongate hairs. Terga 2-6 finely areolate-punctate, without conspicuous pilosity, tergum 2 laterally with weakly developed carina in continuation of subspiracular carina on tergum 1, tergum 2 with smooth dark anterolateral area approx. twice as wide as long and adjacent to antecosta of tergum. Terga 7-8 more irregularly rugose, tergum 8 with prominent projection medially

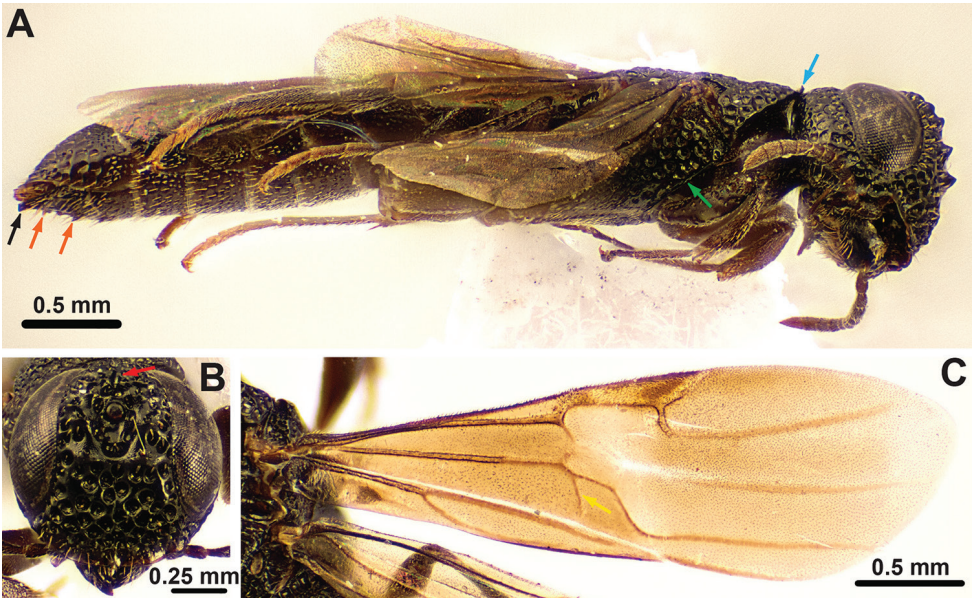

Figure 6. *Ophrella seagi* sp. n., male paratype, NHMD000071775. **A** Habitus lateral **B** Head, anterior **C** Fore wing. Black arrow = posterior projection on sternum 9; brown arrows = spines on sternum 9; blue arrow = pronotal transverse carina; green arrow = mesepisternal carina; red arrow = longitudinal furrow on top of head; yellow arrow = cross vein cu-a.

on posterior margin (Fig. 5B). Tergum 9 ventrally with spicules, longitudinal carina only present as short lobe posteriorly. Sterna 3-7 punctate.

Male. Body length 4.8 mm, fore wing length 3.2 mm. Body uniformly dark brown to black, even more so than female (Fig. 6A). Appendages and mouthparts dark brown to black, legs slightly paler towards apex, hind trochanters light brown. Fore wing infuscated almost throughout, not as heavily as in female, infuscation fades towards apex (Fig. 6C); pterostigma predominantly pale, with brown medial spot in distal half; venation dark brown proximally and anteriorly, light brown distally and posteriorly, vein M proximally hyaline.

Less pilose on top of head and on hind coxa than in female. Mesoscutellar sulcus not interrupted medially. Hind tibia with 22–23 pegs in two rows dorsally. Fore wing vein 2r arises 0.63 from base of pterostigma (Fig. 6C). Sternum 9 with three posteriorly directed spines, one anteromedially and two posterolaterally, sternum 9 terminating in stubby projection (Fig. 6A).

Etymology. Named to acknowledge the contributions of Société Entomologique Antilles Guyane (SEAG) to further the exploration of the diversity of Orussidae in the Neotropics.

Comments. The female and male that have been assigned to *Ophrella seagi* were collected in the same locality, albeit almost four months apart. There are some differences between the two specimens in the coloration of the body and appendages, and in

the degree and pattern of infuscation of the fore wing (compare Figs 4–6), but this is within the degree of variation observed in other known species of Orussidae, especially between sexes (e.g., Vilhelmsen and Smith 2002, Blank et al. 2010).

Ophrella seagi has a unique combination of characters that differs somewhat from the other members of *Ophrella*. The generic placement is based on the presence of a median longitudinal furrow between the posteriormost coronal teeth (Figs 4B, 6B; less developed in *O. seagi* than in *O. amazonica* and *O. eldorado*), the presence of an elongate antennomere 10 (at least three times as long as broad; Fig. 4C), and the position of the fore wing vein cu-a on Cu1 some distance from vein M (Figs 4A, 6C); all these characters are unique within the ophrynopine clade. Previously diagnostic features suggested for *Ophrella*, e.g., the presence of flattened, leaf-shaped setae (Middlekauff 1985) and the presence of only one hind tibial apical spur (Vilhelmsen et al. 2013) are not observed in *O. seagi* and cannot be upheld as potential autapomorphies for *Ophrella*. Nevertheless, the monophyly of the genus, including *O. seagi*, is well supported, and it is still possible to identify *O. seagi* correctly to *Ophrella* in the genus key in Vilhelmsen et al. (2013).

Ophrella seagi is a very distinct species, especially when compared to the other two species in *Ophrella*. The most distinctive feature is the prominent, medially subdivided transverse carina on the dorsal part of the pronotum (Figs 4C, 5A, 6A); *O. eldorado* also has a transverse carina, but it is less developed and not subdivided medially (Vilhelmsen et al. 2013, fig. 7d). Like many other morphological features observed in Hymenoptera pupating in wood, the carina might help the wasp escaping from the wood after eclosion (see Vilhelmsen and Turrisi 2011), probably acting as a brace when the wasp is digging its escape tunnel with the mandibles. A possible analogue occurs in several species of Aulacidae, another family of woodliving parasitoid wasps. Some species of *Pristaulacus* Kieffer, 1900 have a prominent, medially interrupted transverse crest anteriorly on the mesoscutum (Turrisi and Vilhelmsen 2010, fig. 14). Topologically it is in a similar position, i.e., anterodorsally on the thorax, indicating a similar function; morphologically it is developed on a different part (mesoscutum in the Aulacidae, pronotum in Orussidae), perhaps because the pronotum is weakly developed medially in most Aulacidae (Turrisi et al. 2009; char. 25).

Ophrella seagi also differs from the other *Ophrella* species in having slender setae on the frons and around the ocellar corona (Fig. 4A,B) (the setae are leaf-shaped in *O. amazonica* Vilhelmsen et al. (2013, fig. 4d), flattened and elongate in *O. eldorado* Vilhelmsen et al. (2013, fig. 4e)); not having dense pilosity behind the eyes and not having a postocular carina (Fig. 4C; compare with Vilhelmsen et al. 2013, figs 5c, 7a); this carina is present in most other members of the ophrynopine clade. The 9th antennomere in the female is slender and without a lateral carina in *O. seagi* (Fig. 4C), unlike *O. amazonica* and *O. eldorado*. The mesoscutum is less pilose, and the mesoscutellum is more coarsely sculptured in *O. seagi* and it is delimited more clearly from the surrounding sclerites (Fig. 5A; compare with Vilhelmsen et al. 2013, figs

6c, 7c). A ventral longitudinal carina is absent from the fore femur in *O. seagi*, whereas the mesepisternal carina is well developed (Fig. 6A). There is only one short hind tibial apical spur present in *O. amazonica* and *O. eldorado* (Vilhelmsen et al. 2013, figs 6d, 7e), whereas *O. seagi* has two larger spurs. *O. seagi* has at least the basal part of the fore wing pterostigma pale in both sexes (Figs 4A, 6C), the other *Ophrella* species have at most a pale spot basally (Vilhelmsen et al. 2013, fig. 8b). In the male of *O. seagi*, the fore wing is more evenly infuscate than in *O. eldorado* and abdominal sternum 9 has a distinct stubby projecting (Fig. 6A) as opposed to a raised rim in *O. eldorado* (Vilhelmsen et al. 2013, fig. 8e); males of *O. amazonica* have still not been collected.

Key to species of *Ophrella*

1 Longitudinal furrow on top of the head separating the posteriormost coronal teeth present (Figs 4B, 5A, 6B). Fore wing cross vein cu-a inserts on Cu at least 0.3 the width of the discal cell distal to vein M (Figs 4A, 6C). Female with antennomere 10 at least three times as long as broad (Fig. 4C) ....**2 (*Ophrella*)**

– Not with the character combination above .....**other Orussidae**

2 Pronotum with distinct transverse carina anterodorsally, with median notch (Figs 4C, 5A, 6A). Head with setae on lower frons slender, inconspicuous (Fig. 4B, C). Dense pilosity posterior to eye and postocular carina absent (Fig. 4C). Mesepisternal carina present (Fig. 6A). Hind tibia with two apical tibial spurs. Fore wing pterostigma with at least basal half pale (Figs 4A, 6C)..... ..... ***O. seagi* Vilhelmsen, sp. n.**

– Pronotum at most with low transverse carina anterodorsally (Vilhelmsen et al. 2013, fig. 7d), without median notch. Setae on lower frons flattened, either leaf-shaped or elongate (Vilhelmsen et al. 2013, fig. 4d, e). Dense pilosity present posterior to eye and postocular carina present (Vilhelmsen et al. 2013, figs 6a, c; 7a, c). Mesepisternal carina absent (Vilhelmsen et al. 2013, figs 4d, 7d). Hind tibia with only one short apical tibial spur (Vilhelmsen et al. 2013, figs 6d, 7e). Fore wing pterostigma at most with pale spot basally (Vilhelmsen et al. 2013, fig. 8b).....**3**

3 Setae on lower frons leaf-shaped (Vilhelmsen et al. 2013, fig. 4d). Pronotum without transverse carina dorsally (Vilhelmsen et al. 2013, figs 4c, 6a). Female predominantly dark brown to black (Vilhelmsen et al. 2013, figs 4a, 6a) ..... ***O. amazonica* (Westwood)**

– Setae on lower frons elongate (Vilhelmsen et al. 2013, fig. 4e). Pronotum with low transverse carina anterodorsally (Vilhelmsen et al. 2013, fig. 7d), without median notch. Female extensively reddish brown on legs and abdomen (Vilhelmsen et al. 2013, fig. 7a, d, e)..... ***O. eldorado* Vilhelmsen**

Acknowledgements

Yves Braet donated the specimens included in this study. Mikkel Høegh Post mounted them for study. Stephan Blank and Dave Smith provided useful comments to an earlier version of the paper.

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Appendix

Additional material from French Guiana

Ophrella amazonica (Westwood, 1874): FRENCH GUIANA. Montagne des Chevaux: 4°44'56"N - 52°26'28"W, alt. 75 m, Malaise Trap, SEAG leg., iii.2012; female, NHMD000071770.

Ophrynopus batesianus (Westwood, 1874): FRENCH GUIANA, Montagne des Chevaux: 4°44'56"N - 52°26'28"W, alt. 75 m, Malaise trap, SEAG leg., 23.x.2011; female, NHMD000071771.

Ophrynopus fulvostigma (Westwood, 1874): FRENCH GUIANA. Kourou, Savane Matiti, 5°5'N - 52°37'W, SEAG leg., 9.iii.2013; female, NHMD [ethanol]. Montagne des Chevaux: 4°44'56"N - 52°26'28"W, alt. 75 m, SEAG leg., window trap, SEAG leg., 16.vii.2012; male, NHMD000071773. Montagne des Chevaux: 4°44'56"N - 52°26'28"W, alt. 75 m, window trap, SEAG leg., 28.ix.2013; female, NHMD000071772. Regina, SEAG leg., vi.2012; female, NHMD [ethanol].