Revision of the Afrotropical genus *Phorotrophus* Saussure, 1892 (Hymenoptera: Ichneumonidae: Acaenitinae), with descriptions of eight new species

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(with 33 figures)

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We revise the Afrotropical genus *Phorotrophus*. Thirty-three species are recognized, including eight new synonyms and eight newly described species: *P. cyranodebergeraci* sp. nov., *P. fernando* sp. nov., *P. frodoni* sp. nov., *P. hephaistosi* sp. nov., *P. problematicus* sp. nov., *P. vulcani* sp. nov., *P. youpi* sp. nov., and *P. zoutpansbergensis* sp. nov. The following are considered junior synonyms: *P. elevatus* Benoit of *P. alcides* (Wilkinson); *P. caffrariae* Benoit of *P. bivittatus* (Morley); *P. trimaculatus* (Tosquinet) of *P. capensis* (Holmgren); *P. katangensis* Benoit and *P. maynei* Benoit of *P. congoensis* Benoit; *P. basilewski* Benoit, *P. limpidus* Benoit and *P. nigromaculatus* Benoit of *P. mameti* Benoit. New distribution records are included for *P. alcides*, *P. bivittatus*, *P. congoensis*, *P. ealensis* Benoit, *P. kaluleus*, *P. mameti*, *P. perplexus* Benoit and *P. stictor* Benoit. An illustrated dichotomous key to species is provided, and interactive dichotomous and matrix Lucid keys are also available at www.waspweb.org

Keywords: Acaenitinae, Africa, Ichneumonidae, identification keys, Madagascar, parasitoid wasp, systematics, taxonomy.

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INTRODUCTION

Acaenitinae comprise a rather small subfamily of the huge family Ichneumonidae, including fewer than 300 species (Yu *et al*. 2012). The subfamily is included in the pimpliformes lineage (Wahl & Gauld 1998; Quicke *et al*. 2009). Within this lineage and together with Diacritinae, Cyllocerinae, Diplazontinae and Orthocentrinae, they form a distinct clade defined by biological and structural features, this clade being the sister group of the other pimpliformes i.e. Pimplinae, Rhyssinae and Poemeniinae (Wahl & Gauld 1998). The Acaenitinae are distributed worldwide and subdivided into two tribes: the Coleocentrini is structurally the most primitive and virtually restricted to the Holarctic Region, while the Acaenitini are cosmopolitan (Gauld 1991) though they have only recently been reported from South America. Phylogenetic support for these tribes has not been established, particularly because only the Acaenitini are defined by clear synapomorphies, including the presence of an accessory tooth on the fore and mid tarsal claws (Wahl & Gauld 1998). Like other pimpliforme subfamilies, Acaenitinae are hypothesized to have arisen in the northern temperate regions and diversified later in the tropics (Wahl & Gauld 1998). According to Townes *et al*. (1960), they evolved first in the Old World and colonized the Americas more recently through the Bering strait. This hypothesis of a northern hemisphere origin could also be supported by the fact that the rare Acaenitinae reported from Central and South America have been collected at high altitudes (Gauld 1991; Castillo *et al*. 2011).

Acaenitinae are medium-sized to large wasps, their body length ranging from 5 to 30 mm, often colourful, quite uncommon except in old primary forest where they seem to be more frequent (Townes 1971; Gauld 1991). Acaenitine females are also some of the most distinctive Ichneumonidae, because their hypopygium is usually extremely elongate except for a few Palearctic taxa of the *Coleocentrus* group. Their biology is still poorly known, but they are likely to be koinobiont endoparasitioids of several wood-boring coleopteran families (Aubert 1969; Shaw & Wahl 1989; Schwarz 2002). For example, Shaw & Wahl (1989) documented the precise development of *Acaenitus dubitator* Panzer within the larva of its curculionid host.

The present revision deals with the Afrotropical genus *Phorotrophus* Saussure, 1892, which encompasses about one-tenth of the described acaenitine species. The previous French language revisions of Benoit (1952a, 1952b, 1953, 1955) for continental Africa, and Seyrig (1932, 1934) for Madagascar, proved largely insufficient. Both authors ignored critical morphological characters typical of interspecific variation, and inversely Benoit largely underestimated the intraspecific variability. As a result, many of the species he described are considered here as synonyms. The keys provided here should enable a more accurate estimation of *Phorotrophus* diversity. Although about half of the *Phorotropus* species are still known from less than five specimens, the available data enabled us to draw some general conclusions about the distribution of the species within the Afrotropical Region.

MATERIALS AND METHODS

Depositories

BMNH: Natural History Museum, London, UK (Gavin Broad).

HNHM: Hungarian Natural History Museum, Budapest, Hungary (Zoltán Vas).

SAMC: Iziko South African Museum, Cape Town, South Africa (Simon van Noort).

MNHU: Museum für Naturkunde der Humboldt Universität, Berlin, Germany (Frank Koch).

MRAC: Muséum Royal de l'Afrique Centrale, Tervuren, Belgium (Eliane de Coninck).

NHRS: Naturhistoriska Riksmuseet, Stockholm, Sweden (Hege Vårdal).

Material examined

The present revision is based on the examination of the types of *Phorotrophus* species, and the undetermined material housed in the above-mentioned Museums. The SAMC collection houses a large number of specimens that were recently collected from central and southern Africa.

Photographs

Specimens were point-mounted on black, acid-free card for examination (using a Leica M205C stereomicroscope with LED light source), photography and long-term preservation. Images were acquired using the EntoVision® multiple-focus imaging system. This system comprises a Leica® M16 microscope with a JVC® KY-75U 3–CCD digital video camera attached that fed image data to a notebook computer. The program Cartograph® 5.6.0 was then used to merge an image series (representing typically 10–15 focal planes) into a single in-focus image. Lighting was achieved using techniques summarized in Buffington *et al*. (2005), Kerr *et al*. (2009) and Buffington & Gates (2009). All images presented in this paper are available at http://www.waspweb.org.

Terminology and measurements

The morphological terminology follows Wahl & Sharkey (1993), but the wing venation nomenclature follows Gauld (1991) and microsculpture terminology follows Harris (1971). Due to the unusual and variable pattern of the propodeal carination, the terms basal median area and central median area were preferred to the classical terms area basalis and area superomedia, respectively. Most morphological terms are also defined on HymaToL (http://www. hymatol.org) and HAO (http://portal.hymao.org/projects/32/public/ontology/) websites. If not otherwise specified, geographical and biological records were extracted from the Taxapad database (Yu *et al*. 2012). The following morphometric abbreviations are used:

A: antenna length, from base of torulus to flagellar apex.

B: body length, from torulus to metasomal apex.

F: forewing length, from tegula base to wing apex.

IC (forewing intercubital index): length of M between rs–m and 2m–cu/length of rs–m

NI (hind wing 1/Cu&cu–a (nervellus) interception index): length of (1/Cu)/length of cu-a.

OT (ovipositor sheath-tibia index): length of ovipositor sheath/length of hind tibia.

RESULTS

Genus overview

Phorotrophus Saussure, 1892

Phorotrophus Saussure, 1892: pl. 16 fig. 3.

Dischizella Seyrig, 1934: 1974 (synonymy by Townes, 1974).

Genotype: *Phorotrophus trilobus* Saussure, 1892

Diagnosis (updated from Townes, 1971)

Forewing 5 to 18 mm long; ground colour often yellow, but sometimes darker to black; body and legs stout or moderately stout; frons and face with a mid-longitudinal carina of variable length, often reaching clypeal margin; clypeus moderately small with a subapical transverse ridge, ridge blunt to carina-like, concave to convex and most often bluntly produced laterally; ventral margin of clypeus also produced laterally in various forms, and often with a median tooth; labrum largely exposed; mandible bidentate with lower tooth hardly to strongly longer than upper tooth; subocular sulcus deep to shallow; occipital carina short to nearly complete, ventrally joining hypostomal carina well before mandible base; flagellum of moderate length to rather short; front profile of mesoscutum vertical, or rarely moderately slanted forward; notaulus sharp and deep, reaching to or past centre of mesoscutum; epicnemial carina reaching between lower third of hind edge of pronotum to subtegular ridge; propodeal carination various, apical transverse carina usually distinct near midline so that median area is usually not confluent with mid-posterior area; hind tarsal claws without an accessory tooth; forewing with 2m–cu slightly basal to distinctly apical to rs–m, 2m–cu vein with bullae fused to widely separated, and discosubmarginal cell often with a variable internal ramellus; hind wing with 1/Cu&cu–a intercepted between lower and upper third; metasoma smooth and polished, often with patches of shallow punctures; first sternite reaching 0.3× to 0.8× distance between base of first tergite and spiracle, with a median swelling varying from weak to strong and pyramidal; ovipositor sheath 0.8× to 3× longer than hind tibia; ovipositor tip with some vertical ridges near apex and usually with a few widely spaced ridges; no conspicuous sexual dimorphism.

Differential diagnosis

Although morphologically rather uniform, *Phorotrophus* lacks clear synapomorphies. Its characterization in the Afrotropical Region mainly requires the elimination of alternative genera: *Phorotrophus* species have evenly rounded mandibles (distinctly bent in *Paracollyria*), with occipital carina present but incomplete (totally absent in *Dimorphonyx*, complete in *Ishigakia*), a weak to rather strong and rounded ventral swelling on sternite 1 (very high and triangular in *Dimorphonyx*), and the apex of sternite 1 situated distinctly basal to tergite 1 spiracle (subopposite in *Notaulites*). *Phorotrophus* is moreover closely related to the Palaearctic genus *Phaenolobus* and previously was considered to be a subgenus of it (Seyrig 1932). These two genera are separated by subtle morphological differences of uncertain phylogenetic value (Townes 1971).

Biology

Ecological and host data are very scarce. All reported hosts are pest weevils (Curculionidae) and hence representatives of this genus have potential as biological control agents.

Distribution and species richness

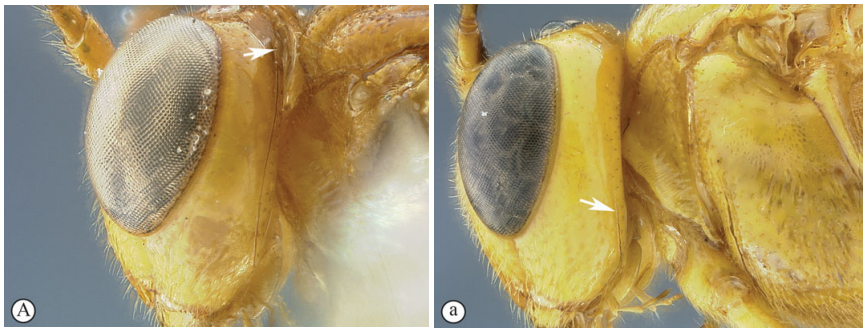
Phorotrophus is restricted to the Afrotropical Region. The present revision recognizes a total of 33 valid species, including eight new species described below, and eight new synonyms. The dichotomous key was developed using primarily the less intraspecifically variable critical characters, i.e. the length of the occipital carina and the sculpture of the scuto-scutellar groove. Some characters sometimes proved to be highly variable within species and are carefully stated in the key with robust confidence intervals when sufficient material was available to assess the variability. The development of an online interactive matrix key (www.waspweb.org) taking into account the range of variability helps to reduce possible misidentification issues.

This revision allows us to draw global conclusions about the biogeographical history of the genus. The Malagasy fauna is well differentiated and totally distinct from the mainland, with eight species belonging to the species group that all have a long occipital carina. Three of these, including the genotype *P. trilobus*, exhibit the typical habitus of the genus, i.e. an overall yellow colour pattern with hyaline wings, while the remaining five species are morphologically readily distinguishable.

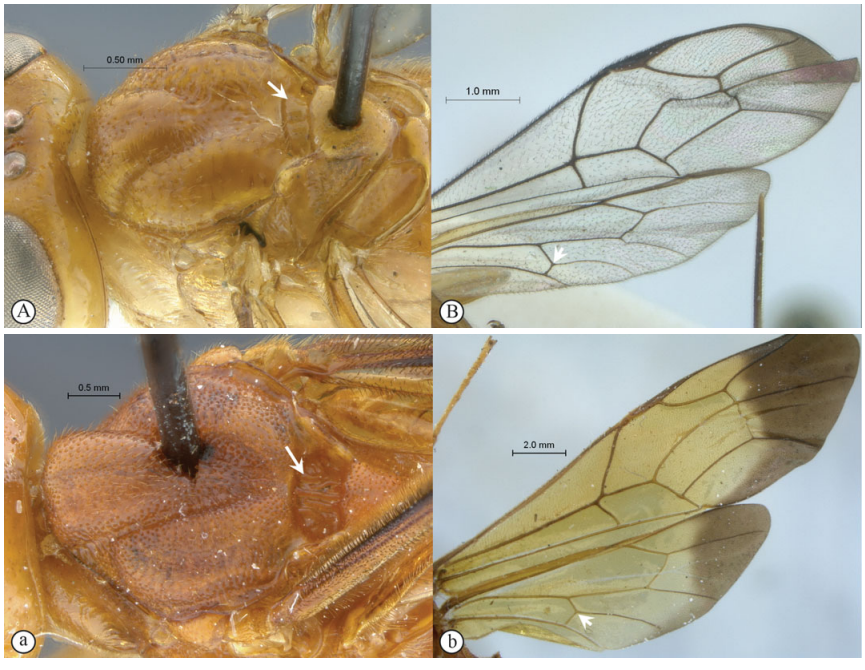
The mainland fauna appears to comprise four widespread species, *P. alcides*, *P. bivittatus*, *P. congoensis* and *P. mameti*, and 21 species poorly represented in collections. Due to their wide distribution, these four widespread species display a correlated range of intraspecific variability, which misled previous authors who described the range of variability as distinct species. Based on current data the distribution of the remaining 21 species appears to be more localized.

However, most of these species are poorly represented in collections, so we are unable to assess whether this assumption is supported by robust biogeographical or ecological data. Actually, the present revision does not enable us to draw more general conclusions about the biogeography of Acaenitinae in the Afrotropical Region. Collection data are too scarce, and often insufficiently detailed to document the ecology or the precise distribution of most species. The previous observation of Castillo *et al.* (2011), stating that Acaenitinae in South America appear to be restricted to high altitudes, is not supported here. Indeed, when the altitude of the collection site is known, it shows that Acaenitinae in the Afrotropical Region were collected both in lowlands or at high altitudes. We cannot, however, state whether or not this preliminary opinion is of any statistical relevance.

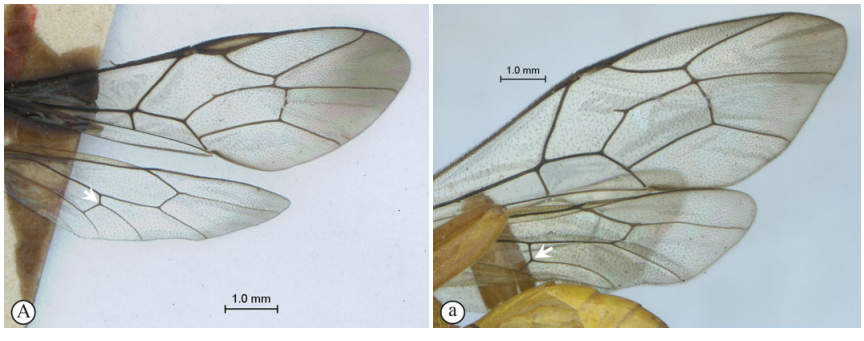
KEY TO THE SPECIES



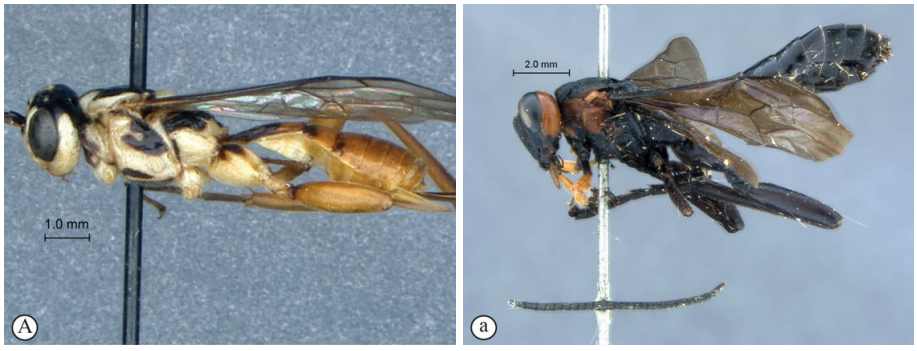
1 Occipital carina long, reaching vertex level or above (A) 2
— Occipital carina short, at most reaching mid-height of eye (a) 14



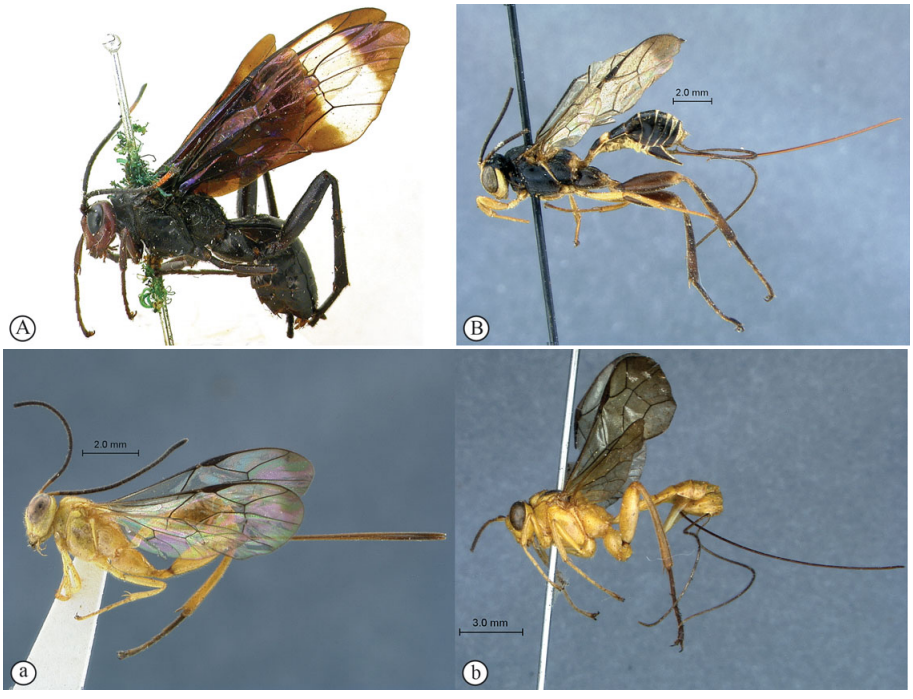
2(1) Scuto-scutellar groove almost smooth, at most with faint incomplete crenulations (A); hind wing with 1/Cu&cu–a intercepted far below middle (NI > 1.6) (B)
..... *P. congoensis* Benoit
— Scuto-scutellar groove distinctly crenulate (a); hind wing with 1/Cu&cu–a intercepted higher (NI < 1.6) (b) 3



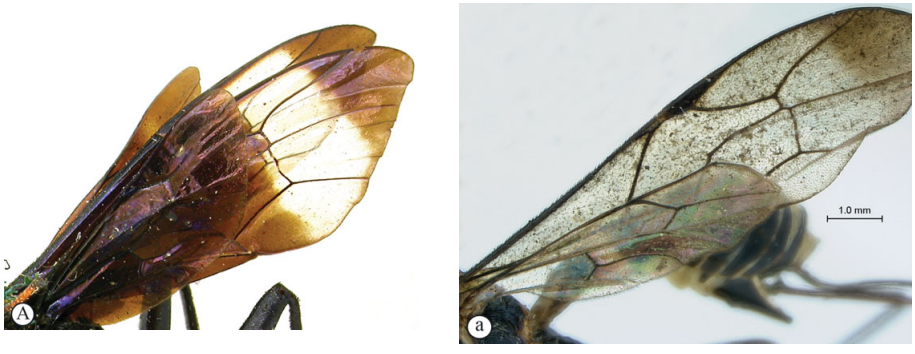
3(2) Hind wing with 1/Cu&cu–a intercepted far above middle (NI < 0.6) (A) 4
— Hind wing with 1/Cu&cu–a intercepted around middle (NI > 0.6) (a) 5



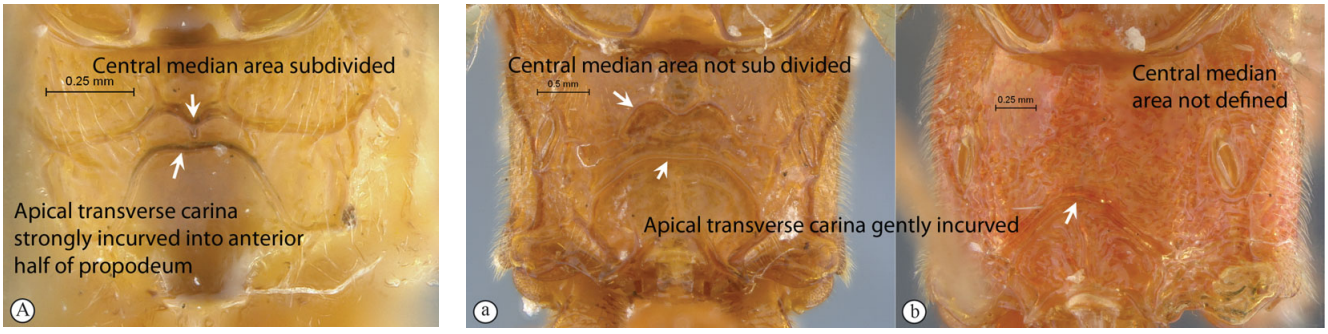
4(3) **Head and mesosoma yellow, metasoma orange, wings hyaline (A); Madagascar** ..... ***P. tricolor* Seyrig**
— **Body almost entirely black, wings strongly infuscate (a); South Africa** ..... ***P. malaisei* Benoit**



5(3) **Mesosoma, and often remainder of body, mostly black (A, B)** **6**
— **Body mostly yellow to reddish orange, at most with isolated black markings (a, b)** **7**

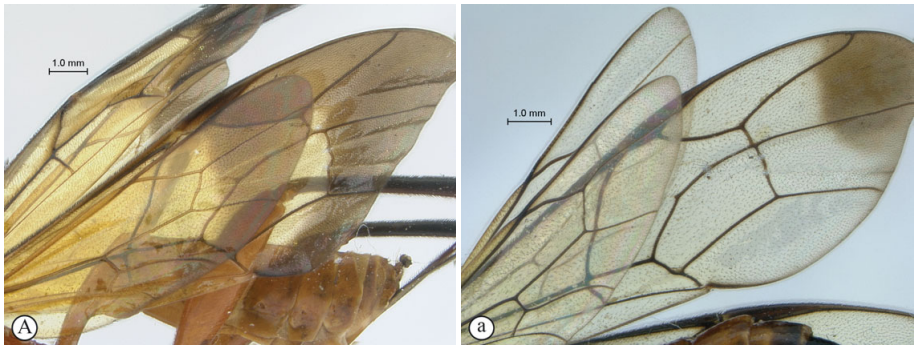


6(5) **Wings strongly infuscate except for a subapical stripe on forewing; 2m–cu basal to rs–m (A); West Africa (Sierra Leone)** ..... ***P. pulcher* (Szépligeti)**
— **Wings hyaline, apically infuscate; 2m–cu apical to rs–m (a); Central Africa** ..... ***P. perplexus* Benoit**



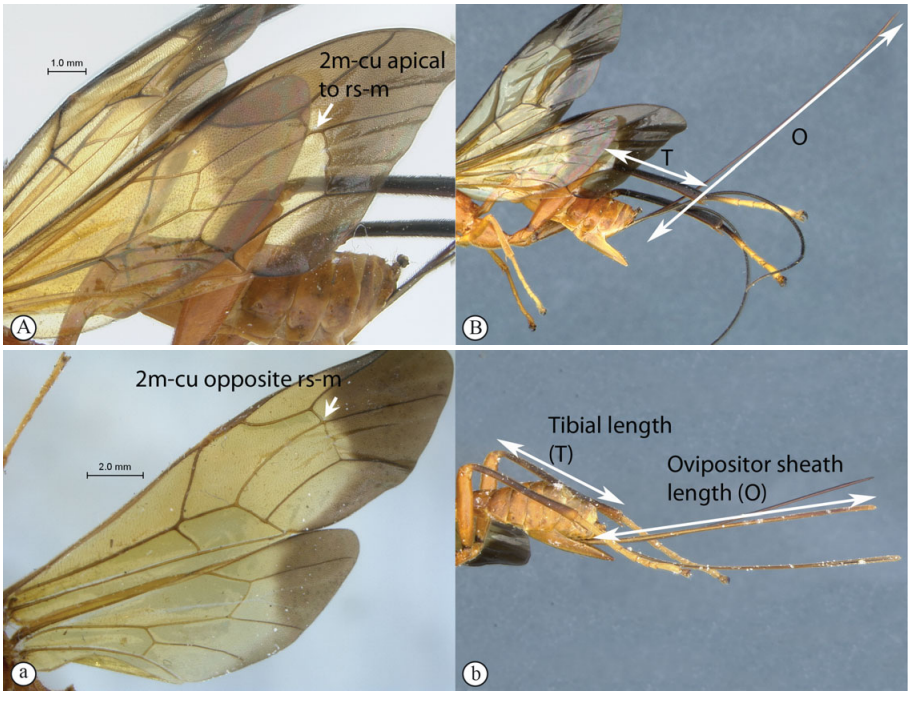
7(6) **Apical transverse carina of propodeum present and strongly medially incurved, almost reaching anterior third of propodeum; central median area of propodeum defined and medially subdivided (A); mainland Africa** ..... ***P. kaluleus* Benoit**

— **Apical transverse carina of propodeum, if present, gently medially incurved reaching at most anterior half of propodeum (a,b); central median area of propodeum usually not defined (b), if present not subdivided (a); Madagascar** **8**



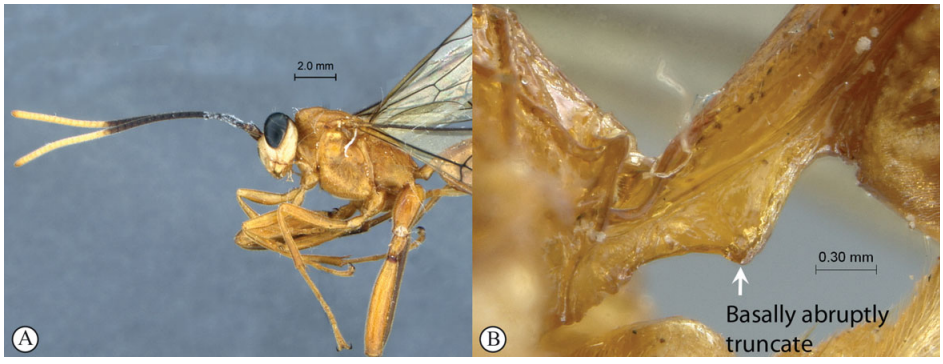
8(7) **Wings yellowish with apex strongly infuscate (A)** **9**

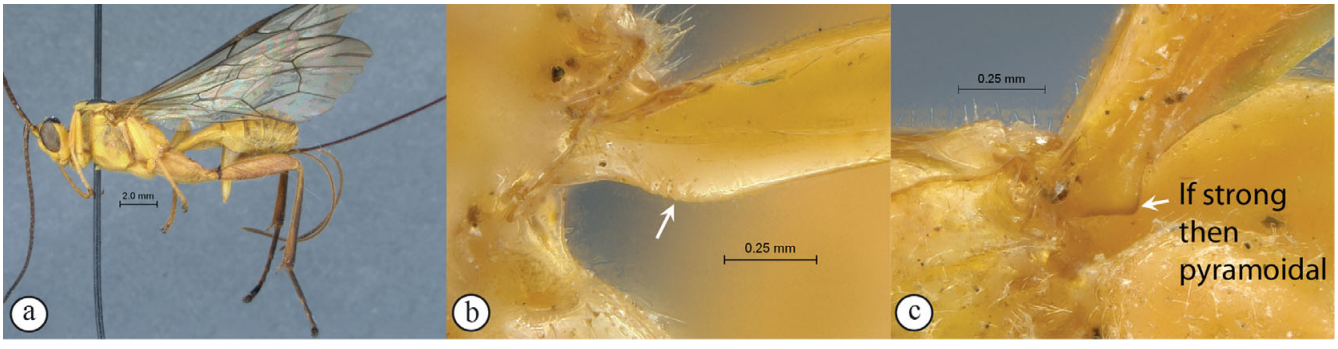
— **Wings hyaline with apex at most moderately infuscate (a)** **10**



9(8) **Vein 2m–cu distinctly apical to rs–m (A); ovipositor very long (OT > 3) (B)** ..... ***P. radialis* (Seyrig)**

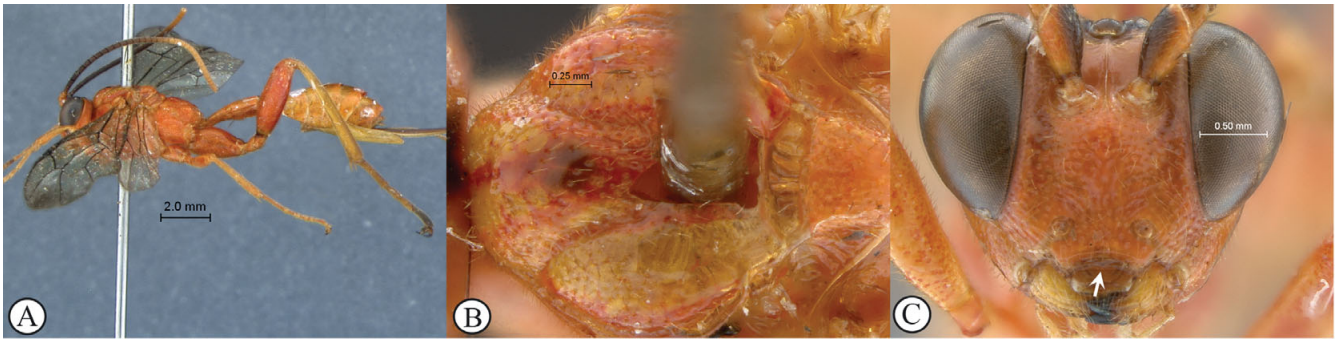
— **Vein 2m–cu opposite rs–m (a); ovipositor shorter (OT < 3) (b)** ..... ***P. magnificus* (Seyrig)**





10(8) **Head distinctly lighter than remainder of body (A); flagellum bicoloured, basally black and apically pale yellow (A); ventral swelling of sternite 1 strong, basally abruptly truncate (B)** ····· ***Phorotrophus thouvenoti*** **(Seyrig)**

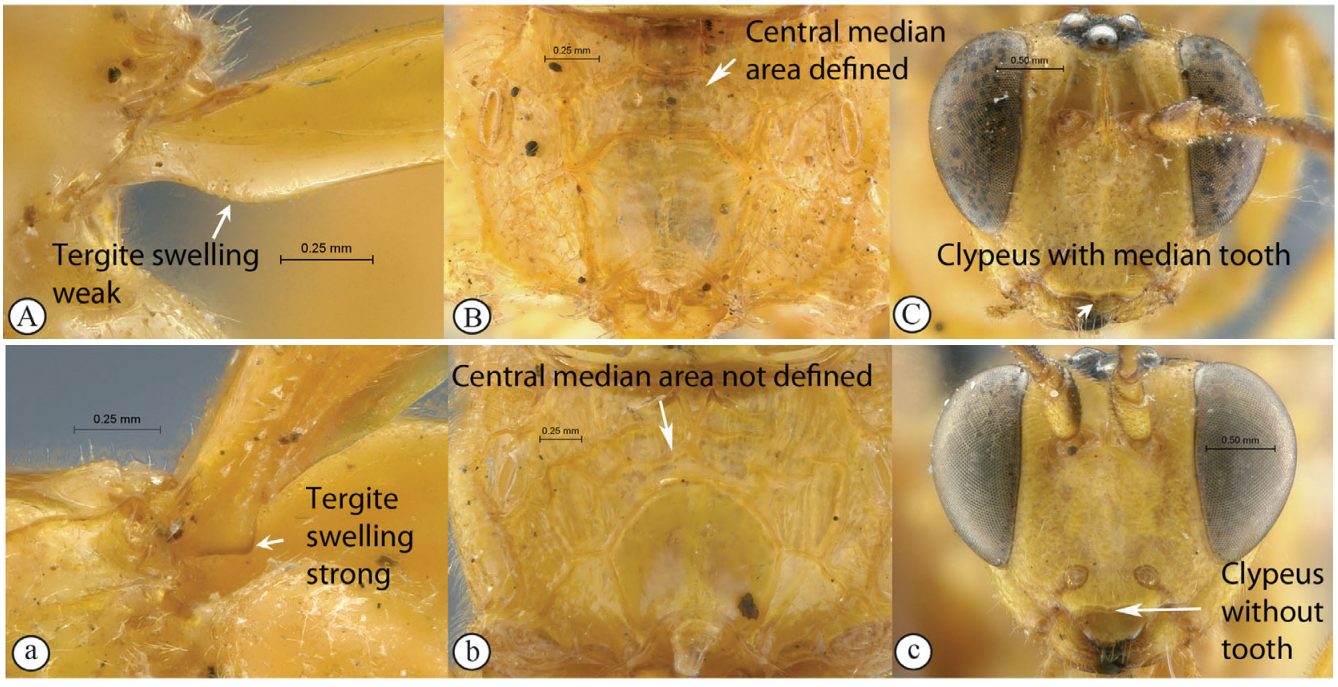
— **Head and remainder of body uniformly coloured (a); flagellum variable; ventral swelling variable (b), but if strong then regularly pyramidal (c)** ····· **11**





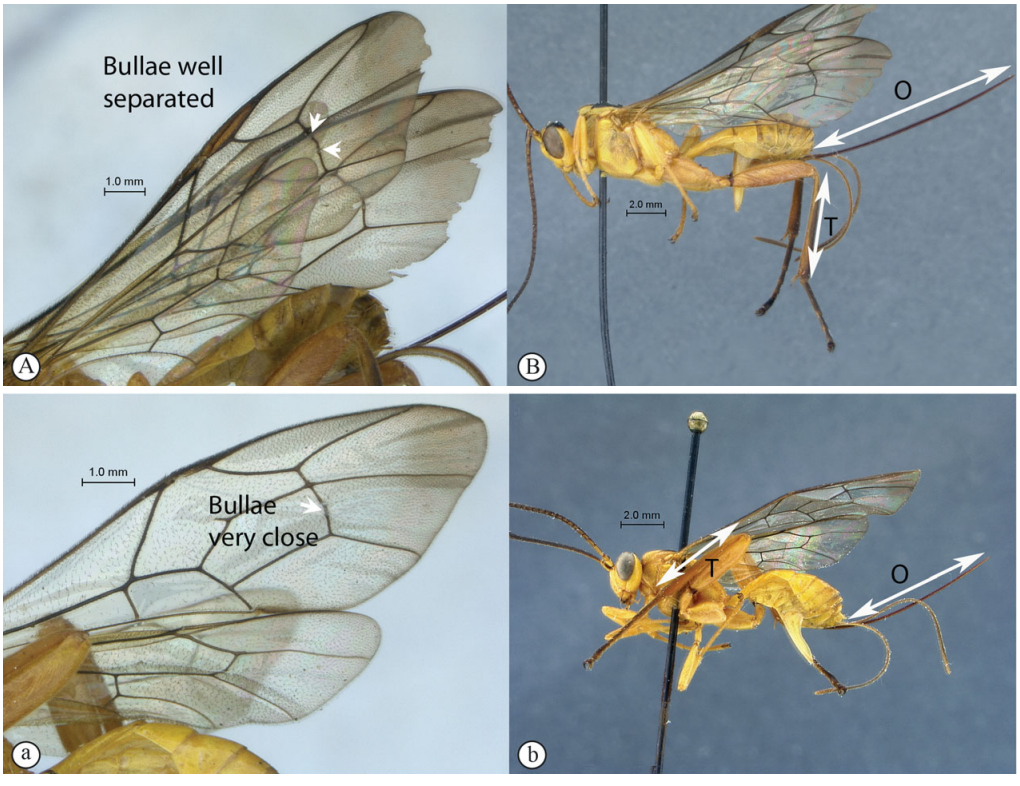
11(10) **Orange overall (A) without black markings on mesosoma (B); flagellum bicoloured, basally black and apically orange (A); subapical ridge of clypeus evenly concave (C)** ····· ***P. youpi*** **sp. nov.**

— **Bright yellow overall (a) with mesoscutal lobes more or less black maculated (b); flagellum entirely black with basal flagellomeres fading to yellow (a); subapical ridge of clypeus subtruncate (c)** ····· **12**



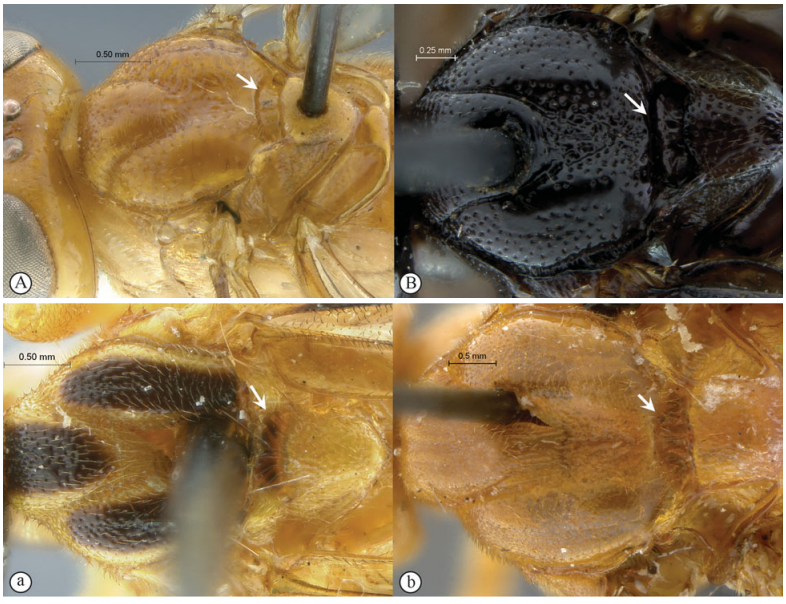
12(11) **Ventral swelling on sternite 1 weak (A); propodeum with central median area defined (B); ventral margin of clypeus with a median tooth (C)** ····· ***P. trilobus* Saussure**

— **Ventral swelling stronger (a); propodeum without distinct central area (b); ventral margin of clypeus evenly concave, without median tooth (c)** ····· **13**



13(12) **Forewing with bullae on 2m–cu small, separated by 4–5× their own length (A); ovipositor long (OT > 1.8) (B)** ····· ***P. maculiceps* (Seyrig)**

— **Forewing with bullae on 2m–cu nearly fused (a); ovipositor moderately long (OT < 1.8) (b)** ···· ***P. hastatus* (Seyrig)**



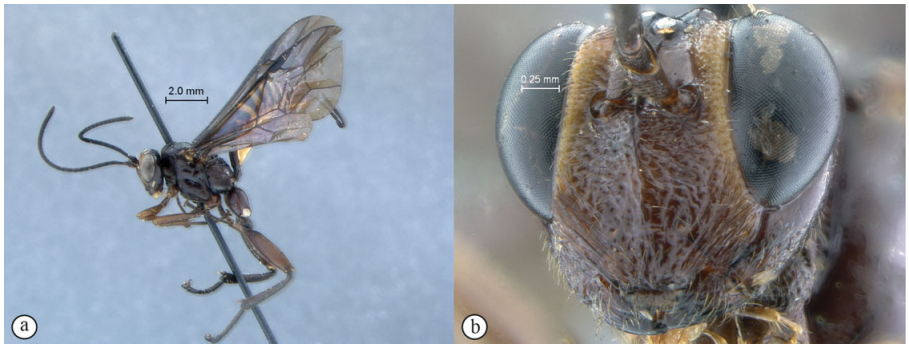
14(1) **Scuto-scutellar groove almost smooth, at most with faint incomplete crenulations (A, B)** **15**
— **Scuto-scutellar groove distinctly crenulate (a, b)** **21**



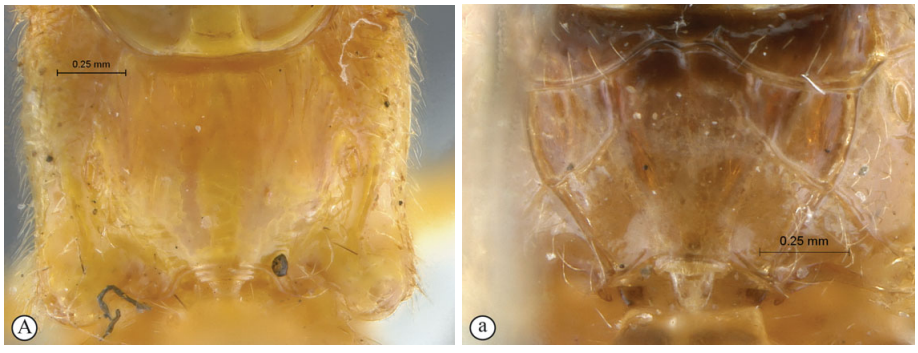
15(14) **Most of mesosoma and metasoma black (A, B)** **16**
— **Most of mesosoma and metasoma yellow to orange (a), at most with isolated black markings (b)** **17**



16(15) **Body black with red markings, wings hyaline (A); face and clypeus punctate, without transverse sculpture (B); South Africa** ..... ***P. hephaistosi* sp. nov.**



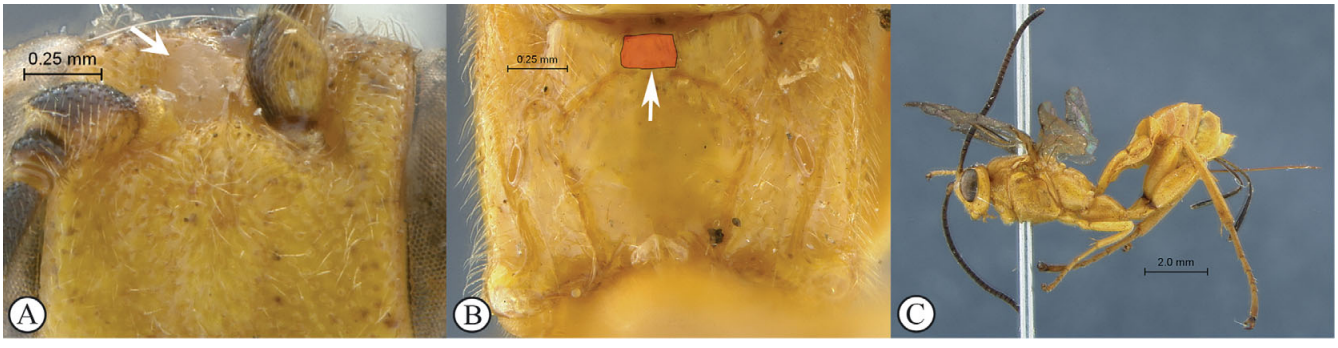
— **Body black with pale yellow markings, wings infuscate (a); face and clypeus with coarse transverse striations (b); Central Africa (Uganda)** ..... ***P. cyranodebergeraci* sp. nov.**



17(16) **Propodeum quite smooth, without any carination (A)** ..... ***P. acarinatus* Benoit**
— **Propodeum more or less sculptured with carination present (a)** **18**



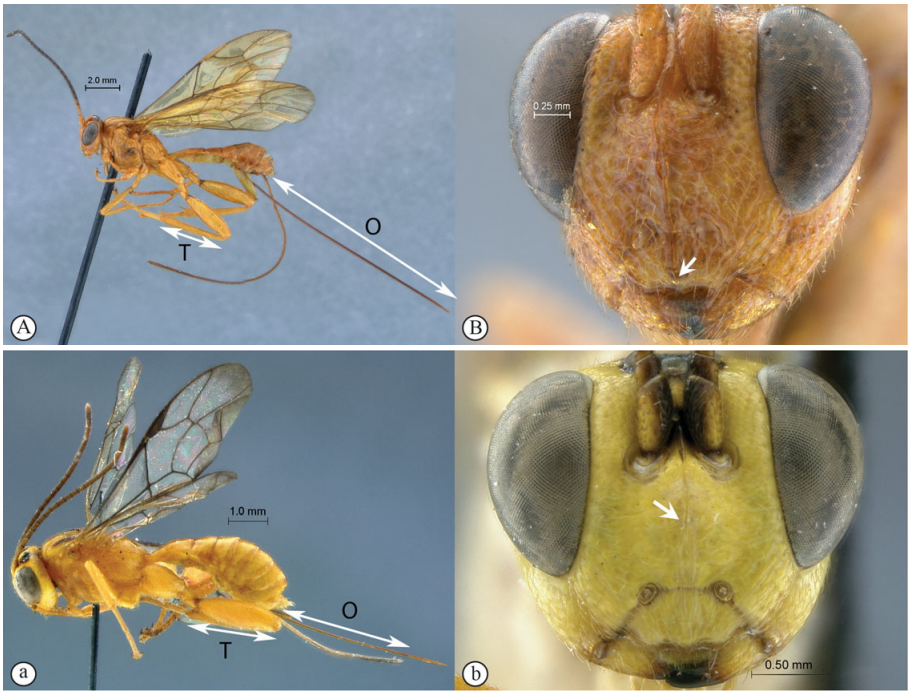
18(17) **Hind wing with 1/Cu&cu–a intercepted distinctly above middle (NI ≤ 0.8) (A)** **19**
— **Hind wing with 1/Cu&cu–a intercepted lower (NI > 0.8) (a)** **20**



19(18) **Frons medially nearly smooth (A); basal median area of propodeum wider than long (B); entirely yellow, without black markings (C)** ..... ***P. flavus* (Roman)**

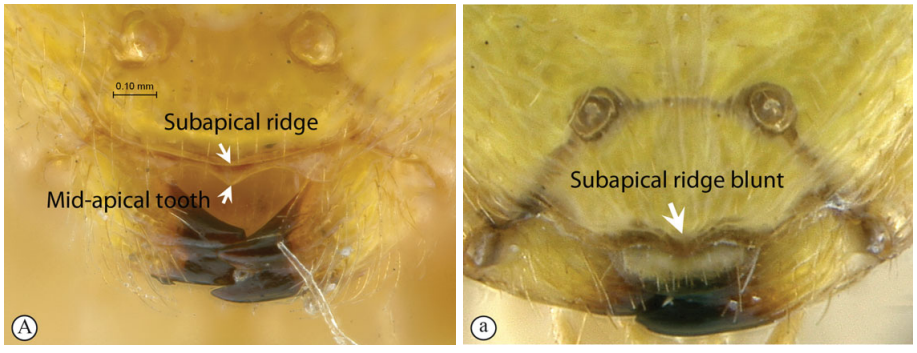


— **Frons medially transversely strigose (a); basal median area of propodeum longer than wide (b); yellow to yellowish orange with dorsal and often ventral large black markings (c)** ····· ***P. bivittatus* (Morley)**



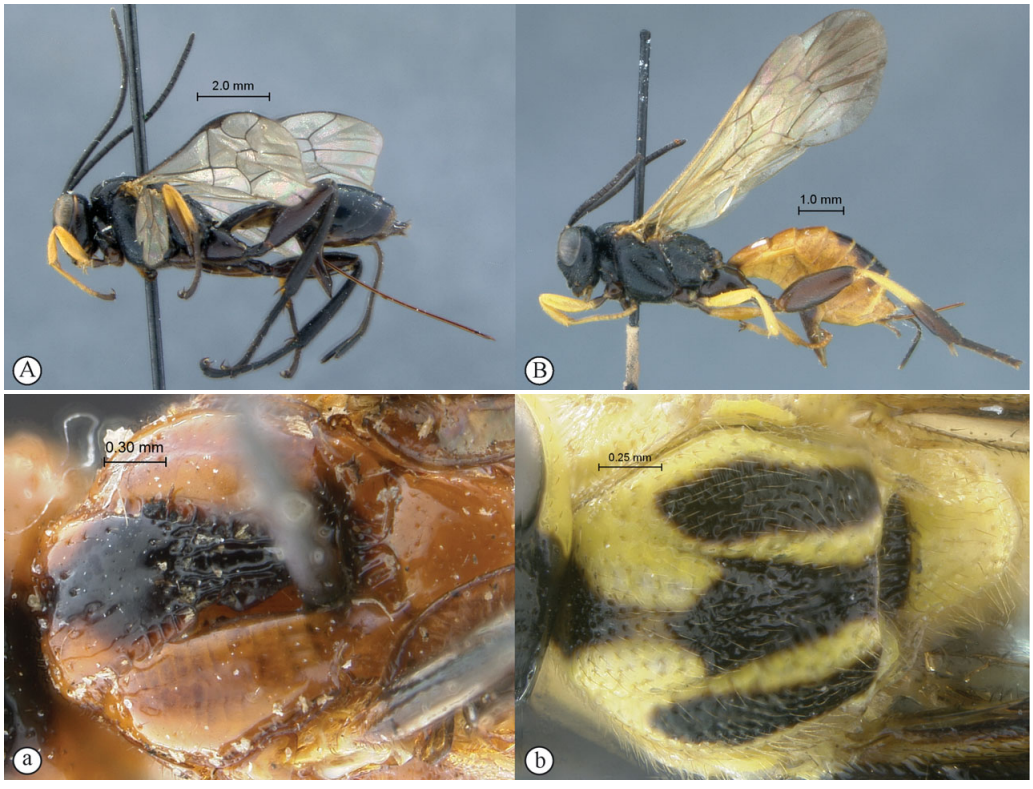
20(18) Body orange without black markings, wings slightly yellowish (A); mid-longitudinal carina on face extending to ventral margin of clypeus (B); ovipositor very long (OT > 2.5) (A) ····· ***P. fernando* sp. nov.**

— **Body bright yellow, always with black markings of variable extent, wings hyaline (a); mid-longitudinal carina on face not reaching dorsal margin of clypeus (b); ovipositor shorter (OT < 2.5) (a)** ····· ***P. mameti* Benoit**

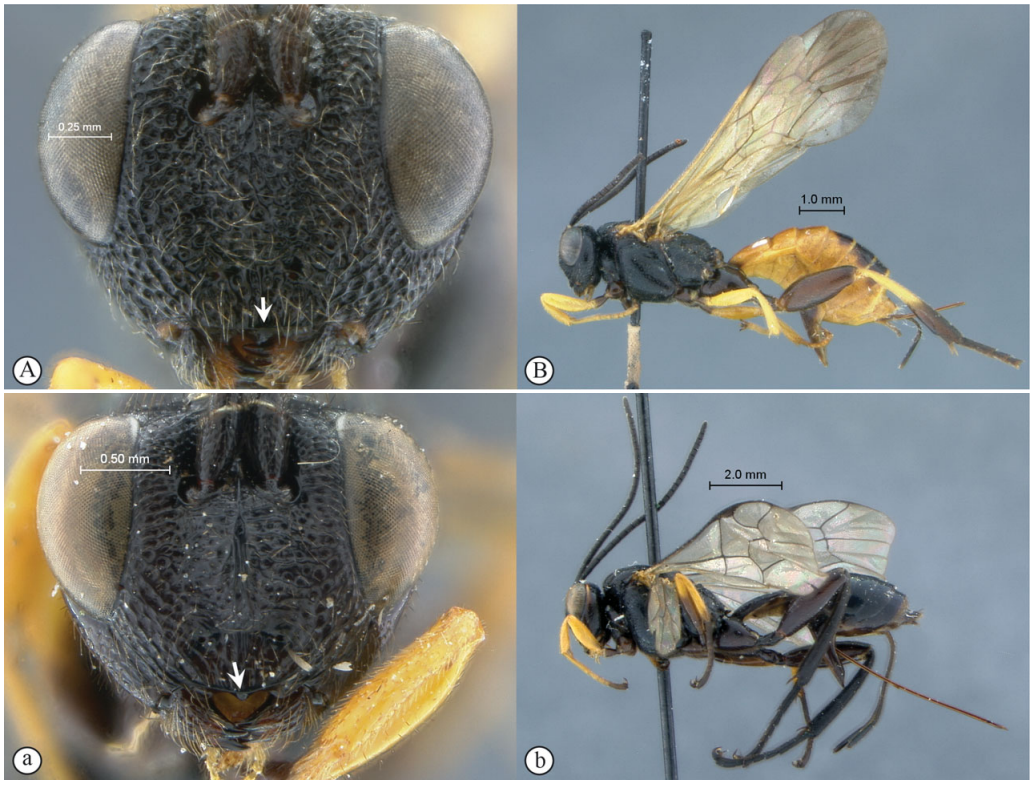


21(14) Subapical ridge of clypeus sharp and evenly concave to convex, distinctly overhanging the mid-apical tooth of clypeus (A) ····· **22**

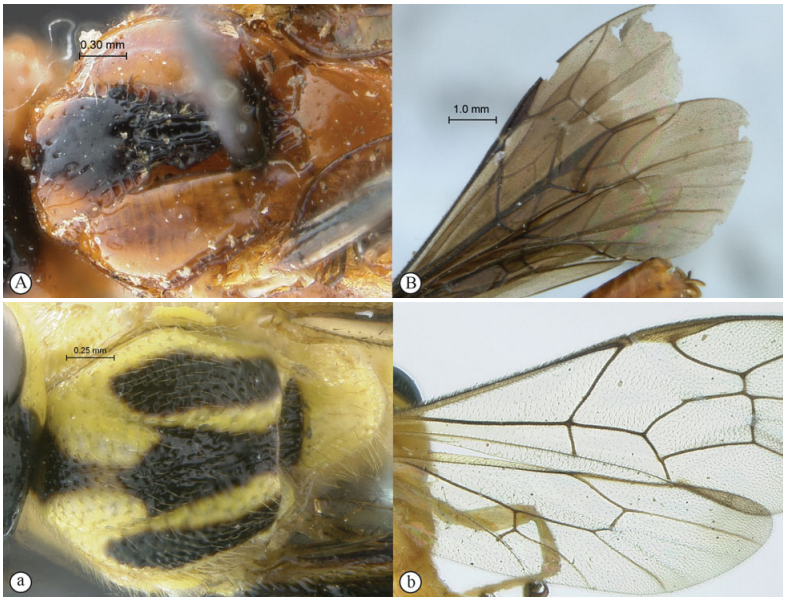
— **Subapical ridge blunt and faint to moderately sharp, always irregularly shaped or sinuate and including the mid-apical tooth of clypeus if present (a)** ····· **25**



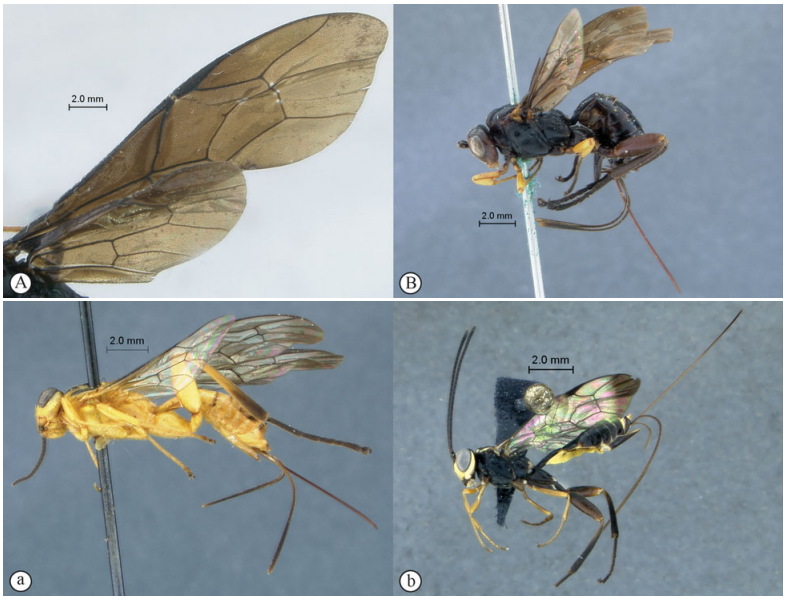
22(21) **Mesosoma totally black (A, B)** **23**
— **Mesosoma mostly yellow to orange, dorsally with or without isolated black markings (a, b)** **24**



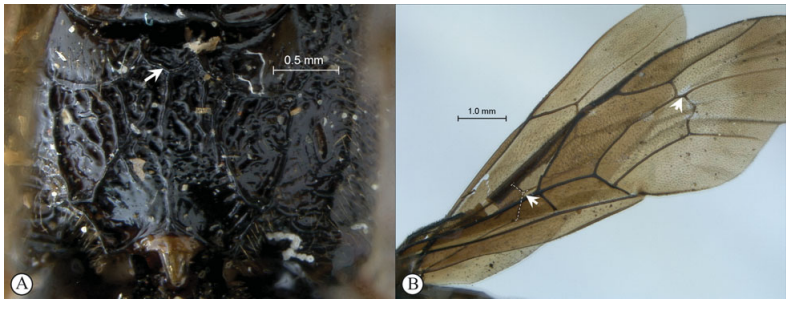
23(22) **Subapical margin truncate (A); metasoma mostly yellowish orange with apical black markings (B); southern Africa** ..... ***P. zoutpansbergensis* sp. nov.**
— **Subapical margin evenly convex (a); metasoma entirely black (b); tropical Africa** ..... ***P. schoutedeni* Benoit**



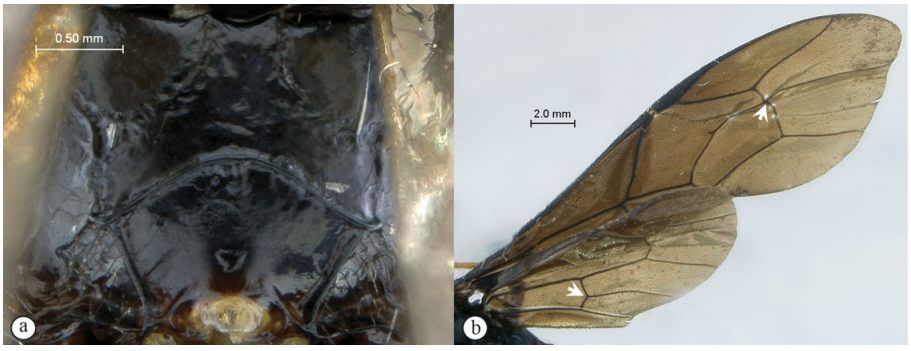
24(22) **Mesoscutum almost totally smooth (A); wings strongly infuscate (B); South Africa** ..... ***P. vulcani* sp. nov.**
— **Mesoscutum densely punctate (a); wings hyaline, apically more or less infuscate (b); widespread** ..... ***P. alcides* (Wilkinson)**



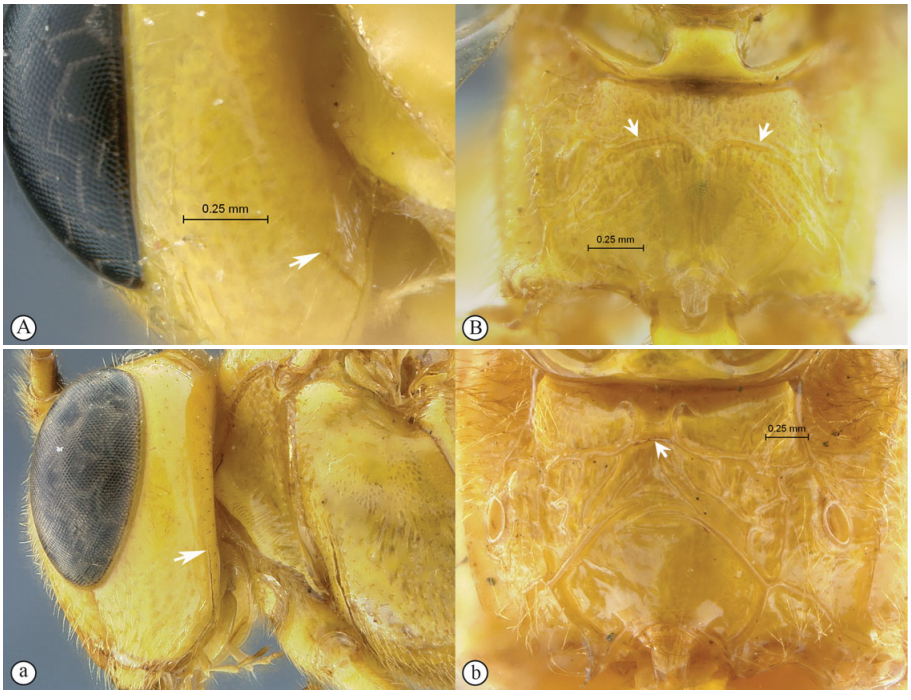
25(21) **Wings strongly infuscate (A), most of body black (B)** **26**
— **Wings hyaline to weakly yellowish (a, b), most of body usually yellow (a) though sometimes largely black (b)** ... **27**



26(25) **Propodeum rugose reticulate with basal median area defined (A); forewing with 2m–cu distinctly apical to rs–m (IC> 0.1), hind wing with 1/Cu&cu–a intercepted far above middle (NI < 0.8) (B); South Africa** ... ***P. ater* (Tosquinet)**

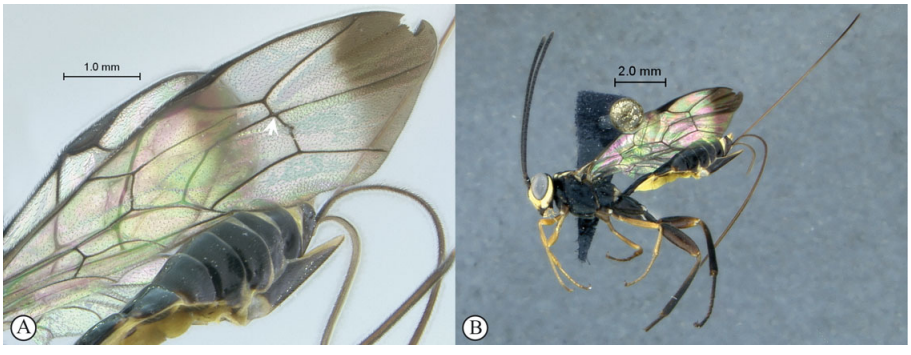


— **Propodeum almost smooth without any median area defined (a); forewing with 2m–cu subopposite rs–m (IC < 0.1), hind wing with 1/Cu&cu–a intercepted below middle (NI > 0.8) (b); tropical Africa** ····· *P. tosquineti* **(Benoit)**

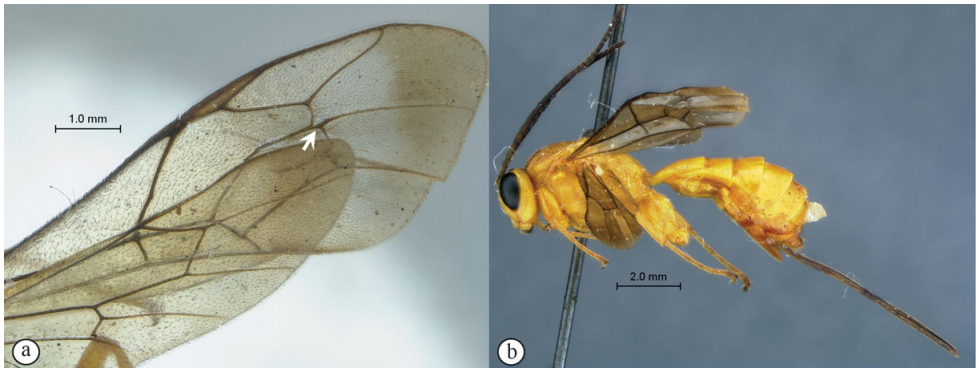


27(25) Occipital carina nearly absent (A); propodeal carination reduced with only basal transverse carina and a long but variously distinct mid-longitudinal carina present, median basal area not defined (B); tropical Africa ····· *P. mangbetuorum* **Benoit**

— **Occipital carina extending to at least lower quarter of eye height (a); propodeal carination more extensive with median basal area defined, never with a long mid-longitudinal carina (b)** ····· **28**



28(27) Forewing with 2m–cu opposite or subopposite rs–m (IC < 0.1) (A); body mostly black, ovipositor very long (B); tropical Africa ····· *P. problematicus* **sp. nov.**



— **Forewing with 2m–cu slightly to strongly apical to rs–m (IC > 0.1) (a); body usually mostly yellow, ovipositor shorter (OT < 2.5) (b)** ····· **29**



29(28) Hind wing with 1/Cu&cu–a intercepted far below middle (NI 2.0) (A); tropical Africa ····· *P. solitarius* **Benoit**
— **Hind wing with 1/Cu&cu–a intercepted about (a) or above middle (NI ≤ 2.0) (b)** ····· **30**

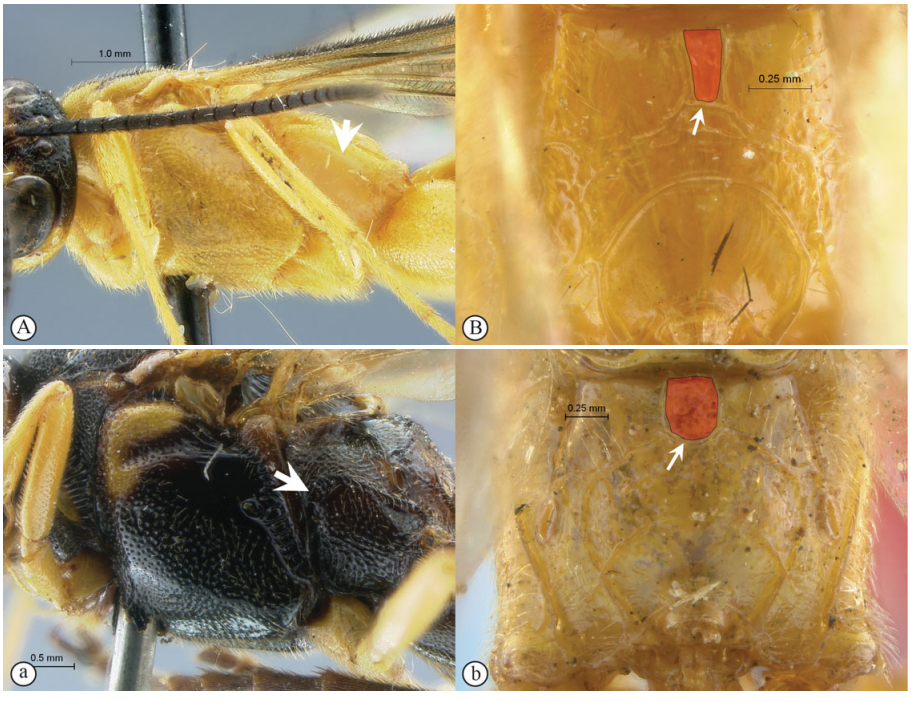


30(29) Hind wing with 1/Cu&cu–a intercepted far above middle (NI < 0.6) (A, B); tropical Africa ····· **31**
— **Hind wing with 1/Cu&cu–a intercepted moderately above (a) to moderately below middle (b) (NI 0.6–2.0) (a)** ···· **32**



31(30) **Subapical ridge of clypeus moderate (A); subocular sulcus deep (A); antenna of 26 flagellomeres without white rings (B)** ..... ***P. stictor* Benoit**

— **Subapical ridge of clypeus hardly distinct (a); subocular groove shallow (a); antenna of 21 flagellomeres with numerous white rings in apical half (b)** ..... ***P. frodoni* sp. nov.**



32(30) **Metapleuron mostly smooth (A); propodeum with basal median area about twice as long as wide (B); tropical Africa** ..... ***P. ealensis* Benoit**

— **Metapleuron distinctly sculptured (a); propodeum with basal median area at most barely longer than wide (b); South Africa** ..... ***P. capensis* (Holmgren)**

DESCRIPTIONS

Phorotrophus acarinatus Benoit, 1952a
Fig. 1

Diagnosis

A bright yellow species with dorsal black markings on vertex and median lobe of mesoscutum; wings hyaline, apically infuscate; frons transversely strigose medially; face strongly bulging medially, rugulose punctate, carina indistinct; clypeus somewhat rugulose, subapical ridge blunt and weakly produced laterally, ventral margin strongly produced laterally with median tooth strong and acute; antenna with 29 flagellomeres; occipital carina short, not reaching above mid-height of eye; pronotum shallowly punctate, ventrally strigose, anterior margin smooth; mesopleuron moderately to densely punctate, speculum smooth; upper part of epicnemial carina faint, reaching mid-height of pronotum; metapleuron densely punctate without longitudinal sculpture; mesoscutum deeply and densely punctate; lateral lobe somewhat flat; notauli very deep, crenulate, joining in front of posterior margin of mesoscutum; scuto-scutellar groove nearly smooth, but for a weak median ridge; propodeum quite smooth without any carination; forewing with bullae on 2m–cu confluent and 2m–cu apical to rs–m; hind wing with 1/Cu&cu–a intercepted below middle; ventral swelling

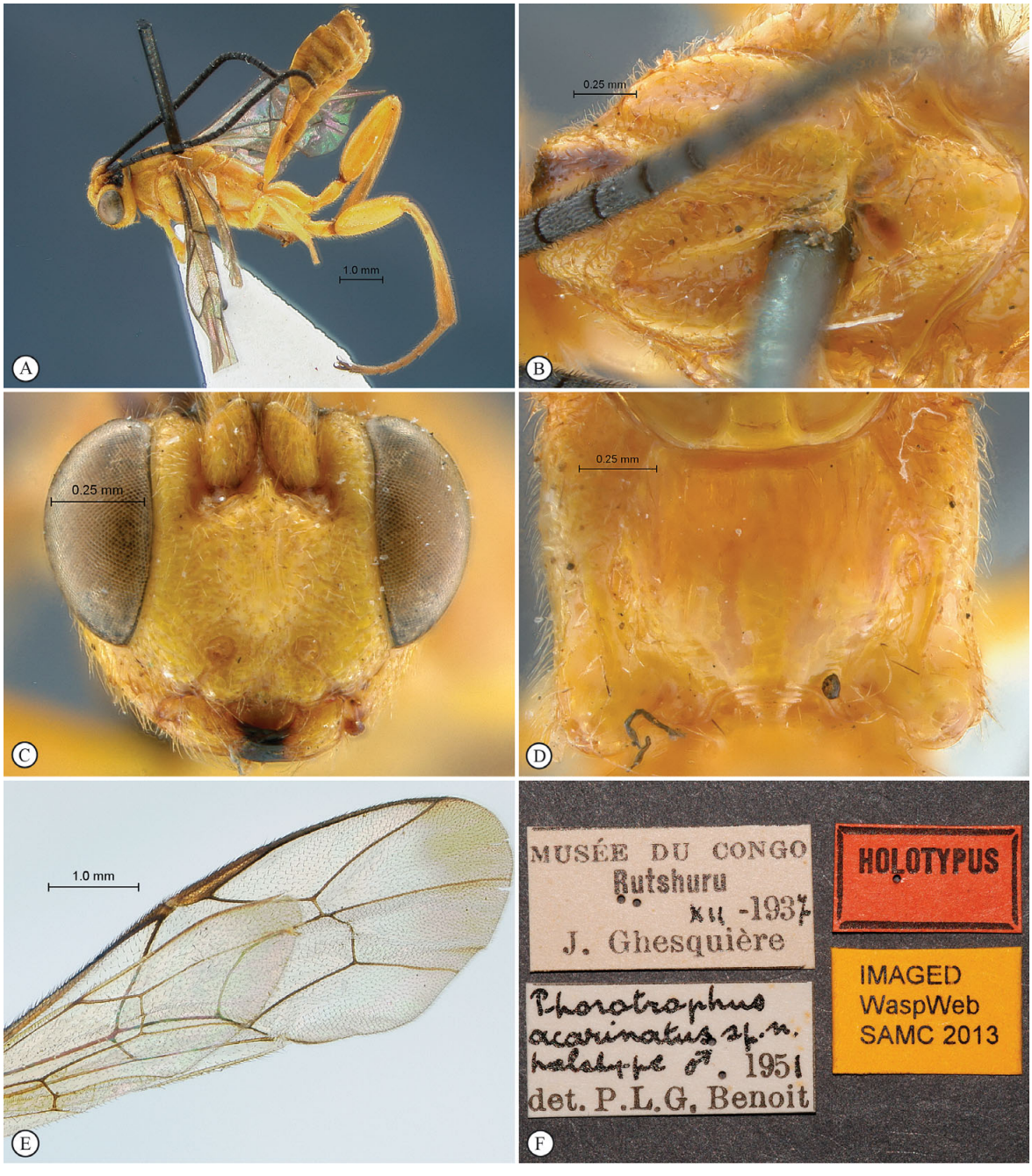


Fig. 1. *Phorotrophus acarinatus* holotype male. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

on sternite 1 absent. IC 0.4; NI 1.3; OT –; B 8.2; A 6.4; F 8.1 (holotype).

Differential diagnosis

Bright yellow species with reduced dorsal black markings, characterized by the almost smooth propodeum without any trace of carination. The flat lateral lobes on the mesoscutum and the absence of any swelling on sternite 1 are also useful diagnostic characters.

Material examined

Holotype ♂: Butshuru [Democratic Republic of Congo] xii.1937, J. Ghesquière (MRAC).

Distribution

Democratic Republic of Congo.

Phorotrophus alcides (Wilkinson, 1930)

Fig. 2

Phaenolobus alcides Wilkinson, 1930: 147.

Phorotrophus elevatus Benoit, 1952a: 52, **syn. nov.**

Phorotrophus ugandensis Benoit, 1952b: 53 (synonymy by Townes & Townes, 1973).

Diagnosis

Bright yellow to orange overall with black markings of variable extent (markings sometimes totally absent) present in following areas: frons, vertex, upper occiput, lobes of mesoscutum to entire mesoscutum, scuto-scutellar groove, mesosternum, hind tarsus and tergites 3–7 medially; antenna black but scape, pedicel and flagellomere 1 often yellow ventrally; wings hyaline, apically more or less infuscate; frons almost smooth medially with faint dorsal oblique striations; face transversely rugulose punctate, carina moderate and reaching dorsal margin of clypeus; clypeus moderately punctate to longitudinally rugulose punctate, subapical ridge simple, sharp and almost evenly rounded, at most weakly pointed medially, ventral margin moderately produced laterally and with a strong median tooth; antenna with 23–26 flagellomeres; occipital carina short, not reaching above mid-height of eye; pronotum shallowly sculptured, ventrally rugulose and dorsally punctate with a variably large median smooth area; mesopleuron densely punctate, speculum mostly smooth to entirely longitudinally strigose; metapleuron densely and shallowly punctate to coarsely rugulose punctate; mesoscutum deeply and densely punctate to rugulose punctate; notauli moderately deep, shallowly crenulate, joining posteriorly into a deeply concave and rugose area; scuto-scutellar groove smoothly to moderately crenulate; propodeum rugulose; basal and transverse carinae present, moderate, basal median area defined and transverse, central median area more or less distinctly defined, transverse and often subdivided by a mid-longitudinal rugosity; forewing with bullae in 2m–cu confluent to separated by less than 0.5× their own length, 2m–cu slightly to definitely apical to rs–m; hind wing with Cu1 joining 1/Cu&cu slightly above to far below middle; ventral swelling on sternite 1 moderate to strong; ovipositor short. IC 0.2–0.9; NI 0.6–1.7; OT 1.2–1.4; B 5.9–8.9; A 3.7–5.6; F 5.2–8.0 (20 specimens).

Differential diagnosis

Mostly yellow to yellowish orange species with largely variable black markings. The main consistent diagnostic features are the short occipital carina, the crenulate scuto-scutellar groove, the sharp and evenly rounded subapical ridge of the clypeus without any tooth, the deeply concave posterior area on the mesoscutum, the strong swelling on sternite 1, and the short ovipositor. The species is otherwise characterized by more variable features: the apical tergites often black maculated; the speculum often longitudinally strigose; vein 2m–cu always apical to rs–m, although the length of separation is variable; the bullae of 2m–cu are most often confluent; and the propodeum with both transverse carinae present and usually both the basal and central median areas defined.

Material examined

Holotype ♀ of *P. alcides*: Tanganyika [Tanzania], Ty. Morogoro 7/22, Coll: A.H. Ritchie, Pres. by Imp. Bur. Ent. Brit. Mus 1930–284 (BMNH 3.G.731) [Antenna lacking] (BMNH). Other material: **Angola**: 1♀: Angola (A5), Sa da Bandeira, 22–24.ii.1972 (BMNH); Cameroon: 1♀: Cameroun: Nkoemvon, 1980, Ms D. Jackson (BMNH); 1♂: B. Cameroons: Kumba, 18.x.1949, H. Oldroyd, B.M. 1950–2 (BMNH). **Democratic Republic of Congo**: 1♀: Congo belge: P.N.A. Shamuberu (volc. Nyamuragira), 1843m, 15.vi.1935, G.F. de Witte: 1436 (MRAC); 1♂: Congo belge: P.N.A. vers Rweru (Volc. Mikeno), 2400 m. (Bambous) 26 au 27–vii-1934, G.F. de Witte: 501 (MRAC); 1♀: Congo belge: Kivu Tshengelero (près Munagana), 1750 m, 21–vii.1934, G.F. de Witte: 5454 (MRAC); 1♂: Congo belge: P.N.A. Niakibumba (près Kikere), 2250 m 5–vii-1934, G.F. de Witte: 474 (MRAC); 1♂: Congo belge: P.N.U. Kankunda (1.300 m.), 22–24–xi-1947, Miss. G.F. de Witte, 1036a (MRAC); 4♀: Congo belge: P.N.U. Lusinga (1760 m), 12–17–xii-1947, Miss. G.F. de Witte, 1146a (MRAC); 1♂: same label data except: 2–4–v-1949, 2604a. **Ghana**: 1♀: Gold Coast: Aburi, 1.400 ft. alt., Dec. 1941, K.M. Guichard, B.M. 1945–39 (BMNH). **Ivory coast**: 1♀, 1♂: Côte d'Ivoire, Taï, Juin 1979, G. Couturier leg.; Bloc Sangbé, parasitoïde *Alcidodes* sur gombo, coll. Orstom ref. no. 1632–1633 (MNHN). **Kenya**: 1♂ [holotype of *P. elevatus*]: Brit. E. Afr., S.E. Slopes of Mt. Kenya, 6,000 to 7,000 ft., Feb 3–12, 1911, S.A. Neave, 1911–177 (BMNH 3b. 1950). Kenya, A.E. Stubbs, B.M. 1972–211, Kerico 17.xii.1970 (BMNH). **Liberia**: 1♀: Liberia: Var h 31.vii.1953, W. Peters, B.M. 1953–727 (BMNH). **Malawi**: 2♂: 1389 15/3/33, Nyasaland, Malwale, Dr W.A. Lamborn, ex cocoon in chamber of weevil larva no. 1389 in wild bean stem (BMNH). **Sierra Leone**: Kennema, Sierra Leone, ex Callus Cotton Dates, 15.xii.24, E. Hargreaves (BMNH). **Tanzania**: 1♂: Van Someren, Meru, 7/43, V.G.L. van Someren, collection Brit. Mus. 1959–468 (BMNH). **Uganda**: 1♀: Uganda, Kibale National Park, Kanyawara, Makerere University Biological Field Station, 1495m, 0°33.996′N, 30°21.262′E, 3–5.vii.2005, S. van Noort, UG05–M11, Malaise trap, secondary mid-altitude Rainforest, SAM–HYM–P047317 (SAMC); 1♀: same label data except: 1587 m, 0°33.408′N, 30°22.603′E, 30vii–5viii.2005, S. van Noort, UG05–M09, Malaise trap, degraded mid-altitude Rainforest, SAM–HYM–P047323 (SAMC); 1♂: same label data except: SAM–HYM–P047315 (SAMC); 2♂: same label

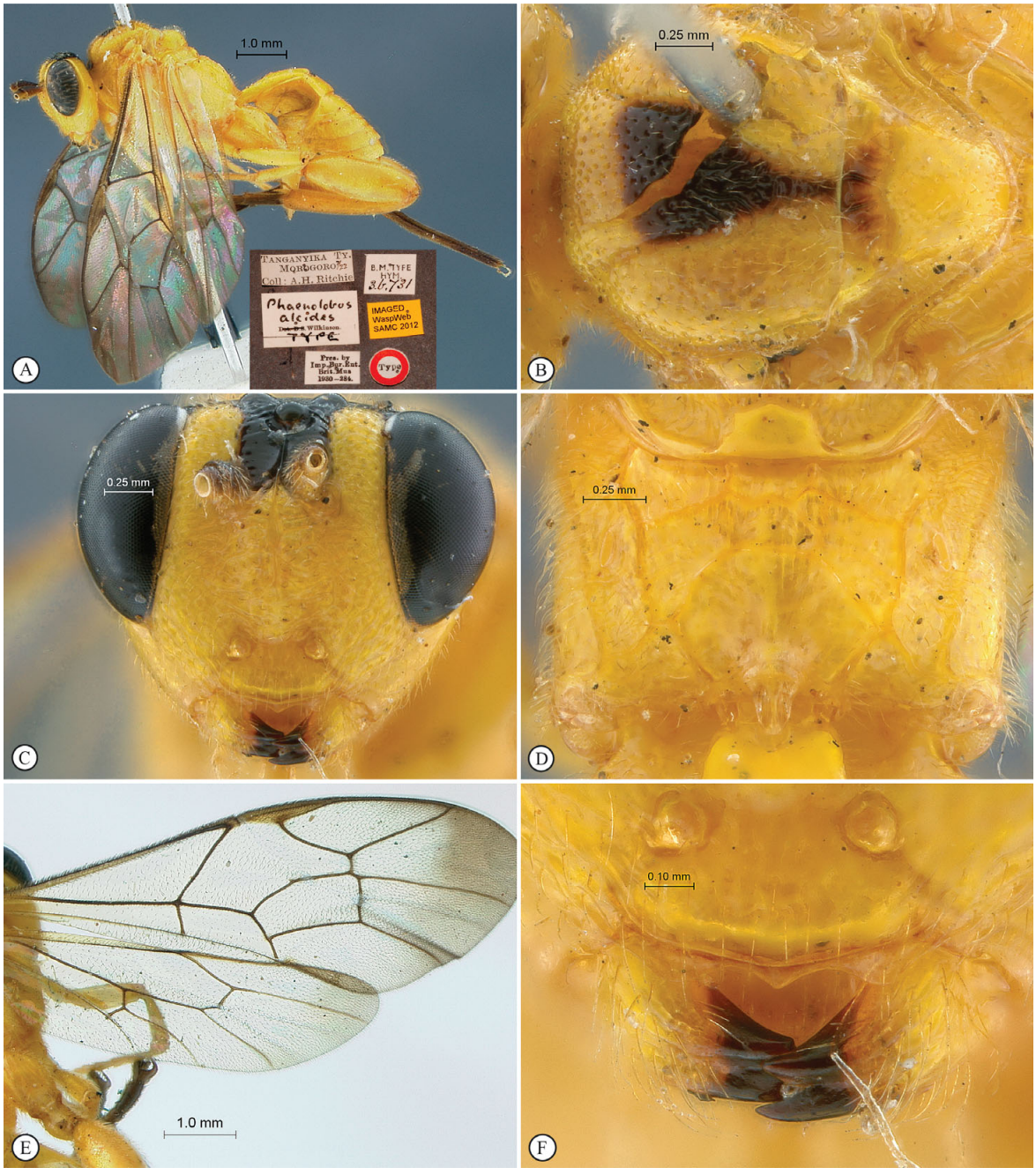


Fig. 2. *Phorotrophus alcides* holotype female. **A**, Habitus lateral view (insert: data labels); **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, clypeus anterior view showing the sharp and evenly rounded subapical ridge.

data except: 1582 m, 0°33.823′N, 30°21.490′E, 2–12.viii.2008, UG08–KF3–M13, primary mid-altitude Rainforest, SAM–HYM–P047316 (SAMC); 1♀: same label data except: 1500 m, 0°33.784′N, 30°21.617′E, 12–26.viii.2008, UG08–KF4–M14, SAM–HYM–P047318 (SAMC); 1♀: same label data except: 1494 m, 0°34.808′N, 30°21.873′E, 12–26.viii.2008, UG08–KF5–M15, Malaise trap, secondary mid-altitude Rainforest, marshy area, SAM–HYM–P047314 (SAMC); 1♂: Mulange, Uganda, Nov. 1922, R. Dummer, SAM–HYM–P005160 (SAMC); 1♀: Uganda, Kigezi Dist., F.W. Edwards, Mt. Muhavura, 7000 ft, 29.ix.1934, F.W. Edwards (BMNH); 1♂: Uganda, Kigaianga, 1.v.1927, H. Hargreaves (BMNH); 1♂: Uganda, Entebbe, 16.iv.1927 G.L.R. Hancock (BMNH); 1♂: Uganda, Ruwenzori range. xii.1934.–i.1935, B.M.E. Afr. Exp., B.M. 1935–203, Kilembe, 4500 ft., F.W. Edwards (BMNH); 1♂: Uganda, Kampala 3.iii.1927, Erisa (BMNH); 1♂: Uganda, Kueka, 23.1.1927, G.L.R. Hancock (BMNH); 1♀: Uganda Prot., Mt. Kokanjero, S.W. of Elgon, 6400 ft., Aug. 7–9 1911, S.A. Neave, British Museum Loan no. 2617, 1912–193 (BMNH). **Zimbabwe**: 1♀: S. Rhodesia, Chapungu falls, III 1957, N.L.H. Krauss, B.M. 1957–226 (BMNH); 1♀: Saw Mills, S. Rhodesia, 24.12.1927, Rhod. Museum (BMNH); 1♀: Brit. E. Africa, Kisii District, S. Kavirondo, 5000 ft, May 9–12, 1911, S.A. Neave (BMNH).

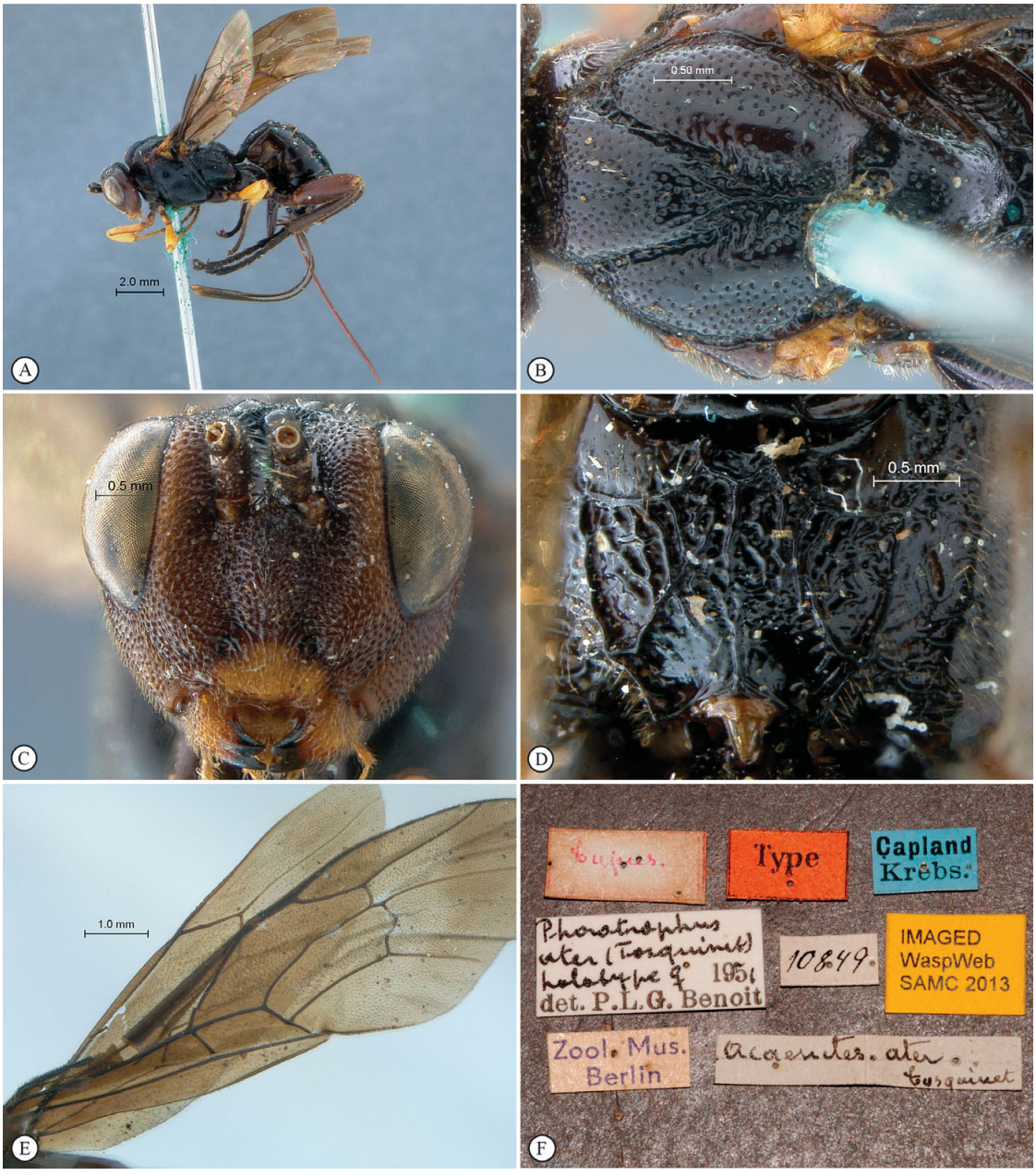


Fig. 3. *Phorotrophus ater* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Host records

Reared from *Alcides brevirostris* (Chevrolat)and *A. erythropterus* (Chevrolat) (Coleoptera: Curculionidae) on *Dolichos* sp. (Fabaceae); reared from *Alcides* sp. on *Abelmoschus esculentus* (Malvaceae) (okra); reared from an unidentified host on *Gossypium* sp. (Malvaceae) (cotton).

Distribution

Democratic Republic of Congo, Ivory Coast, Kenya, Liberia, Malawi, Rwanda, Tanzania, Uganda. New records: Angola, Cameroon, Ghana, Liberia, Sierra Leone, Zimbabwe.

Comments

Phorotrophus alcides is a widespread species: the collection localities cover a wide range of geographical, altitudinal and ecological diversity. The strong intraspecific variability is thus not unexpected. The unusual subapical ridge of the clypeus is, however, consistent, uniting all the specimens in a single species.

Phorotrophus ater (Tosquinet, 1896)

Fig. 3

Acoenites ater Tosquinet, 1896: 253.

Acoenites cunctator Tosquinet, 1896: 254 (synonymy by Townes and Townes, 1973).

Diagnosis

Dark testaceous to black with a highly variable anterior lighter part, ranging from a faint diffuse spot on head

to entire head and anterior half of mesosoma yellowish orange; legs yellowish orange with tarsi variously black, hind legs sometimes reddish black; wings yellowish, slightly darker apically; frons transversely striate; face deeply reticulate, carina indistinct below toruli; clypeus longitudinally strigose, subapical ridge sharp and simple, ventral margin moderately produced laterally with median tooth strong; antenna with 28–29 flagellomeres; occipital carina not reaching above mid-height of eye; pronotum ventrally canaliculate, dorsally punctate, with a large smooth median area; mesopleuron and metapleuron densely and deeply punctate, speculum smooth, somewhat longitudinally striate dorsally; upper part of epicnemial carina faint, reaching mid-height of pronotum; mesoscutum densely and deeply punctate; notauli deep, crenulate, joining posteriorly into a depressed and coarsely rugose area; scuto-scutellar weakly but distinctly crenulate; propodeum rugose-reticulate, posteriorly smoother; anterior transverse carina strong, other carinae weak or hardly distinct among reticulations; basal median area defined, quadrate; forewing with bullae on 2m–cu large, separated by less than 0.5× their own length, and 2m–cu distinctly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a far above middle; ventral swelling on sternite 1 weak; ovipositor moderately long. IC 0.2–0.3; NI 0.3–0.4; OT 1.7; B 12.6–15.1; A 12.4; F 9.1–10.9 (4 specimens).

Differential diagnosis

Black and orange species with a characteristic though variable colour pattern, from southern Africa. It is otherwise characterized by the deep reticulations on the face and the rugose-reticulate propodeum with most of the carinae indistinct.

Material examined

Holotype ♀ of *P. ater*: Capland [Cape of Good Hope (Tosquinet 1896), South Africa], Krebs, 10849 (MNHU). Other material: 1♀ [holotype of *P. cunctator*]: Delgoa-Bai [Mozambique] (26371) (MNHU); 2♂: MFongosi, Zulu L. [South Africa], WE Jones, Jan. 1917, SAM–HYM–P001676 (SAMC).

Distribution

Mozambique, South Africa.

Phorotrophus bivittatus (Morley, 1916)

Fig. 4

Acaenitus bivittatus Morley, 1916: 385.

Phorotrophus caffrariae Benoit, 1952a, **syn. nov.**

Diagnosis

Yellow overall with dorsal and ventral black markings of variable extent: vertex, upper occiput, mesoscutal lobes and scuto-scutellar groove to almost entire mesoscutum, often most of mesosoma ventrally, black markings sometimes extending onto mesopleuron, metapleuron and inner side of coxae (mesosoma ventrally without black markings in the female specimen), sometimes hind leg from tibia on, tergites mid-basally from tergite 2, 3 or 4 on; flagellum black, sometimes with a large paler yellow ring in apical half; wings hyaline, barely to strongly infuscate apically; frons transversely strigose medially; face strongly bulging medially, deeply punctate-reticulate laterally, rugulose-punctate on median bulge, carina strong and nearly reaching dorsal margin of clypeus; clypeus densely and deeply punctate granulate, subapical ridge blunt and weakly produced laterally, ventral margin strongly produced laterally and median tooth strong and acute; antenna with 28–30 flagellomeres; occipital carina short, not reaching above mid-height of eye; pronotum densely punctate, ventrally canaliculate, without median smooth area; mesopleuron and metapleuron moderately to densely punctate, speculum smooth; epicnemial carina faint and short, hardly reaching posteroventral corner of pronotum; mesoscutum deeply and densely punctate; notauli deep and crenulate, joining posteriorly into a concave punctate area; scuto-scutellar groove quite to nearly smooth, at most with weak crossing ridges; most of propodeum shallowly rugose; propodeal carination weak, transverse carinae faint and often medially obsolescent; median basal area distinctly defined, elongate, concave and slightly widening apically; posteromedian area often subdivided by a weak mid-longitudinal carina; forewing with bullae on 2m–cu fused to separated by about their own length, and 2m–cu slightly to distinctly apical to rs–m; hind wing with 1/Cu&cu–a intercepted above middle; ventral swelling on sternite 1 weak; ovipositor very short. IC 0.2–0.7; NI 0.5–0.8; OT 0.8; B 8.2–10.5; A 5.8–7.5; F 7.8–9.4 (6 specimens).

Differential diagnosis

A mostly yellow species, often with very extensive dorsal and ventral black markings. Otherwise characterized by the combination of the smooth scuto-scutellar groove; the wing venation with 2m–cu often strongly apical to rs–m and 1/Cu&cu–a intercepted distinctly above middle; the near absence of a subapical ridge on the clypeus with a strong and acute median tooth; the strong mid-longitudinal carina on the face; the short epicnemial carina; the elongate median basal area on the otherwise weakly sculptured propodeum; and the short ovipositor.

Material examined

Holotype ♂ of *P. bivittatus*: Barberton, Transvaal [South Africa], LL Edwards, Nov. 1911, SAM–HYM–P001675 (SAMC). Other material: **Democratic Republic of Congo**: Lualaba R. 25.4.07, 2,500–4.000 ft, Neave coll. 1907–230 (BMNH). **Ethiopia**: 1♂: C. Abyssinia: Maraquo [Marequo], 7.v.1914, O. Kovacs (BMNH). **Gambia**: 1♀: Gambia: Keneba, Malaise, ix–x.1975 M.C.D. Speight (BMNH). **Kenya**: 1♂: Brit. E. Africa, Masai Reserve, 191, T.J. Anderson (BMNH). **South Africa**: 1♂ [holotype of *P. caffrariae*]: Caffraria [Eastern and Western Cape], J. Wahlb., NHRS-HEVA 000002548 (NHRS) [head and metasoma lacking]; 1♂: Lady Grey, 13 Feb. 1926, R.I. Nel (BMNH); 2♀ W Cape, Kogelberg Nature Reserve, 34°16.481′S, 19°01.033′E, 16 Mar–16 Apr 1999, S. van Noort, Malaise trap, KO98-M19, Mesic Mountain Fynbos, last burnt *c.* 1978, SAM–HYM–P048048 (SAMC).

Distribution

South Africa, Uganda, Zimbabwe. New records: Democratic Republic of Congo, Ethiopia, Gambia, Kenya.

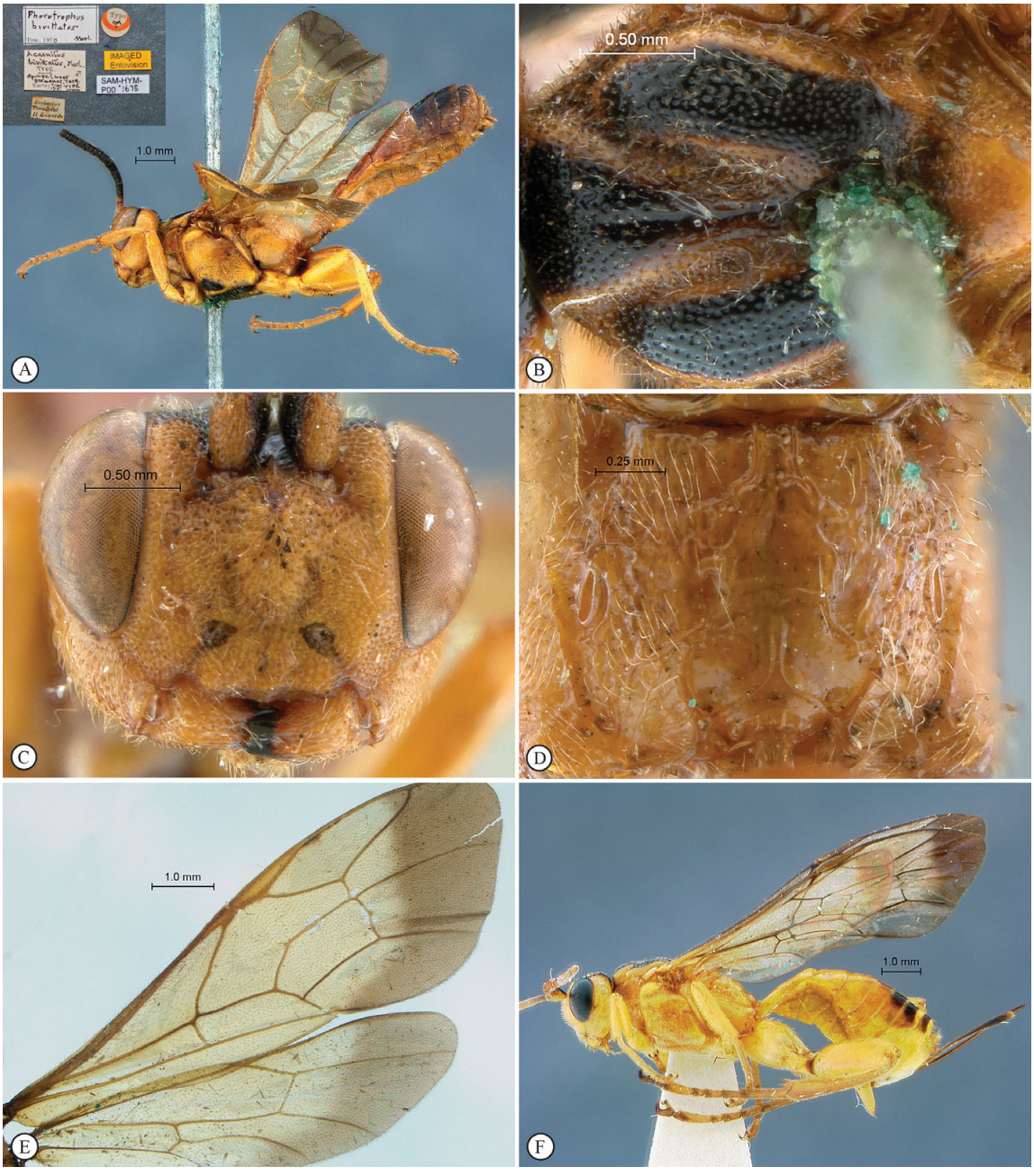


Fig. 4. *Phorotrophus bivittatus* holotype male (except F). **A**, Habitus lateral view (insert: data labels); **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, female lateral view.

Phorotrophus capensis (Holmgren, 1868)

Fig. 5

Acoenites capensis Holmgren, 1868: 403.

Acoenites trimaculatus Tosquinet, 1896: 261, **syn. nov.**

Diagnosis

Head yellow with black markings; remainder of body mostly yellow with large dorsal black markings to mostly black with isolated yellow markings; wings hyaline, apically slightly infuscate; frons medially smooth with strong transverse striations dorsally; face densely punctate, carina indistinct below median bulge; clypeus rugulose punctate, subapical ridge strong and blunt, strongly produced laterally, ventral margin weakly produced laterally with median tooth strong; occipital carina reaching half eye height; antenna with 27 flagellomeres in the single specimen with complete antenna; pronotum totally sculptured, ventrally deeply canaliculate and dorsally densely punctate; mesopleuron and metapleuron densely punctate, speculum smooth; upper part of epicnemial carina faint, reaching mid-height of pronotum; mesoscutum densely punctate, punctation sometimes distinctly sparser on lateral lobe; notauli relatively shallow, densely crenulate, joining posteriorly into a coarsely sculptured depressed area with strong longitudinal rugosities; scuto-scutellar groove weakly crenulate; propodeum smoothly rugulose; carination weak but distinct: basal transverse carina complete, apical transverse carina medially obsolescent, basal median area

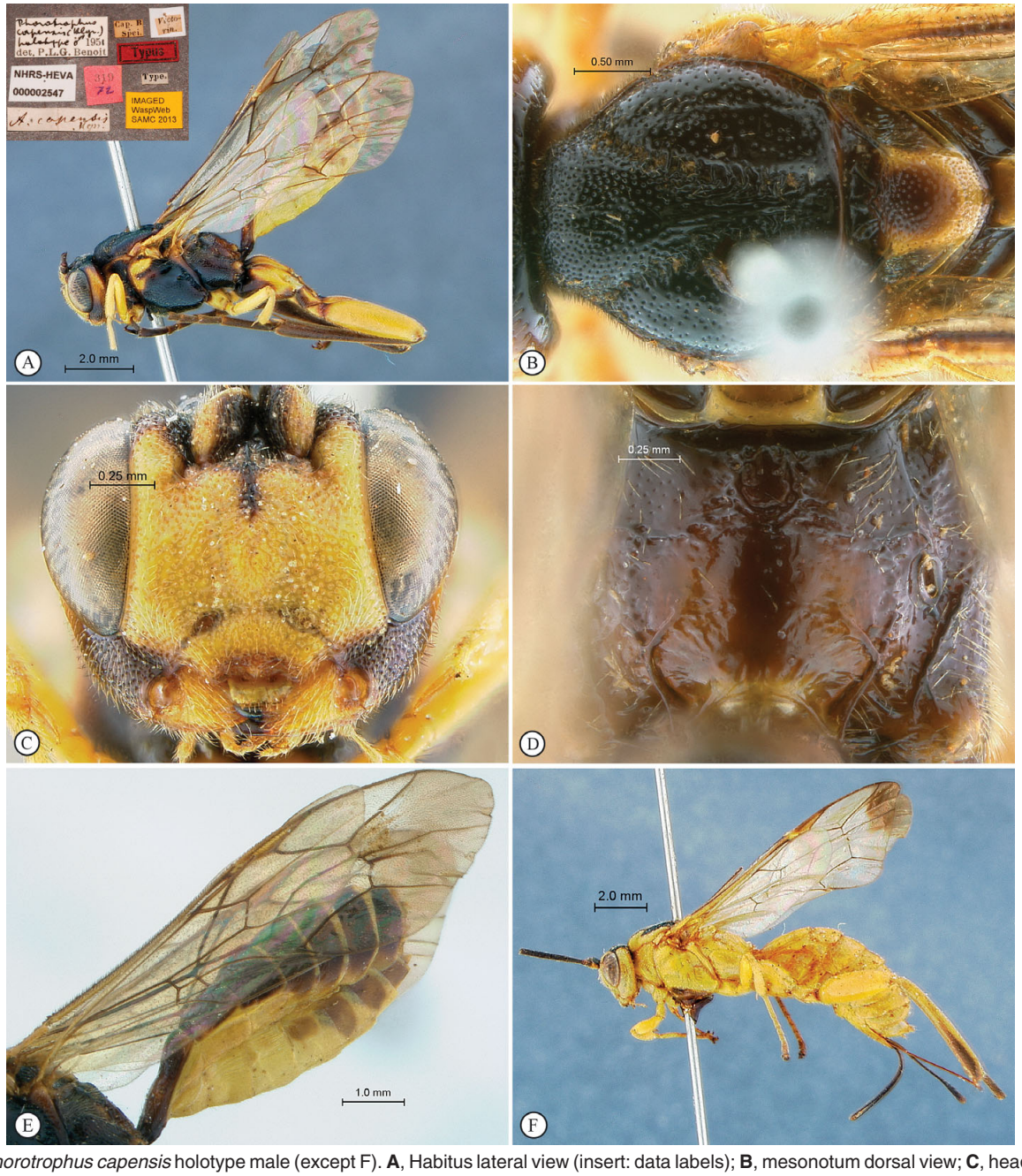


Fig. 5. *Phorotrophus capensis* holotype male (except F). **A**, Habitus lateral view (insert: data labels); **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, holotype female of *P. trimaculatus* lateral view, emphasizing the strong colour variation in the species.

defined, elongate; forewing with bullae separated by 0.5–1.0× their own length, 2m-cu, 2m–cu barely to distinctly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a near middle; sternite 1 with swelling weak; ovipositor short. IC 0.2–0.4; NI 0.8–1.0; OT 0.8–1.2; B 9.3–13.5; A 5.2; F 8.1–11.0 (3 specimens).

Differential diagnosis

A black and yellow species of highly variable colour pattern, restricted to the southwestern cape area. Characterized by the combination of the completely sculptured pronotum; the coarsely sculptured posterior area of the mesoscutum; both transverse carinae present but weak on the propodeum with the basal median area defined and elongate; and the short ovipositor.

Material examined

Holotype ♀ of *P. capensis*: Cap. B. Spei. [Cape of Good Hope, South Africa], Victorin, NHRS-HEVA 000002547 (NHRS). Other material: 1♀ [holotype of *P. trimaculatus*]: Capland [Cape of Good Hope (Tosquinet 1896), South Africa], Krebs, 10847 (MNHU); 1♀: South Africa, W. Cape, Koeberg Nature Reserve, 33°37.622′S, 18°24.259′E, 16 May–13 June, 1997, S van Noort, Malaise trap KO97–M01, West Coast Strandveld, SAM–HYM–P047313 (SAMC).

Distribution

South Africa.

Phorotrophus congoensis Benoit, 1952a

Fig. 6

Phorotrophus congoensis katangensis Benoit, 1952a: 351, **syn. nov.**

Phorotrophus maynéi Benoit, 1953: 77, **syn. nov.**

Diagnosis

Yellowish orange to orange without black markings; flagellum black, rarely with a subapical pale ring; wings hyaline, apically infuscate; frons laterally shallowly punctate, medially moderately transversely strigose, with one additional lateral carina along frontal orbits; face and clypeus deeply and densely rugulose-punctate, mid-longitudinal carina moderate; subapical ridge of clypeus blunt and weakly produced laterally, ventral margin strongly produced laterally with median tooth moderate; antenna with 22–26 flagellomeres; occipital carina long, reaching vertex level; pronotum ventrally canaliculate, dorsally punctate, with a variable smooth median area; mesopleuron moderately punctate ventrally, dorsal half smooth; upper part of epicnemial carina faint, reaching subtegular ridge; mesoscutum moderately punctate; notauli deep and crenulate, joining posteriorly into a depressed punctate area; scuto-scutellar groove nearly smooth; propodeum quite smooth, carination strong with basal median area defined, quadrate, and a mid-longitudinal carina of variable length from apical margin of basal area backwards; forewing with bullae on 2m–cu separated by 0.5–1× their own length; 2m–cu nearly opposite to apical to rs–m by about its width; hind wing with Cu1 joining 1/Cu&cu–a far below middle; ventral swelling on sternite 1 weak to moderate; ovipositor long. IC 0–0.3; NI 1.7–1.9; OT 2.2–2.4; B 6.1–7.8; A 4.4–4.8; F 5.7–7.1 (10 specimens).

Differential diagnosis

A yellow species without dorsal black spots, widespread and common in collections, characterized by the combination of a long occipital carina reaching vertex level; the frons quite smooth medially with an additional lateral carina along orbits; the smooth scuto-scutellar groove; and the hind wing venation with 1/Cu&cu–a intercepted far below the middle.

Material examined

Holotype ♀ of *P. congoensis*: Eala [Democratic Republic of Congo], -VIII-1953–, J. Ghesquière (MRAC). Other material: **Cameroon**: 2♀: Cameroun: Nkoemvon, 29.viii–25.ix.1979 Ms D. Jackson (BMNH); 1♀: same label data except: viii–viiii[*sic*].1979 (BMNH); 3♀, 1♂: same label data except: 25.ix–19.xi.1979 (BMNH); 4♀, 1♂: same label data except: 25.ix.1979–19.xi.1979 (BMNH); 4♀, 1♂: same label data except: xii 1979–i 1980 (BMNH); 3♀, 1♂: same label data except: 21.i-6.ii 1980 (BMNH); 1♀: same label data except: 4–18.v.1980 (BMNH); 15♀, 1♂: same label data except: 13.vii–24.viii 80 (BMNH); 5♀: same label data except: viii–x.1980 (BMNH); 3♀: same label data except: x–xi 1980 (BMNH); 1♀: Cameroun: Korup, 1981, Mrs. D. Jackson (BMNH). **Central African Republic**: 1♂: Central African Republic, Préfecture Sangha-Mbaéré, Réserve special de Forêt dense de Dzanga-Sangha, 12.7 km 326° NW Bayanga, 3°00.27′N, 16°11.55′E, 420 m, 11–12.v.2001, S. van Noort, Malaise Trap, CAR01–M96, Lowland rainforest, SAM–HYM–P047347 (SAMC); 1♀: same label data except: 16–17.v.2001, CAR01–M144, SAM–HYM–P047354 (SAMC); 1♀: same label data except: Parc National de Dzanga-Ndoki, 38.6 km 173°S Lidjombo, 2°21.60′N, 16°09.20′E, 350 m, 21–22.v.2001, CAR01–M168, Lowland rainforest, SAM–HYM–P047351 (SAMC); 1♀: same label data except: 22–23.v.2001, CAR01–M183 SAM–HYM–P047349 (SAMC); 1♀: same label data except: 24–25.v.2001, CAR01–M209 SAM–HYM–P047356 (SAMC); 1♀: same label data except: 26–27.v.2001, CAR01–M224 SAM–HYM–P047350 (SAMC). **Democratic Republic of Congo**: 1♀ [holotype of *P. congoensis katangensis*]: Elisabethville [Lubumbashi], 21-XII-1920, Dr. M. Bequaert (MRAC); 1♀ [holotype of *P. maynéi*]: Bitale, 19-VIII-52 (MRAC). **Ghana**: 3♀, 2♂: Ghana, Ashanti, Manpong mt, 600 m, N7.00 – W1.22, from tree barks, 21.12 1965, no. 111, leg. Endrödy-Younga (BMNH). **Uganda**: 2♀: Uganda, Kibale National Park, Kanyawara, Makerere University Biological Field Station, 1495 m, 0°33.996′N, 30°21.262′E, 31.vii–3.viii.2005, S. van Noort, UG05–M06, Malaise trap, secondary mid-altitude Rainforest, SAM–HYM–P047339 (SAMC); 1♀: same label data except: UG05–M05, SAM–HYM–P047352 (SAMC); 3♀: same label data except: 12–18.viii.2005, UG05–M19, SAM–HYM–P047340 (SAMC); 2♀: same label data except: 1506 m, 0°33.891′N, 30°21.468′E, 2–12.viii.2008, UG08–KF7–M07, primary mid-altitude Rainforest SAM–HYM–P047341 (SAMC); 1♀: same label data except: 1587m, 0°33.408′N, 30°22.603′E, 30.vii-5.viii.2005, UG05–M09, degraded mid-altitude Rainforest, SAM–HYM–P047353 (SAMC); 2♀: same label data except: 1500 m, 0°33.784′N, 30°21.617′E, 12–26.viii.2008, UG08–KF4–M14, primary mid-altitude Rainforest, SAM–HYM–P047345 (SAMC); 1♀: same label data except: 1495 m, 0°33.871′N, 30°21.355′E, 2–12.viii.2008, UG08–KF1–M01, secondary mid-altitude Rainforest, SAM–HYM–P047346 (SAMC); 1♀: same label data except: 12–26.viii.2008, UG08–KF2–M12, SAM–HYM–P047342 (SAMC); 1♀: same label data except: 1505m, 0°33.823′N, 30°21.490′E, 2–12.viii.2008, UGO8–KF3–M03, primary mid-altitude Rainforest, SAM–HYM–P047338 (SAMC); 1♀: same label data except: 0°33.823′N, 30°21.490′E, 12–26.viii.2008, UG08–KF3–M13, primary mid-altitude Rainforest, SAM–HYM–P047348 (SAMC); 2♀: same label data except: 1500 m, 0°34.784’N, 30°21.617′E, primary mid-altitude Rainforest, SAM–HYM–P047345 (SAMC); 1♀: same label data except: 1494 m, 0°34.808′N, 30°21.873′E, UG08–KF5–M15, secondary mid-altitude Rainforest, marshy area, SAM–HYM–P047357 (SAMC); 1♀: same label data except: 1491m, 0°34.806′N, 30°21.874′E, UG08–KF6–M16, SAM–HYM–P047355 (SAMC); 2♀: same label data except: 1506 m, 0°33.891′N, 30°21.468′E, UG08–KF7–M17, primary mid-altitude Rainforest, SAM–HYM–P047343 (SAMC); 1♀: same label data except: 1465 m, 0°35.442′N, 30°21.741′E, 10.viii.2008, UG08–KF12–S03, Sweep, near stream, SAM–HYM–P047344 (SAMC).

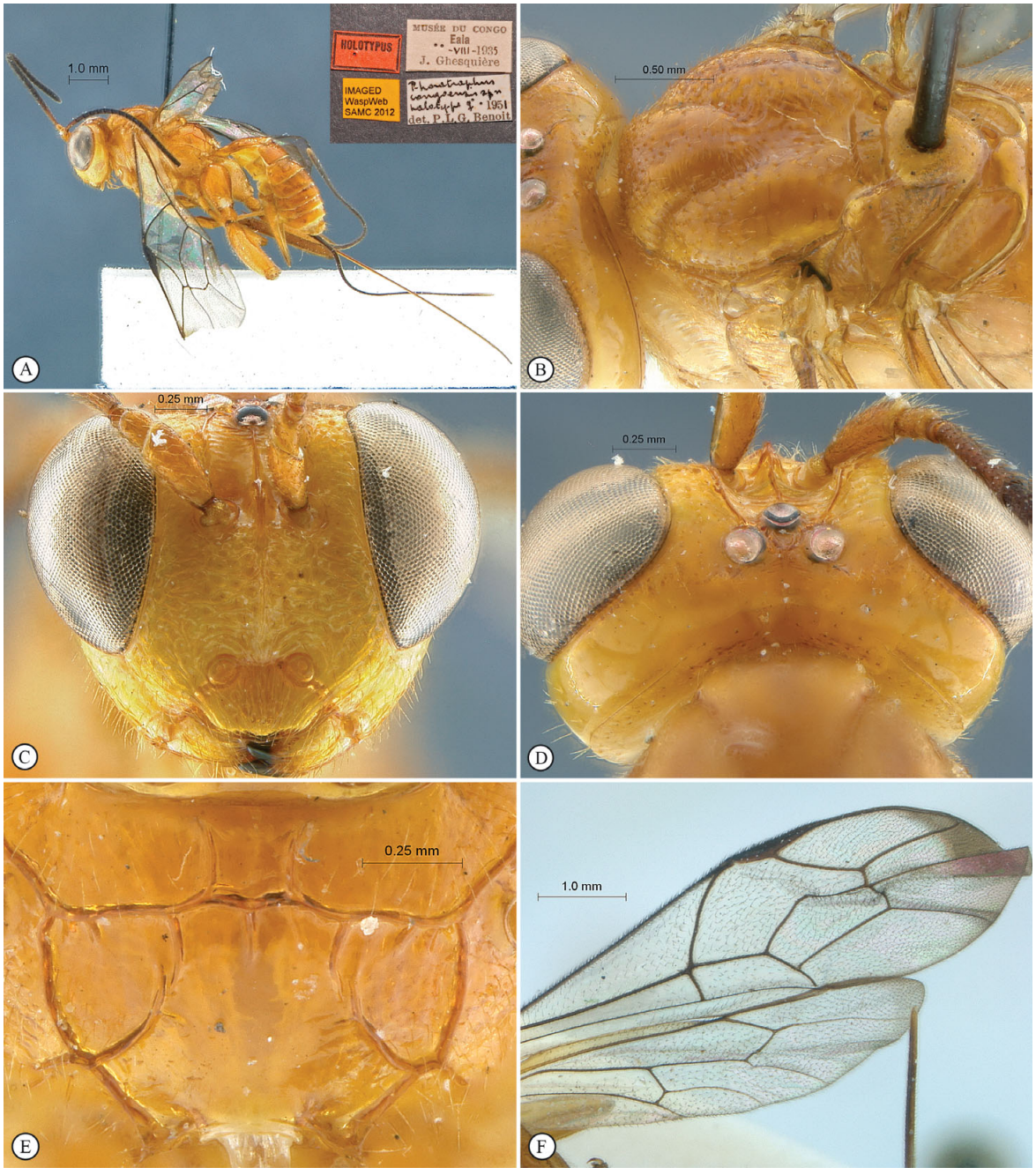


Fig. 6. *Phorotrophus congoensis* holotype female. **A**, Habitus lateral view (insert: data labels); **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, head dorsal view showing the additional lateral carinae along frontal orbits.

Distribution

Democratic Republic of Congo, Rwanda. New records: Cameroon, Central African Republic, Ghana, Uganda.

Phorotrophus cyranodebergeraci Maquart, Rousse & van Noort **sp. nov.**

Fig. 7

Diagnosis

Mostly dark reddish brown to black with tergites 3–7 apically pale yellow; wings infuscate; frons medially smooth; face transversely rugose-punctate; clypeus longitudinally rugose punctate, subapical margin thin and simple, ventral margin hardly produced laterally with median tooth strong; antenna with 26 flagellomeres; occipital carina short, not reaching beyond mid-height of eye; Pronotum ventrally canaliculate, dorsally punctate and centrally largely smooth; mesopleuron densely punctate with a large posterodorsal smooth area including speculum; metapleuron medially longitudinally rugose-punctate; mesoscutum moderately to densely punctate; notauli deep, joining posteriorly in a deep rugulose punctate depression; scuto-scutellar groove faintly crenulate; propodeum smoothly sculptured, with both transverse carinae strong and both basal and central areas defined, transverse; forewing with bullae on 2m–cu small, separated by 3–4× their own length, 2m–cu slightly



Fig. 7. *Phorotrophus cyranodebergeraci* sp. nov. holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

apical to rs–m; hind wing with 1/Cu&cu–a intercepted far below middle; ventral swelling on sternite 1 strong and pyramidal; ovipositor long. IC 0.2; NI 1.9; OT 1.7. Male unknown.

Differential diagnosis

Dark species, mostly characterized by the coarse rugose sculpture of the face and clypeus, and otherwise by the strongly carinate propodeum and the strong swelling on sternite 1.

Description

FEMALE. B 10.4; A 7.2; F 9.2 (holotype).

Colour. Head, mesosoma, tergites 1–2, antenna, ovipositor sheath and legs dark reddish brown with inner orbits pale yellow; tergite 3 and following black with apical half pale yellow; wings infuscate, venation brown.

Head. Temple, gena and vertex sparsely punctate with inter-ocellar area somewhat rugose; malar space coarsely longitudinally rugose, subocular sulcus deep; frons medially smooth, laterally punctate-reticulate; face moderately bulging medially, transversely rugose-punctate, rugosities coarser and more oblique on lower face, extending onto clypeus; clypeus longitudinally rugose-punctate, subapical ridge sharp and fine with no lateral protuberance, ventral margin barely produced laterally and median tooth strong

and sharp; antenna with 26 flagellomeres; occipital carina short, not reaching above mid-height of eye.

Mesosoma. Pronotum ventrally canaliculate, dorsally punctate and centrally largely smooth; mesopleuron densely punctate with a large posterodorsal smooth area including speculum; epicnemial carina reaching slightly above posteroventral corner of pronotum; metapleuron moderately to densely punctate, medially longitudinally rugose-punctate; mesoscutum moderately to densely punctate; notauli deep, hardly sculptured, joining posteriorly in a deep rugulose punctate depression; scuto-scutellar groove mostly smooth with faint crenulations; scutellum densely punctate; propodeum smoothly sculptured, mostly rugulose; both transverse carinae present and strong, both basal and central areas defined, transverse. *Wings*. Forewing with bullae on 2m–cu small, separated by 3–4× their own length, 2m–cu slightly apical to rs–m; hind wing with 1/Cu&cu–a intercepted far below middle.

Metasoma. Ventral swelling on sternite 1 strong, pyramidal; ovipositor long.

MALE. Unknown.

Type material

Holotype ♀: Uganda: Ruwenzori Range, xii.1934–i.1935, B.M.E. Afr. Exp. B.M. 1935–203, Namwamba Valley, 6500 ft., F.W. Edwards (BMNH).

Etymology

Refers to the strong median tooth on the subapical margin of the clypeus, emphasized by the rugosities converging toward it: the name is dedicated to Edmond Rostand's character *Cyrano de Bergerac*, famous for his impressive nose.

Distribution

Uganda.

Phorotrophus ealensis Benoit, 1952b

Fig. 8

Diagnosis

Yellow overall with or without black markings of variable extent on median frons, vertex, upper occiput, mesoscutal lobes and apical tergites medially; wings hyaline, variously infuscate apically; frons transversely strigose medially; face coarsely and deeply rugulose-punctate, mid-longitudinal carina moderate and reaching dorsal margin of clypeus; clypeus rugulose punctate, flat, subapical ridge blunt, weak and weakly produced laterally, ventral margin moderately produced laterally and with median tooth strong; antenna with 19–25 flagellomeres; occipital carina not reaching above mid-height of eye; pronotum ventrally canaliculate, dorsally shallowly punctate and centrally smooth; mesopleuron densely rugulose-punctate to smoothly punctate-reticulate, speculum smooth; upper part of epicnemial carina faint, reaching subtegular ridge; metapleuron usually nearly smooth with sparse shallow punctures along dorsal margin, sculpture sometimes slightly stronger; mesoscutum densely punctate, notauli deep, joining posteriorly in a large median rugose depression; scuto-scutellar groove strongly crenulate; propodeum smoothly sculptured, somewhat rugulose; basal transverse carina faint to moderate, posterior transverse carina complete to medially obsolescent; basal median area defined, elongate and often widening or narrowing apically; forewing with bullae on 2m–cu fused to separated by less than 0.5× their own length, 2m–cu hardly to distinctly apical to rs–m; hind wing with 1/Cu&cu–a intercepted near to far below middle; ventral swelling on sternite 1 weak to moderate; ovipositor short. IC 0.1–0.3; NI 0.8–1.5; OT 1.3–1.4; B 7.7–11.8; A 7.2–7.9; F 6.4–11.8 (11 specimens).

Differential diagnosis

A mostly yellow species, with or without black markings, characterized by the combination of the short antennae; the blunt subapical ridge of the clypeus; the smooth to weakly sculptured metapleuron; the weak propodeal carination with the basal median area always defined and elongate; and the short ovipositor.

Material examined

Holotype ♀: Eala [Democratic Republic of Congo], / – 1936, J. Ghesquières (MRAC). Other material: **Cameroon**: 1♀, 4♂: Cameroun: Nkoemvon, 30.iii–19.iv.1980, Ms. D. Jackson. (BMNH); 2♂: same label data except: viii–ix.1980. Mrs. D. Jackson (BMNH); 1♂: same label data except: xii.1980 (BMNH). **Central African Republic**: 1♂: Central African Republic, Préfecture Sangha-Mbaéré, Parc National de Dzanga-Ndula, 38 km 173°S Lidjombo, 2°21.60′N, 16°09.20′E, 250 m, 26–27.v.2001, S. van Noort, Malaise trap, CAR01–M222, Lowland Rainforest, SAM–HYM–P047319 (SAMC). **Sierra Leone**: 1♀: Sierra Leone, Njala, xii.34, E. Hargreaves (BMNH).

Distribution

Democratic Republic of Congo. New records: Cameroon, Central African Republic, Sierra Leone.

Phorotrophus fernando Maquart, Rousse & van Noort **sp. nov.**

Fig. 9

Diagnosis

Orange overall, without dorsal black markings; flagellomeres 1–2 orange, remainder of flagellum black; wings yellowish; frons medially smooth; face deeply reticulate with mid-longitudinal carina extending to ventral margin of clypeus; clypeus longitudinally strigose, subapical ridge moderately sharp and weakly produced laterally, ventral margin moderately produced laterally with median tooth moderate; antenna with 28–29 flagellomeres; occipital carina short, not extending above mid-height of eyes; pronotum ventrally canaliculate, dorsally punctate, with a large smooth median area; mesopleuron moderately punctate, dorsal half smooth to longitudinally strigose; metapleuron moderately punctate with deep longitudinal striations medially; mesoscutum densely punctate, notauli deep and crenulate; scuto-scutellar groove smooth; propodeum smooth with basal transverse carina strong, apical transverse carina medially weak, strongly incurved forward; basal median area defined, central median area sometimes apically open; forewing with 2m–cu subopposite to rs–m,



Fig. 8. *Phorotrophus ealensis* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

and bullae on 2m–cu separated by 2–3× their own length; hind wing with 1/Cu&cu–a intercepted slightly below middle; ventral swelling of sternite 1 moderate; ovipositor very long. IC 0; NI 1.2–1.3.

Differential diagnosis

Overall an orange species with yellowish wings, without black markings. Otherwise characterized by the combination of the deeply reticulate face; the long mid-longitudinal facial carina; the rugulose clypeus; the smooth scuto-scutellar groove; and the very long ovipositor.

Description

FEMALE. B 11.5–12.1; A 7.7–8.2; F 10.3–10.5 (3 specimens).

Colour. Body orange to yellowish orange overall, without black markings; flagellum black, but flagellomere 1 and most of flagellomere 2 orange; wings yellowish, venation brownish orange, but pterostigma yellowish.

Head. Vertex, temple and gena sparsely punctate, but inter-ocellar area finely rugose; lower gena and malar space longitudinally striate, striations extending onto clypeus; subocular sulcus deep; frons medially smooth, sometimes with weak dorsal transverse striations, laterally coarsely reticulate, somewhat carinate along inner margin of frontal orbit; face deeply and coarsely reticulate, medially bulging, carina strong to moderate and distinctly extending to ventral margin of clypeus; clypeus longitudinally strigose, subapical margin moderately sharp and weakly produced laterally,

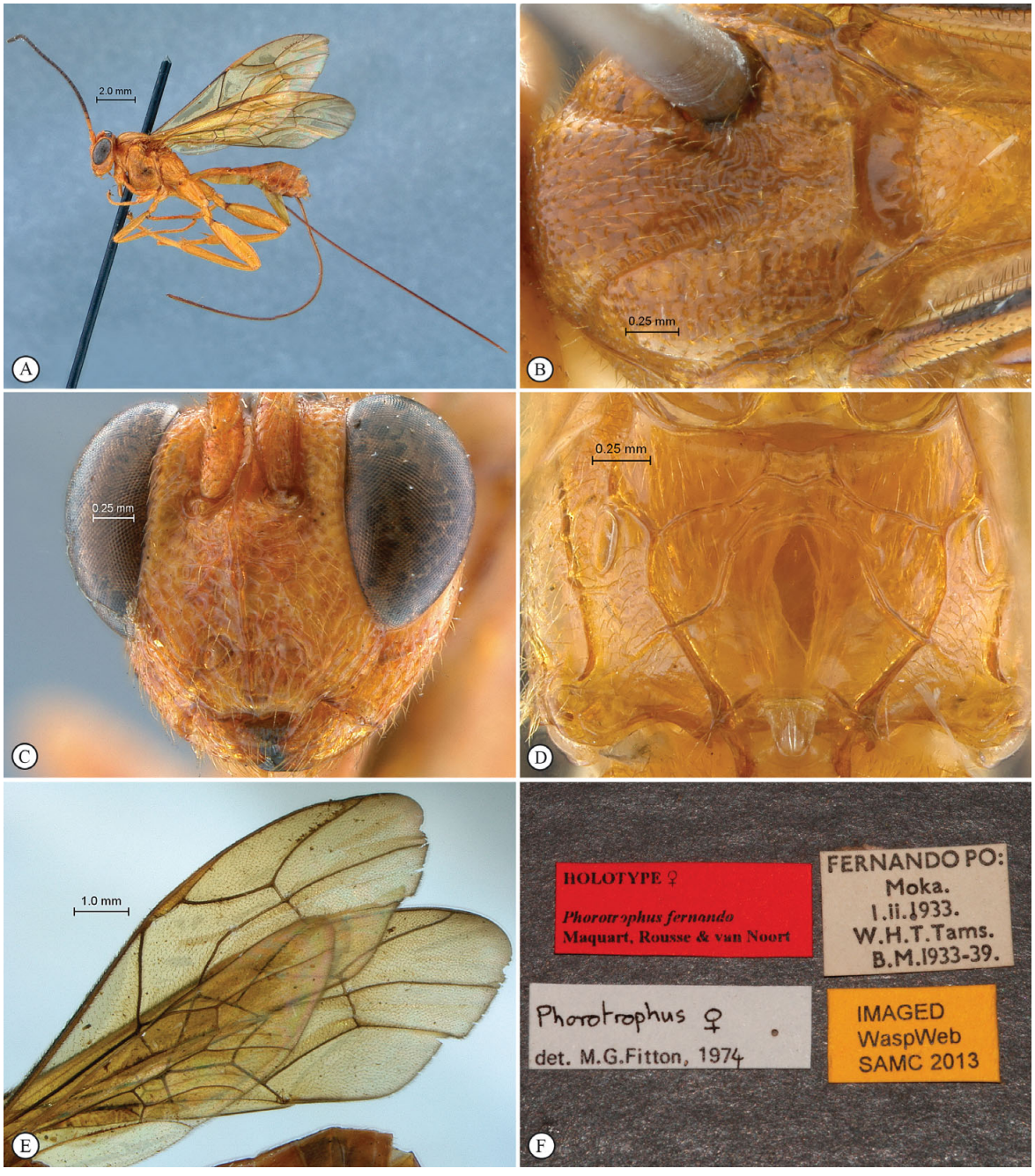


Fig. 9. *Phorotrophus fernando* sp. nov. holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

ventral margin moderately produced laterally with median tooth moderate; antenna with 28–29 flagellomeres; occipital carina short, not extending above mid-height of eye.

Mesosoma. Pronotum ventrally canaliculate, dorsally punctate, with a large smooth median area; mesopleuron deeply and moderately punctate with a large smooth to longitudinally strigose dorsal area including speculum; upper part of epicnemial carina faint, reaching mid-height of pronotum; metapleuron moderately punctate with longitudinal striations of variable extent medially; mesoscutum deeply and densely punctate; notauli deep and crenulate, joining in front of posterior margin of mesoscutum; scuto-scutellar groove almost smooth; scutellum shallowly and densely punctate; propodeum quite smooth; basal transverse carina strong, apical transverse carina medially weak to obsolescent, strongly incurved forward and reaching anterior third of propodeum; basal median area defined, slightly transverse, central median area defined or posteriorly open, transverse and short. *Wings*. Forewing with 2m–cu subopposite to rs–m, and bullae on 2m–cu separated by 2–3× their own length; hind wing with 1/Cu&cu–a intercepted slightly below middle.

Metasoma. Tergites mostly shining and smooth, fading to moderately punctate apically; ventral swelling on sternite 1 moderate; ovipositor very long.

MALE. Unknown.

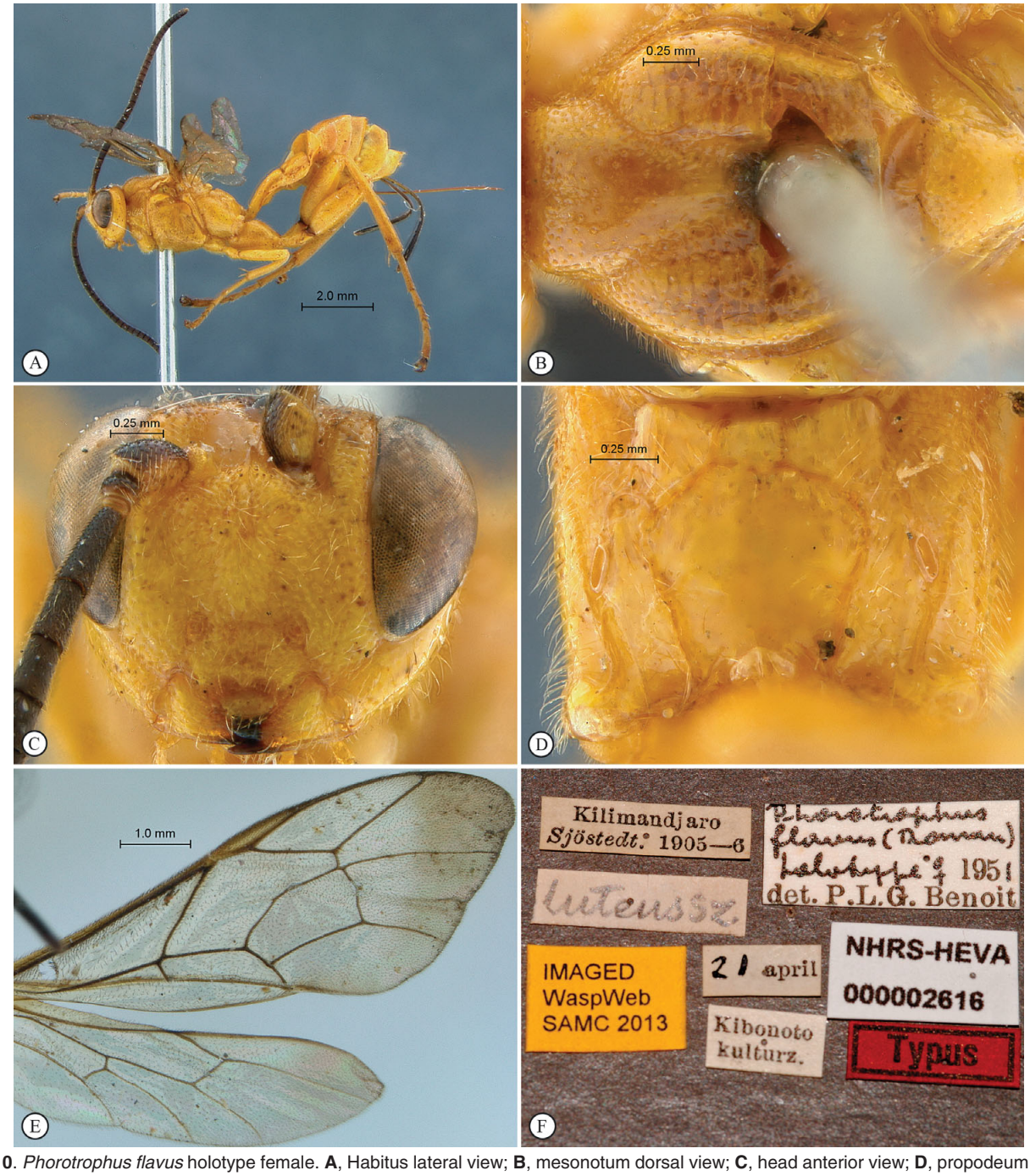


Fig. 10. *Phorotrophus flavus* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Type material

Holotype ♀: Fernando Po [Bioko, Equatorial Guinea]: Moka, I.ii.1933. W.H.T. Tams, B.M. 1933–39 (BMNH). Paratypes, 2♀: Cameroun: Nkoemvon viii–x.1980, Ms. D. Jackson (BMNH).

Etymology

Refers to the ancient name of the type locality. Name in apposition.

Distribution

Cameroon, Equatorial Guinea.

Phorotrophus flavus (Roman, 1910)

Fig. 10

Phaenolobus flavus Roman, 1910: 184.

Phaenolobus luteus Szépligeti, 1908: 87 [secondary homonym].

Diagnosis

Bright yellow overall, without black dorsal markings; wings hyaline, apically infuscate; frons nearly smooth medially; face strongly bulging mid-longitudinally, coarsely rugulose-punctate medially, densely punctate laterally, carina indistinct below mid-height of face; clypeus longitudinally rugulose, subapical ridge blunt and moderately

produced laterally, ventral margin moderately produced laterally and with median tooth strong and acute; antenna with 29 flagellomeres; occipital carina short, not reaching above mid-height of eye; pronotum ventrally canaliculate, dorsally punctate, with a smooth median area; mesopleuron deeply and densely punctate, speculum smooth; epicnemial carina inflexed toward anterior margin at level of posteroventral corner of pronotum; metapleuron deeply and densely punctate, without distinct longitudinal sculpture; mesoscutum deeply and densely punctate, notauli deep and crenulate; scuto-scutellar groove nearly smooth; propodeum nearly smooth with some rugosities along anterior carinae; basal median area defined, slightly wider than long, apical transverse carina medially obsolescent; forewing with bullae on 2m–cu almost fused, 2m–cu barely apical to rs–m; hind wing with 1/Cu&cu–a intercepted far above middle; ventral swelling on sternite 1 weak; ovipositor short. IC 0.2; NI 0.4; OT 1.2; B 10.5; A 6.0; F 8.2 (holotype).

Differential diagnosis

Overall a yellow species, without dorsal black markings, characterized by the combination of the nearly smooth scuto-scutellar groove; wing venation with 1/Cu&cu–a intercepted far above middle; the strong and acute median tooth on the subapical ridge of the clypeus; the smooth sculpture of the propodeum; and the short ovipositor.

Material examined

1♀ [holotype of *P. flavus*]: [Tanzania] Kilimandjaro Sjöstedt, 1905–6, 21 April, Kibonoto kulturz, NHRS-HEVA 000002616 (NHRS).

Distribution

Tanzania.

Phorotrophus frodoni Maquart, Rousse & van Noort **sp. nov.**

Fig. 11

Diagnosis

Bright yellow overall with dorsal black markings on head and mesosoma; basal half of flagellomeres 12–19 white; wings hyaline, apically infuscate; frons smooth; face and clypeus rugulose-punctate; clypeus with subapical ridge weak and subtruncate, ventral margin weakly produced laterally and median tooth moderate; antenna with 21 flagellomeres; occipital carina reaching mid-height of eye; mesosoma unusually elongate; pronotum shallowly sculptured; mesopleuron and metapleuron densely and shallowly punctate; mesoscutum densely punctate; scuto-scutellar groove deeply crenulate; propodeum smooth to shallowly rugose, basal transverse carina present, basal median area defined and quadrate; forewing with bullae on 2m–cu fused, 2m–cu slightly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a far above middle; ventral swelling on sternite 1 moderate. IC 0.2; NI 0.5; OT –. Female unknown.

Differential diagnosis

A mostly yellow species, defined by the short antennae with white rings on the apical flagellomeres. Otherwise characterized by the faint, toothless subapical ridge on the clypeus; the elongate mesosoma; and the hind wing venation with 1/Cu&cu–a intercepted far above middle.

Description

MALE. B 8.3; A 4.2; F 7.9 (holotype).

Colour. Bright yellow overall with the following black parts: mandible tip, vertex, occiput mid-dorsally, mesoscutal lobes, and hind tarsus; remainder of mandible darker yellowish; antenna black but scape and pedicel ventrally yellow, and basal half of flagellomeres 12–19 white; wings hyaline, apically infuscate.

Head. Temple, vertex and gena shallowly and moderately punctate; malar space granulate and slightly concave, subocular sulcus shallow; frons laterally rugulose, medially nearly smooth, carina weak; face rugulose-punctate, carina indistinct below toruli; clypeus shallowly rugulose-punctate, flat, subapical ridge weak and blunt, subtruncate, ventral margin weakly produced laterally and with median tooth moderate; mandible short, longitudinally strigose, lower tooth distinctly longer and broader than upper tooth; antenna with 21 flagellomeres; occipital carina reaching mid-height of eye.

Mesosoma. Mesosoma elongate; pronotum shallowly sculptured, ventrally canaliculate and dorsally densely punctate; mesopleuron and metapleuron densely and shallowly punctate, speculum smooth with some dorsal striations; epicnemial carina weak and short, hardly reaching posteroventral corner of pronotum; mesoscutum densely punctate; notauli deep and crenulate, joining posteriorly in a large punctate depression; scuto-scutellar groove deeply crenulate; scutellum densely punctate; propodeum anteriorly shallowly rugulose, posteriorly quite smooth; basal transverse carina present, basal median area defined and quadrate. *Wings*. Forewing with bullae on 2m–cu confluent, 2m–cu slightly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a far above middle.

Metasoma. Ventral swelling on sternite 1 moderate.

FEMALE. Unknown.

Type material

Holotype ♂: Gabon, Prov. Ogoové-Maritime, Réserve des Monts Doudou, 25.2 km 304° NW Doussala, 2°13.63′S, 10°23.67′E, 660 m, 18–19.iii.2000. S. van Noort, Malaise trap, GA00–M77, Coastal Lowland Rainforest, Summit ridge, SAM–HYM–P046363 (SAMC).

Etymology

Dedicated to Frodon Saquet, for he carries the Ring as well.

Distribution

Gabon.

Phorotrophus hastatus (Seyrig, 1932)

Fig. 12

Phaenolobus (*Phorotrophus*) *hastatus* Seyrig, 1932: 98.

Diagnosis

Bright yellow overall with infuscate to black markings: inter-ocellar area, upper occiput, lateral lobe of mesoscutum, scuto-scutellar groove, hind tarsus; wings hyaline, weakly

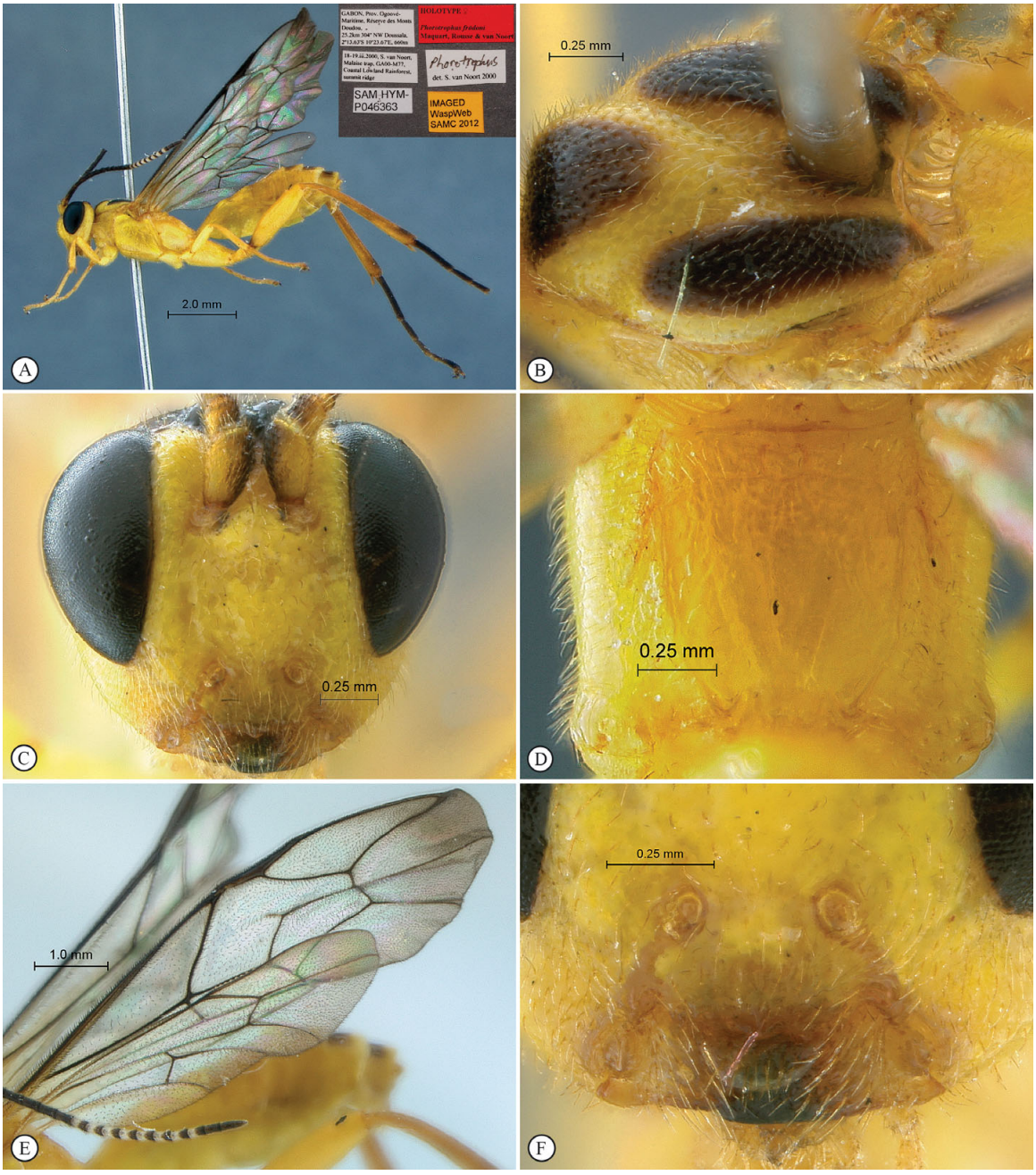


Fig. 11. *Phorotrophus frodoni* sp. nov. holotype female. **A**, Habitus lateral view (insert: data labels); **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, clypeus and lower face anterior view, showing the weak subapical ridge and the shallow subocular groove.

infuscate apically; frons quite smooth medially; face transversely rugulose-punctate, carina weak below median bulge; clypeus somewhat longitudinally rugulose, subapical margin of clypeus sharp and subtruncate, hardly pointed medially, without distinct protuberance, ventral margin strongly produced laterally with a strong median tooth; antenna with 31–33 flagellomeres (Seyrig 1932); occipital carina nearly complete, shortly interrupted mid-dorsally; pronotum totally canaliculate to strigose, without median smooth area; mesopleuron densely punctate ventrally with a large dorsal smooth area encompassing speculum, and with more or less distinct long vertical striations below speculum, speculum also somewhat striate dorsally with posterodorsal quarter smooth, speculum somewhat striate dorsally; upper part of epicnemial carina faint, hardly reaching above posteroventral corner of pronotum; metapleuron coarsely rugulose-punctate; mesoscutum densely and deeply punctate; notauli very deep, crenulate, joining posteriorly in front of posterior margin of mesoscutum; scuto-scutellar groove moderately crenulate; propodeum mostly coarsely rugose, without distinct area defined; forewing with bullae on 2m–cu nearly fused, rs–m opposite 2m-cu; hind wing with Cu1 joining 1/Cu&cu–a below middle; ventral swelling of sternite 1 strong, pyramidal; ovipositor long. IC 0; NI 1.3; OT 1.6; B 12.1; A 9.9; F 11.8 (lectotype).

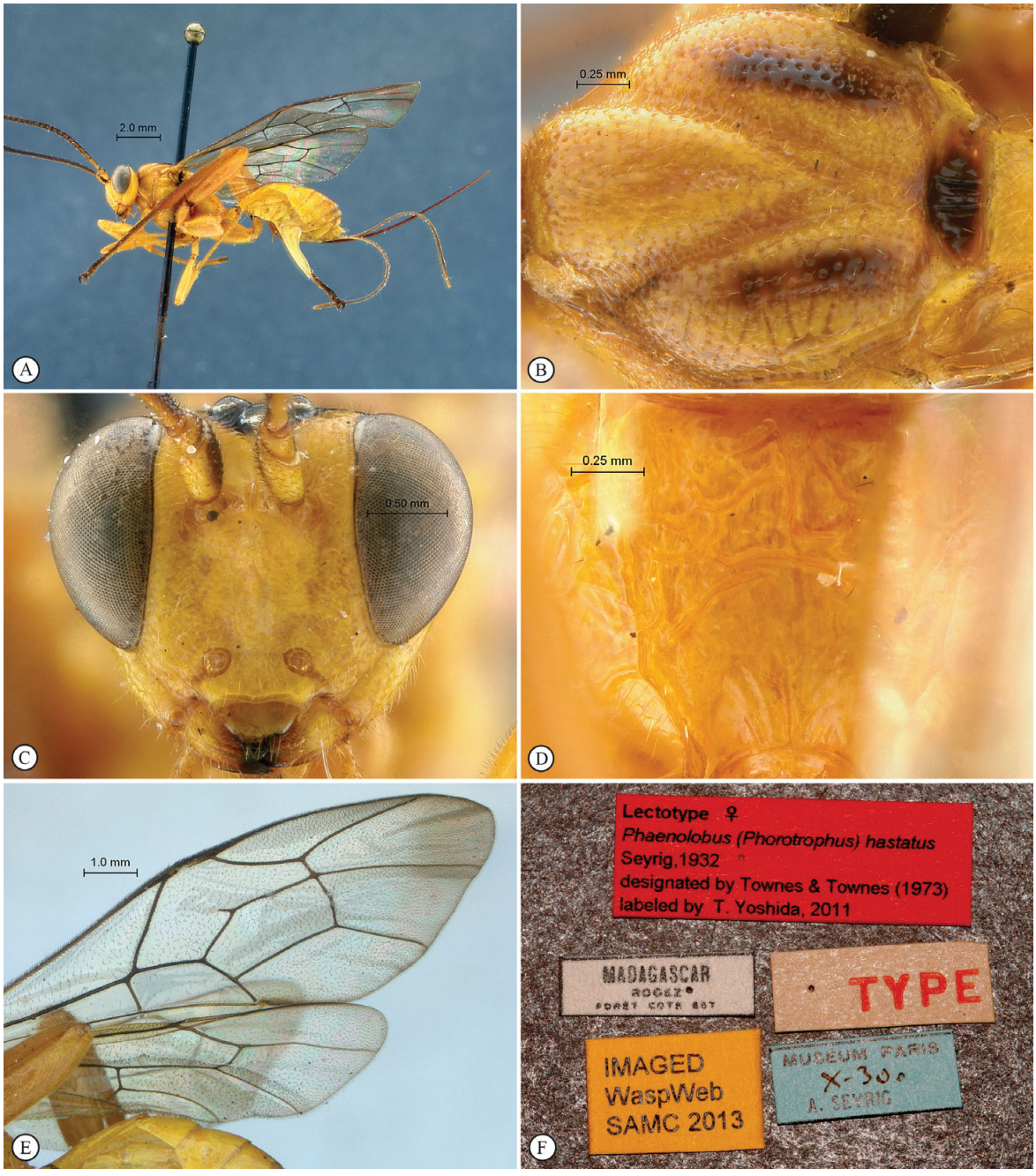


Fig. 12. *Phorotrophus hastatus* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Differential diagnosis

Bright yellow species from Madagascar, characterized by the long occipital carina and the crenulate scuto-scutellar groove. It shares close similarities with *P. maculiceps* and *P. trilobus* (*cf.* comments below) from which it may be differentiated by the combination of the moderately short ovipositor, the strong ventral swelling on sternite 1, the absence of a distinctly defined central area on propodeum and the near-fusion of bullae on 2m-cu.

Material examined

Lectotype ♀: Madagascar, Rogez, Forêt côte est, X.30, A. Seyrig (MNHN).

Distribution

Madagascar.

Comments

This species, together with *P. maculiceps* and *P. trilobus*, form a Malagasy species group mainly characterized by the shape of the subapical ridge of the clypeus, which is sharp, subtruncate, medially more or less pointed and without lateral teeth. The colouration and micro-sculpture are quite similar, but the significant differences in the ovipositor lengths and propodeal carination suggest they do belong to three different species.

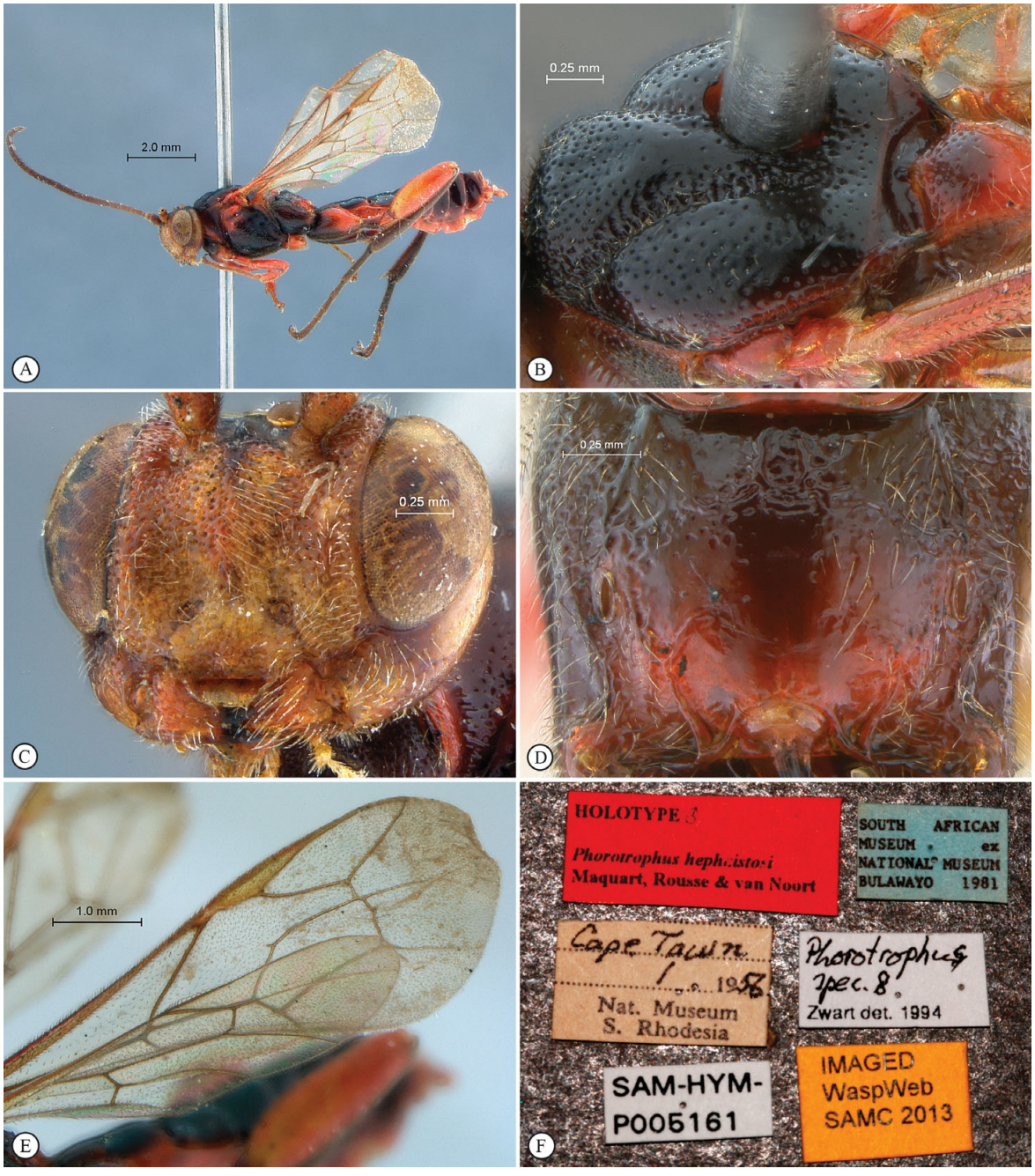


Fig. 13. *Phorotrophus hephaistosi* sp. nov. holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Phorotrophus hephaistosi Maquart, Rousse & van Noort **sp. nov.**

Fig. 13

Diagnosis

Head mostly yellow to light testaceous; mesosoma and metasoma black interspersed with reddish orange; wings hyaline; frons transversely striate; face deeply punctate-reticulate, carina nearly absent; subapical ridge of clypeus weak and weakly produced laterally, ventral margin strongly produced laterally with median tooth strong; antenna with 29 flagellomeres; occipital carina short, not reaching mid-height of eye; pronotum densely punctate, ventrally canaliculate, without median smooth area; mesopleuron and metapleuron deeply, densely and regularly punctate, speculum smooth; epicnemial carina weak and short, hardly reaching posteroventral corner of pronotum; mesoscutum deeply and densely punctate; scuto-scutellar groove nearly smooth; propodeum largely smooth, basal median area defined, elongate; forewing with bullae on 2m–cu distinctly separated, 2m–cu apical to rs–m; hind wing with 1/Cu&cu–a intercepted near middle; swelling on sternite 1 weak. IC 0.3; NI 0.9; OT –.

Differential diagnosis

Species of characteristic colour pattern, mostly red and

black. Otherwise characterized by the combination of the nearly smooth scuto-scutellar groove; the weak subapical margin of the clypeus with a strong median tooth; the deeply punctate-reticulate face; and the smoothly sculptured propodeum with the elongate basal median area.

Description

MALE. B 10.5; A 5.61; F 7.7 (holotype).

Colour. Head yellow to testaceous with black markings: frons medially, vertex and occiput dorsally; antenna testaceous; mesosoma reddish black to black with bright reddish orange parts: scutellum, metanotum, pronotum, subtegular area and propodeum posteriorly; metasomal tergites reddish black to black with apical margins and all sternites bright reddish orange; legs reddish orange with hind tibia and hind tarsus brown; wings hyaline.

Head. Temples and vertex sparsely and shallowly punctate, punctation denser on gena; subocular sulcus moderate; frons laterally deeply punctate-reticulate, medially coarsely transversely striate with carina strong; face deeply punctate-reticulate, mid-longitudinal carina interrupted slightly below toruli; clypeus shallowly and densely punctate, subapical ridge blunt and weak, weakly produced laterally, ventral margin strongly produced laterally and with median tooth strong; mandible short, longitudinally striate, teeth subequal; lower face, clypeus and mandible noticeably hairy; occipital carina hardly reaching mid-height of eye; antenna with 29 flagellomeres.

Mesosoma. Pronotum densely punctate, ventrally canaliculate, without smooth median area; mesopleuron and metapleuron deeply, densely and regularly punctate, speculum smooth; epicnemial carina very weak, hardly reaching ventral corner of pronotum; median lobe of mesoscutum densely and deeply punctate, punctation sparser on lateral lobe; notaulus deep, crenulate, joining posteriorly in a rugose-punctate depression; scuto-scutellar groove with a single weak and incomplete median ridge; scutellum moderately punctate; propodeum largely smooth, anteriorly shallowly rugulose-punctate; propodeal carination reduced but posterolateral apophysis strong, transverse carinae faint, only median basal area delimited, elongate and slightly widening apically. *Wings*. Forewing with bullae on 2m–cu wide, separated by 1–2× their own length, and 2m–cu apical to 2rs–m; hind wing with Cu1 joining 1/Cu&cu–a near middle.

Metasoma. Ventral swelling on sternite 1 weak; tergites 1–2 sparsely and finely punctate, polished; punctation denser on following tergites.

FEMALE. Unknown.

Type material

Holotype ♂: Cape Town [South Africa], 1956, SAM–HYM–P005161 (SAMC).

Etymology

Refers to the colour pattern: dedicated to Hephaïstos, Greek God of forge and fire.

Distribution

South Africa.

Phorotrophus kaluleus Benoit, 1952a

Fig. 14

Diagnosis

Bright yellow overall with dorsal black markings, including entire mesoscutum in male; flagellum black with flagellomeres 18–20 yellow in male, uniformly coloured in female; wings hyaline, weakly infuscate apically; frons strigose medially; face transversely rugulose-punctate, mid-longitudinal carina weak below toruli; clypeus indistinctly sculptured medially, subapical ridge blunt and weakly produced laterally, ventral margin moderately produced laterally with median tooth strong and acute; occipital carina long, reaching vertex level; antennae with 24–26 flagellomeres; pronotum ventrally canaliculate, dorsally punctate, with a median smooth area; mesopleuron densely and shallowly punctate, smooth area on speculum reduced; upper part of epicnemial carina faint, nearly reaching subtegular ridge; metapleuron longitudinally rugulose-punctate; mesoscutum deeply and densely punctate; notauli deep, crenulate, joining posteriorly in a concave rugose area; scuto-scutellar groove crenulate; propodeum shallowly sculptured, quite smooth posteriorly to apical transverse carina; carination strong, apical transverse carina strongly incurved forward, its median part reaching anterior third of propodeum; three median areas defined, basal area subquadrate, central area short, transverse and medially subdivided; forewing with bullae on 2m–cu separated by about 0.5× their own length, 2m–cu apical to subopposite rs–m; hind wing with Cu1 joining 1/Cu&cu–a above middle; ventral swelling on sternite 1 weak to moderately strong. IC 0–0.5; NI 0.7–1.1; OT 1.9–2.1; B 8.2–8.7; A 6.2–6.4; F 8.0–8.5 (3 specimens).

Differential diagnosis

Bright yellow species with black dorsal markings, otherwise characterized by the combination of the long occipital carina; the acute median tooth on the subapical clypeal ridge; and the propodeal carination with the posterior transverse carina strongly incurved forward and the central area defined and subdivided.

Material examined

Holotype ♂: [Democratic Republic of Congo] Katanga Kalule N. -1934, Ch. Seydel (MRAC). Other material: 1♀: Cameroun: Nkoemvon, viii–x 1980, Ms. D. Jackson (BMNH); 1♀: Cameroun, env. Yaoundé, 30.xii.1955, C.I.E. coll 15098 (BMNH).

Distribution

Democratic Republic of Congo. New record: Cameroon.

Phorotrophus maculiceps (Seyrig, 1932)

Fig. 15

Phaenolobus (*Phorotrophus*) *maculiceps* Seyrig, 1932: 99.

Diagnosis

Overall bright yellow with dorsal black markings on head and mesosoma: inter-ocellar area, vertex posteriorly, upper occiput, mesoscutal lobes, scuto-scutellar groove; wings hyaline, slightly infuscate apically; frons smooth; face

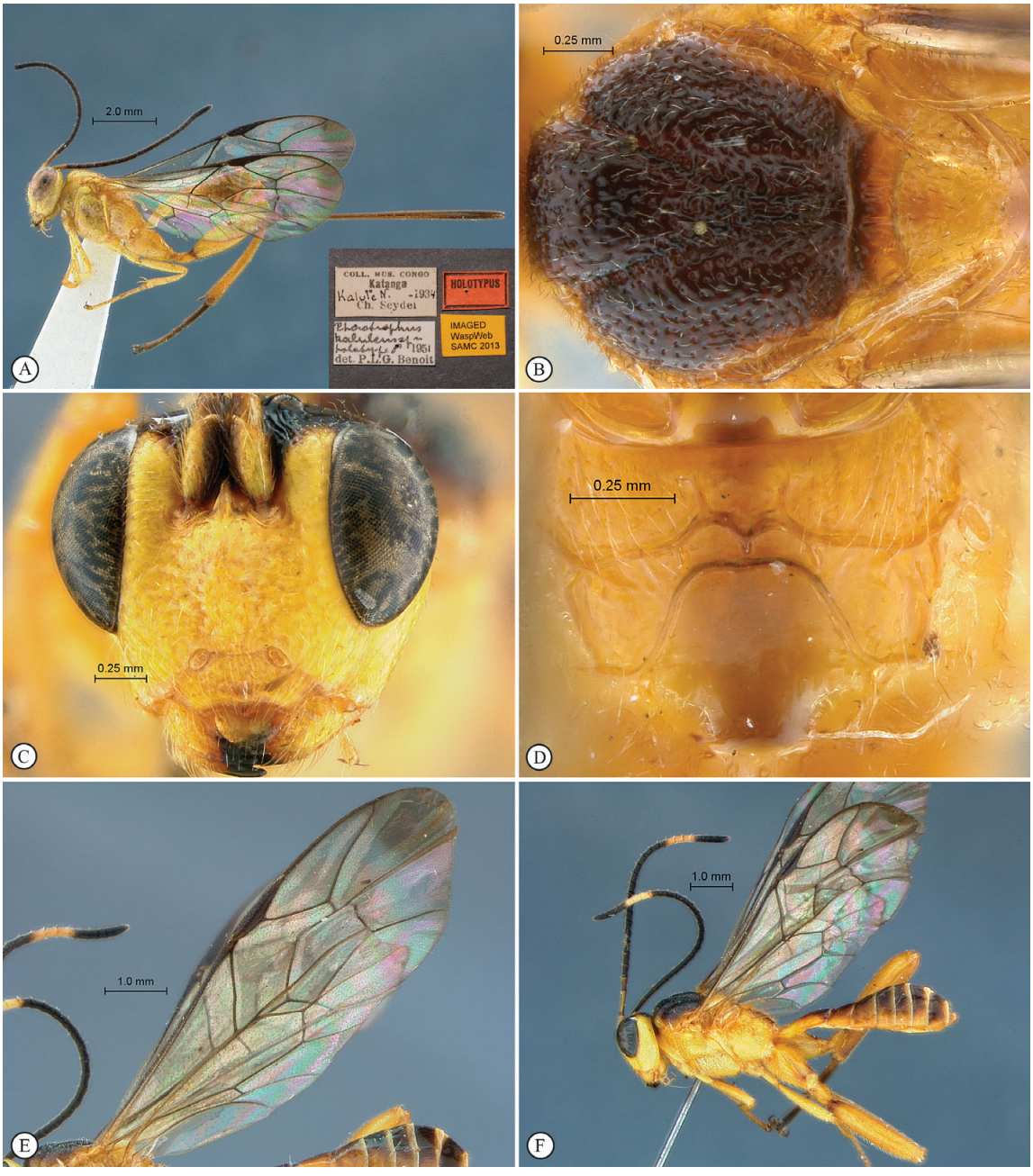


Fig. 14. *Phorotrophus kaluleus* holotype male (except F). **A**, Habitus lateral view (insert: data labels); **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, female lateral view.

rugulose-punctate, carina weak below median bulge; clypeus punctate, somewhat longitudinally rugulose medially, subapical ridge subtruncate, weakly pointed medially and without lateral protuberance, ventral margin strongly produced laterally; antenna with 30–32 flagellomeres (Seyrig 1932); occipital carina long, reaching vertex level; pronotum entirely canaliculate to striate, without smooth area; mesopleuron densely punctate ventrally with a large dorsal smooth area encompassing speculum, and with more or less distinct long vertical striations below speculum, speculum also somewhat striate dorsally with posterodorsal quarter smooth, speculum somewhat striate dorsally; upper section of epicnemial carina faint, hardly reaching above posteroventral corner of pronotum; metapleuron rugulose-punctate; notauli very deep, crenulate, joining posteriorly in front of posterior margin of mesoscutum; scuto-scutellar groove moderately crenulate; propodeum with anterior carinae incomplete, smooth posterior to apical transverse carina, anterior areas poorly defined; forewing with bullae on 2m–cu small, separated by 4–5× their own length, 2m–cu opposite to rs–m; hind wing with Cu1 joining 1/Cu&cu–a above middle; ventral swelling on sternite 1 strong; ovipositor long. IC 0; NI 0.8; OT 2.1; B 15.7; A 11.1; F 14.7 (lectotype female).

Differential diagnosis

Bright yellow species from Madagascar, characterized by the long occipital carina and the crenulate scuto-scutellar

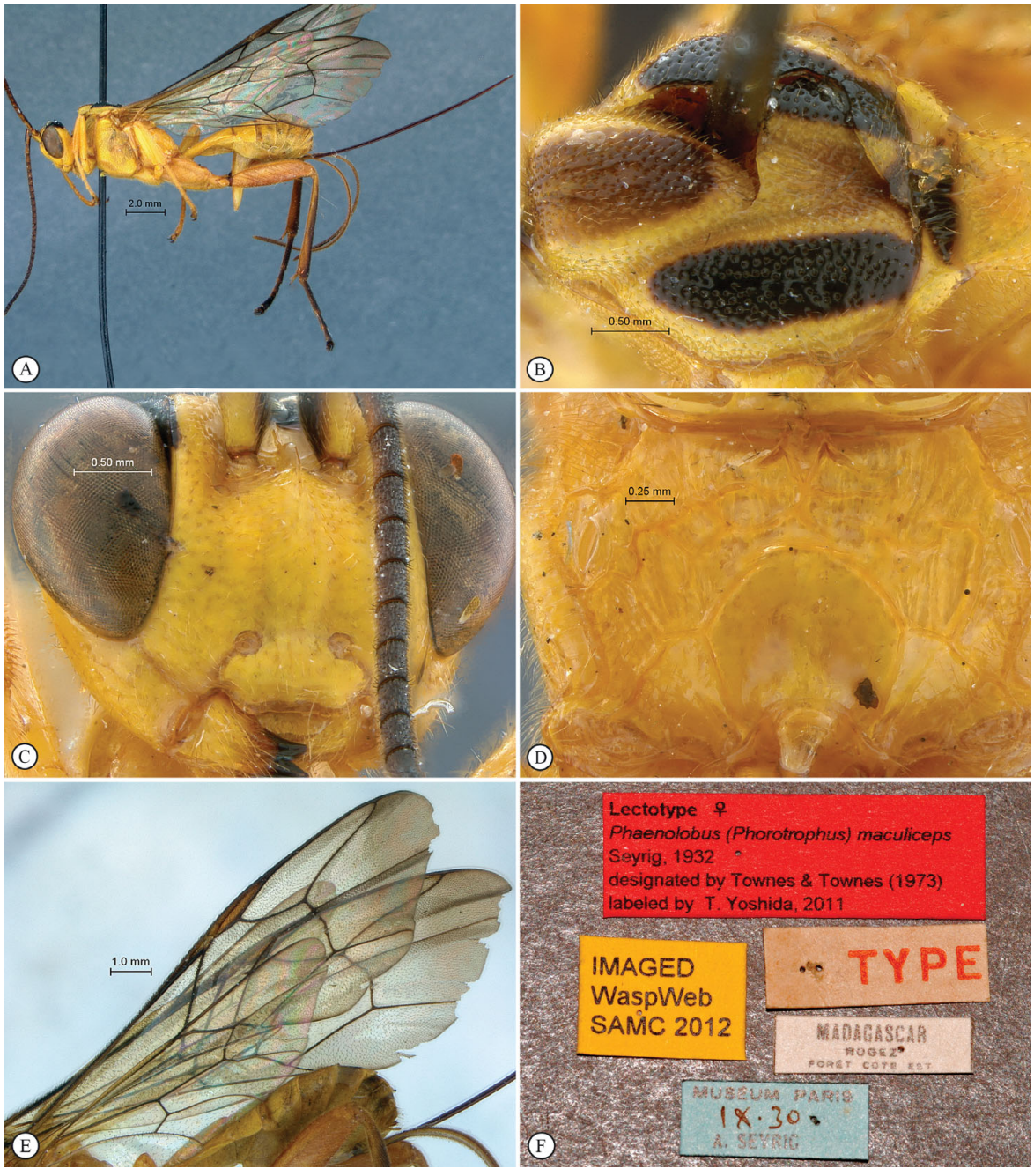


Fig. 15. *Phorotrophus maculiceps* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

groove. It shares close similarities with *P. hastatus* and *P. trilobus* (*cf.* comments under *P. hastatus*) from which it may be differentiated by the combination of the long ovipositor; the strong ventral swelling on sternite 1; the absence of a distinctly defined central area on the propodeum; and the long separation of bullae on 2m-cu.

Material examined

Lectotype ♀: Madagascar, Rogez, Forêt côte est, IX.30, A. Seyrig. (MNHN).

Distribution

Madagascar.

Phorotrophus magnificus (Seyrig, 1932)

Fig. 16

Phaenolobus (*Phorotrophus*) *magnificus* Seyrig, 1932: 100.

Diagnosis

Testaceous overall; wings yellowish, apically blackish; frons quite smooth medially; face and clypeus densely punctate, somewhat rugulose, mid-longitudinal carina weak below median bulge; subapical margin of clypeus sharp and truncate, without protuberance, ventral margin weakly produced medially; antenna with 35 flagellomeres; occipital carina nearly complete, narrowly interrupted mid-dorsally; pronotum almost totally smooth with shallow striations on

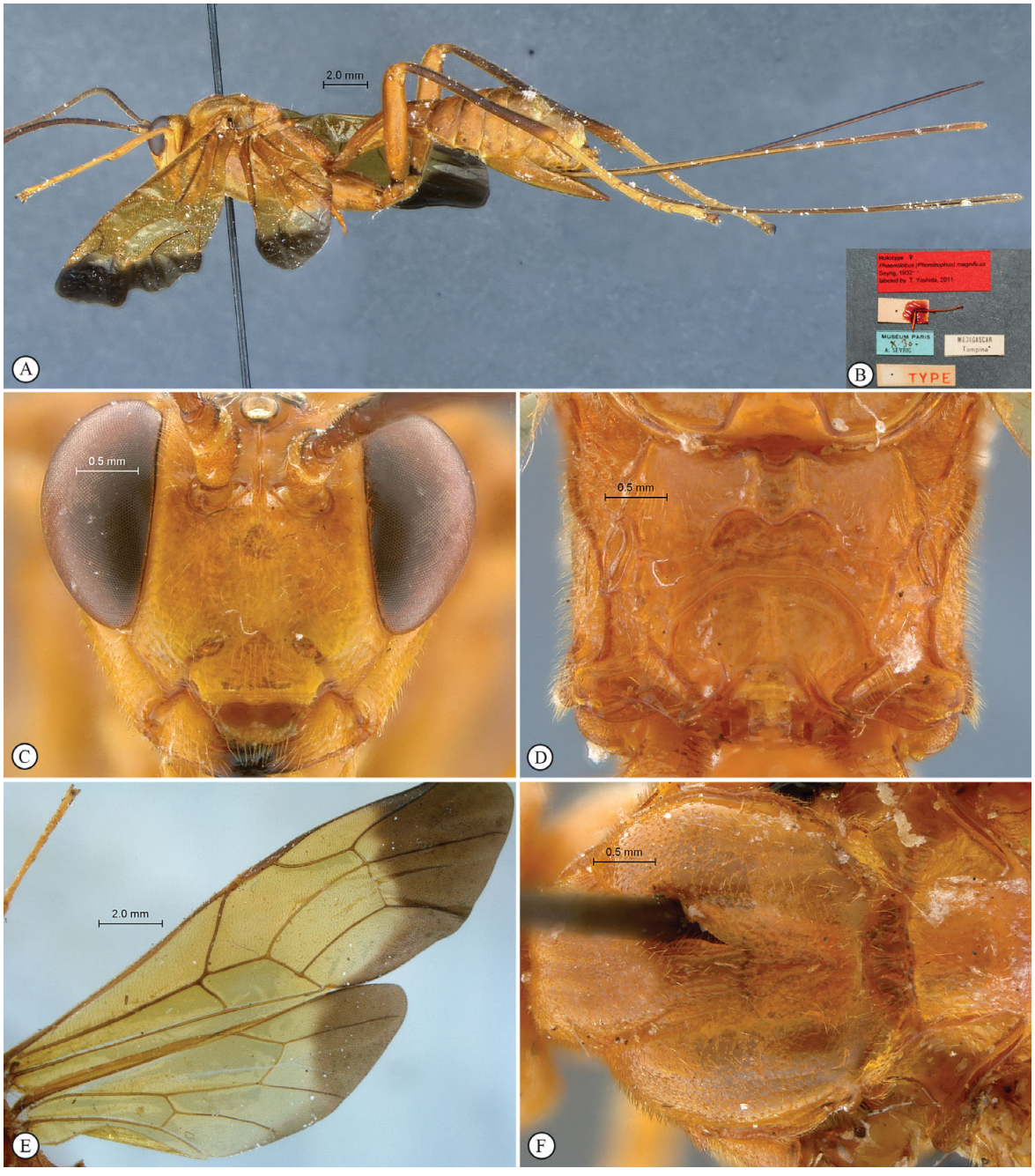


Fig. 16. *Phorotrophus magnificus* holotype female. **A**, Habitus lateral view; **B**, data labels; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, mesonotum dorsal view.

margins; mesopleuron densely punctate with posterodorsal quarter smooth, speculum somewhat striate dorsally; metapleuron coarsely rugose-punctate; mesoscutum densely and deeply punctate; notauli very deep, crenulate, joining posteriorly in a large concave and punctate area; scuto-scutellar groove distinctly crenulate; propodeum mostly rugulose, sculpture smoother posterior to basal transverse carina; carination strong, basal median area defined, elongate and distinctly concave; forewing with bullae on 2m–cu separated by 2–3× their own length, rs–m opposite to 2m-cu; hind wing with Cu1 joining 1/Cu&cu–a near middle; ventral swelling of sternite 1 weak; ovipositor very long. IC 0; NI 0.9; OT 2.5; B 22.5; A: 15.0; F: 18.5 (holotype female). Male unknown.

Differential diagnosis

Large yellowish orange species with yellowish wings, characterized like other *Phorotrophus* species from Madagascar by the combination of the long occipital carina and the crenulate scuto-scutellar groove, and otherwise by the truncate subapical ridge on the clypeus; the smooth pronotum; the wing venation with 2m–cu opposite rs–m; the elongate and concave basal median area of the propodeum; and the very long ovipositor.

Material examined

Holotype ♀: Madagascar, Tampina, X.30, A. Seyrig (MNHN).



Fig. 17. *Phorotrophus malaisei* holotype male. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Distribution

Madagascar.

Phorotrophus malaisei Benoit, 1952a

Fig. 17

Diagnosis

Overall black with orange markings: gena, pronotum dorsally, mesopleuron anterodorsally, tegula, fore femur and fore tibia; wings yellowish; frons transversely striate medially; face elongate, deeply and densely punctate-reticulate, mid-longitudinal carina absent below toruli; clypeus densely punctate-reticulate with fine longitudinal rugosities, subapical ridge blunt without distinct lateral protuberance, ventral margin strongly produced laterally and with strong median tooth; occipital carina long, narrowly interrupted mid-dorsally; [antennae lacking in single available specimen]; pronotum densely and deeply punctate, medially longitudinally strigose; mesopleuron densely punctate-reticulate with speculum area deeply longitudinally striate; epicnemial carina strong, interrupted shortly above posteroventral corner of pronotum; metapleuron deeply longitudinally puncto-striate; mesoscutum deeply punctate-reticulate; notauli deep, crenulate, joining posterior margin of mesoscutum; scuto-scutellar groove crenulate; propodeum coarsely rugose-reticulate without

differentiated areas; forewing with bullae on 2m–cu separated by about their own length, 2m–cu slightly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a above middle; ventral swelling on sternite 1 weak. IC 0.2; NI 0.5; OT –; B 13.9; A 7.9; F 12.3 (holotype male). Female unknown.

Differential diagnosis

A readily distinguishable species, characterized by the long occipital carina; the mostly black colouration; the elongate face; the coarse punctate-reticulate sculpture on the frontal head and mesosoma; and the coarsely sculptured propodeum without differentiated areas.

Material examined

Holotype ♂: [South Africa] Caffraria [Eastern and Western Cape], J. Wahlb., 18, NHRS-HEVA 000002549 (NHRS).

Distribution

South Africa.

Phorotrophus mameti Benoit, 1952a

Fig. 18

Phorotrophus basilewskyi Benoit, 1952a: 348, **syn. nov.**
Phorotrophus limpidus Benoit, 1955: 38: 9, **syn. nov.**
Phorotrophus nigromaculatus Benoit, 1952a: 349, **syn. nov.**

Diagnosis

Overall bright yellow with always present black markings of variable extent on: inter-ocellar area, upper occiput and mesoscutal lobes, and additionally some variable black spots (sometimes totally absent) on: scuto-scutellar groove, scutellum, post-scutellum, propodeum anterolaterally, hind coxa, hind tarsus, basal tip of hind femur and apical half of hind tibia, spiracular area on tergite 1, basal margins of following tergites, and ovipositor sheath; antenna black, ventro-basally yellow, occasionally with a subapical pale ring of variable intensity; wing hyaline, apically infuscate; frons medially smooth; face densely rugulose-punctate, mid-longitudinal carina moderate and indistinct below mid-height of face; clypeus somewhat longitudinally rugulose, subapical ridge weak and weakly produced laterally, ventral margin weakly produced laterally and with median tooth strong; antenna with 21–26 flagellomeres; occipital carina short, not reaching above mid-height of eye; pronotum shallowly sculptured, dorsally punctate and ventrally canaliculate with a large smooth median area; mesopleuron densely punctate with a large smooth dorsal area including speculum, speculum often somewhat longitudinally striate dorsally; upper part of epicnemial carina faint, reaching subtegular ridge; metapleuron shallowly punctate, sometimes almost smooth, indistinctly to deeply longitudinally strigose medially; mesoscutum densely punctate, more or less deeply transversely rugulose along notaular course; notaulus relatively shallow, joining posteriorly in a depressed, punctate to rugulose area; scuto-scutellar groove smooth or nearly so, at most with barely distinct crossing ridges; propodeum quite smooth; propodeal carination of variable intensity: basal transverse carina always present and strong, apical transverse carina nearly absent to shortly obsolescent medially, when present strongly incurved forward, reaching anterior third of propodeum; submedian longitudinal carinae also of variable extent: basal median area always defined, quadrate to transverse, central median area sometimes defined, strongly transverse; forewing with bullae on 2m–cu confluent to separated by about their own length, 2m–cu distinctly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu at middle to far below; ventral swelling on sternite 1 strong, pyramidal; ovipositor long. IC 0.3–0.4; NI 1.0–1.9; OT 1.8–2.0; B 6.8–11.2; A 5.2–8.3; F 7.0–11.2 (10 specimens).

Differential diagnosis

A mostly bright yellow species with a greatly variable set of black markings, characterized by the combination of the smooth frons, the short antennae, the largely smooth upper mesopleuron, the often transversely rugulose mesoscutum, the smooth background sculpture of the propodeum, the always distinctly apical position of 2m–cu relatively to rs–m, the strong pyramidal swelling on sternite 1 and the long ovipositor.

Material examined

Holotype ♀ of *P. mameti*: Bikora (Lac Tumba) [Democratic Republic of Congo], 1950, M. Mamet, Parasite de *Paremydica kolae* Hust. (MRAC). Other material: **Cameroon**: 2♂, 1♀: Cameroun: Nkoemvon, 16–30.iii.1980 Ms. D. Jackson (BMNH); 2♀: same label data except: 30.iii–19-iv.1980 (BMNH); 2♀: same label data except: 13-vii–24.viii.80 (BMNH), 1♀: same label data except: 1980 (BMNH). **Central African Republic**: 1♀: Central African Republic, Prefecture Sangha-Mbaéré, Parc National de Dzanga-Ndoki, Mabéa Bai, 21.4 km 53° NE Bayanga 3°02.01′N, 16°24.57′E, 510 m, 1–2.v.2001, S. van Noort, Malaise trap, CAR01–M01, Lowland Rainforest, marsh clearing, SAM–HYM–P047320 (SAMC); 1♀: same label data except: CAR01–M02, SAM–HYM–P047328 (SAMC); 1♀: same label data except: 2–3.v.2001, CAR01–M15, SAM–HYM–P047334 (SAMC); 1♀: same label data except: CAR01–M21, SAM–HYM–P047324 (SAMC); 1♀: same label data except: 3–4.v.2001, CAR01–M24, SAM–HYM–P047325 (SAMC); 1♀: same label data except: CAR01–M32, SAM–HYM–P047331 (SAMC); 1♀: same label data except: 4–5.v.2001, CAR01–M38, SAM–HYM–P047326 (SAMC); 1♀: same label data except: 5–6.v.2001, CAR01–M50, SAM–HYM–P047327 (SAMC); 1♀: same label data except: Réserve Spéciale de Forêt Dense de Dzanga-Sangha, 12.7 km 326° NW Bayanga, 3°00.27′N, 16°11.55′E, 420 m, 12–13.v.2001, CAR01–M109 SAM–HYM–P047337 (SAMC); 1♀: same label data except: 38.6 km 173° S Lidjombo, 2°21.60′N, 16°09.20′E, 350 m, 20–21.v.2001, CAR01–M157, Lowland rainforest, SAM–HYM–P047332 (SAMC); 1♀: same label data except: 21–22.v.2001, CAR01–M172, SAM–HYM–P047330 (SAMC); 1♀: same label data except: 22–23.v.2001, CAR01–M179, SAM–HYM–P047329 (SAMC); 1♀: same label data except: CAR01–M186, SAM–HYM–P047333 (SAMC). **Democratic Republic of Cong**o: 1♀ [holotype of *P. basilewskyi*]: Haut-Uele: Paulis, III-1947 (MRAC); 1♀ [holotype of *P. limpidus*]: Bambesa, XII-1946 (MRAC); 1♀ [holotype of *P. nigromaculatus*]: Uele-Nepoko, Bayenge (Delpierre) (MRAC); 1♀: Uele: Bayanga, terr. Wamba, 810 m, 15-ix-1956 R. Castelain (MRAC); 1♂: SL Edouard: Kamande (925m)

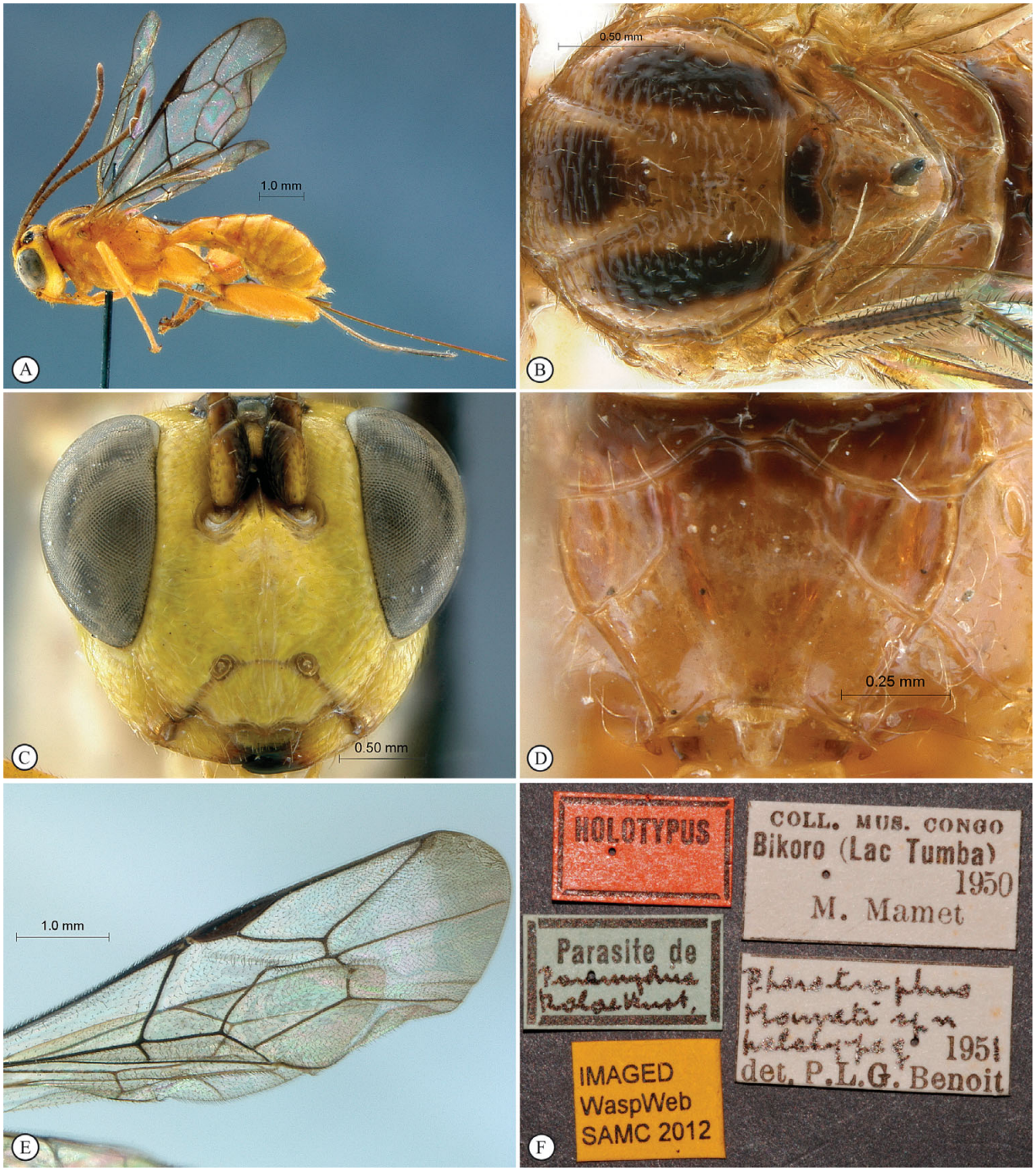


Fig. 18. *Phorotrophus mameti* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

3–iv-36 L. Lippens Parc Net. Albert (MRAC). **Gabon**: 1♀: Gabon, Prov. Ogoové-Maritime, Réserve des Monts Doudou, 24.3 Km 307° NW Doussala, 2°13.35′S, 10°24.35′E, 350 m, 6–7.iii. 2000, S. van Noort, Malaise trap, GA00–M38, Coastal Lowland Rainforest, Forest margin along river, SAM–HYM–P021278 (SAMC). **Ghana**: 1♀, 2♂: Ghana, Ashanti Manpong mt, 600 m, N7.00 – W1.22, from tree barks 21.12 1965, no. 111, leg. Endrödy-Younga (BMNH). **Ivory Coast**: 12♀, 3♂: Côte d'Ivoire: Eloka, J. Decelle, I.1963, ex follicules *Cola cordifolia* avecc [*sic*] *Pter. kolae* et 2 sp. charançons (MRAC). **Nigeria**: 1♀: Nigeria, Ile-Ife Oyo state, 6-5-1976, B.A. Metanbanmi Coll., C.I.E. Coll. A 9065 (BMNH); 1♀: Ibadan, 15-xi-20, So. Nigeria, N° 415 (BMNH). **Sierra Leone**: 1♂: Sierra Leone, Njala, ex Kola nuts with Paremydica + Balanogastris, 5.1.34, E. Hargreaves (BMNH). **Uganda**: 1♀: Uganda, Kibale National Park, Kanyawara, Makerere University Biological Field Station, 1587 m, 0°34.390′N, 30°21.658′E, 12–26.viii.2008, S. van Noort, UG08–KF9–M19, Malaise trap, primary mid-altitude Rainforest, near stream, SAM–HYM–P047336 (SAMC); 1♀: same label data except: 1495m, 0°33.871′N, 30°21.355′E, UG08–KF2–M02, secondary mid-altitude Rainforest,

SAM–HYM–P047335 (SAMC). **Unknown origin**: 4♀, 2♂: from kola culture [date and locality not reported] (BMNH).

Distribution

Democratic Republic of Congo. New records: Cameroon, Central African Republic, Gabon, Ghana, Ivory Coast, Nigeria, Uganda.

Host records

Reared ex *Balanogastris kolae* (Desbrochers) and *Paremydica kolae* (Hustache) (Coleoptera: Curculionidae) on *Cola cordifolia* (Sterculiaceae).

Comments

This species is widespread and very common in collections. It exhibits a large intraspecific variation in size, colour and structure. The most variable features are the presence or absence of the pale ring on the flagellum, the intensity of striations on the mesoscutum, the level of interception of 1/Cu&cu–a on the hind wing, and the intensity of central carination on the propodeum. Noticeably, the length of the antennae and the depth of the mesoscutal striations vary allometrically with specimen size. One specimen (SAMC P047320) is exceptional in having the frons transversely strigose, while it is invariably smooth to very shallowly sculptured in all other specimens. Since the other characters of this specimen fall within the intraspecific variation of *P. mameti*, we refrain from describing this doubtful singleton as a separate species.

Phorotrophus mangbetuorum Benoit, 1952a

Fig. 19

Diagnosis

Bright yellow overall with black markings: inter-ocellar area, upper occiput, mesoscutal lobes; apical tergites somewhat infuscate; wings hyaline, apically infuscate; frons medially smooth with transverse striations dorsally; face deeply rugulose-punctate, carina moderate and distinct to centre of face; clypeus longitudinally strigose, subapical ridge blunt and moderately produced laterally, ventral margin moderately produced laterally and with median tooth moderate; antennae with 22 flagellomeres; occipital carina present only as a short stub joining hypostomal carina; pronotum ventrally canaliculate, dorsally punctate, with a large median smooth area; mesopleuron deeply rugulose-punctate with a large dorsal smooth area including speculum; epicnemial carina nearly absent laterally, hardly reaching posteroventral corner of pronotum; metapleuron weakly rugulose-punctate; mesoscutum densely punctate; notauli deep and crenulate, joining posteriorly in a deep rugulose depression; propodeum nearly smooth with carination weak; basal transverse carina only present, posterior half of propodeum transversely strigose and subdivided by a more or less distinct mid-longitudinal carina; forewing with bullae on 2m–cu separated by about their own length, 2m–cu strongly apical to rs–m; hind wing with Cu&cu-a intercepted slightly above middle; ventral swelling on sternite 1 strong. IC 0.3–1.1; NI 0.8–0.9; OT –; B 9.0–9.8; A 4.9 ; F 8.9–9.6 (2 specimens).

Differential diagnosis

Overall a yellow species with black markings, mainly characterized by the near-absence of the occipital carina and the propodeal carination, with only the basal transverse carina present and sometimes a long mid-longitudinal carina arising from that transverse carina in the posterior half of the propodeum.

Material examined

Holotype ♂: Haut-Uele [Democratic Republic of Congo]: Paulis, xii.1947, P.L.G. Benoit (MRAC). Other material: Congo belge [Democratic Republic of Congo]: Kivu Rutshuru ,1285 m, 11-vii-1935, G.F. de Witte, 1638 (MRAC).

Distribution

Democratic Republic of Congo.

Phorotrophus perplexus Benoit, 1952a

Fig. 20

Diagnosis

Head mostly yellow with vertex and upper occiput black; mesosoma and metasoma mostly black with isolated yellow markings; frons medially smooth; face deeply reticulate, carina reaching upper margin of clypeus; clypeus longitudinally rugulose, subapical ridge moderately sharp without lateral protuberance, ventral margin moderately produced laterally and with strong median tooth; occipital carina long, narrowly interrupted mid-dorsally; [antennae of known specimens broken, originally holotype with 28 flagellomeres]; pronotum longitudinally canaliculate with a large smooth area medially; mesopleuron densely and deeply punctate with a large smooth dorsal area encompassing speculum, anterior margin of area crenulate; upper part of epicnemial carina faint, reaching subtegular ridge; metapleuron densely punctate with deep longitudinal rugosities medially; mesoscutum deeply, densely and regularly punctate; notauli deep, punctate-reticulate, joining posteriorly in a depressed area; scuto-scutellar groove deeply crenulate; propodeum transversely rugulose, rather smooth posterior to apical transverse carina, without longitudinal carinae, both transverse carinae medially obsolescent; forewing with bullae on 2m–cu separated by 2–3× their own length, 2m–cu apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a near middle; ventral swelling on sternite 1 strong; ovipositor very long. IC 0.5; NI 1.1; OT 3.1; B 10.7; A –; F 10.1 (holotype female).

Differential diagnosis

Distinguishable by the overall colouration with the head mostly yellow and the remainder of the body mostly black, otherwise characterized by the combination of the long occipital carina; the medially pointed subapical ridge of the clypeus; the reticulations on the face; the longitudinal striations on the clypeus; the large dorsal smooth area on the mesopleuron; and the very long ovipositor.

Material examined

Holotype ♀: [Democratic Republic of Congo] Wamba (Uele-Nepoko), 24-IV-1931 J. Vrydagh (MRAC). Other material: 1♀: Cameroun: Nkoemvon, 16–30.iii.1980, Ms. D. Jackson (BMNH)

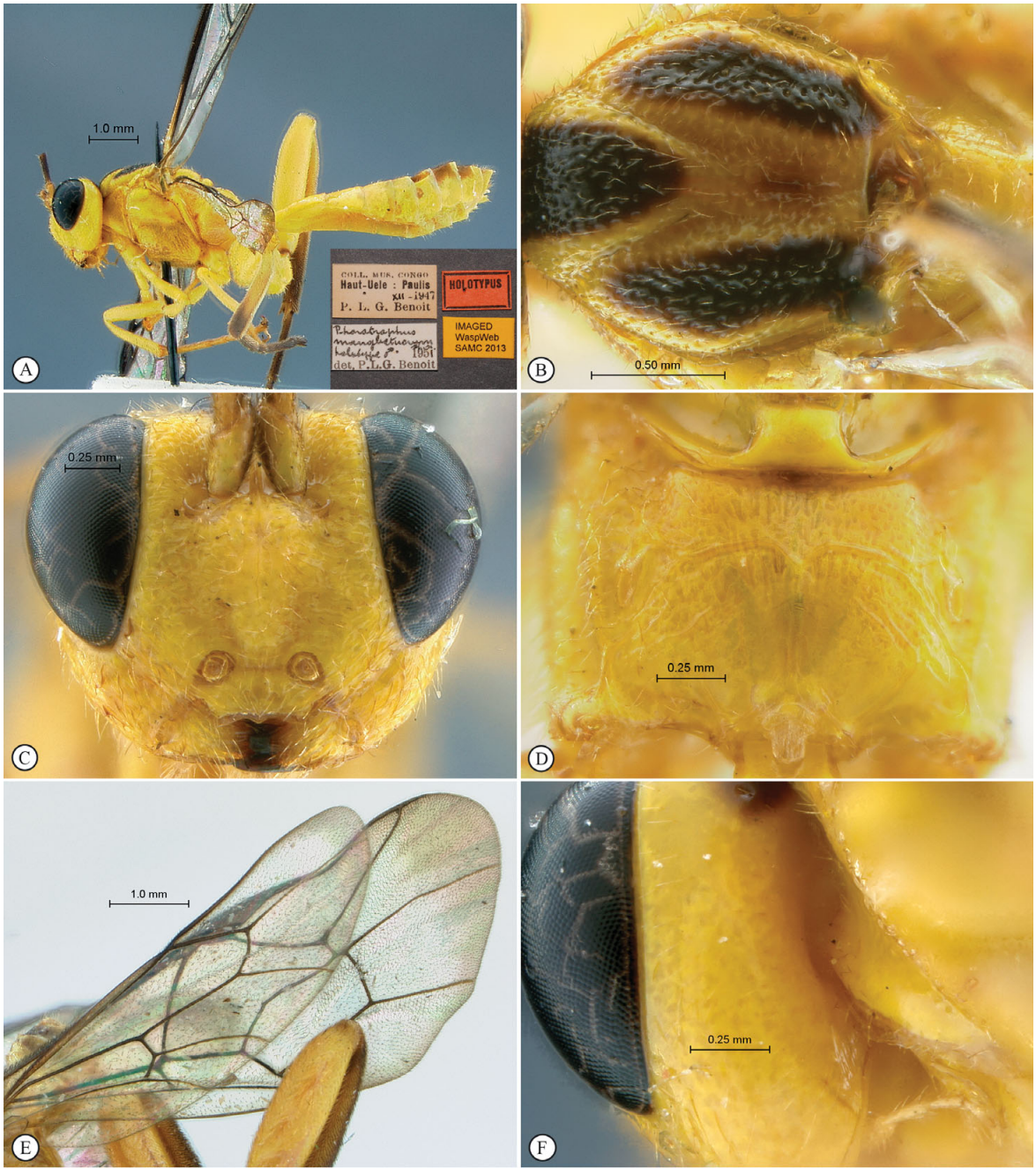


Fig. 19. *Phorotrophus mangbetuorum* holotype female. **A**, Habitus lateral view (insert: data labels); **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, head dorsolateral view showing the strongly reduced occipital carina.

Distribution

Democratic Republic of Congo. New record: Cameroon.

Phorotrophus problematicus Maquart, Rousse & van Noort **sp. nov.**

Fig. 21

Diagnosis

Head mostly yellow with black parts; mesosoma and metasoma almost totally black; wings hyaline, apically infuscate; frons smooth; face rugulose-punctate; clypeus longitudinally rugulose, subapical ridge weakly produced laterally, ventral margin strongly produced laterally and with median tooth strong; antenna with 27–29 flagellomeres; occipital carina reaching mid-height of eye; pronotum medially smooth, dorsally densely punctate and ventrally canaliculate; mesopleuron densely punctate, speculum smooth; metapleuron densely punctate with faint longitudinal striations; mesoscutum moderately punctate; notauli deep and crenulate, joining posteriorly in a deep reticulate depression; scuto-scutellar groove moderately crenulate; propodeum nearly smooth, basal transverse carina complete and apical transverse carina variably complete; basal median area defined, slightly longer than wide; forewing with bullae on 2m–cu fused, 2m–cu opposite rs–m; hind wing with Cu1 joining 1/Cu&cu–a above middle; ventral swelling

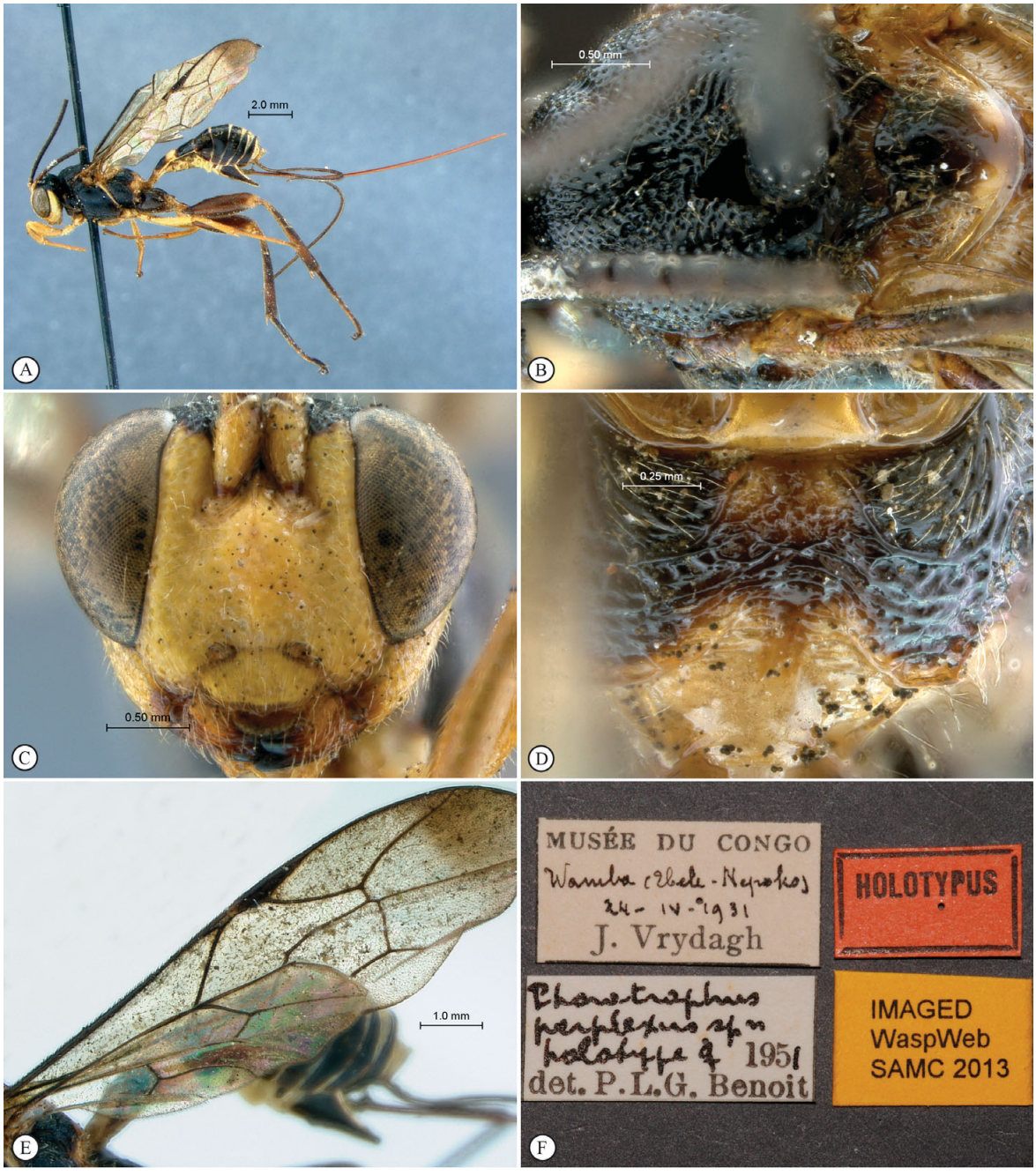


Fig. 20. *Phorotrophus perplexus* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

on sternite 1 weak; ovipositor very long. IC 0; NI 0.6–0.8; OT 2.9–3.1.

Differential diagnosis

A mostly black species with a very long ovipositor, otherwise characterized by the forewing venation with 2m–cu opposite rs–m and the almost smooth propodeum with strong carination.

Description

FEMALE (2 specimens). B: 8.7–9.1; A: 6.2–6.4; F: 7.6–8.0.

Colour. Head yellow with dark reddish to black parts: entire mandible, frons medially, vertex, temple, occiput, antenna, and a variable mid-longitudinal stripe on upper face; mesosoma and metasoma black with yellow parts: anterior margin of mesoscutum, apex of scutellum, postscutellum, sometimes apex of propodeum, and sometimes apical margins of tergites 1–2; fore- and mid legs yellow with coxae darker, hind leg dark reddish with apex of femur lighter; wings hyaline, apically infuscate.

Head. Temple and gena moderately punctate; vertex nearly smooth with inter-ocellar area rugose; frons densely punctate laterally, medially smooth, carina strong; face moderately protruding, rugulose-punctate, carina weak and distinct to middle of face; clypeus longitudinally rugulose, flat, subapical ridge weakly produced laterally, ventral

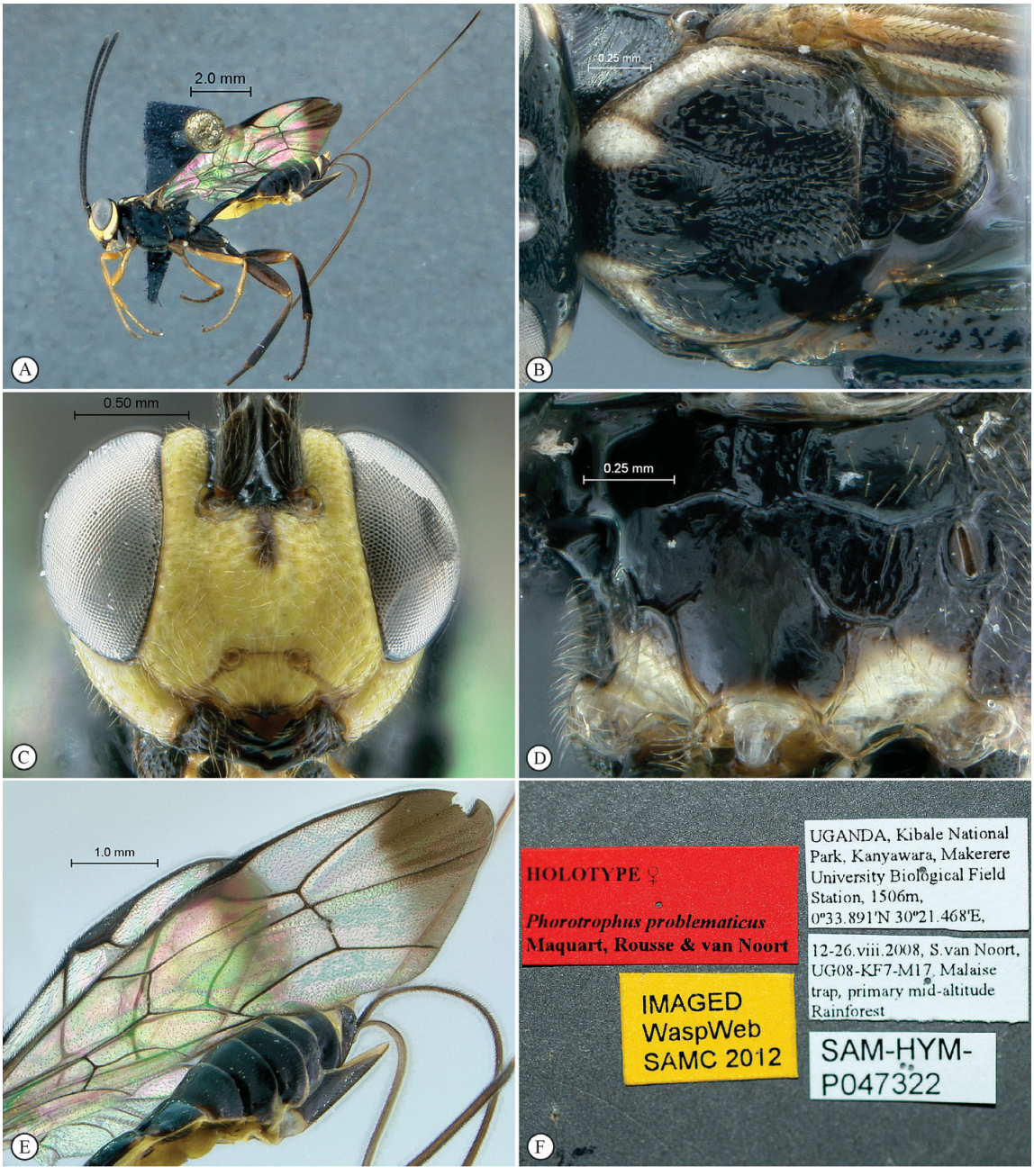


Fig. 21. *Phorotrophus problematicus* sp. nov. holotype female. **A**, Habitus lateral view. **B**, mesonotum dorsal view. **C**, head anterior view. **D**, propodeum dorsal view. **E**, wings. **F**, data labels.

margin strongly produced laterally and with median tooth strong; mandible short and stout, lower tooth slightly longer than upper tooth; antenna with 27–29 flagellomeres; occipital carina not reaching above mid-height of eye.

Mesosoma. Pronotum medially smooth, dorsally densely punctate and ventrally canaliculate; mesopleuron densely punctate to transversely rugulose-punctate, speculum smooth; upper part of epicnemial carina faint, reaching subtegular ridge; metapleuron densely punctate with some weak longitudinal striations, punctation dorsally sparser; mesoscutum moderately punctate, notauli fine, deep and crenulate, joining posteriorly in a large reticulate depression; scuto-scutellar groove moderately but distinctly crenulate; scutellum moderately punctate; propodeum nearly smooth; basal transverse carina complete, apical transverse carina medially obsolescent to complete, when complete strongly incurved forward medially and joining basal carina; basal median area defined, slightly longer than wide. *Wings*. Forewing with bullae on 2m–cu confluent, rs–m opposite 2m-cu; hind wing with Cu1 joining 1/Cu&cu–a above middle.

Metasoma. Ventral swelling on sternite 1 weak; ovipositor very long.

MALE. Unknown.

Type material

Holotype ♀: Uganda, Kibale National Park, Kanyawara, Makerere University Biological Field Station, 1506 m,

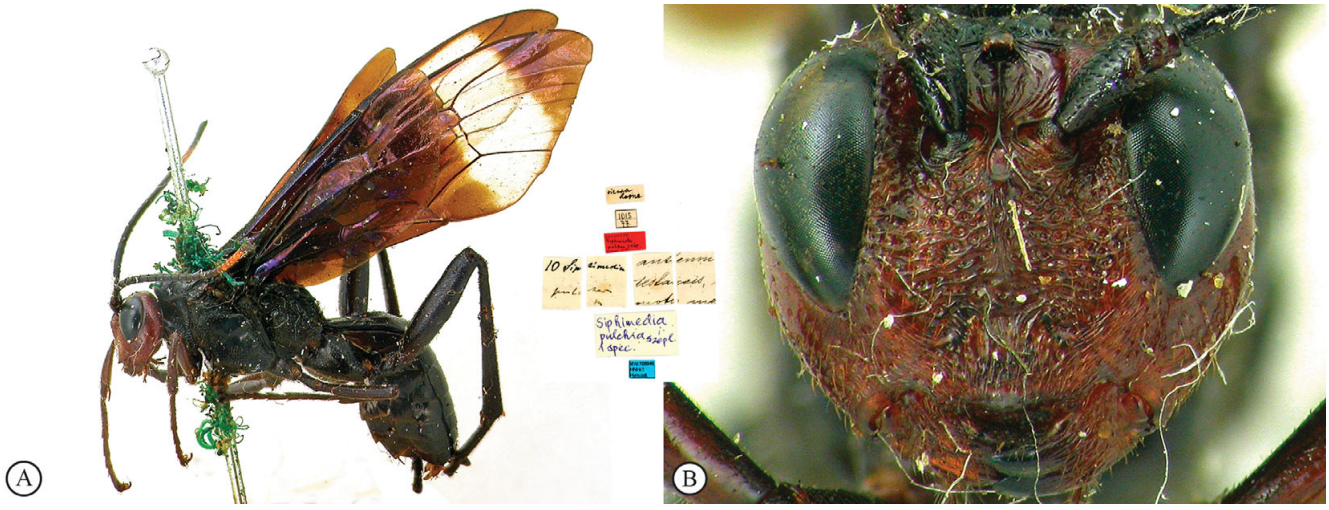


Fig. 22. *Phorotrophus pulcher* holotype male. **A**, Habitus lateral view; **B**, head anterior view. Insert: data labels (images courtesy HNHM).

0°33.891′N, 30°21.468′E, 12–26.viii.2008, S. van Noort, UG08–KF7–M17, Malaise trap, primary mid-altitude Rainforest, SAM–HYM–P047322 (SAMC). Paratypes: 1♀: same label data except: 1494 m, 0°34.808′N, 30°21.873′E, UG08–KF5–M15, secondary mid-altitude Rainforest, marshy area, SAM–HYM–P047321 (SAMC); 1♀: Cameroun: Nkoemvon, 1980, Ms D. Jackson (BMNH).

Etymology

With reference to the morphological affinities with *P. perplexus*.

Distribution

Cameroon, Uganda.

Phorotrophus pulcher (Szépligeti, 1914)

Fig. 22

Siphimedia pulchra Szépligeti, 1914: 425.

Diagnosis

Overall black with head and forelegs mostly dark reddish; wings strongly infuscate but with a subapical transverse hyaline stripe on forewing; antenna black with flagellomeres 17–22 orange; frons transversely rugulose medially; face reticulate, carina absent below toruli; clypeus longitudinally rugulose, subapical ridge sharp, simple and regularly rounded, ventral margin moderately produced laterally; occipital carina long, reaching vertex level; antenna with 29 flagellomeres; pronotum longitudinally canaliculate with a large smooth area medially; mesopleuron densely and deeply punctate with speculum area smooth; metapleuron coarsely puncto-striate; mesoscutum densely and finely punctate; scuto-scutellar groove crenulate; propodeum mid-transversely rugose, about smooth anteriorly to basal transverse carina and posterior to apical transverse carina, basal median area defined, subquadrate; forewing with bullae on 2m–cu separated by about 2× their own length, 2m–cu distinctly basal to rs–m; hind wing with Cu1 joining 1/Cu&cu–a at middle; [ventral swelling on sternite 1 concealed by coxae on single known specimen]. IC 0.2; NI 1.0; OT –; B 19.2; F 20.1 (holotype male). Female unknown.

Differential diagnosis

A readily distinguishable species, mostly characterized by the wing venation with 2m–cu distinctly basal to 2rs–m; the overall black colouration; the subapical hyaline stripe on the infuscate forewing; and the orange ring on a black flagellum.

Material examined

Holotype ♂: Sierra Leone [locality and date of collection not reported], 1015 77, id nr. 108946 HNHM Hym. coll. (HNHM).

Distribution

Sierra Leone.

Phorotrophus radialis (Seyrig, 1932)

Fig. 23

Phaenolobus (*Phorotrophus*) *radialis* Seyrig, 1932: 101.

Diagnosis

Yellowish orange overall with hind tibia black; wings yellowish, apically blackish; frons hardly strigose medially; face and clypeus densely punctate, carina indistinct below toruli; clypeus with subapical ridge sharp and subtruncate, without protuberance, ventral margin moderately produced laterally; occipital carina long, narrowly interrupted mid-dorsally; antenna with 34 flagellomeres; pronotum longitudinally canaliculate with a large smooth area medially and some punctures dorsally; mesopleuron densely punctate, smooth area on speculum reduced; upper part of epicnemial carina faint, reaching mid-height of pronotum; metapleuron rugulose-punctate; mesoscutum densely and deeply punctate, almost punctate-reticulate; notauli deep and shallowly crenulate, joining posteriorly in a rugulose area; scuto-scutellar groove distinctly crenulate; propodeum mostly rugose-reticulate; carination strong, basal median area defined, quadrate, apical transverse carina medially obsolescent; forewing with bullae on 2m–cu small, separated by 3–4× their own length, 2m–cu distinctly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a near middle; ventral swelling of sternite 1 weak. IC 0.5; NI 0.8; OT 3.3; B 18.4; A 10.3; F 15.8 (lectotype female). Male unknown.

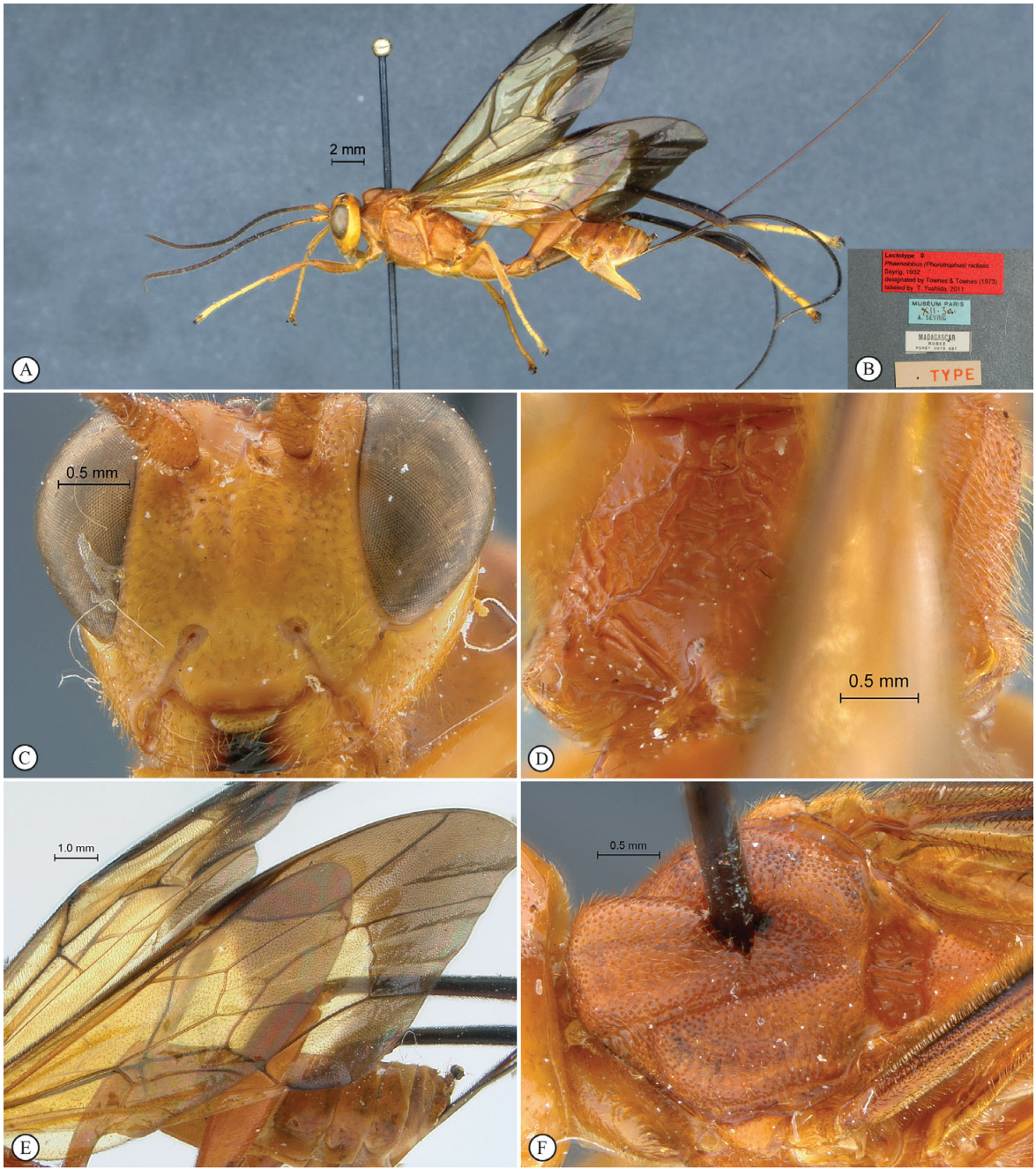


Fig. 23. *Phorotrophus radialis* holotype female. **A**, Habitus lateral view; **B**, data labels; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, mesonotum dorsal view.

Differential diagnosis

A large yellowish orange species with yellowish wings, characterized like other *Phorotrophus* species from Madagascar by the combination of the long occipital carina and the crenulate scuto-scutellar groove, and otherwise by the dense punctation of the face and clypeus, and the very long ovipositor.

Material examined

Lectotype: 1♀: Madagascar, Rogez, Forêt côte est (MNHN).

Distribution

Madagascar.

Phorotrophus schoutedeni Benoit, 1952a

Fig. 24

Diagnosis

Overall black with yellowish orange markings: upper dorsal orbit, tegula, foreleg from femur, mid femur apically and mid tibia; wings hyaline, hardly infuscate apically; frons transversely striate medially; face reticulate, carina absent below toruli; clypeus longitudinally rugulose, subapical ridge sharp, simple and regularly rounded, ventral margin strongly produced laterally; occipital carina short, interrupted near mid-height of eye; antenna with 26 flagellomeres; pronotum densely punctate with a large smooth area

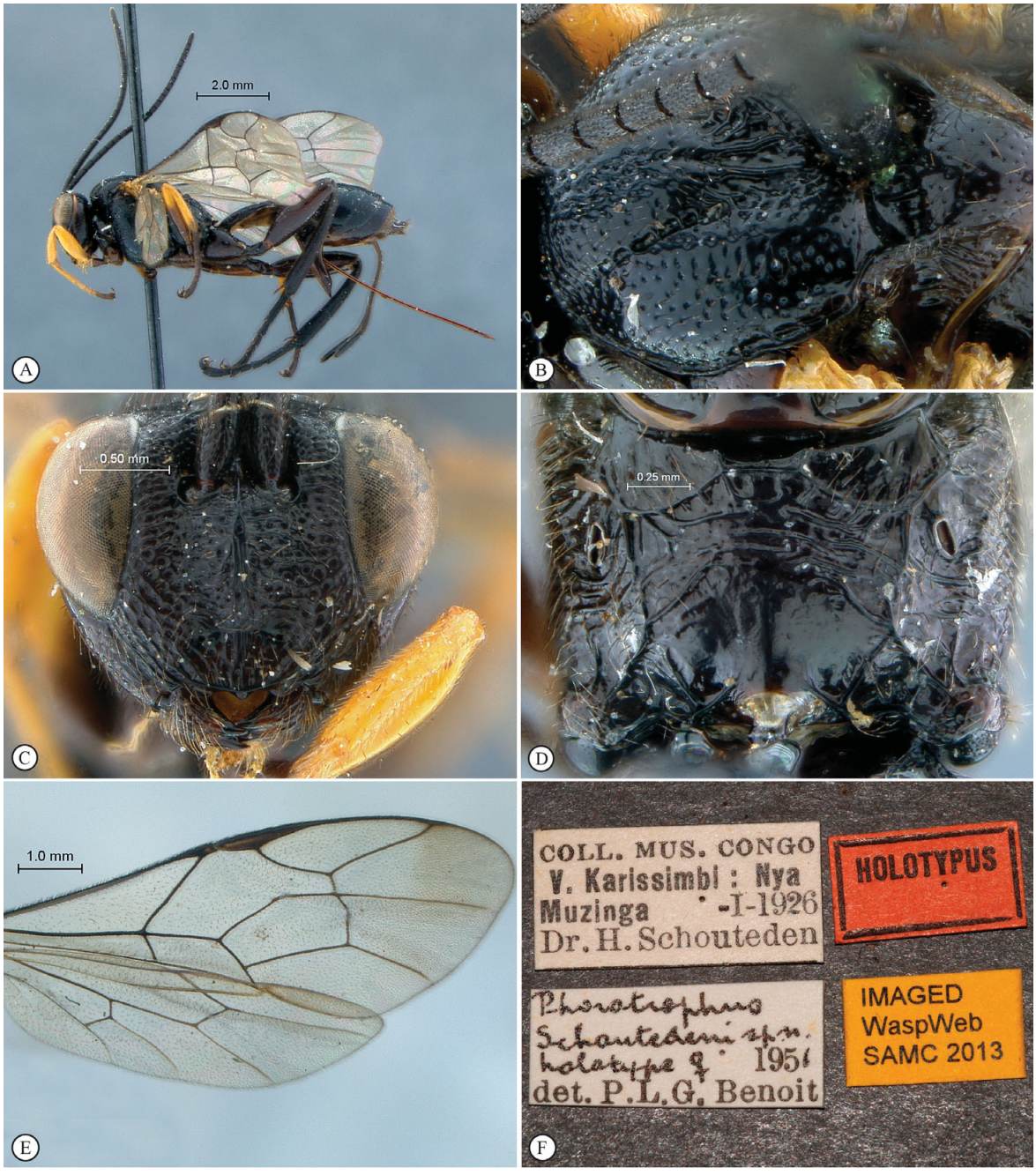


Fig. 24. *Phorotrophus schoutedeni* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

and some crenulations medially; mesopleuron densely and deeply punctate with speculum area smooth; epicnemial carina strong, interrupted shortly above posteroventral corner of pronotum; metapleuron densely punctate with deep longitudinal striations medially; mesoscutum deeply and densely punctate; notauli deep, crenulate, joining posterior margin of mesoscutum; scuto-scutellar groove moderately crenulate; propodeum transversely rugulose, about smooth posterior to apical transverse carina, basal median area defined, short and transverse; forewing with bullae on 2m–cu confluent, 2m–cu subopposite rs–m; hind wing with Cu1 joining 1/Cu&cu–a above middle; ventral swelling on sternite 1 moderate; ovipositor short. IC 0; NI 0.6; OT 1.2; B 9.6; A 6.6; F 9.1 (holotype female). Male unknown.

Differential diagnosis

A mostly black species with the occipital carina short, otherwise characterized by the combination of the hind wing venation with 1/Cu&cu–a intercepted above the middle; the reticulate face; and the evenly rounded subapical ridge of the clypeus.

Material examined

Holotype ♀: [Democratic Republic of Congo] V. Karissimbi: Nya Muzinga, -I-1926, Dr. H. Schouteden (MRAC).

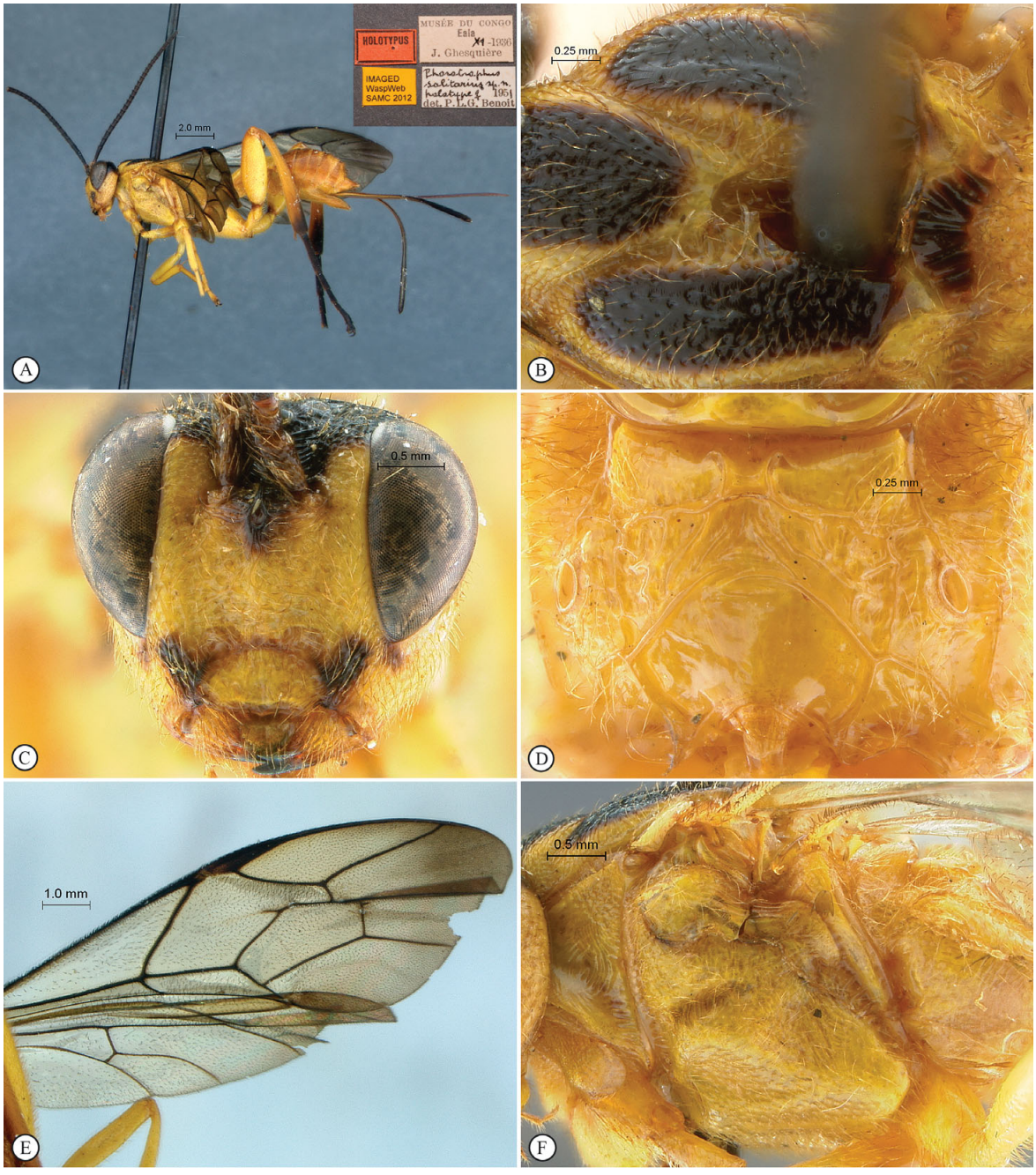


Fig. 25. *Phorotrophus solitarius* holotype female. **A**, Habitus lateral view (insert: data labels); **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, mesopleuron lateral view showing the deep anteroventral depression.

Distribution

Democratic Republic of Congo.

Phorotrophus solitarius Benoit, 1952a

Fig. 25

Diagnosis

Bright yellow overall with apex of metasoma reddish and with black markings on: malar space, frons, vertex, upper occiput, mesoscutal lobes, scuto-scutellar groove, hind tarsus and apex of hind tibia; wings hyaline, apically infuscate; frons medially striate; face densely rugulose-punctate, moderately bulging medially, carina distinct to middle of face; clypeus shallowly sculptured, subapical margin subtruncate and weakly produced laterally, ventral margin moderately produced laterally and with median tooth small; antenna with 27 flagellomeres; occipital carina not reaching above mid-height of eye; pronotum entirely sculptured, ventrally canaliculate and dorsally punctate; mesopleuron densely punctate, with speculum smooth and somewhat longitudinally strigose dorsally, and with a deep and short smoothly crenulate depression anteromedially; metapleuron sparsely punctate, smoothly rugulose medially; mesoscutum densely punctate; notaulus deep and crenulate [posterior junction area destroyed by pin in unique specimen]; scuto-scutellar groove deeply crenulate; propodeum rugulose between

transverse carinae, otherwise nearly smooth; both transverse carinae present and strong, basal median area defined, subquadrate; forewing with bullae on 2m–cu separated by about their won length, 2m–cu distinctly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a far below middle; ventral swelling on sternite 1 weak; ovipositor moderately long. IC 0.3; NI 2.0; OT 1.6; B 14.7; A 9.3; F 12.5 (holotype). Male unknown.

Differential diagnosis

A large and mostly yellow species characterized by the sternaulus-like anteromedian depression on the mesopleuron. Otherwise characterized by the subtruncate subapical ridge on the clypeus with a small median tooth; the propodeum with both transverse carinae strong; and the hind wing venation with 1/Cu&cu–a intercepted far below the middle.

Material examined

Holotype ♀: Eala [Democratic Republic of Congo], XI-1936, J. Ghesquière (MRAC).

Distribution

Democratic Republic of Congo.

Phorotrophus stictor Benoit, 1952a

Fig. 26

Diagnosis

Bright yellow overall with dorsal black markings on inter-ocellar area, mesoscutal lobes testaceous to black; wings hyaline, slightly infuscate apically; frons transversely striate medially; face deeply and coarsely punctate, carina moderate and distinct to centre of face; clypeus longitudinally rugulose, subapical margin strong and blunt, weakly produced laterally, ventral margin barely produced laterally with median tooth strong; antenna with 26 flagellomeres; occipital carina not reaching above half eye height; pronotum deeply canaliculate ventrally, dorsally punctate, medially largely smooth; mesopleuron shallowly and densely punctate with a large posterodorsal smooth area including speculum; epicnemial carina reaching mid-height of pronotum; metapleuron shallowly and densely punctate with some longitudinal rugosities medially; mesoscutum deeply and densely punctate; notauli deep, crenulate, joining posteriorly in a deeply rugulose depressed area; scuto-scutellar groove deeply crenulate; propodeum shallowly rugulose, mostly smooth centrally; carination weak: basal transverse carina complete, apical transverse carina of variable extent, when medially defined strongly incurved forward and then joining basal transverse carina; basal median area defined, transverse; forewing with bullae of 2m–cu fused to hardly separated, 2m–cu distinctly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a distinctly above middle; ventral swelling on sternite 1 weak; ovipositor very long. IC 0.4; NI 0.5; OT 2.0–2.2; B 11.1–11.3; A 7.1–7.4; F 9.5–9.6 (2 specimens).

Differential diagnosis

A bright yellow species with testaceous to black markings, characterized by the combination of the short occipital carina; the deeply crenulate scuto-scutellar groove; the frons strongly transversely striate above the toruli; the hind wing venation with vein Cu&cu-a intercepted far above the middle; the weak swelling on sternite 1; and the very long ovipositor.

Material examined

Holotype ♀: Elisabethville [Democratic Republic of Congo]: Lubumbashi, -XII.1925, Dr Van Saceghem (MRAC). Other material: Rhodesia [Zimbabwe], Chishawasha, xi.1979, A. Watsham (BMNH).

Distribution

Democratic Republic of Congo. New record: Zimbabwe.

Phorotrophus thouvenoti (Seyrig, 1932)

Fig. 27

Phaenolobus (*Phorotrophus*) *thouvenoti* Seyrig, 1932: 102.

Diagnosis

Head pale yellow, dorsally black; remainder of body orange to testaceous orange; flagellum strikingly bicoloured, basally black then yellow from flagellomere 15 on; wings hyaline, apically infuscate; frons quite smooth medially; face transversely rugulose punctate, carina indistinct below median bulge; clypeus shallowly punctate with some hardly distinct longitudinal rugosities, subapical margin of clypeus blunt and weakly produced laterally, ventral margin strongly produced laterally with median tooth moderate; antenna with 32 flagellomeres; occipital carina long and nearly complete, narrowly interrupted mid-dorsally; pronotum ventrally canaliculate, dorsally obliquely strigose, without smooth median area; mesopleuron moderately to densely punctate, dorsally largely smooth with oblique striations dorsally and ventrally to speculum; upper part of epicnemial carina faint, reaching mid-height of pronotum; metapleuron rugulose-punctate; mesoscutum densely punctate, punctation much sparser and shallower on lateral lobe; notauli strong and crenulate, joining posteriorly in a concave punctate area; scuto-scutellar groove distinctly crenulate; propodeum mostly transversely rugulose-punctate; carination strong, basal median area defined, quadrate; forewing with bullae of 2m–cu separated by about 2× their own length, 2m–cu nearly opposite rs–m; hind wing with Cu1 joining 1/Cu&cu–a above middle; ventral swelling of sternite 1 strong, pyramidal, with anterior edge nearly vertical; ovipositor long. IC 0; NI 0.7; OT 1.8; B 16.5; A 12.0; F 17.0 (lectotype female). Male unknown.

Differential diagnosis

Characterized like other *Phorotrophus* species from Madagascar by the combination of the long occipital carina and the crenulate scuto-scutellar groove, and otherwise by the bicoloured flagellum; the entirely strigose pronotum; the strong tooth-like swelling on sternite 1; and the long ovipositor.

Material examined

Lectotype ♀: Madagascar, Périnet, II.1931, A. Seyrig. (MNHN).



Fig. 26. *Phorotrophus stictor* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Distribution

Madagascar.

Phorotrophus tosquineti (Benoit, 1951)

Fig. 28

Hieroceryx tosquineti Benoit, 1951: 104.

Diagnosis

Mostly black, with head and prothorax yellowish orange; wings infuscate; frons medially smooth; face transversely rugulose-punctate, carina reaching middle of median bulge; clypeus somewhat longitudinally strigose, subapical ridge blunt and weakly produced laterally, ventral margin strongly produced laterally and with median tooth strong; antenna with 29–30 flagellomeres (Benoit 1951); occipital carina short, not reaching above mid-height of eye; pronotum ventrally canaliculate, dorsally punctate with a large smooth median area; mesopleuron densely to moderately punctate, speculum largely smooth; epicnemial carina strong, reaching mid-height of pronotum; metapleuron coarsely rugulose- punctate; mesoscutum moderately punctate, punctation distinctly sparse on lateral lobe and apex of median lobe; notauli deep, loosely crenulate, joining posteriorly into a straight mid-longitudinal furrow extending to scuto-scutellar groove; scuto-scutellar groove deeply crenulate; propodeum almost smooth with apical transverse

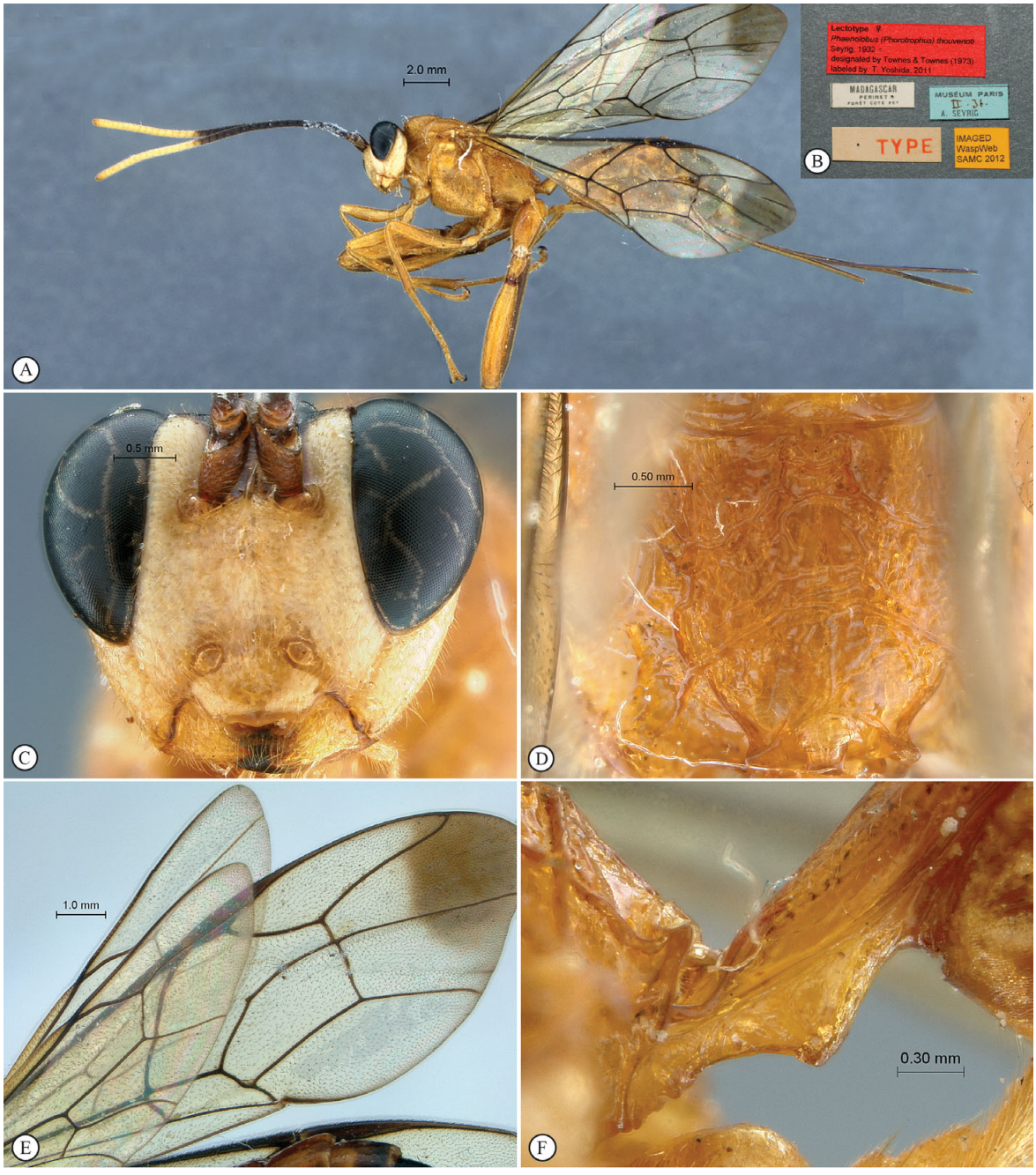


Fig. 27. *Phorotrophus thouvenoti* holotype female. **A**, Habitus lateral view; **B**, data labels; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, first metasomal segment lateral view, showing the strong and anteriorly abruptly decurved ventral swelling.

carina strong and complete and a faint curved carina in anterolateral corner; forewing with bullae on 2m–cu separated by 1–2× their own length, and 2m–cu subopposite rs–m; hind wing with 1/Cu&cu–a intercepted below middle; ventral swelling on sternite 1 moderate; ovipositor moderately long. IC < 0.1; NI 1.3; OT 1.6; B 17.1; A –; F 22.7 (holotype). Male unknown.

Differential diagnosis

A mostly black species, with the head lighter and the wings entirely infuscate. Otherwise characterized by the posterior fusion of the notauli into a single mid-longitudinal furrow; the nearly smooth propodeum with a strong apical transverse carina; and the presence of two remnants of curved carinae in the anterolateral corners of the propodeum.

Material examined

Holotype ♀: Uelé [Democratic Republic of Congo]: Bambesa, 20-x-1933, J. Leroy (MRAC).

Distribution

Democratic Republic of Congo.

Phorotrophus tricolor (Seyrig, 1934)

Fig. 29

Dischizella tricolor Seyrig, 1934: 75.

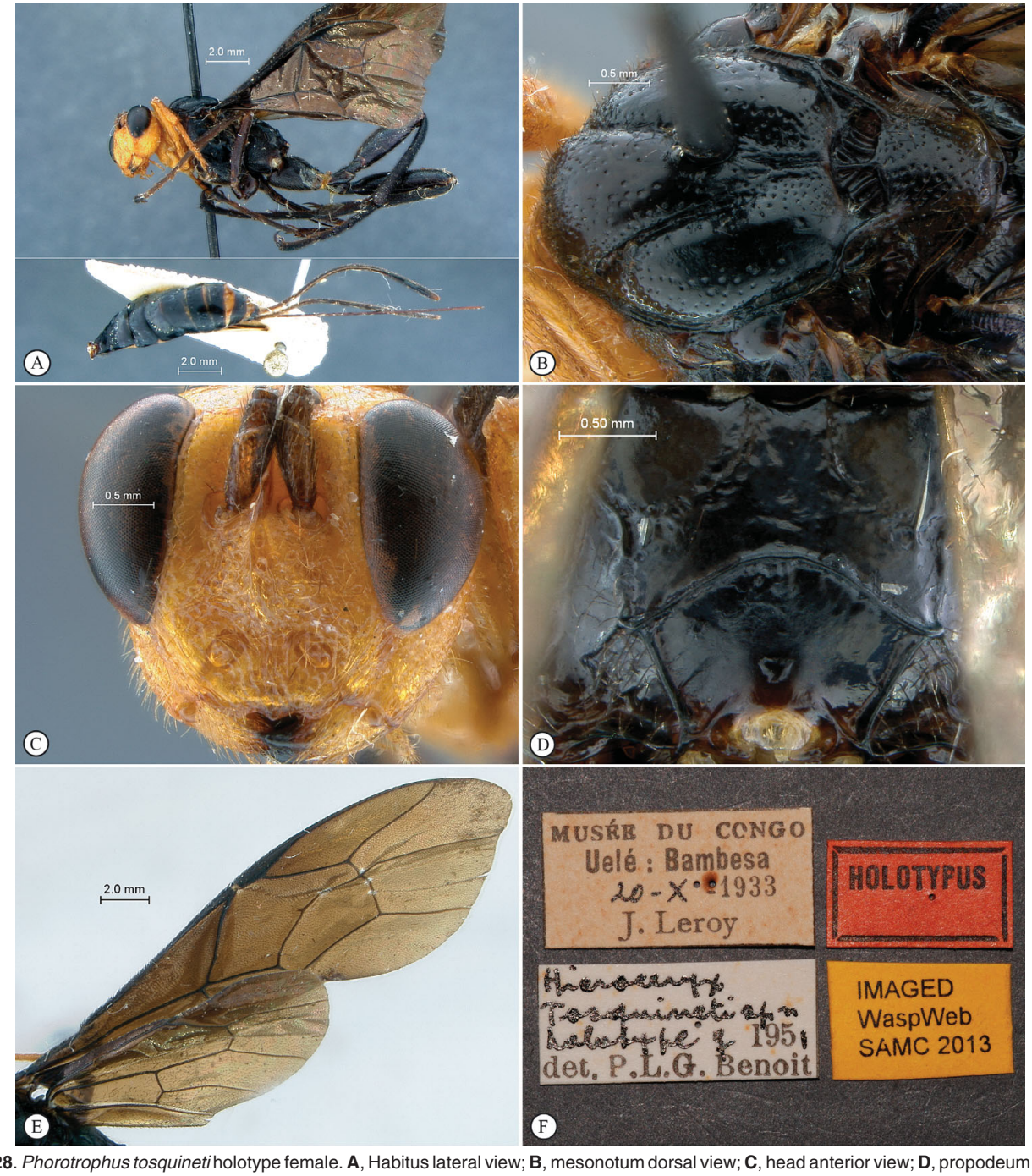


Fig. 28. *Phorotrophus tosquineti* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Diagnosis

Head and mesosoma pale yellow with black markings, metasoma mostly orange; wings hyaline, apically infuscate; frons medially smooth; face densely and deeply punctate laterally, somewhat rugulose-punctate medially, carina weak; clypeus densely punctate, laterally with oblique striations, subapical ridge sharp without distinct lateral protuberance, ventral margin strongly produced laterally and with median tooth strong; occipital carina long, shortly interrupted mid-dorsally; antenna with 24 flagellomeres; pronotum densely and deeply punctate, medially longitudinally rugulose; mesopleuron densely punctate with smooth area on speculum large; upper part of epicnemial carina faint, reaching subtegular ridge; metapleuron rugulose-punctate; mesoscutum densely, deeply and regularly punctate; notauli deep, crenulate, joining posteriorly into a rugulose area; scuto-scutellar groove crenulate; propodeum smoothly rugose, carination strong, defining three median areas, most basal area longitudinally subdivided; forewing with bullae on 2m–cu small and separated by 3–4× their own length, 2m–cu strongly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a far above middle; ventral swelling on sternite 1 weak; ovipositor long. IC 1.7; NI 0.4; OT 1.8; B 8.9; A 5.6; F 8.4 (holotype female). Male unknown.

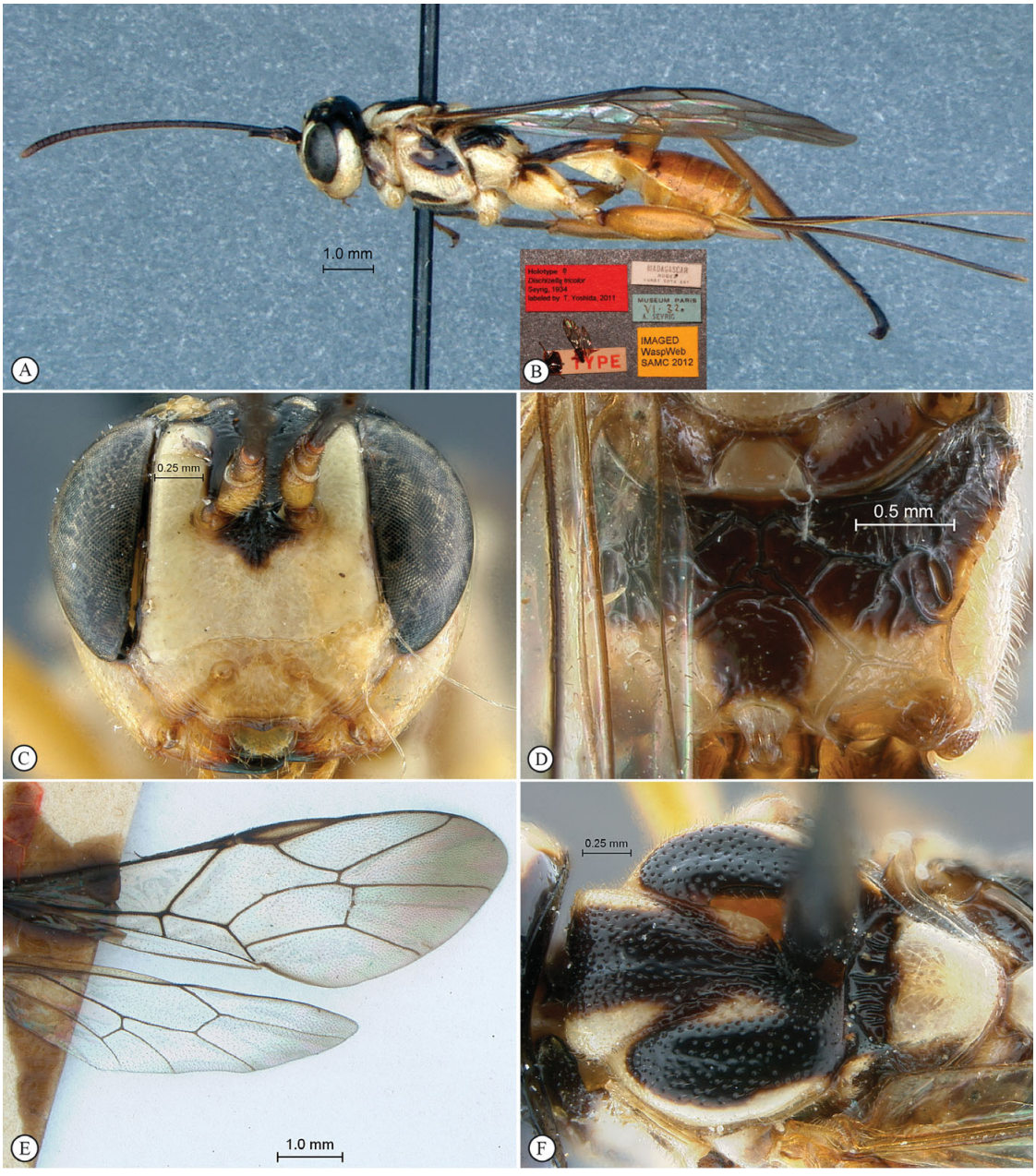


Fig. 29. *Phorotrophus tricolor* holotype female. **A**, Habitus lateral view; **B**, data labels; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, mesonotum dorsal view.

Differential diagnosis

A yellowish orange species characterized like other *Phorotrophus* species from Madagascar by the combination of the long occipital carina and the crenulate scuto-scutellar groove. Otherwise characterized by the interception of 1/Cu&cu–a far above middle and by the colour pattern with the metasoma obviously darker than the head and mesosoma.

Material examined

Holotype ♀: Madagascar, Rogez, Forêt côte est, VI.32, A. Seyrig (MNHN).

Distribution

Madagascar.

Phorotrophus trilobus Saussure, 1892

Fig. 30

Phaenolobus (*Phorotrophus*) *lunulatus* Seyrig, 1932: 100 (synonymy by Townes & Townes, 1973).

Diagnosis

Bright yellow overall with infuscate to black markings: inter-ocellar area, upper occiput, mesoscutal lobes and hind tarsus; flagellum black, basal flagellomeres somewhat lighter; frons medially smooth; face shallowly rugulose-punctate, carina indistinct below toruli; clypeus flat, hardly sculptured, subapical ridge blunt and subtruncate, simple, ventral margin strongly produced laterally with a strong median tooth; antenna with 26–27 flagellomeres; occipital carina long, narrowly interrupted mid-dorsally; pronotum



Fig. 30. *Phorotrophus trilobus* holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

entirely sculptured, mostly canaliculate and postero-dorsally punctate; mesopleuron moderately to densely punctate, smooth area on propodeum reduced; upper part of epicnemial carina faint, almost reaching subtegular ridge; metapleuron densely punctate with more or less deep longitudinal rugosities; mesoscutum densely punctate; notauli deep and crenulate, joining posteriorly in a depressed area; scuto-scutellar groove distinctly crenulate; propodeum smoothly sculptured; apical and basal transverse carinae present, basal median area defined and quadrate, central median area defined and transverse, posterior area subdivided by a mid-longitudinal carina; forewing with bullae on 2m–cu separated by 1–2× their own length, 2m–cu subopposite rs–m; hind wing with 1/Cu&cu–a intercepted slightly above to near middle; ventral swelling on sternite 1 weak; ovipositor very long. IC < 0.1; NI 0.7–1.0; OT 2.5–2.7; B 10.1–11.6; A 6.4; F 9.0–9.8 (2 specimens).

Differential diagnosis

A bright yellow species from Madagascar, characterized by the long occipital carina and the crenulate scuto-scutellar groove. It shares close similarities with *P. maculiceps* and *P. hastatus* (*cf.* comments) from which it may be differentiated by the combination of the very long ovipositor; the weak ventral swelling on sternite 1; the presence of a central area on the propodeum; and the wide separation of bullae on 2m-cu.



Fig. 31. *Phorotrophus vulcani* sp. nov. holotype male. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Material examined

Holotype ♀ of *P. trilobus*: Madagascar [date and locality not reported] (MNHN). Other material: 1♀ [holotype of *P. lunulatus*]: Madagascar, Tananarive, X.30, A. Seyrig. (MNHN).

Distribution

Madagascar.

Phorotrophus vulcani Maquart, Rousse & van Noort **sp. nov.**

Fig. 31

Diagnosis

Orange with black dorsal markings; wings infuscate; frons medially smooth; face rugulose-punctate, carina moderate, reaching clypeus margin; clypeus flat and shallowly punctate with weak striations dorsally, subapical ridge sharp and regularly convex, simple, ventral margin strongly produced laterally and with a strong median tooth; antenna with 24 flagellomeres; occipital carina short, not reaching above mid-height of eye; pronotum ventrally canaliculate, dorsally punctate and largely smooth medially; mesopleuron sparsely to moderately punctate, smooth area on speculum reduced; metapleuron moderately punctate with some longitudinal rugosities medially; mesoscutum smooth and shining with no distinct punctures; notauli deeply crenulate, joining posteriorly in a rugose area; scuto-scutellar groove distinctly crenulate; propodeum rugose-reticulate with carination variably distinct; forewing with bullae on 2m–cu

nearly confluent, 2m–cu subopposite rs–m; hind wing with Cu1 joining 1/Cu&cu near middle; ventral swelling on sternite 1 weak. IC < 0.1; NI 0.9; OT –. Female unknown.

Differential diagnosis

A mostly orange species, mainly characterized by the simple subapical ridge on the clypeus, the smooth sculpture of the mesoscutum, and the coarse sculpture of the propodeum.

Description

MALE. B 10.2–10.6; A 5.9–6.0; F 9.5–9.8 (2 specimens).

Colour. Head orange with variable black areas, sometimes very extensive, on face, frons, vertex, occiput and gena; mesosoma varying from orange with only a mid-longitudinal black line on mesoscutum to much more extensively black with lateral or central orange markings on mesoscutum, scutellum, propodeum and metapleuron; metasoma orange, tergites 1–3 sometimes medially black; legs orange, hind tibia and hind tarsus slightly infuscate; antenna basally black, sometimes somewhat lighter apically; wings infuscate.

Head. Temple and vertex very sparsely punctate, punctation denser on gena; malar space strigose, striations extending narrowly onto clypeus; frons medially smooth, sparsely punctate laterally, mid-longitudinal carina moderate; face laterally moderately punctate, medially rugulose-punctate, carina uneven, moderate, reaching dorsal margin of clypeus; clypeus shallowly sculptured, flat, mostly punctate with some striations dorsally and laterally, flat, subapical ridge sharp, simple and evenly convex, ventral margin strongly produced laterally and with a strong median tooth; mandible densely punctate, lower tooth slightly but distinctly longer and broader than upper tooth, occipital carina reaching half eye height; antenna with 23–24 flagellomeres.

Mesosoma. Pronotum ventrally canaliculate, dorsally densely punctate, medially largely smooth; mesopleuron moderately and regularly punctate but a small median smooth area on speculum; epicnemial carina reaching half height of pronotum; metapleuron with punctation denser and rougher, with some longitudinal rugosities medially; mesoscutum smooth and polished with a few punctures anteriorly; notaulus moderate, crenulate, joining in a mid-posterior longitudinally rugose depression; scuto-scutellar groove crenulate; scutellum sparsely punctate; propodeum rugose-reticulate, posteromedially smoother, carination hardly to partially distinct with apical transverse carina strong, posterior area longitudinally subdivided by a weak carina, and basal median area almost defined, quadrate. *Wings*. Forewing with bullae on 2m–cu fused, rs–m almost opposite to 2m-cu; hind wing with Cu1 joining 1/Cu&cu–a near middle.

Metasoma. Median swelling on sternite 1 moderate.

FEMALE. Unknown.

Type material

Holotype ♂: Constable, C.P. [South Africa], feb. 1959, SAM–HYM–P001681 (SAMC). Paratype ♂: S. Africa, Cape Province, Calvinia, 11–16.xi.1931, Mrs I. Ogilvie (BMNH).

Etymology

Refers to the colour pattern: dedicated to Vulcan, Roman God of forge and fire.

Distribution

South Africa.

Phorotrophus youpi Maquart, Rousse & van Noort **sp. nov.**

Fig. 32

Diagnosis

Orange overall with basal half of flagellum black; wings hyaline, somewhat infuscate apically; frons medially smooth; face rugulose-punctate; clypeus flat, shallowly and sparsely punctate, subapical ridge blunt and evenly concave without protuberance, ventral margin moderately produced laterally; antenna with 33 flagellomeres; occipital carina long, narrowly interrupted mid-dorsally; pronotum mostly striate, posterodorsally punctate; mesopleuron moderately to densely punctate with a large smooth dorsal area including speculum; metapleuron densely punctate with some longitudinal rugosities medially; mesoscutum densely punctate, punctation sparser on posterior half of lobes; notaulus moderate, smoothly crenulate; scuto-scutellar groove smoothly and weakly crenulate; propodeum rugulose with apical transverse carina strong, posterior area weakly longitudinally subdivided, and basal median area defined, elongate; fore wing with bullae on 2m–cu separated by 1–2× their own length, 2m–cu strongly apical to rs–m; hind wing with Cu1 joining 1/Cu&cu above middle; ventral swelling on sternite 1 weak; ovipositor very long. IC 0.9; NI 0.7; OT 2.5. Male unknown.

Differential diagnosis

Orange overall with flagellum bicoloured, characterized like other *Phorotrophus* species from Madagascar by the combination of the long occipital carina and the crenulate scuto-scutellar groove. Otherwise characterized by the concave subapical margin of the clypeus, without a distinct protuberance; the elongate basal median area on the propodeum; and the very long ovipositor.

Description

FEMALE. B 13.6; A 7.9; F 11.4 (holotype).

Colour. Orange overall with inter-ocellar area and scape dorsally black; flagellum black fading to orange from mid-length on; wings hyaline, weakly infuscate apically, venation dark brown.

Head. Vertex, temple and gena shallowly and very sparsely punctate; malar space densely punctate, subocular sulcus moderately deep; frons sparsely punctate laterally, medially quite smooth with weak transverse striations near ocellus, carina strong; face laterally moderately punctate, medially smoothly rugulose-punctate, carina indistinct below toruli; clypeus flat, sparsely and shallowly punctate, subapical ridge blunt and evenly concave without lateral protuberance, ventral margin moderately produced laterally and without median tooth; mandible sparsely punctate, lower tooth barely longer than upper tooth; antenna with 33 flagellomeres; occipital carina long, narrowly obsolescent mid-dorsally.

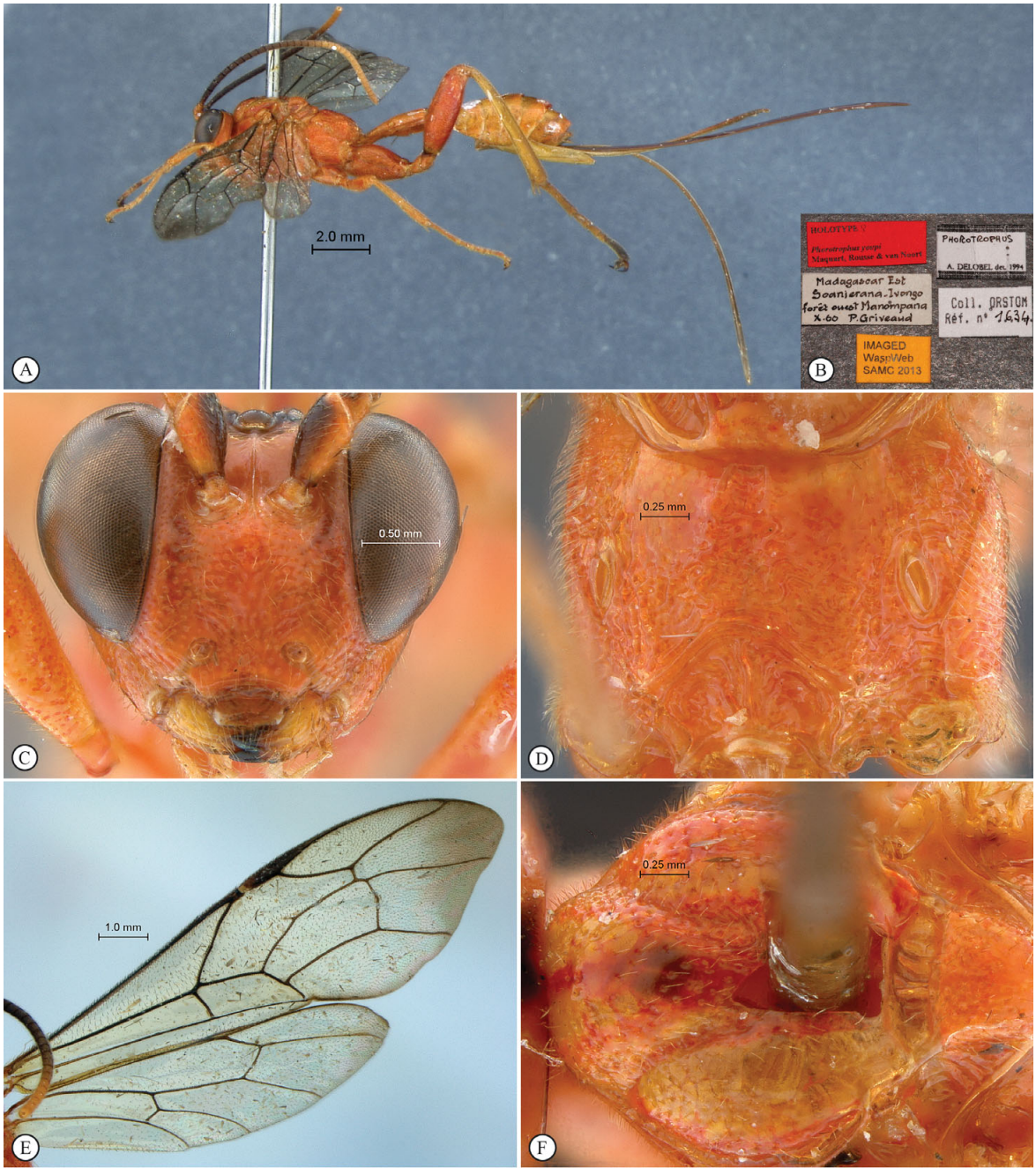


Fig. 32. *Phorotrophus youpi* sp. nov. holotype female. **A**, Habitus lateral view; **B**, data labels; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, mesonotum dorsal view.

Mesosoma. Pronotum entirely sculptured, mostly transversely striate with posterodorsal dense punctation; mesopleuron moderately to densely punctate with a large dorsal smooth area including speculum; epicnemial carina distinct to subtegular ridge; metapleuron densely punctate with some longitudinal rugosities medially; mesoscutum densely punctate, punctation sparser on posterior half of lobes; notaulus moderate, smoothly crenulate [junction area destroyed by pin in unique specimen]; scuto-scutellar groove weakly and smoothly crenulate; scutellum densely punctate; propodeum rugulose, anterolaterally smoother; apical transverse carina strong, posterior area longitudinally subdivided by a weak carina, basal median area defined but apically weak, elongate, slightly widening apically. *Wings*. Forewing with bullae on 2m–cu separated by 1–2× their own length, rs–m strongly apical to 2m-cu; hind wing with Cu1 joining 1/Cu&cu–a above middle.

Metasoma. Ventral swelling on sternite 1 weak; ovipositor very long.

MALE. Unknown.

Type material

Holotype ♀: Madagascar Est Soanierana-Ivongo forêt ouest Manaompana, x.60, P. Griveaud, coll. Orstom Ref. no. 1634 (MNHN).



Fig. 33. *Phorotrophus zoutpansbergensis* sp. nov. holotype female. **A**, Habitus lateral view; **B**, mesonotum dorsal view; **C**, head anterior view; **D**, propodeum dorsal view; **E**, wings; **F**, data labels.

Etymology

Euphonic cheerful exclamation. Noun in apposition.

Distribution

Madagascar.

Phorotrophus zoutpansbergensis Maquart, Rousse & van Noort **sp. nov.**

Fig. 33

Diagnosis

Head and mesosoma black, metasoma yellowish orange with dorsal black markings; wings yellowish; frons transversely striate; face coarsely punctate-reticulate; clypeus longitudinally striate, subapical ridge strong, sharply truncate, without protuberance, ventral margin moderately produced laterally with median tooth strong; antenna short with 21 flagellomeres; occipital carina not reaching above mid-height of eye; pronotum ventrally canaliculate, dorsally moderately punctate, and centrally smooth; mesopleuron deeply and densely punctate, speculum smooth; metapleuron medially longitudinally striate; mesoscutum deeply and densely punctate; scuto-scutellar groove moderately but distinctly crenulate; propodeum coarsely reticulate, apical transverse carina strong, other carinae hardly distinct among reticulations; forewing with bullae on 2m–cu fused, 2m–cu apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a far above middle; ventral swelling on sternite 1

weak; ovipositor very short. IC 0.3; NI 0.5; OT 0.8. Male unknown.

Differential diagnosis

A mostly black species from southern Africa, characterized by the sharp truncate subapical ridge on the clypeus. Otherwise characterized by the short antennae; the reticulate propodeum; the hind wing venation with 1/Cu&cu–a intercepted very high; and the short ovipositor.

Description

FEMALE (holotype). B 7.9; A 3.2; F: 7.3.

Colour. Head and mesosoma black; metasoma yellowish orange with tergite 1 basally and tergites 4–6 medially black, and hypopygium reddish testaceous; fore- and mid legs yellow with coxa and trochanters reddish testaceous, hind leg reddish testaceous with basal half of tibia yellow; wings weakly yellowish, apically infuscate, venation brown with pterostigma basally yellow.

Head. Temple moderately and finely punctate; punctation denser and rougher on gena; subocular sulcus moderate; vertex coarsely transversely striate; frons laterally punctate-reticulate, medially coarsely transversely striate, carina strong; face strongly bulging medially, coarsely and deeply punctate-reticulate, carina indistinct below toruli; clypeus flat, longitudinally strigose, subapical ridge strongly prominent, acute and sharply truncate, without lateral protuberance, ventral margin moderately produced laterally and with median tooth strong; mandible short and stout, teeth subequal; antenna short with 21 flagellomeres; occipital carina short, not reaching above mid-height of eye.

Mesosoma. Pronotum ventrally canaliculate, dorsally moderately punctate, and centrally smooth; mesopleuron densely and deeply punctate, speculum smooth with shallow dorsal striations; upper part of epicnemial carina faint, almost reaching subtegular ridge; metapleuron medially longitudinally striate, otherwise sparsely and shallowly punctate; mesoscutum deeply and densely punctate; notaulus deep, crenulate [posterior area of mesoscutum destroyed by pin in unique specimen]; scuto-scutellar groove moderately but distinctly crenulate; scutellum densely punctate; propodeum coarsely reticulate, apical transverse carina strong, other carinae hardly distinct among reticulations. *Wings*.Forewing with bullae on 2m–cu fused, 2m–cu apical to rs–m; hind wing with Cu1 joining 1/Cu&cu–a far above middle.

Metasoma. Ventral swelling on sternite 1 weak; ovipositor very short.

MALE. Unknown.

Type material

Holotype ♀: [South Africa] Zoutpansberg, Louis Trichardt [Makhado], Tvl., 4500 ft, R.F. Lawrence, Feb. 1928, SAM–HYM–P001679 (SAMC).

Etymology

Refers to the ancient name of the type locality.

Distribution

South Africa.

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