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Monograph

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A photographic catalog of Ceraphronoidea types at the Muséum national d'Histoire naturelle, Paris (MNHN), with comments on unpublished notes from Paul Dessart

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Abstract. The majority of Ceraphronoidea (Insecta: Hymenoptera) species were described in the late 1800s and early 1900s, with most of these early descriptions relying on text alone. Few type specimens have been illustrated and even fewer have been photographed, posing a challenge to taxonomists working on the group today. Here, we attempt to remove the barriers obstructing Ceraphronoidea research by creating a photographic catalog of the type specimens present at the Muséum national d'Histoire naturelle (MNHN) in Paris, France. We discuss the history of the ceraphronoid specimens present in the collection and provide comments on unpublished species notes from former Ceraphronoidea taxonomist Paul Dessart. We synonymize *Ceraphron myrmecophilus* Kieffer, 1913 syn. nov. with *Aphanogmus abdominalis* (Thomson, 1858) (Hymenoptera: Ceraphronidae) based on the male genitalia morphology, body shape and presence of foveae on the median length of the mesoscutellum. We also report the discovery of the missing male holotype of *Ceraphron testaceus* (Risbec, 1953) (Hymenoptera: Ceraphronidae) and several potential types of *Aphanogmus aphidi* (Risbec, 1955) (Hymenoptera: Ceraphronidae).

Keywords. Megaspilidae, morphology, systematics, taxonomy, parasitoid wasps.

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Introduction

Ceraphronoidea is a diverse superfamily of parasitoid wasps with over 600 described species (Johnson & Musetti 2004; Mikó & Deans 2009; Mikó *et al.* 2016; Trietsch *et al.* 2018). The superfamily is found worldwide; as a consequence, many of the type specimens are scattered across collections around the

world. One such repository of ceraphronoid types is the Muséum National d'Histoire Naturelle, Paris (MNHN). This collection contains type specimens from Jean-Jacques Kieffer, Paul Dessart and Jean Risbec, and serves as a valuable resource for those studying Ceraphronoidea taxonomy.

History of Ceraphronoidea specimens at the MNHN

Several MNHN specimens were studied by J.J. Kieffer, a naturalist and priest who taught in Bitche, France (Kelner-Pillault 1958; Notton 2004). The majority of these specimens were described in Kieffer (1913b), which deals with material collected by Ch. Alluaud and R. Jeannel on an African expedition from 1911–1912. Kieffer discussed other specimens present at the MNHN in other publications (Kieffer 1904, 1907a, 1907b, 1913a).

Most of the material Kieffer studied was sent to him by others (Kieffer 1904, 1907a, 1907b, 1913a, 1913b). Kieffer was known to identify the material, describe species and then mail the specimens back to their original collectors (Notton 2004). As a result, many of the specimens Kieffer described species from are missing, and could be present but unmarked in public or private collections. Kieffer did not designate types and often did not indicate how many specimens he included in his type series. In several cases, Kieffer was also quite vague with the collection information he provided (Notton 2004). As a result, it takes a great deal of time and detective work to determine which specimens he observed and whether they have type status.

Though it is believed that Kieffer did not have a personal collection (Masner 1965), insect specimens were found at the university in Bitche where he used to teach, and subsequently donated to the MNHN (Kelner-Pillault 1958). This collection included four type specimens: *Aphanogmus fasciipennis* Thomson, 1858 var. *radialis* Kieffer, 1907 (now *Aphanogmus radialis* Kieffer, 1907), *Ceraphron myrmecophilus* Kieffer, 1913, *Ceraphron nigrelliceps* Kieffer, 1907 and *Megaspilus wasmanni* Kieffer, 1904 (now a junior synonym of *Conostigmus formiceti* (Erichson, 1884)). The single holotype specimen of *Aphanogmus radialis* was collected by Kieffer himself in Bitche, whereas the type specimens of *Ceraphron nigrelliceps*, *Ceraphron myrmecophilus* and *Megaspilus wasmanni* were sent to him by P. Cameron, H. Donisthorpe and R.P. Wasmann, respectively (Kieffer 1904, 1907b, 1913a). It appears that in cases where Kieffer was sent more than one specimen to identify, he sometimes retained a specimen for his own personal uses.

All of the Kieffer specimens deposited at the MNHN were later examined by Ceraphronoidea expert Paul Dessart, who did most of the taxonomic work on the superfamily from 1962 until his death in 2001 (Pauly 2001; Mikó *et al.* 2013). Dessart studied specimens from the collection in the 1960s and published his findings (Dessart 1966a), synonymizing several of Kieffer's species and providing re-descriptions and illustrations of some of the specimens. Dessart also deposited type specimens of his own species at the MNHN (Dessart & Masner 1965; Dessart 1975, 1979b). Dessart recognized the importance of using male genitalia to distinguish between species; as a result, much of the material he observed at the MNHN is dissected, and parts of specimens are scattered across point mounts, slides and ethanol vials.

The last taxonomist who deposited type specimens at the MNHN was Jean Risbec, a French zoologist. Though Dessart (1989) viewed the male holotype of *Ceraphron cavifrons* Risbec, 1950, it appears that he did not observe other Risbec specimens present in the collection. The MNHN holds a large collection of slides from Risbec, among which CT found a missing type specimen of *Ceraphron testaceus* (Risbec, 1953) and potential type specimens of *Aphanogmus aphidi* (Risbec, 1955).

In the current publication, we aim to support future ceraphronoid taxonomists by creating a photographic catalog of the type specimens at the MNHN and discussing their history and physical condition. Several specimens had labels containing unpublished notes from Dessart, which we provide here for the first time.

We also synonymize *Ceraphron myrmecophilus* Kieffer, 1913 syn. nov. with *Aphanogmus abdominalis* (Thomson, 1858) (Hymenoptera: Ceraphronidae) and report the discovery the missing type of *Ceraphron testaceus* (Risbec, 1953), as well as potential type specimens of *Aphanogmus aphidi* (Risbec, 1955).

Material and methods

Specimens were examined and imaged by CT during a three-day visit to the MNHN from 24 to 26 July 2017, except for two slide preparations for *Conostigmus formiceti* (Erichson, 1844) (MNHN EY25344), which were imaged by Agnièle Touret-Alby (Agnièle Touret-Alby © MNHN). Specimens were imaged with a Canon EOS 70D digital SLR camera mounted on an Olympus CX41 microscope, with an Olympus UPlanFLN 4× UIS2 objective and Olympus LMPlanFLN (10×/0.25; 20×/0.40 and 50×/0.50) UIS2 objectives. This is a portable and relatively inexpensive system that works well for imaging microhymenoptera (Trietsch & Mikó 2018; Trietsch *et al.* 2018) (standard operating procedure available on figshare at <https://doi.org/10.6084/m9.figshare.6826148.v1>).

For pinned and point-mounted specimens, labels were removed from the pin and imaged with a cellphone camera for transcription at a later date. Specimens were positioned and stabilized for imaging by using molding clay (Sculpey, Polyform Products Company, Elk Grove Village, Illinois, USA). For each specimen, series of images were taken manually and then aligned and stacked by using Zerene stacker 1.04 Build T201706041920. Adobe Photoshop Elements Version 3.1 was used to create figure plates. Specimens were databased and original images of specimens and labels were uploaded to the online content management system, MX (<http://purl.oclc.org/NET/mx-database>). All figures and tables are available on figshare (https://figshare.com/projects/A_Photographic_Catalog_of_Ceraphronoidea_Types_at_the_Museum_National_d'Histoire_Naturelle_Paris_MNHN_with_comments_on_unpublished_notes_from_Paul_Dessart/36449) and on ScholarSphere (<https://doi.org/10.18113/SIJD10>).

Unique identifiers from the MNHN (MNHN EY#####) were assigned to each specimen. Identifiers were placed on the pins of dried specimens and added to the vial for specimens in ethanol. For slides, identifiers were glued either to the label or to the glass slide with Scotch gel universal (3M Company, Maplewood, MN, USA). Identifiers were placed on the front of the slide if there was space; otherwise, they were glued to the back of the slide.

In cases where specimens were dissected and had separate pieces that were slide mounted, pointed or stored in ethanol, a separate identifier was assigned to each portion of the specimen. Thus, some specimens will have more than one identifier associated with them. Specimens that were dissected by Paul Dessart also bear his unique identification numbers (Dessart prép. no. #####/####) matching the specimen to the slides, and these have been indicated for each species below.

All specimen label data is present on MX and in [Supplementary File 1](#). The specimen data in [Supplementary File 1](#) was also used to produce a Darwin Core file ([Supplementary File 2](#)) following the template given by the Integrated Publishing Toolkit (<https://www.gbif.org/news/82852/new-darwin-core-spreadsheet-templates-simplify-data-preparation-and-publishing>) and will be made available on GBIF. For label information given in [Supplementary File 2](#), separate lines are delimited by “||” and separate labels are delimited by “++”. For specimens that did not have locality information given on labels, the locality information is reproduced from the original sources under ‘Material examined’ Section.

All systematic literature lists, distributions and locations of type specimens (see Table 1) are modified from Johnson & Musetti (2004). Updates are shown in bold font. Four-letter museum collection codens are updated from Johnson & Musetti (2004) and Arnett *et al.* (1993) using Evenhuis (2018), and are provided in Table 1. Following Johnson & Musetti (2004), the Neotropical realm is considered to

Table 1. A list of all museum repositories and their corresponding collection codens, updated from Johnson & Musetti (2004) and Arnett *et al.* (1993).

Collection coden	Museum name and location
HNHM	Hungarian Natural History Museum, Budapest, Hungary
IPCP	Institut Pasteur Collection, Paris, France
ISNB	Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium
LACM	Los Angeles County Museum, Los Angeles, California, USA
MCSN	Museu Civico di Storia Naturale "Giacomo Doria", Genoa, Italy
MHNG	Muséum d'Histoire Naturelle, Geneva, Switzerland
MNHN	Muséum national d'Histoire naturelle, Paris, France
MRAC	Musée Royal de l'Afrique Centrale, Tervuren, Belgium
MZLU	Museum of Zoology, Lund University, Lund, Sweden
NHME	Natural History Museum, Maastricht, The Netherlands
NHMUK	The Natural History Museum, London, UK (formerly BMNH)
NHMW	Naturhistorisches Museum, Vienna, Austria
NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden
PBZT	Parc Botanique et Zoologique de Tsimbazaza, Antananarivo, Madagascar
USNM	Smithsonian Institution, Washington, DC
ZMHB	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany
ZMUC	Zoological Museum, University of Copenhagen, Denmark (presently NHMD)

include Mexico and the Caribbean, the Oriental realm is considered to include China and India, and the Australian realm is considered to include New Guinea and all islands east of it.

A note on specimens in ethanol

Several Kieffer type specimens are stored in ethanol, in separate glass vials stored together in a glass bail-lid jar (Fig. 1). These specimens were collected by entomologists Ch. Alluaud and R. Jeannel during an expedition to Africa from 1911 to 1912, then sent to Kieffer for identification and description (Kieffer 1913b). After reviewing the literature (specifically: Kieffer 1913b; Risbec 1950; Dessart 1966a), there are no indications that these specimens were ever mounted. It is likely that the specimens were collected in ethanol, and that Kieffer described species from wet or temporarily dried specimens, as was probably the case with Diapriinae wasps collected during the same expedition (Notton 2014). A list of these specimens is provided in Table 2.

None of the specimens stored in ethanol bear labels with collection information. It appears that locality labels were never made for Diapriinae specimens collected during the 1911–1912 African expedition (David G. Notton, pers. comm.); the same appears to be true for the ceraphronoid specimens.

Some specimens in ethanol have numbered determination labels from Kieffer (i.e., “Type 12”; see Fig. 1B). A complete list of these specimens is provided in Table 3. Kieffer was known to number specimens and write notes correlating to these numbers: for example, he numbered specimens sent to

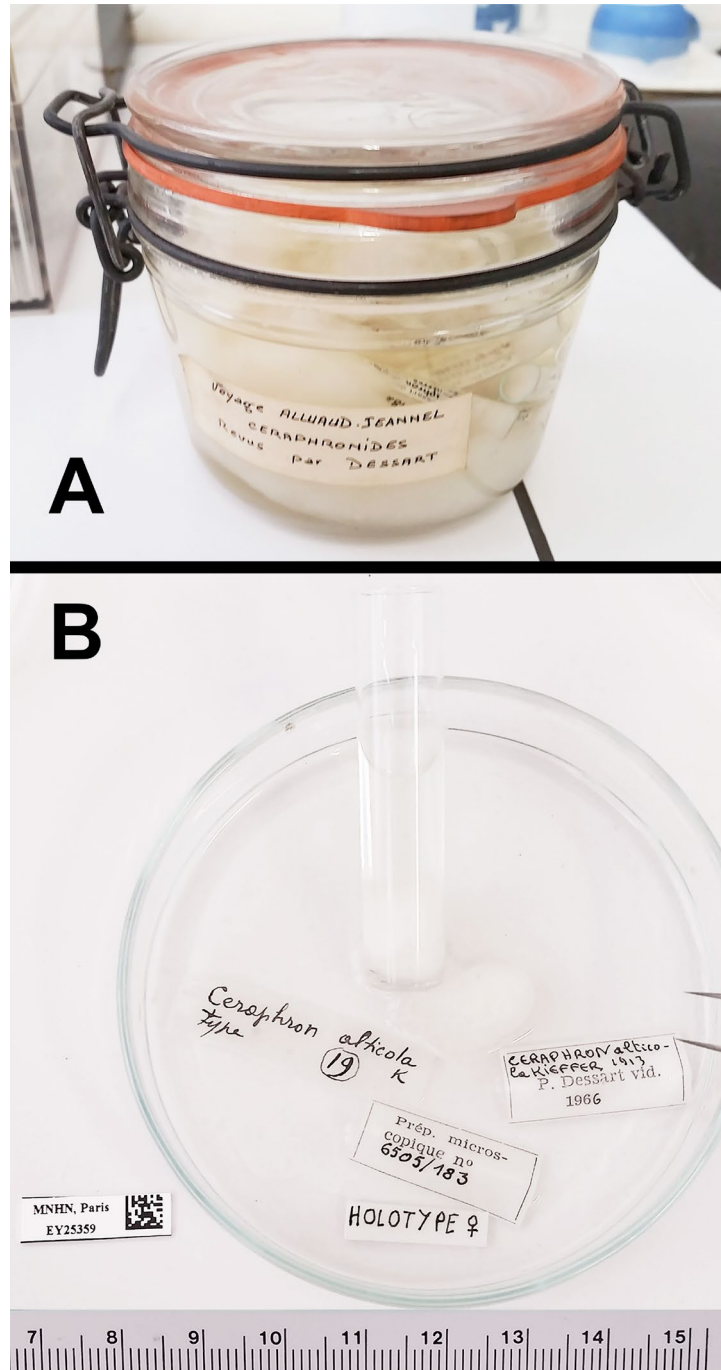


Fig. 1. A. An image of the glass bail-lid jar containing several Kieffer type specimens collected by Ch. Alluaud and R. Jeannel during an expedition to Africa from 1911 to 1912. The specimens are stored in ethanol, in separate glass vials inside the jar. B. An image of the ethanol vial and labels for *Ceraphron alticola* Kieffer, 1913 (MNHN EY25359).

Table 2. A list of all Ceraphronoidea type specimens stored in ethanol at the Muséum national d’Histoire naturelle, Paris (MNHN) and their associated identifiers.

Species	Identifier of ethanol vial
<i>Aphanogmus fumipennis</i>	MNHN EY25361
<i>Aphanogmus origenus</i>	MNHN EY25350
<i>Aphanogmus origenus</i>	MNHN EY25352
<i>Aphanogmus origenus</i>	MNHN EY25357
<i>Aphanogmus origenus</i>	MNHN EY25358
<i>Ceraphron alticola</i>	MNHN EY25359
<i>Ceraphron crenulatus</i>	MNHN EY25351
<i>Ceraphron naivashae</i>	MNHN EY25360
<i>Ceraphron nigrelliceus</i>	MNHN EY22476
<i>Ceraphron parvalatus</i>	MNHN EY25363
<i>Ceraphron parvalatus</i>	MNHN EY25362
<i>Conostigmus pedester</i>	MNHN EY25353
<i>Conostigmus pedester</i>	MNHN EY25354
<i>Conostigmus pedester</i>	MNHN EY25355
<i>Conostigmus pedester</i>	MNHN EY25356

him by collector Peter Cameron and wrote specimen notes and identifications on postcards, which he then mailed back to Cameron separately of the specimens (Notton 2014).

The type numbers on the MNHN specimens do not appear to correlate with the species identification. For example, Kieffer’s specimens of *Ceraphron oriphilus* (MNHN EY25361; junior synonym of *Aphanogmus fumipennis* (Thomson, 1858)) and *Ceraphron alticola* (MNHN EY25359) are both labeled “Type 19”. However, both specimens were collected at the same location on the same date (more collection details are provided for *Ceraphron oriphilus* in Kieffer 1913b), so these numbers may relate to the collection event. Kieffer may have written a numbered list for the Alluaud and Jeannel specimens, but there is no such written material present in the MNHN libraries or known from other sources.

Dessart (1966a) discussed all specimens stored in ethanol at the MNHN. He made observations on temporarily dried material, as well as performing dissections and making gelatin glycerine slide preparations. All specimens in ethanol bear labels from Dessart with species determinations, microscope preparations, type status and specimen notes. For *Aphanogmus origenus* (Kieffer, 1913) (MNHN EY25358 and MNHN EY25350), it appears that Dessart rewrote one of Kieffer’s labels, providing Kieffer’s determination and type number on his own label in quotation marks; it is unknown what happened to the original determination label in this case. Dessart (1966a) also provides the locality information for all of the specimens, presumably from the original publications.

Table 3. A list of all Kieffer specimens stored in ethanol at the Muséum national d'Histoire naturelle, Paris (MNHN) and their associated type numbers assigned by Kieffer.

Species	Author and year	Kieffer's original determination	Kieffer's type number	Identifier (ethanol vial)
<i>Aphanogmus fumipennis</i>	Thomson, 1858	<i>Ceraphron oriphilus</i>	19	MNHN EY25361
<i>Aphanogmus origenus</i>	Kieffer, 1913a	<i>Ceraphron origenus</i>	71	MNHN EY25350
<i>Aphanogmus origenus</i>	Kieffer, 1913a	<i>Ceraphron origenus</i>	71	MNHN EY25358
<i>Ceraphron alticola</i>	Kieffer, 1913a	<i>Ceraphron alticola</i>	19	MNHN EY25359
<i>Ceraphron crenulatus</i>	Kieffer, 1913a	<i>Ceraphron crenulatus</i>	39	MNHN EY25351
<i>Ceraphron naivashae</i>	Kieffer, 1913a	<i>Ceraphron naivashae</i>	14	MNHN EY25360
<i>Ceraphron parvalatus</i>	Kieffer, 1913a	<i>Ceraphron apterus</i>	40	MNHN EY25363
<i>Ceraphron parvalatus</i>	Kieffer, 1913a	<i>Ceraphron apterus</i>	70	MNHN EY25362
<i>Conostigmus pedester</i>	Kieffer, 1913a	<i>Conostigmus pedester</i>	44	MNHN EY25356
<i>Conostigmus pedester</i>	Kieffer, 1913a	<i>Conostigmus pedester</i>	43	MNHN EY25355

Due to the poor condition and fragmented state of the specimens, as well as limited time during the 3-day visit to the museum, all specimens stored in ethanol were kept in their original vials. For future researchers working on the collection, we recommend moving these specimens from ethanol into glycerin and storing them in glass capsules or genitalia vials (such as the #1133M glass genitalia vials from Bioquip Products, Inc., Rancho Dominguez, CA USA).

Results

Class Hexapoda Blainville, 1816
 Order Hymenoptera Linnaeus, 1758
 Suborder Apocrita Latreille, 1810
 Superfamily Ceraphronoidea Haliday, 1833
 Family Ceraphronidae Haliday, 1833
 Genus *Aphanogmus* Thomson, 1858

Aphanogmus abdominalis (Thomson, 1858)

Figs 2–4

Calliceras abdominalis Thomson, 1858: 303, ♂, ♀. MZLU.

Ceraphron pallidiventris Ashmead, 1893: 124, 126, ♀. Keyed. Type missing (Masner & Muesebeck 1968). Synonymized by Dessart (1996).

Ceraphron Cameroni Kieffer, 1907b: 230, ♀. BMNH. Synonymized by Dessart (1996).

Ceraphron Microneurus Kieffer, 1907b: 238, ♂. MCSN. Synonymized by Dessart (1965). Preoccupied by *Aphanogmus Microneurus* Kieffer (1907b).

Ceraphron myrmecophilus **Kieffer, 1913b: 197, ♂. NHMUK, MNHN. Keyed.**

Calliceras clavata violae Novitzky, 1954: 54, ♂, ♀. NHMW. Synonymized by Dessart (1996).

Ceraphron abdominalis – Marshall 1873: 2. Generic transfer. — Kieffer 1907b: 230, 240. Description. — Petersen 1956: 117. Variation, type information. — Dessart 1972c: 35. Discussion of Zangheri (1969).

Ceraphron pallidiventris – Brues 1906: 146. Keyed; 1916: 560. Description, keyed. — Masner & Muesebeck 1968: 107. Type information. — Dessart 1996: 286. Junior synonym of *Aphanogmus abdominalis* (Thomson, 1858).

Calliceras myrmecophila – **Kieffer 1914b: 77, 100. Generic transfer, description, keyed.**

Calliceras abdominalis – Kieffer 1914c: 76, 77. Keyed. — Széleányi 1939: 87. Description.

Calliceras abdominalis abdominalis – Kieffer 1914c: 95. Description.

Calliceras cameroni – Kieffer 1914c: 76, 95. Generic transfer, description, keyed.

Calliceras microneura – Kieffer 1914c: 77, 98. Generic transfer, description, keyed.

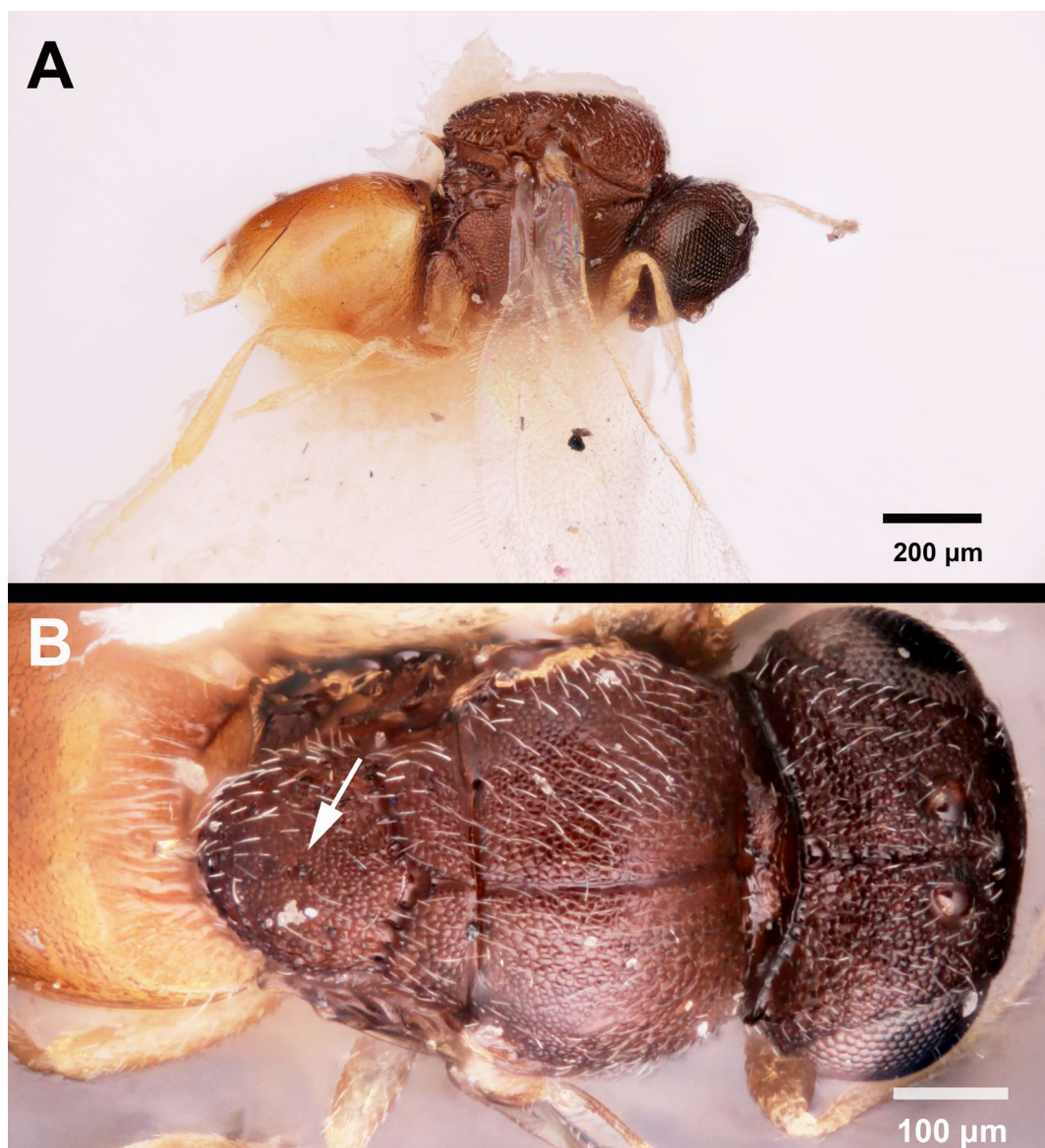


Fig. 2. *Ceraphron mymecophilus* Kieffer, 1913, synonymized with *Aphanogmus abdominalis* (Thomson, 1858). Syntype, ♂ (MNHN EY22475). **A.** Lateral view. **B.** Dorsal view, with arrow pointing to the fovea on the mesoscutellum characteristic of *Aphanogmus abdominalis* (Thomson, 1858).

Calliceras pallidiventris – Kieffer 1914c: 79, 110. Generic transfer, description, keyed.

Ceraphron myrmecophilus – **Kelner-Pillault 1958: 149. Type information.** — **Masner 1965: 12. Type information.**

Aphanogmus abdominalis – Dessart 1964: 121. Generic transfer, description, lectotype designation; 1965: 170. Description. — Hellén 1966: 30, 32. Description, keyed. — Alekseev & Kozlov in Alekseev 1978: 682. Description.

Ceraphron microneurus – Dessart 1965: 170, 171. Junior synonym of *Aphanogmus abdominalis* (Thomson, 1858).

Ceraphron cameroni – Masner 1965: 11. Type information. — Dessart 1996: 286. Junior synonym of *Aphanogmus abdominalis* (Thomson, 1858).

Calliceras clavata violae – Dessart 1996: 287. Junior synonym of *Aphanogmus abdominalis* (Thomson, 1858).

Material examined

Syntype

UNITED KINGDOM • ♂; “Moeurs et patrie. Angleterre: Londres, myrmecophile (H. Donisthorpe)” (Kieffer 1913a: 197); MNHN EY22475, EY22463 to EY22465.



Fig. 3. *Ceraphron myrmecophilus* Kieffer, 1913, synonymized with *Aphanogmus abdominalis* (Thomson, 1858). Syntype, ♂. **A.** Frontal view (MNHN EY22475). **B.** Right antenna (MNHN EY22465).

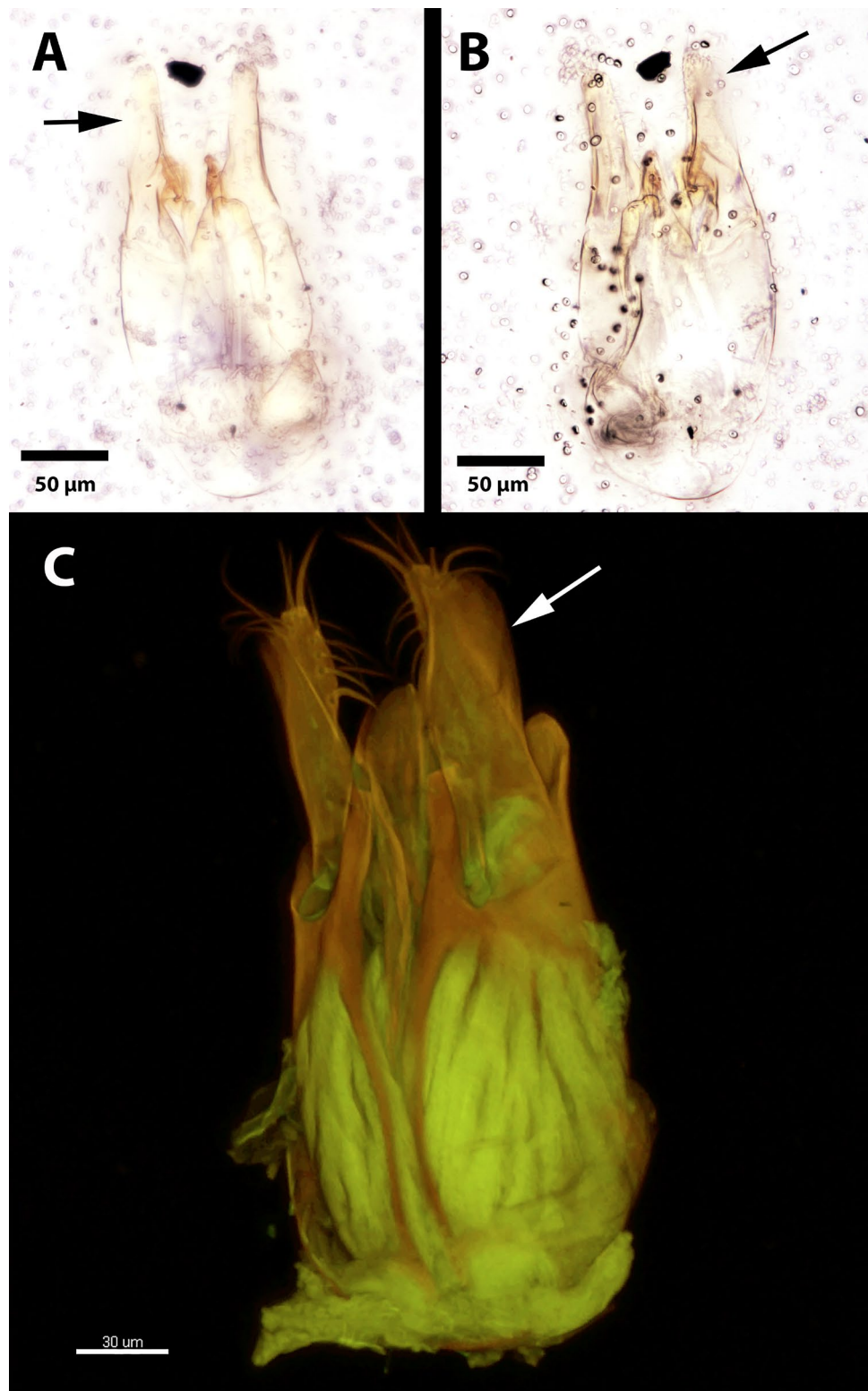


Fig. 4. *Ceraphron mymecophilus* Kieffer, 1913, synonymized with *Aphanogmus abdominalis* (Thomson, 1858). **A–B.** Syntype, ♂ (MNHN EY22464). Genitalia. **A.** Dorsal view. **B.** Ventral view. **C.** CLSM image showing the male genitalia of a different specimen (PSUCIM_3120), ventral view. Volume rendered media file available at <https://doi.org/10.6084/m9.figshare.100875.v2>. Arrows point to the cuticular fold on the ventral edge of the harpe that is characteristic of *Aphanogmus abdominalis* (Thomson, 1858).

Distribution

Nearctic and palearctic.

Comments

CT found one male specimen marked as the holotype of *Ceraphron myrmecophilus* Kieffer, 1913 in the MNHN collections. However, there is also a male specimen marked as the holotype of this species at the NHMUK (NHMUK010812101), as well as an additional female specimen (NHMUK010812106) marked as an allotype. Concerning the female specimen, Kieffer only described the male of the species (1913a) and an allotype has never been published. Though it is not a part of Kieffer's syntype series, it is worth noting that the female was captured by the same collector in the same month and year as the two males, and mounted in the same way.

Both the male NHMUK and MNHN specimens were originally card-mounted (Dessart removed the MNHN specimen from its mount when he dissected it), with collection information written on the front or back of the card mounts. Both specimens were collected at Nethy Bridge from *Formica rufa* Linnaeus, 1761. Based on the similar handwriting and mountings, it appears that both specimens were collected by H. Donisthorpe, though only the NHMUK specimen bears a label with Donisthorpe's name. The MNHN specimen was collected on "14.vi.12", whereas the NHMUK specimen was collected on "12.VI.12" (the female specimen was captured on "23.VI.12").

The original locality information given in Kieffer (1913a) (written in French) is "Angleterre: Londres, myrmecophile (H. Donisthorpe)", which does not match either male specimen. However, Kieffer (1914c) (written in German) re-describes the species and gives the locality information as "Mit Formica rufa L., im Juni. England (Nethy Bridge)". Kieffer has been known to make mistakes in correctly reporting specimen localities, especially when the handwriting of the collector was poor (see Notton 2014). It appears that Kieffer made a mistake in his 1913a publication, which he corrected in his 1914c paper (although Nethy Bridge is actually located in Scotland, not England).

Dessart dissected the card-mounted specimen at the MNHN (MNHN EY22475) and made three slide preparations (prép. no. 6605-181) of an anterior and posterior wing (MNHN EY22463), the male genitalia and metasoma (MNHN EY22464), and the right antenna and the left mid- and hind legs (MNHN EY22465). Although Dessart examined the specimens at both the MNHN and the NHMUK, it does not appear that he ever declared a lectotype or published anything on this species (Johnson & Musetti 2004). However, Dessart did leave a label on the female at the NHMUK which reads "Not allotype since only ♂ described... but ♂ and ♀ = APH. crassiceps (K)".

At this time, we consider the two male specimens at the NHMUK and the MNHN as syntypes, not holotypes. However, we synonymize *Ceraphron myrmecophilus* Kieffer, 1913 syn. nov. with *Aphanogmus abdominalis* (Thomson, 1858) based on the male genitalia morphology, body shape and especially the presence of foveae on the median length of the mesoscutellum (Mikó 2012a, 2012b; Mikó *et al.* 2013). It is possible that this species may also be synonymous with *Aphanogmus crassiceps* Kieffer, 1907, as Dessart believed, but we leave this to future researchers to investigate.

Aphanogmus fumipennis Thomson, 1858

Fig. 5

Aphanogmus fumipennis Thomson, 1858: 305, ♂, ♀. NHRS.

Aphanogmus hyalinipennis Thomson, 1858: 305, ♀. NHRS. Synonymized by Dessart (1963a).

Aphanogmus laevis Förster, 1861: 40, ♀. Synonymized by Szelényi (1940).

Aphanogmus grenadensis Ashmead, 1896: 789, ♀. NHMUK. Keyed. Synonymized by Dessart (1975).

Aphanogmus formicarius Kieffer, 1905: 6, ♀. NHME. Synonymized by Dessart (1975).

Aphanogmus Clavatus Kieffer, 1907b: 204, ♀. Type not found in MCSN (Dessart 1975). Synonymized by Dessart (1975).

Ceraphron Armatus Kieffer, 1907b: 215, ♀. NHMUK. Preoccupied by *Ceraphron armatus* Say, 1836. Synonymized by Dessart (1975).

Ceraphron Formicarum Kieffer, 1907b: 231, ♀. NHMUK. Synonymized by Dessart (1975).

Ceraphron Frenalis Kieffer, 1907b: 226, ♀. MCSN. Synonymized by Szelényi, in Russo (1938).

Ceraphron oriphilus Kieffer, 1913b: 10, 12, ♀. MNHN. Keyed. Synonymized by Dessart (1966a).

Ceraphron fuliginosi Box, 1921: 15. NHMUK. Synonymized by Dessart (1975).

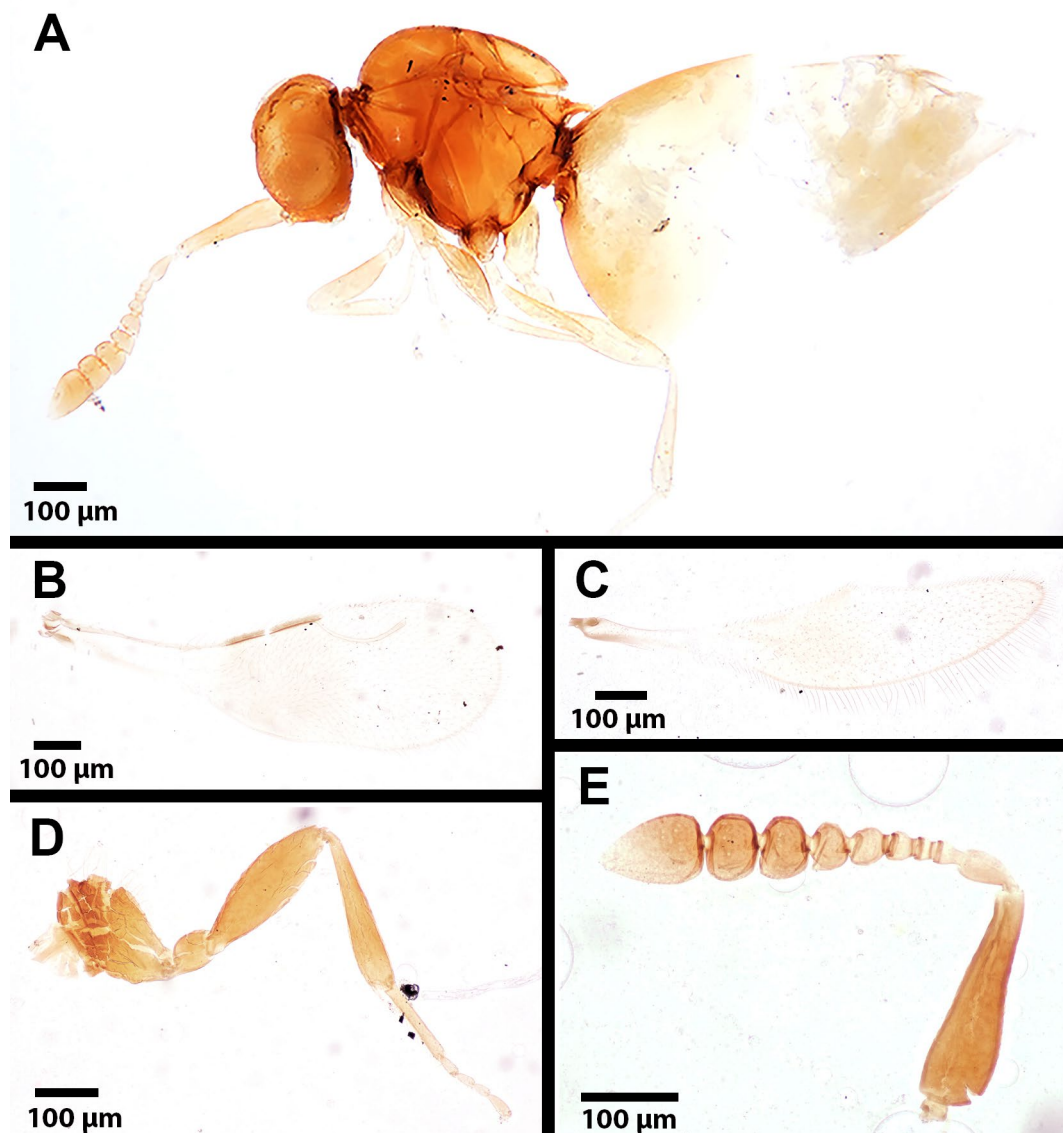


Fig. 5. *Aphanogmus fumipennis* Thomson, 1858, originally the female type of *Ceraphron oriphilus* Kieffer, 1913, synonymized by Dessart (1966a). **A.** Lateral habitus of the specimen in ethanol (vial MNHN EY25361). **B.** Fore wing (slide MNHN EY22433) **C.** Hind wing (slide MNHN EY22433). **D.** Left posterior leg (slide MNHN EY22432) **E.** Antenna (slide MNHN EY22434).

- Calliceras fasciata* Fouts, 1924: 162, ♀. LACM. Preoccupied by *Ceraphron fasciatus* Meunier, 1917. Synonymized by Dessart (1981b).
- Calliceras boreale* Whittaker, 1930: 71, ♀. NHMUK. Synonymized by Dessart (1975).
- Allomicrops bemisiae* Ghesquière, 1935: 59, ♀. MRAC. Synonymized by Dessart (1963b).
- Ceraphron roberti* Dessart, 1979a: 239. Replacement name for *Calliceras fasciata* Fouts, 1924.
- Ceraphron hyalinipennis* – Marshall 1873: 3. Generic transfer.
- Aphanogmus laevis* – Dalla Torre 1885: 75. Reprint of Förster (1861). — Kieffer 1914c: 116, 120. Description, keyed. — Szelényi 1940: 126. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.
- Aphanogmus levis* – Dalla Torre 1898: 523. Emendation. — Kieffer 1907b: 205. Description.
- Ceraphron fumipennis* – Dalla Torre 1898: 525. Generic transfer.
- Aphanogmus Hyalinipennis* – Kieffer 1907b: 203. Description.
- Aphanogmus Fumipennis* – Kieffer 1907b: 203, 204. Description.
- Aphanogmus Formicarius* – Kieffer 1907b: 204. Description.
- Aphanogmus formicarius* – Kieffer 1914c: 116, 120. Description, keyed. — Kieffer 1914c: 115, 117. Generic transfer, description, keyed. — Szelényi 1940: 125. Keyed. — Dessart 1975: 24, 25, 26. Type information, junior synonym of *Aphanogmus fumipennis* Thomson, 1858.
- Aphanogmus fumipennis* – Kieffer 1914c: 116, 121. Description, keyed. — Russo 1938: 362. Description. — Szelényi 1940: 126. Keyed. — Parr 1960: 126. Description, taxonomic status. — Dessart 1963a: 391. Description, synonymy, lectotype designation; 1963b: 515. Description; 1965: 167. Synonymy; 1975: 25. Synonymy; 1981b: 12. Synonymy. — Hellén 1966: 30, 33. Description, keyed. — Alekseev & Kozlov in Alekseev (1978): 686. Description.
- Aphanogmus hyalinipennis* – Kieffer 1914c: 116, 121. Description, keyed. — Szelényi 1940: 126. Keyed. — Dessart 1963a: 391, 395. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.
- Aphanogmus clavatus* – Kieffer 1914c: 116, 121. Description, keyed. — Szelényi 1940: 125. Keyed. — Hellén 1966: 31, 36. Description, keyed. — Dessart 1975: 24, 26. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.
- Aphanogmus grenadensis* – Kieffer 1914c: 117, 124. Description, keyed. — Masner 1965: 10. Type information. — Dessart 1975: 24, 25. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858; 1981b: 12. Lectotype designation.
- Calliceras armata* – Kieffer 1914c: 74, 89. Generic transfer, description, keyed.
- Calliceras frenalis* – Kieffer 1914c: 76, 94. Generic transfer, description, keyed. — Szelényi in Russo 1938: 362, 363. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.
- Calliceras oriphila* – Kieffer 1914c: 78, 103. Generic transfer, description, keyed.
- ?*Calliceras clavatus* – Szelényi 1940: 126. Keyed.
- Ceraphron orphilus* – Risbec 1950: 552. Keyed, spelling error.
- Ceraphron borealis* – Muesebeck & Walkley 1951: 666. Generic transfer. — Dessart, 1975: 25. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.
- Ceraphron fasciatus* – Muesebeck & Walkley 1951: 667. Generic transfer.
- Allomicrops bemisiae* – Dessart 1963b: 515, 521. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.
- Ceraphron frenalis* – Dessart 1965: 167. Lectotype designation.
- Aphanogmus formicarum* – Masner 1965: 10. Type information.
- Ceraphron armatus* – Masner 1965: 11. Type information. — Dessart 1975: 24, 25. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.
- Ceraphron borealis* – Masner 1965: 11. Type information.
- Ceraphron fuliginosi* – Masner 1965: 12. Type information. — Dessart 1975: 25. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.

Ceraphron oriphilus – Dessart 1966a: 15, 17. Synonymy, emendation of description, junior synonym of *Aphanogmus fumipennis* Thomson, 1858.

Ceraphron formicarum – Dessart 1975: 25. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.

Calliceras fasciata – Dessart 1981b: 12. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.

Ceraphron roberti – Dessart 1981b: 12. Junior synonym of *Aphanogmus fumipennis* Thomson, 1858.

Material examined

Holotype

KENYA • ♀ of *Ceraphron oriphilus* Kieffer, 1913, synonymized with *Aphanogmus fumipennis* Thomson, 1858; “Maü escarpment, à Molo, station de l’Uganda railway, située près du sommet de l’escarpement, dans la forêt, mais sur le versant oriental, altitude de 2.420 m., 2 décembre 1911, st. no 19” (Kieffer 1913b: 12); MNHN EY22432 to EY22434, EY25361.

Distribution

Afrotropical, nearctic, neotropical, and palearctic.

Comments

There is one female specimen stored in ethanol that Kieffer originally described as the type of *Ceraphron oriphilus* (1913b), but Dessart synonymized this species with *Aphanogmus fumipennis* Thomson, 1858 (1966a). There are no locality labels with the specimen, though there is a determination label from Kieffer indicating “Type 19”. Dessart dissected the specimen and made three slide preparations (prép. no. 6505/182) of the left posterior leg (MNHN EY22432), both fore wings and one hind wing (MNHN EY22433), and one antenna (MNHN EY22434). The rest of the specimen is in ethanol (vial MNHN EY25361).

Aphanogmus origenus (Kieffer, 1913)

Figs 6–7

Ceraphron origenus Kieffer, 1913b: 10, 12, ♂, ♀. MNHN. Keyed.

Calliceras origena – Kieffer, 1914c: 78, 102. Generic transfer, description, keyed.

Ceraphron origenus – Risbec 1950: 552. Keyed.

Aphanogmus origenus – Dessart 1966a: 10. Generic transfer, description, lectotype designation.

Material examined

Lectotype

TANZANIA • ♀ of *Ceraphron origenus* Kieffer, 1913, new combination *Aphanogmus origenus* in Dessart (1966a); “Mont Kilimandjaro: lisière supérieure de la forêt auprès du Bismarckhügel, entre 2.700 et 2.800 m. d’altitude, 2 avril 1912 (st. no 71)” (Kieffer 1913b: 12); MNHN EY22436, EY22437, EY25358.

Paralectotypes

TANZANIA: 2 ♀♀; same data as for the lectotype; MNHN EY25352 • 1 ♂, 1 ♀, syntypes of *Ceraphron origenus* Kieffer, 1913, identified as *Aphanogmus fumipennis* Thomson, 1858; same data as for the lectotype; MNHN EY22435, EY25350 • 1 ♀; same data as for the lectotype; MNHN EY25357.

Distribution

Afrotropical.

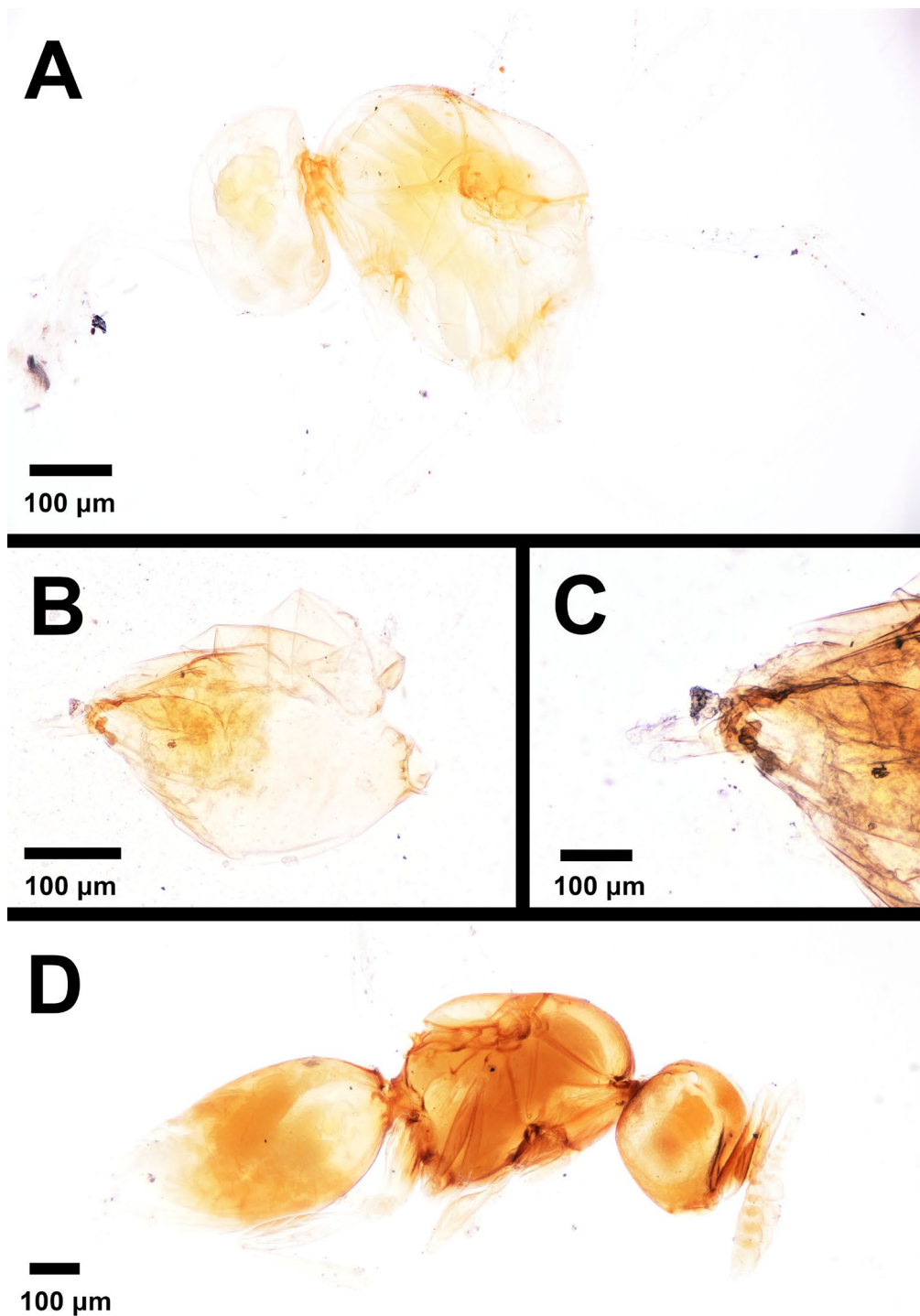


Fig. 6. The two *Ceraphron origenus* Kieffer, 1913 (male and female) syntype specimens that Dessart determined to be *Aphanogmus fumipennis* Thomson, 1858. **A.** Lateral habitus of the male specimen in ethanol (MNHN EY25350). **B.** Male metasoma (MNHN EY22435). **C.** Close up of the male metasoma with genitalia showing (MNHN EY22435). **D.** Female specimen in ethanol (MNHN EY25350).

Comments

This species was originally described as *Ceraphron origenus* by Kieffer (1913b) from a series of male and female specimens. According to Dessart (1966a), the original syntypic series consisted of five

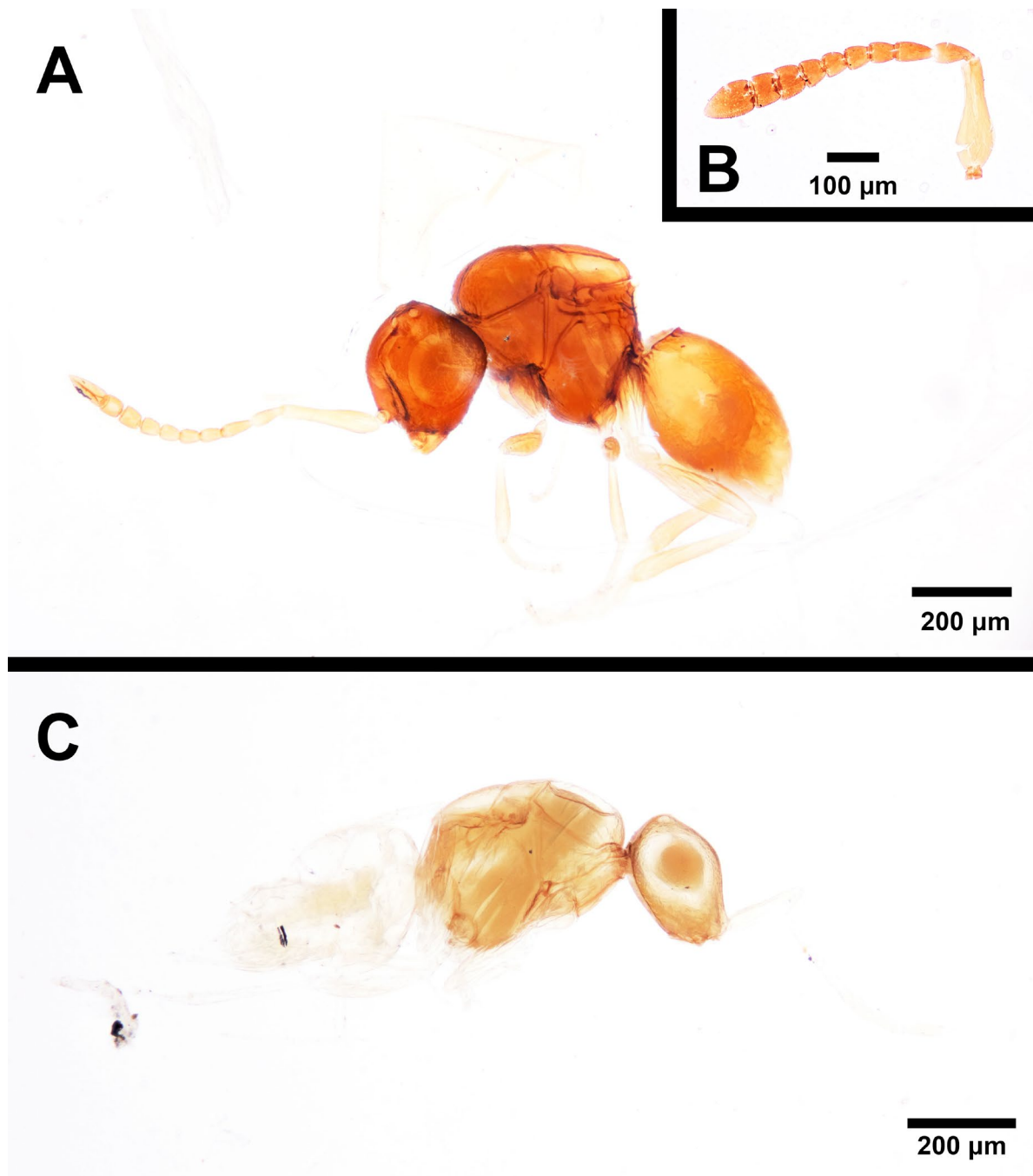


Fig. 7. A. *Aphanogmus origenus* (Kieffer, 1913), lectotype, ♀, lateral view (MNHN EY25358). B. Left antenna of the female lectotype (MNHN EY22436). C. The last *Ceraphron origenus* Kieffer, 1913, paralectotype that Dessart determined to be a different species of *Aphanogmus*, possibly a new species (MNHN EY25357).

females and one male. However, upon reviewing the specimens himself, Dessart found that the six specimens actually belonged to three different *Aphanogmus* species (Dessart 1966a).

Dessart identified the male and one female specimen as *Aphanogmus fumipennis* based on antennal characters and the male genitalia (Fig. 6). He made a slide preparation (prép. no. 6505/06) of the male metasoma and genitalia (MNHN EY22435), and appears to have left the remaining bleached fragments of the male in an ethanol vial with the female specimen (MNHN EY25350).

In looking at the other syntypes, Dessart found that three of the remaining females belonged to the same species (Fig. 7A–B). Rather than synonymize *Ceraphron origenus* with *Aphanogmus fumipennis*, he chose a lectotype and paratypes from these three females to represent a new combination, *Aphanogmus origenus*, then re-described the species and noted that the male is unknown (Dessart 1966a). He dissected the female lectotype and made two slide preparations (prép. no. 6504/261), with one slide containing the left antenna (MNHN EY22436), and the other containing the left fore wing and hind wing (MNHN EY22437). The rest of the female lectotype is stored in an ethanol vial (MNHN EY25358). Two female paralectotypes are stored together in another ethanol vial (MNHN EY25352). These two specimens were not imaged.

The state of the last female paralectotype remains uncertain (Fig. 7C). Dessart (1966a: 11) provided the following comments: “également dépourvue de rebord périphérique au scutellum mais à antennes non massuées, représente sans doute une nouvelle espèce malheureusement en trop mauvais état pour être bien décrite”. Dessart determined that the specimen was an *Aphanogmus* and not a *Ceraphron*, and based on differences in the antenna and scutellum, thought that the specimen could represent a new species. However, he thought the specimen’s condition was too poor to describe a new species from. The specimen currently remains in ethanol (vial MNHN EY25357).

None of the specimens have locality labels, though Dessart’s labels for ethanol specimens MNHN EY25358 and MNHN EY25350 quote a determination label from Kieffer that indicate “Type 71”.

Aphanogmus radialis Kieffer, 1907

Fig. 8

Aphanogmus fasciipennis var. *radialis* Kieffer, 1907b: 199, ♀. MNHN.

Aphanogmus radialis Kieffer, 1914c: 116, 118. Description, change to species status, keyed. — Szelényi 1940: 125. Keyed.

Aphanogmus fasciipennis var. *radialis* – Kelner-Pillault 1958: 149. Type information.

Material examined

Holotype

FRANCE • ♀; “Bitche, en octobre” (Kieffer, 1907b: 199); MNHN EY25347, EY22466, EY22467.

Distribution

Palaearctic.

Comments

Thomson (1858: 305) described the species *Aphanogmus fasciipennis* from male and female specimens from Lund, and described a female variation from the same locality that differed in the following regard: “antennarum basi pedibusque testaceis, abdomine. piceo.”. Kieffer (1907b: 199) keyed out the species

and also described a female variation of his own with different coloration and antennal characters, collected from “Bitche, en octobre”, which he named *radialis*.

It is unclear whether the female variations described by Thomson and Kieffer are the same; though Kieffer’s variation was collected from a different locality than Thomson’s, it is described in a similar way, with a lighter coloration on the antenna, legs and abdomen. Kieffer (1914c) later changed his variation to species status. Kelner-Pillault (1958) reported a female found in Kieffer’s collection in Bitche, which was considered a holotype and donated to the MNHN.

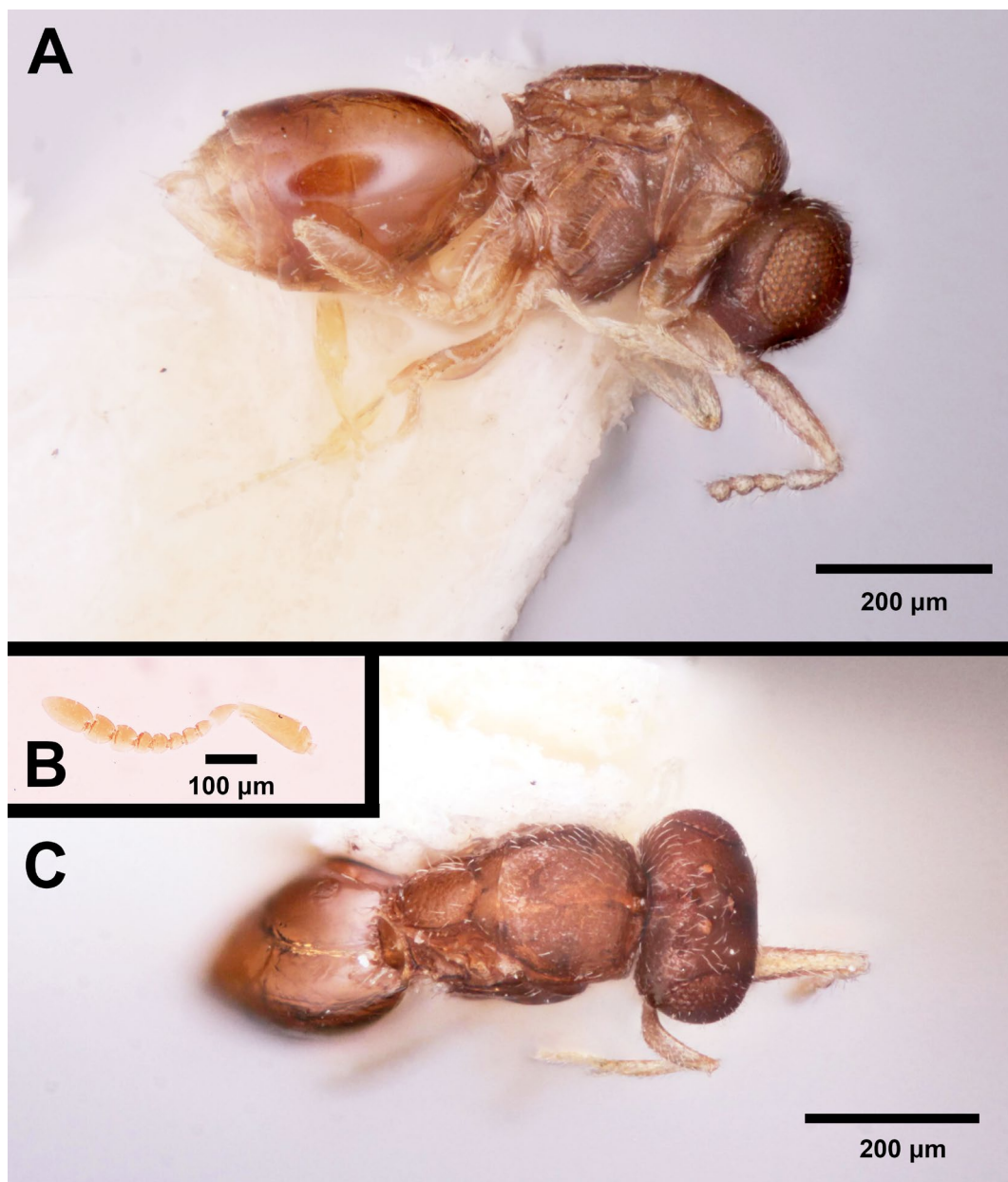


Fig. 8. *Aphanogmus radialis* Kieffer, 1907, holotype, ♀. **A.** Lateral view (MNHN EY25347). **B.** Left antenna (MNHN EY22467). **C.** Dorsal view (MNHN EY25347).

Dessart (1963a) redescribed *Aphanogmus fasciipennis* and briefly discussed the variation Thomson had described. However, the only specimen of the variation Dessart had viewed for this publication was missing from the mount except for a few tarsi, so he was unable to determine if it was actually a different species or not. Dessart did not view the holotype female specimen at the MNHN until 1966, according to the label he placed on the specimen. Dessart dissected the female specimen and made two slide mounts (prép. no. 6605/252), leaving the rest of the specimen on its point mount (MNHN EY25347). One slide contains the anterior left wing and posterior right wing (MNHN EY22466), while the other has the complete left antenna and fragments of the right antenna (MNHN EY22467).

Though Dessart (1966a) discusses several of the MNHN specimens, this specimen is not one of them. It appears that Dessart dissected the specimen in 1966 but then left it out of the final publication. According to Johnson & Musetti (2004), Dessart never published any further papers discussing *Aphanogmus fasciipennis* or *A. radialis*. He did add a label to the holotype female at the MNHN commenting “=A. fasc. f. typique!”, but he never officially synonymized it with *Aphanogmus fasciipennis* Thomson, 1858 (Johnson & Musetti 2004). While the original specimen bears a holotype label, Dessart did not add any holotype labels to his slide preparations: instead, he marked them with Kieffer’s original determination, *Aphanogmus fasciipennis* var. *radialis*.

Genus *Ceraphron* Jurine, 1807

Ceraphron alticola Kieffer, 1913

Fig. 9

Ceraphron alticola Kieffer, 1913b: 10, 13, ♀. MNHN. Keyed.

Calliceras alticola – Kieffer 1914c: 78, 103. Generic transfer, description, keyed.

Ceraphron alticola – Risbec 1950: 552. Keyed. — Dessart 1966a: 20. Description; 1989: 230. Keyed.

Material examined

Syntype

KENYA • ♀; “Maü escarpment, á Molo, altitude de 2.420 m., 2 décembre 1911, st. no 19” (Kieffer 1913b: 13); MNHN EY25359, EY22427, EY22428.

Distribution

Afrotropical.

Comments

Kieffer (1913) described *Ceraphron alticola* from a female specimen or specimens, though this is the only type known for this species to date. At this point, we consider this specimen to be a syntype. There are no original locality or type labels with the specimen, though there is a note reading “*Ceraphron alticola* || Type 19 K.”. The same type number appears on the label for *Aphanogmus fumipennis* (vial MNHN EY25361), originally the type of Kieffer’s *Ceraphron oriphilus*.

Dessart dissected this specimen in 1966 and made two microscope preparations (prép. no. 6505/183), one of the right antenna (MNHN EY22427) and one of the right forewing (MNHN EY22428). The specimens are circled in black to indicate their position on the slides. The rest of the female specimen is in ethanol (vial MNHN EY25359).



Fig. 9. *Ceraphron alticola* Kieffer, 1913, syntype, ♀. **A.** Lateral view (MNHN EY25359). **B.** Right antenna (MNHN EY22427).

Ceraphron barbieri Dessart, 1975

Fig. 10

Ceraphron barbieri Dessart, 1975: 47, 50, ♂, ♀. ZMUC, ISNB, MNHN, MHNG. Keyed.

Ceraphron (Allomicrops) barbieri – Dessart 1981a: 3. Subgeneric assignment.

Material examined

Allotype

FRANCE • ♀; “Contre mur / dans la / maison, Dijon / 4–VIII–1973 / C. D’or. J. Barbier” (Dessart 1975: 49); MNHN EY25349, EY22449.

Distribution

Nearctic and palearctic.

Comments

Dessart described the species from three male and two female specimens. According to Dessart (1975), the male holotype and one male paratype are deposited at the Zoological Museum at the University of Copenhagen, Denmark (ZMUC), which was indicated in Johnson & Musetti (2004). However, missing from Johnson & Musetti (2004), there is another male paratype at the Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium (ISNB), a female paratype in the Cl. Bésuchet collection in

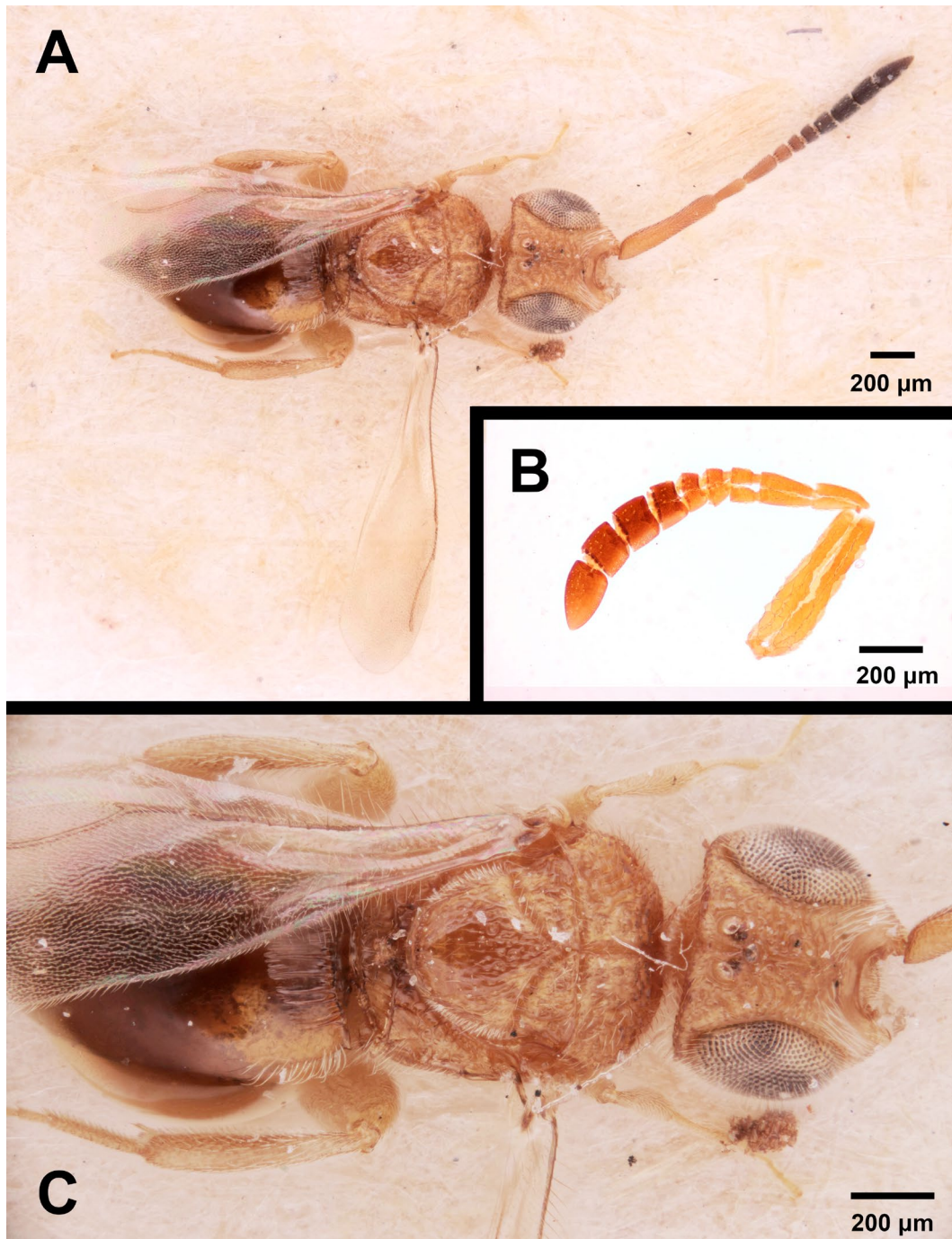


Fig. 10. *Ceraphron barbieri* Dessart, 1975, allotype, ♀. **A.** Dorsal view (MNHN EY25349). **B.** Right antenna (MNHN EY22449). **C.** A closer dorsal view (MNHN EY25349).

the Muséum d'Histoire Naturelle, Geneva, Switzerland (MHNG), and a female allotype in the J. Barbier collection in the MNHN. The female allotype specimen is card mounted (MNHN EY25349), and there is one microscope preparation (prép. no. 7312/141) with the right antenna (MNHN EY22449).

There are a few errors and inconsistencies in the original publication. Dessart (1975) gives the identifier used for the allotype specimen as “N°7312/111”, but the actual number on both the specimens and the slides is N°7312/141. The label information given in the paper matches the specimen, although Dessart (1975: 49) reports an additional label saying “Contre mur / dans la / maison” which is missing from the actual specimen. Still, there is no doubt that this is the allotype specimen Dessart studied in describing *Ceraphron barbieri*.

Ceraphron cavifrons Risbec, 1950

Fig. 11

Ceraphron cavifrons Risbec, 1950: 552, ♂. MNHN. Keyed.

Ceraphron cavifrons – Risbec 1955: 216. Keyed. — Dessart 1989: 227. Keyed.

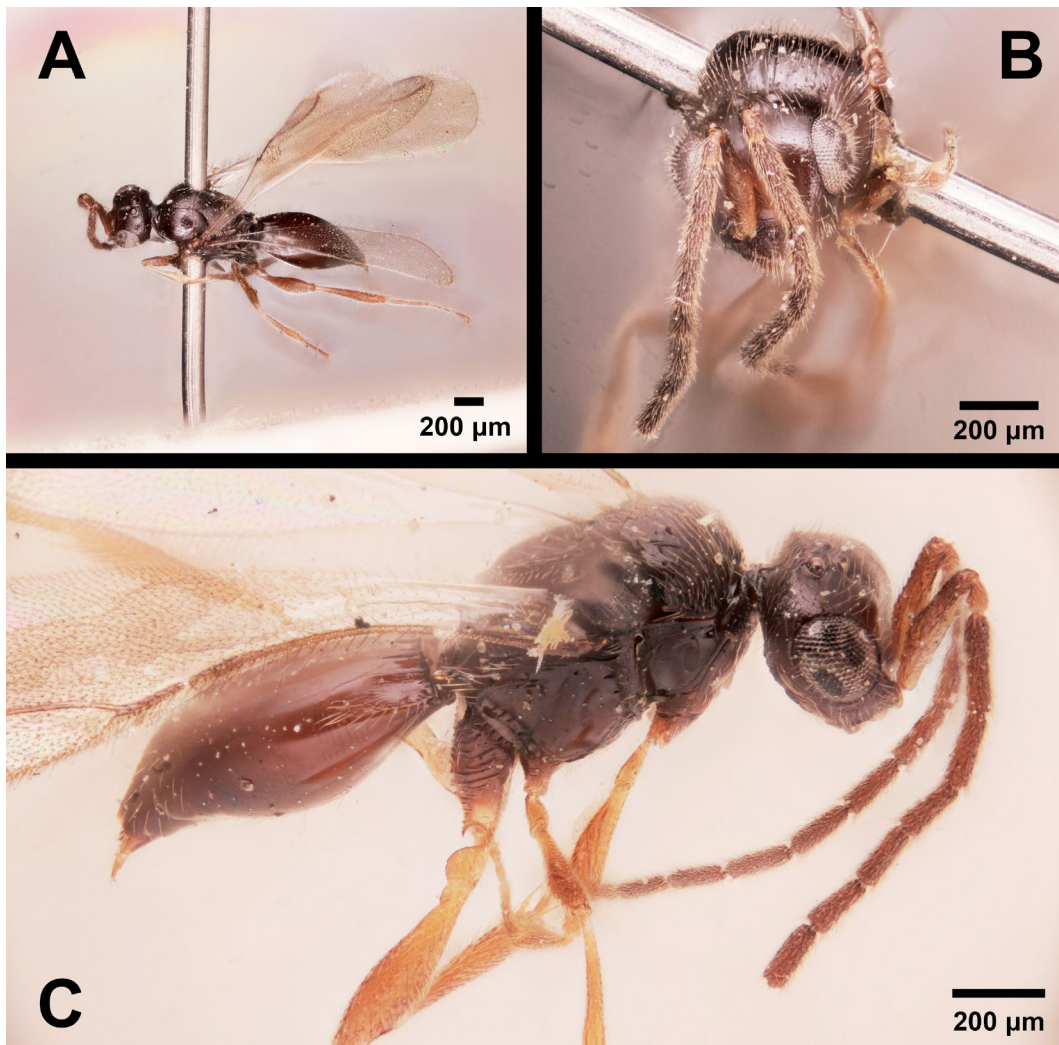


Fig. 11. *Ceraphron cavifrons* Risbec, 1950, holotype, ♂ (MNHN EY22473). **A.** Dorsal view. **B.** Frontal view. **C.** Lateral view.

Material examined

Holotype

KENYA • ♂; “Forêt de L’Elgon, Versant Est. 2.700–2.800m., Mission de l’Omo, ARAMBOURG, CHAPPUIS, JEANNEL, 1932–1933.” (Risbec 1950: 552); MNHN EY22473.

Distribution

Afrotropical.

Comments

Risbec (1950) described the species from a single male, and thought it could be related to *C. oriphilus*, *C. naivashae* or *C. alticola*, three species all described by Kieffer based on single female specimens. Risbec comments that Kieffer’s descriptions are not detailed enough to accurately match this male to any of the three females, suggesting that Risbec had not viewed those three Kieffer types at the time of the 1950 publication. The introduction to his key to African and Malagasy Ceraphronoidea (Risbec 1955) also omits *C. oriphilus*, *C. naivashae* and *C. alticola* due to his confusion with Kieffer’s original descriptions. Even though all three specimens were deposited at the MNHN, it appears that Risbec never viewed them.

Dessart did not dissect the male holotype or leave any labels on it indicating that he had viewed it, but he did include the species in a key to African *Ceraphron* species south of the Sahara, where he wrote that the male had been “insuffisamment décrit” and described a few additional characters (Dessart 1989: 227). Thus, we know that Dessart did view this specimen. Dessart (1989) distinguished this species from *C. alticola* and *C. naivashae* in this key and had also previously synonymized *Ceraphron oriphilus* with *Aphanogmus fumipennis* (Dessart 1966a), so it is not likely that this specimen is the male to any of Kieffer’s three female specimens, contrary to what Risbec (1950) thought.

The male holotype specimen (MNHN EY22473) is on a double point mount. The pin through the specimen made it difficult to image. The specimen is missing the last two flagellomeres from the right antenna. It was not possible to image the male genitalia, but the specimen appears to have harpe that are pointed and longer than the gonostipes, with distal tufts of setae.

Ceraphron crenulatus Kieffer, 1913

Fig. 12

Ceraphron crenulatus Kieffer, 1913b: 10, 11, ♀. MNHN. Keyed.

Calliceras crenulata – Kieffer 1914c: 77, 101. Generic transfer, description, keyed.

Ceraphron crenulatus – Risbec 1950: 552. Keyed; 1955: 216. Keyed. — Dessart 1966a: 6. Description; 1989: 224. Keyed.

Material examined

Holotype

KENYA • ♀; “Forêts inférieures du mont Kénia, près de la maison forestière, altitude de 2.400 m, 22 janvier 1912, st. no 39, tamisage de terreau d’arbres” (Kieffer 1913b: 11); MNHN EY25351, EY22438, EY22439.

Distribution

Afrotropical.

Comments

Kieffer (1913b) only described the female of this species, naming it for its crenulate antennae. Dessart (1964: 120, comments) noted that the species is similar to *Ceraphron xanthosoma*, another species Kieffer described from Africa that also has crenulate antennae, “comme bon nombre d’autres espèces, d’ailleurs”, but that they differ in coloration and the shape of the antenna.

It was not until 1966 that Dessart re-described and illustrated the holotype female specimen of *Ceraphron crenulatus*. Dessart asserted that the species was easily recognizable by its reduced wing state, the shape of the head (especially the occipital and vertical keels), the ocellar depressions, and the reduced eye size (Dessart 1966a). He also noted that the reduced eyes and large apical antennal section are shared

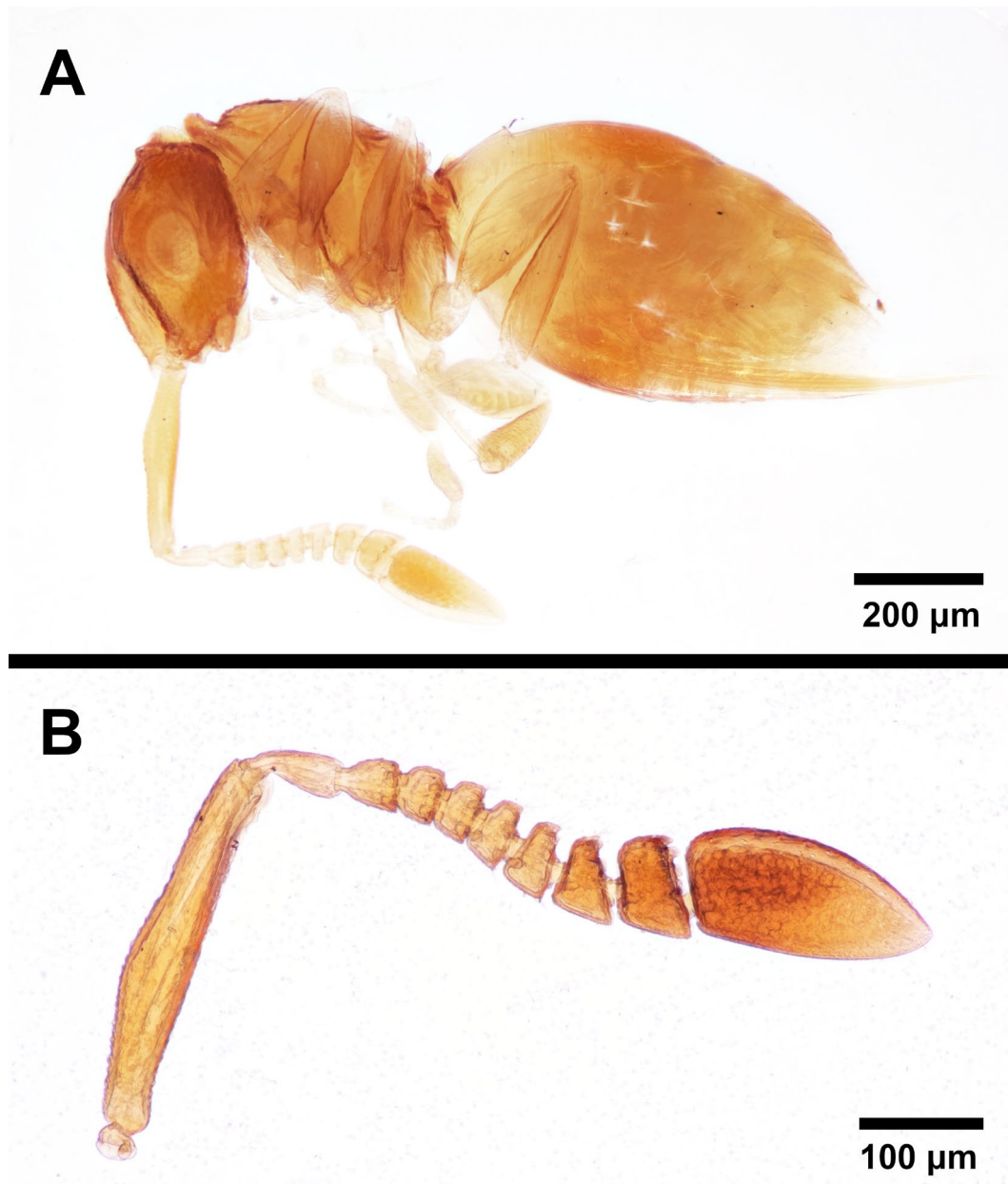


Fig. 12. *Ceraphron crenulatus* Kieffer, 1913, holotype, ♀. **A.** Lateral view (MNHN EY25351). **B.** Right antennae (MNHN EY22438).

between this species and the palearctic species *Ceraphron pristomicrops* Dessart, 1965, which has no ocelli, even more reduced wings, and a broader metasomatic groove.

The specimen is in ethanol (vial MNHN EY25351), and does not have any locality labels associated with it, though it does bear determination labels from Dessart and Kieffer. Kieffer's determination label reads "Ceraphron crenulatus || type 39 K.". Dessart made two slide preparations (prép. no. 6503/301), one of the right antennae (MNHN EY22438) and one of the anterior and posterior right wings (MNHN EY22439). Oddly, the preparation year given on the slides is 1965, while the label Dessart put on the ethanol specimen is from 1966.

***Ceraphron naivashae* Kieffer, 1913**

Fig. 13

Ceraphron Naivashae Kieffer, 1913b: 10, 13, ♀. MNHN. Keyed.

Calliceras naivashae – Kieffer 1914c: 78, 103. Generic transfer, description, keyed.

Ceraphron naivashae – Risbec 1955: 552. Keyed. — Dessart 1966a: 17, figs 22–24. Description, illustration; 1989: 233. Keyed.

Material examined

Holotype

KENYA • ♀; "AFRIQUE ORIENTALE ANGLAISE: fond du Rift Valley, a Naivasha, station de l'Uganda railway et chef-lieu de province, sur les bords du lac de Naivasha, altitude de 1.900 m., st. no 14, 1er decembre 1911." (Kieffer 1913b: 13); MNHN EY25360, EY22429 to EY22431.

Distribution

Afrotropical.

Comments

Kieffer (1913b) only described the female of this species, naming it for Naivasha, Africa, where it was collected. The female specimen at the MNHN is the only known specimen, which Dessart (1966a) considered as the holotype. Dessart (1966a) re-described the species from this female specimen and illustrated the wing and antennae.

Risbec (1950) proposed that *Ceraphron cavifrons* could be the male matching the female of *C. naivashae* (or *C. oriphilus* or *C. alticola*), while Risbec (1953b) suggested that *Ceraphron soavinae* could be the male matching this species. Dessart (1966a) comments on Risbec's musings, saying that neither species seemed to match *Ceraphron naivashae* from their descriptions, though he had not viewed the type of either at that point. We know that Dessart later viewed *C. cavifrons*, providing diagnostic characters for the species and distinguishing it from *C. naivashae* in his key (Dessart 1989). Dessart never found the type of *C. soavinae*; however, he noted that Risbec (1953b) had described the species as a type of *Ceraphron* without a median mesoscutal furrow. Since Dessart knew of only one *Ceraphron* species from America with a partially absent median mesoscutal groove and no *Ceraphron* species where it was completely missing, he thought that either Risbec had made a mistake or that the species was actually an *Aphanogmus* (Dessart 1989: 216). Dessart (1989) kept *C. soavinae* in his key, since he had not observed any specimens, but the key distinguishes it from *C. naivashae*, and it is highly unlikely that the male and female match.

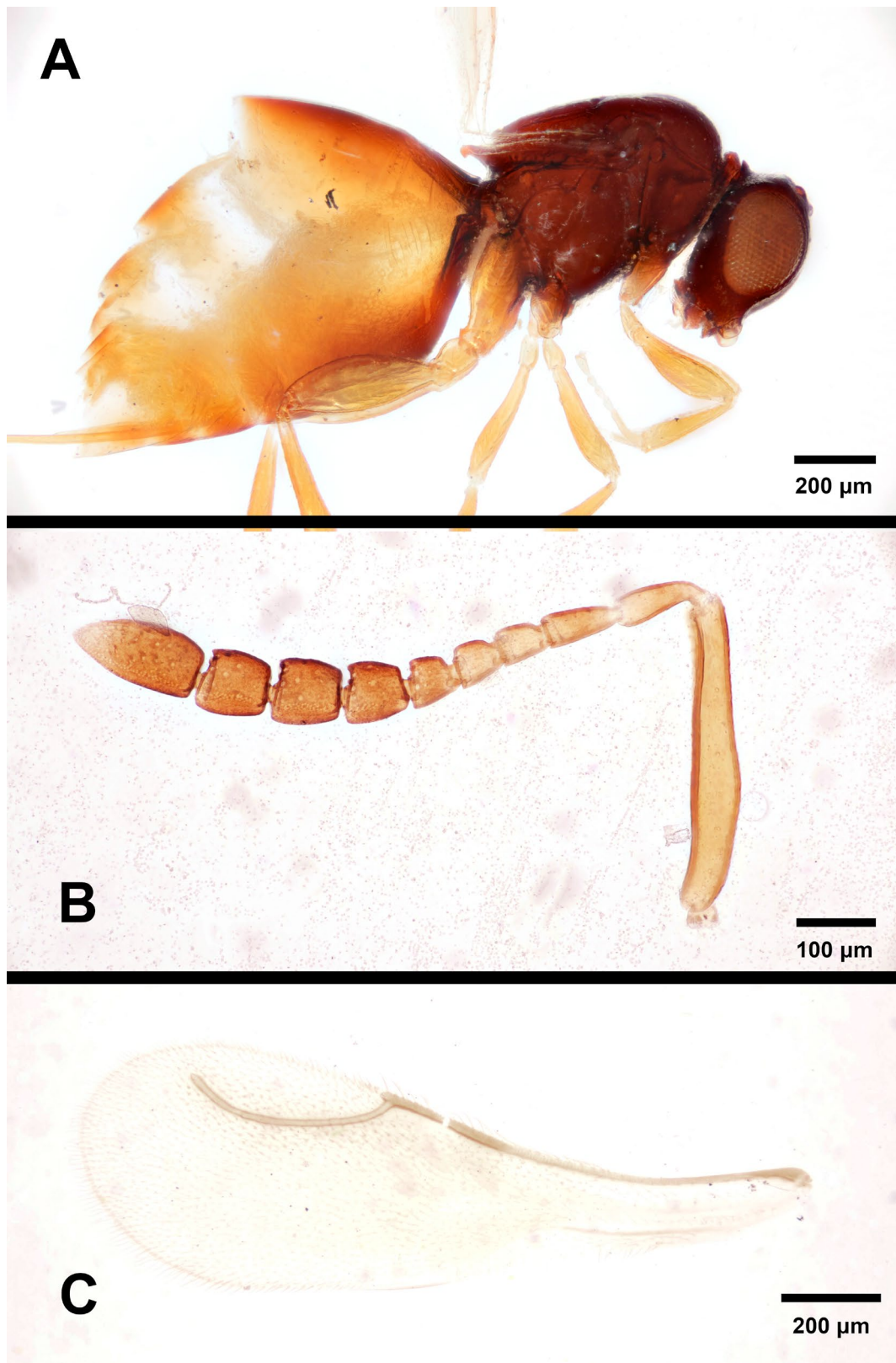


Fig. 13. *Ceraphron naivashae* Kieffer, 1913, holotype, ♀. **A.** Lateral view (MNHN EY25360). **B.** Left antenna (MNHN EY22430). **C.** Left wing (MNHN EY22431).

Dessart dissected the specimen and made three preparations (prep. no. 6505/181) of the right antenna (MNHN EY22429), left antenna (MNHN EY22430) and left wing (MNHN EY22431). The rest of the specimen is in ethanol (vial MNHN EY25360). It is uncertain when Dessart dissected the specimen: the year given on the slides is 1965, while the year written on his determination label on the specimen in ethanol is 1966. The specimen in ethanol does not have any locality labels associated with it, though it does bear a determination label from Kieffer reading “*Ceraphron Naivashae* K || type 14”.

Ceraphron nigrelliceus Kieffer, 1907

Fig. 14

Ceraphron Nigrelliceus Kieffer, 1907b: 247, ♀. NHMUK, MNHN.

Calliceras nigrelliceus – Kieffer 1914c: 72, 82. Generic transfer, description, keyed.

Ceraphron nigrelliceus – Kelner-Pillault 1958: 149. Type information. — Masner 1965: 13. Type information.

Material examined

Syntype

FRANCE • ♀; “Bitche” (Kieffer 1907b: 247); MNHN EY22476.

Distribution

Palaearctic.

Comments

Kieffer (1907b) only described the female of this species. The female specimen at the MNHN appears to have been collected at the university in Bitche where Kieffer used to teach, and subsequently donated to the MNHN (Kelner-Pillault 1958). The specimen (MNHN EY22476) is point mounted and in good condition.

Dessart left a label on the specimen in 1966 indicating that it is actually *Ceraphron pedes* Förster, 1861 but never officially synonymized it according to Johnson & Musetti (2004). There is a second female specimen at the Natural History Museum in London (NHMUK010812034) that Dessart viewed in 1965 and also identified as *Ceraphron pedes* Förster, 1861. It is unclear why Dessart never published this. Both the NHMUK and MNHN specimens were collected by P. Cameron and have determination labels from Kieffer, and are presumably syntypes. Dessart labeled the type at the NHMUK as a syntype, but the type at the MNHN still bears a holotype label.

Ceraphron parvalatus Dessart, 1966

Fig. 15

Ceraphron apterus Kieffer, 1913b: 10, ♂, ♀. MNHN. Keyed. Preoccupied by *Ceraphron apterus* Zetterstedt, 1840.

Ceraphron parvalatus Dessart, 1966a: 1, figs 1–5. Replacement name, description, lectotype, designation, illustration.

Calliceras aptera – Kieffer 1914c: 77, 101. Generic transfer, description, keyed.

Ceraphron apterus – Risbec 1950: 552. Keyed; 1955: 216. Keyed.

Ceraphron parvalatus – Dessart 1989: 225. Keyed.

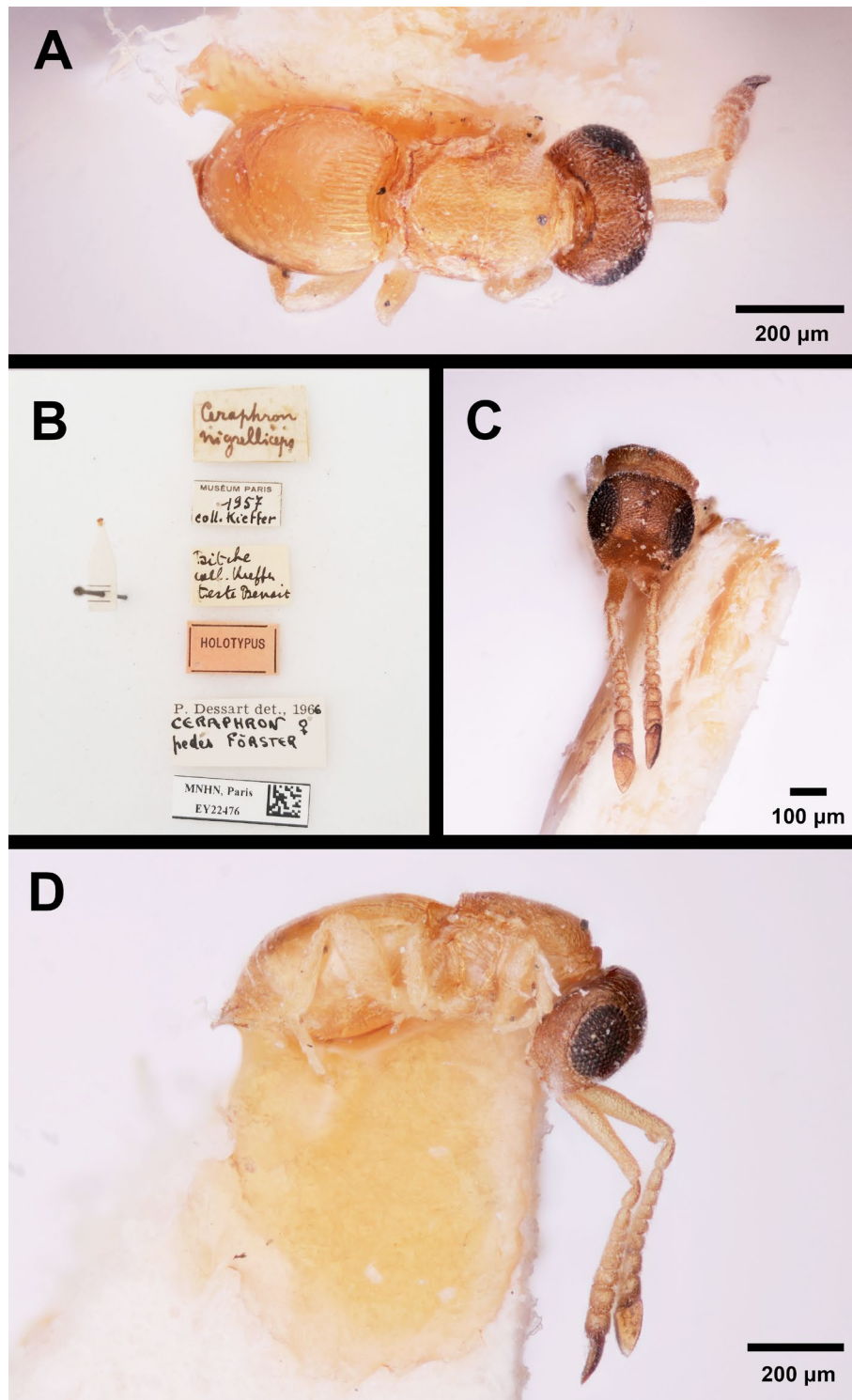


Fig. 14. *Ceraphron nigrelliceus* Kieffer, 1907, syntype, ♀ (MNHN EY22476). **A.** Dorsal view. **B.** Labels. **C.** Frontal view. **D.** Lateral view.

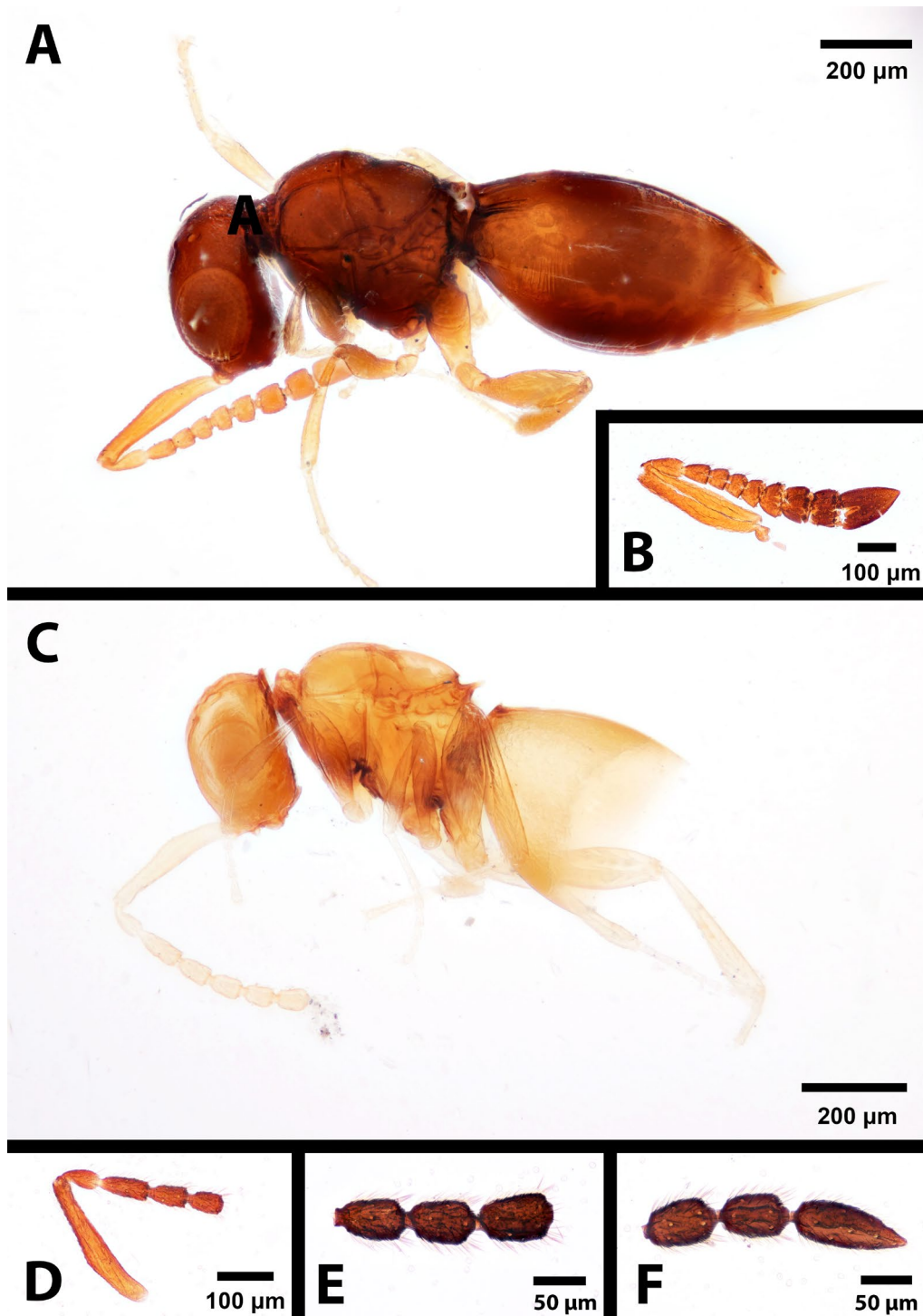


Fig. 15. *Ceraphron parvalatus* Dessart, 1966. **A–B.** Lectotype, ♀. **A.** Lateral view (MNHN EY25362). **B.** Antenna (MNHN EY22443). **C.** Allolectotype, ♂ (MNHN EY25363). **D–F.** Allolectotype, ♂ (MNHN EY22441). **D.** Scape, pedicel and first three flagellomeres. **E.** F4–6. **F.** F7–9.

Material examined

Lectotype

TANZANIA • ♀; “AFRIQUE ORIENTALE ALLEMANDE: mont Kilimandjaro: prairies alpines autour du Bismarckhugel, a la lisiere superieure de la foret sur le versant sud-est du Mawenzi, altitude de 2.740 m., st. no 70, 1” “avril 1912” (Kieffer 1913b: 10); MNHN EY22443, EY25362.

Allolectotype

TANZANIA • ♂; same data as for lectotype; MNHN EY22440 to EY22442, EY25363.

Distribution

Afrotropical.

Comments

Dessart (1966a) provides insight into the history of the naming of this species and the mistakes that abounded. Zetterstedt (1840) described a species called *Ceraphron apterus*, which Kieffer (1907a) transferred to the genus *Conostigmus* Dahlbom, 1858, even though Kieffer had himself described a species called *Conostigmus apterus* in the same work. Kieffer (1909) tried to rectify this mistake by renaming his *Conostigmus apterus* to *Conostigmus apteryx*. However, Kieffer (1913b) also described *Ceraphron apterus*, then referred to “*Conostigmus apterus* Zetterstedt” as “*Conostigmus apterus* Kieffer” (Kieffer 1914c). Dessart (1966a) set the record straight on these species and offered *Ceraphron parvalatus* as a *nomen novum* for *Ceraphron apterus* Kieffer. The new name fixes more than one mistake: Dessart (1966a) noted that the species is not actually apterous, as Kieffer described, but has reduced wings. It is for this reason that Dessart (1966a) chose the new name *parvalatus*, with the Latin word “parvus” meaning “small”.

Kieffer (1907a) described the male and female of the species, which Dessart (1966a) redescribed and illustrated, confirming that the male and female both belong to the same species. The male and female at the MNHN are the only known specimens, and are both considered as the syntypes that Kieffer observed. Dessart (1966a) designated the female as the lectotype and the male as the allolectotype, dissecting both and making slide preparations.

The female lectotype (prep. no. 6503/222) has a single slide preparation of one antenna (MNHN EY22443), with the rest of the specimen in ethanol (vial MNHN EY25362). The vial contains a determination label from Kieffer labeled with the number “Type 70”. The male allolectotype specimen (prep. no. 6503/221) has three slide preparations associated with it: the metasoma without the genitalia, in a poor preparation full of bubbles (MNHN EY22440); the male antenna in pieces, with three pieces marked in one black circle, and the last four flagellomeres in another circle (MNHN EY22441); and the right wing (MNHN EY22442). The original male specimen is in ethanol (vial MNHN EY25363), and has a determination label from Kieffer also labeled with “Type 70”.

Family Megaspilidae Ashmead, 1893
Subfamily Megaspilinae Masner & Dessart, 1967
Genus *Conostigmus* Dahlbom, 1858

Conostigmus abdominalis (Boheman, 1832)

Fig. 16

Ceraphron abdominalis Boheman, 1832: 330, ♀.

Ceraphron tenuicornis Boheman, 1832: 332, ♂. Synonymized by Thomson (1858).

Conostigmus Abdominalis var. *Testacea* Kieffer, 1907a: 112, ♀. MZLU. Synonymized by Dessart (1972b).

Conostigmus Divisifrons Kieffer, 1907a: 126, ♀. MNHN. Synonymized by Dessart (1972b).

Conostigmus Foveatifrons Kieffer, 1907a: 130, ♀. MCSN. Synonymized by Dessart (1972b).

Conostigmus pilosiceps Szabo, 1979: 89, ♀. HNHM. Synonymized by Dessart (1983).

Conostigmus curvilineaticeps Szabo, 1979: 91, ♀. HNHM. Synonymized by Dessart (1983).

Ceraphron tenuicornis – Thomson 1858: 294. Junior synonym of *Conostigmus abdominalis* (Boheman, 1832).

Megaspilus abdominalis – Thomson 1858: 294. Description, generic transfer. — Hellén 1966: 5, 8. Description, keyed.

Conostigmus Abdominalis – Kieffer 1907a: 112, 128. Description, generic transfer.

Conostigmus abdominalis var. *testaceus* – Kieffer 1909: 9. Emendation. — Dessart 1972b: 28. Type information.

Conostigmus abdominalis – Kieffer 1914c: 171, 172. Keyed. — Dessart 1972b: 28. Generic placement, synonymy; 1983: 116, 117. Synonymy; 1997b: 35. Comparison with *Conostigmus pulchellus* Whittaker, 1930. — Alekseev 1978: 678. Description.

Conostigmus abdominalis abdominalis – Kieffer 1914c: 190. Description.

Conostigmus abdominalis testaceus – Kieffer 1914c: 190. Description, change to subspecies status.

Conostigmus divisifrons – Kieffer 1914c: 172, 196. Description, keyed. — Dessart 1972b: 28. Junior synonym of *Conostigmus abdominalis* (Boheman, 1832).

Conostigmus foveatifrons – Kieffer 1914c: 173, 197. Description, keyed. — Dessart 1972b: 28, 30. Junior synonym of *Conostigmus abdominalis* (Boheman, 1832), type information.

Conostigmus abdominalis var. *Testacea* – Dessart 1972b: 28: Junior synonym of *Conostigmus abdominalis* (Boheman, 1832).

Conostigmus pilosiceps – Dessart 1983: 116. Junior synonym of *Conostigmus abdominalis* (Boheman, 1832).

Conostigmus curvilineaticeps – Dessart 1983: 117. Junior synonym of *Conostigmus abdominalis* (Boheman, 1832).

Material examined

Holotype

FRANCE • ♀ of *Conostigmus divisifrons* Kieffer, 1914, synonymized with *Conostigmus abdominalis* (Boheman, 1832); “Frankreich (Maisons-Laffite, im Juli)” (Kieffer 1907a: 196); MNHN EY25343.

Distribution

Palaearctic.

Comments

Kieffer (1907a) only described the female of *C. divisifrons*. Dessart (1972b) suspected that the species Kieffer had described was actually *Conostigmus abdominalis* from the description, but did not know the whereabouts of the specimen at the time. Dessart (1972b) speculated that the specimen had been returned to its owner, J. De Gaulle, and that it would be found in his collection.

CT found a single female specimen with a determination label from Kieffer identifying it as *C. divisifrons*. The locality information matched that of Kieffer (1907a). Though Dessart (1972b) did not know the whereabouts of *C. divisifrons*, there is a label on this specimen from Dessart (1973) synonymizing this type with *Conostigmus abdominalis* and providing the publication and page number. Thus, we can conclude that this is the missing holotype of *C. divisifrons* Kieffer, and that Dessart was able to confirm its synonymization with *C. abdominalis*. The female is point mounted (MNHN EY25343) and in good condition, with no pieces missing.

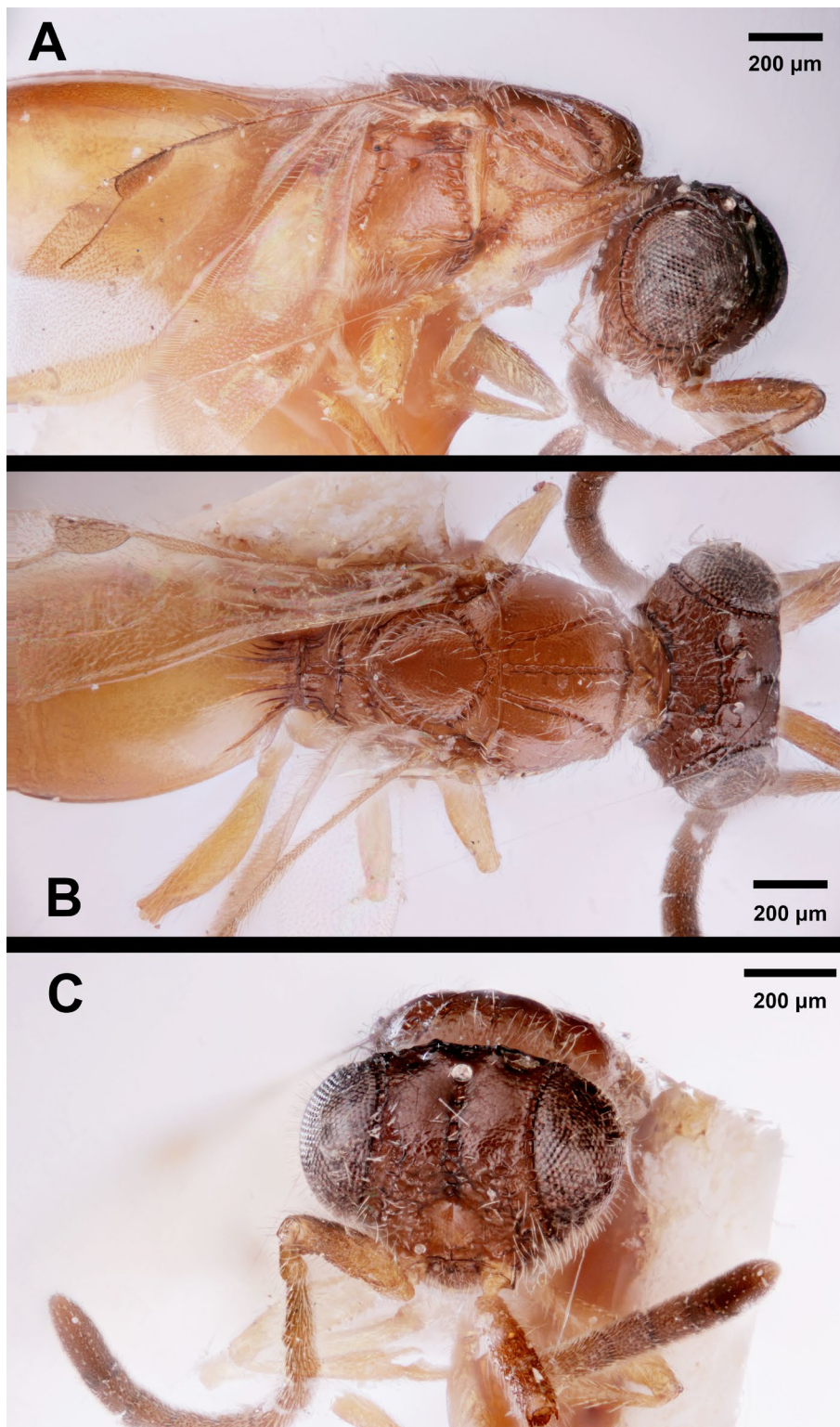


Fig. 16. *Conostigmus divisifrons* Kieffer, 1907, synonymized with *Conostigmus abdominalis* (Boheman, 1832), holotype, ♀ (MNHN EY25343). **A.** Lateral view. **B.** Dorsal view. **C.** Frontal view.

Conostigmus formiceti (Erichson, 1844)

Fig. 17

Ceraphron formiceti Erichson in Märkel, 1844: 265, ♂. ZMHB.

Megaspilus Wasmanni Kieffer, 1904: 38, ♂, ♀. NHME, MNHN. Synonymized by Dessart (1975).

Megaspilus antennalis Kieffer, 1904: 40, ♀. NHME. Synonymized by Dessart (1975).

Megaspilus crassinervis var. *testaceipes* Kieffer, 1904: 40, ♀. Synonymized with reservations by Dessart (1975).

Megaspilus lasiophilus Kieffer, 1905: 5, ♀. Synonymized with reservations by Dessart (1975).

Conostigmus Tricolor Kieffer, 1907a: 140, ♀. MCSN. Synonymized by Dessart (1975).

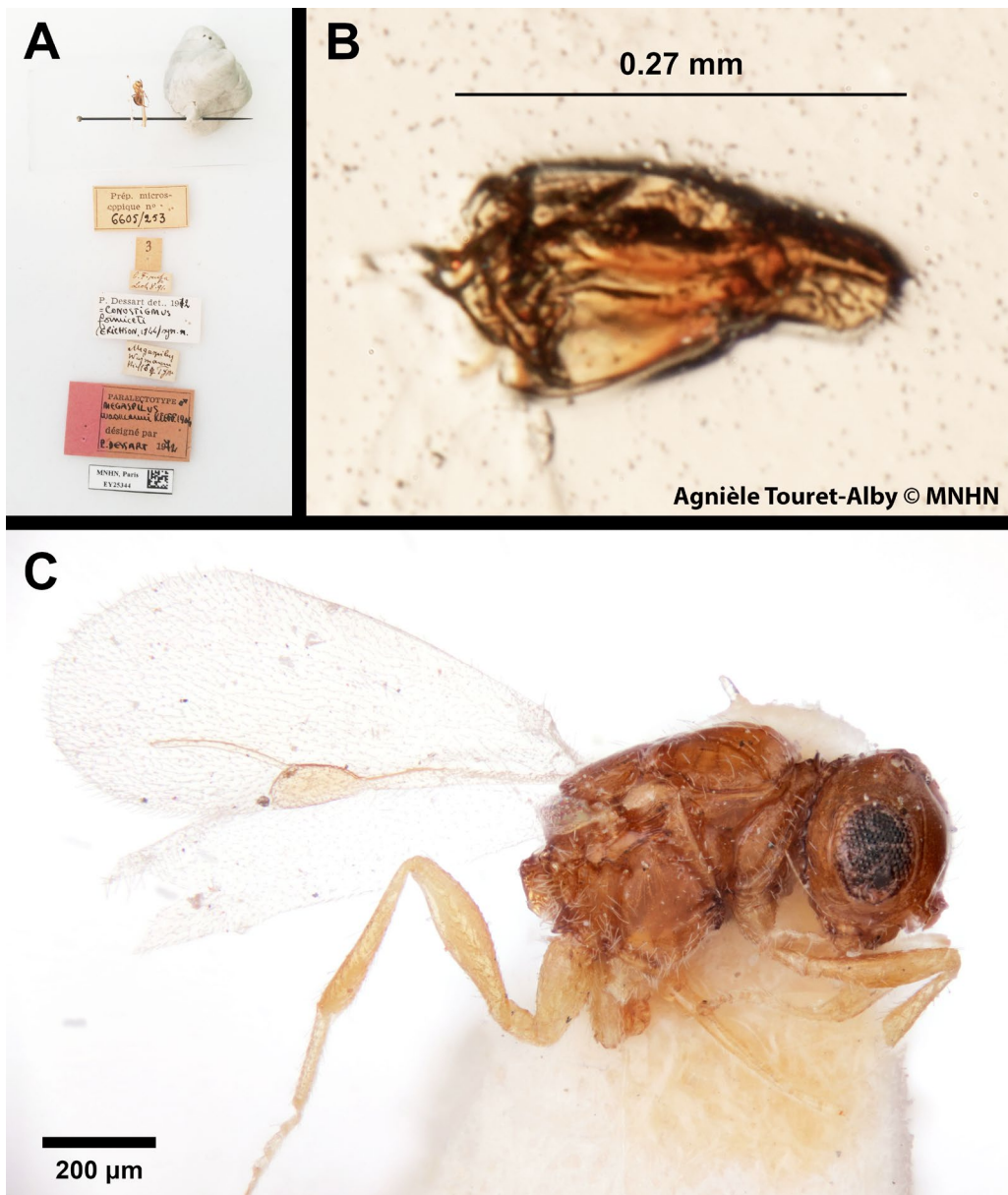


Fig. 17. *Megaspilus wasmanni* Kieffer, 1904, synonym of *Conostigmus formiceti* (Erichson, 1844), paralectotype, ♂ (MNHN EY25344). **A.** Labels **B.** Lateral view of the male genitalia, imaged by Agnière Touret-Alby © MNHN. **C.** Lateral habitus.

- Conostigmus myrmecobia* Kieffer, 1913a: 198, ♂. NHMUK. Synonymized by Dessart (1975).
Conostigmus formicarum Kieffer, 1914a: 141, ♂, ♀. NHMUK. Synonymized by Dessart (1975).
Conostigmus wasmanni nidorum Kieffer, 1914c: 205, ♂, ♀. Synonymized by Dessart (1975).
- Conostigmus Testaceipes* – Kieffer 1907a: 134, 167. Description, generic transfer, change to species status.
Conostigmus Wasmanni – Kieffer 1907b: 151, 160. Description, generic transfer. — Maneval 1937: 6. Variation.
- Conostigmus Antennalis* – Kieffer 1907b: 163. Description, generic transfer.
Conostigmus Lasiophilus – Kieffer 1907b: 167. Description, generic transfer.
Conostigmus Formiceti – Kieffer 1907b: 170. Description, generic transfer.
Conostigmus testaceipes – Kieffer 1914c: 173, 177, 198. Description, keyed. — Dessart 1975: 57. Junior synonym of *Conostigmus formiceti* (Erichson, 1844). — Alekseev 1978: 678, 679. Description.
Conostigmus tricolor – Kieffer 1914c: 174, 201. Description, keyed. — Dessart 1975: 57, 61, 63. Type information, junior synonym of *Conostigmus formiceti* (Erichson, 1844). — Alekseev 1978: 678. Description.
Conostigmus wasmanni – Kieffer 1914c: 175, 176. Keyed. — Alekseev 1978: 679. Description.
Conostigmus wasmanni wasmanni – Kieffer 1914c: 204. Description. — Dessart 1975: 57. Junior synonym of *Conostigmus formiceti* (Erichson, 1844).
Conostigmus myrmecobius – Kieffer 1914c: 175, 207. Description, emendation, keyed. — Masner 1965: 16. Type information. — Dessart 1975: 57, 61, 63. Description, type information, junior synonym of *Conostigmus formiceti* (Erichson, 1844).
Conostigmus formicarum – Kieffer 1914c: 176, 177, 209. Description, keyed. — Masner 1965: 15. Type information. — Dessart 1975: 57, 61, 63. Type information, junior synonym of *Conostigmus formiceti* (Erichson, 1844).
Conostigmus antennalis – Kieffer 1914c: 176, 210. Description, keyed. — Dessart 1975: 57, 61, 63. Type information, junior synonym of *Conostigmus formiceti* (Erichson, 1844). — Alekseev 1978: 678. Description.
Conostigmus lasiophilus – Kieffer 1914c: 177, 211. Description, keyed. — Dessart 1975: 57. Junior synonym of *Conostigmus formiceti* (Erichson, 1844).
Conostigmus formiceti – Kieffer 1914c: 213. Description. — Dessart 1975: 56. Description, synonymy, type information.
Megaspilus wasmanni – Kelner-Pillault 1958: 149. Type information. — Dessart 1975: 59, 61, 62. Description, lectotype designation.
Ceraphron formiceti – Dessart 1972a: 236. Lectotype designation.
Conostigmus wasmanni nidorum – Dessart 1975: 57. Junior synonym of *Conostigmus formiceti* (Erichson, 1844).
Conostigmus wasmanni var. *nidorum* – Dessart 1975: 63. Type information.

Material examined

Paralectotype

FRANCE • ♂, paralectotype of *Megaspilus wasmanni*; “PATRIE. Dans les colonies de *Formica rufa* a Exaeten, en Hollande, en mars et août” (Kieffer 1904: 39); MNHN EY25344.

Distribution

Palaearctic.

Comments

Kieffer (1904) described *Megaspilus wasmanni* from a syntype series of males and females collected at several locations. The male specimen at the MNHN was collected in Leche, and was reportedly found at the university in Bitche where Kieffer used to teach and subsequently donated to the MNHN

(Kelner-Pillault 1958). Dessart viewed the specimen in 1972 and determined it was a paralectotype of *Megaspilus wasmanni*, which he later published (Dessart 1975).

The male specimen is point mounted (MNHN EY25344), with the ant it parasitized point mounted underneath it. The antennae, one fore wing, one hind wing, and several portions of the legs are missing. The abdomen is detached and glued to the point. There is a label from Dessart indicating that there was at least one slide preparation associated with the specimen (prép. no. 6605/253), but CT was unable to locate any corresponding slides at the MNHN. Several months later, MNHN collection manager Agnièle Touret-Alby was able to locate two slides, one of the male genitalia and one containing two legs and wings. The slides were originally borrowed with other material by Dessart. A colleague returned the bulk of the material to the MNHN after Dessart's death, including the dried specimen but not the associated slides. Upon contact, the colleague generously located the slides and mailed them to the MNHN. Both slides were imaged by Agnièle Touret-Alby © MNHN.

***Conostigmus grangeri* (Dessart & Masner, 1965)**

Figs 18–19

Ecnomothorax grangeri Dessart & Masner, 1965: 283, 287, ♂, ♀. MNHN. Keyed.

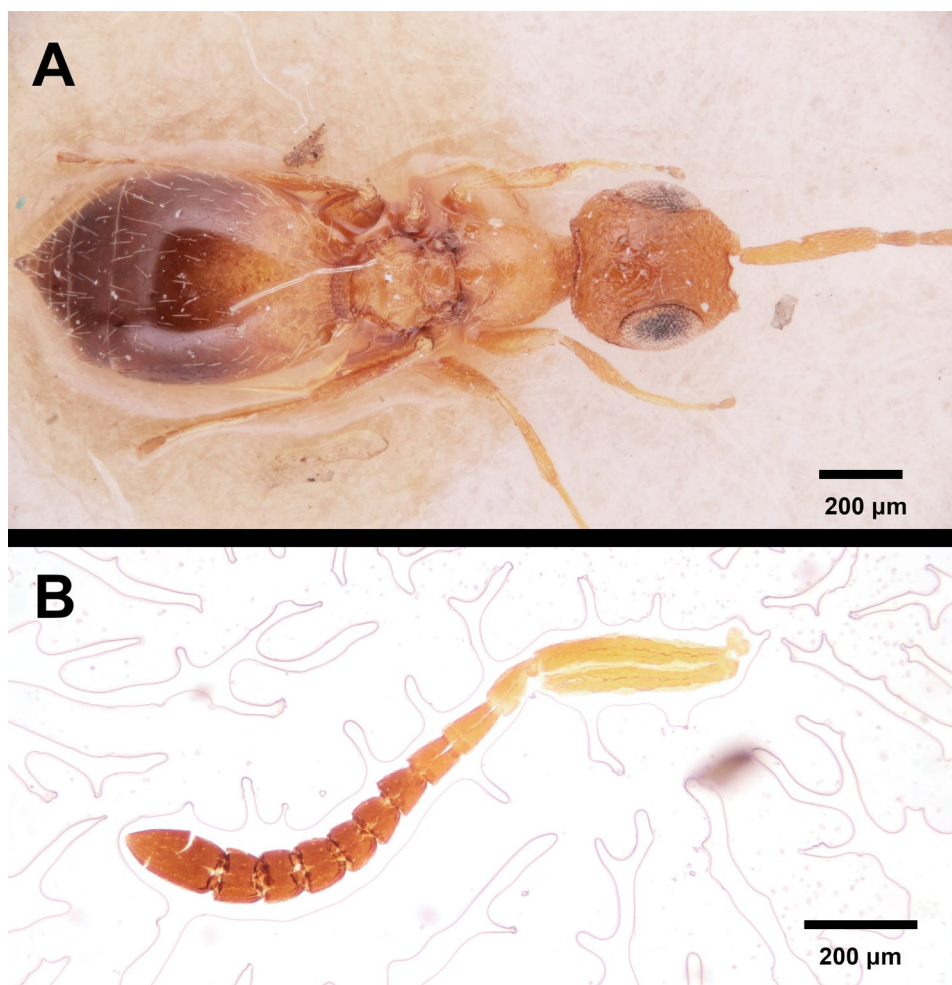


Fig. 18. *Conostigmus grangeri* (Dessart & Masner, 1965), holotype, ♀. **A.** Dorsal view (MNHN EY25339). **B.** Right antenna (MNHN EY22448).

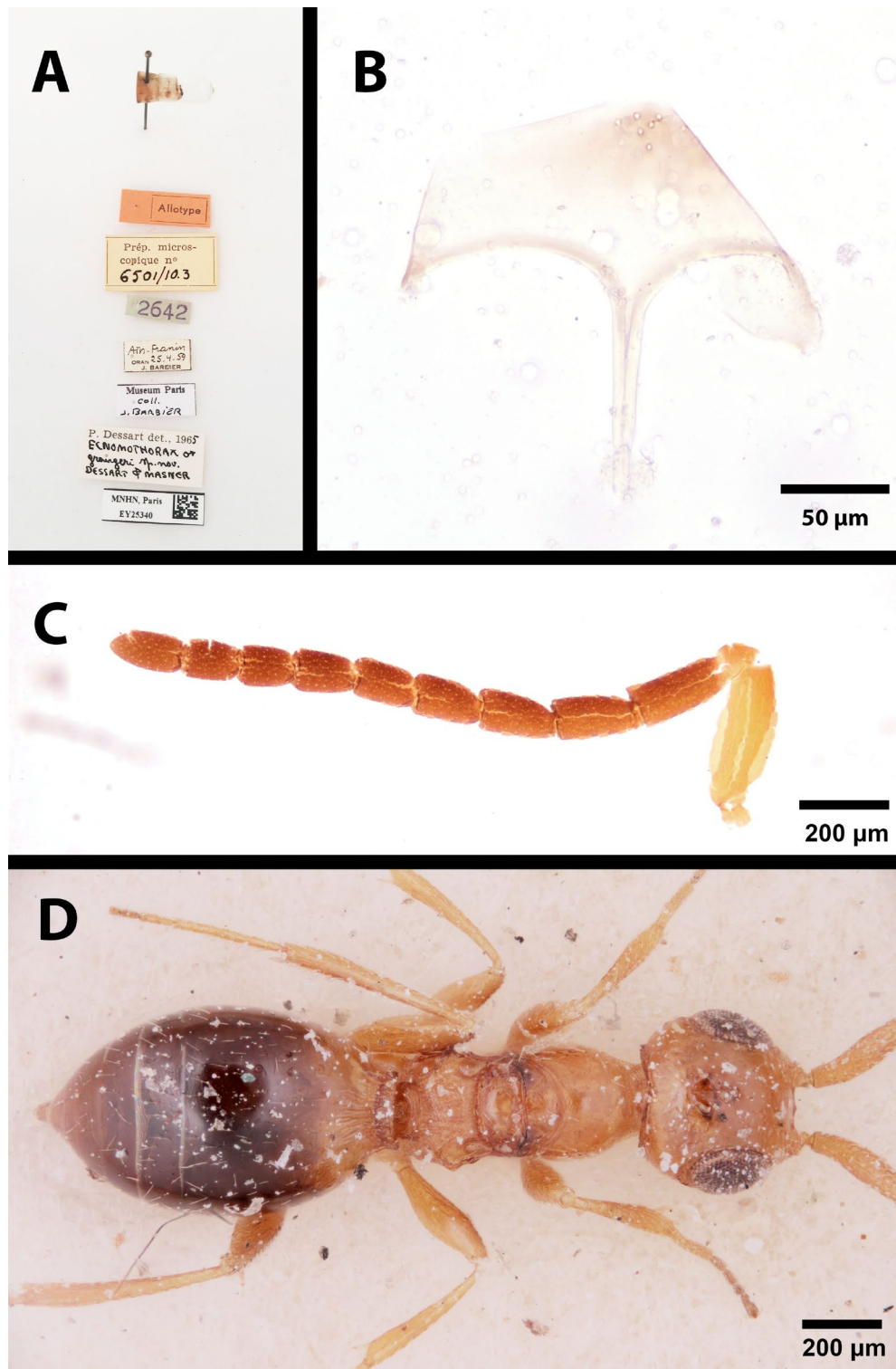


Fig. 19. *Conostigmus grangeri* (Dessart & Masner, 1965). **A–C.** Allotype, ♂. **A.** Labels and specimen (MNHN EY25340). **B.** S9, dorsal view (MNHN EY22444). **C.** Left antenna (MNHN EY22446). **D.** Paratype, ♂, dorsal habitus (MNHN EY25342).

***Conostigmus grangeri* – Dessart & Cancemi 1987: 315, 323. Generic transfer.**

Material examined

Holotype

ALGERIA • ♀; “«Font. des Gazelles, Oran, 6-4-58, J. BARBIER» (6 avril 1958)” (Dessart & Masner 1987: 287); MNHN EY25339, EY22448.

Allotype

ALGERIA • ♂; “«Aïn Franin, Oran, 25-4-59, J. BARBIER»” (Dessart & Masner 1987: 287); MNHN EY25340, EY22444 to EY22447.

Paratypes

ALGERIA • 1 ♀; “«Le Portet, Oran, 15-3-59, J. BARBIER»” (Dessart & Masner 1987: 287); MNHN EY25341 • 1 ♂; same data as for preceding; MNHN EY25342.

Distribution

Palaearctic.

Comments

Dessart & Masner (1965) described *Ecnomothorax grangeri* from two male and two female specimens, all of which are deposited at the MNHN. The genus *Ecnomothorax* Dessart & Masner, 1965 was later synonymized with *Conostigmus* by Dessart & Cancemi (1987).

The female holotype is glued to cardstock (MNHN EY25339), with one slide preparation (prép. no. 6501/104) of the right antenna in poor condition (MNHN EY22448). The male allotype is contained within a vial that is point mounted through the cork (MNHN EY25340). There are four associated slides (prép. no. 6501/103), including the left antenna (MNHN EY22446), the right anterior leg (MNHN EY22445), and the last few segments of the metasoma, the pedicel and F1–5 of the right antenna (MNHN EY22444). The fourth slide, containing the male genitalia (MNHN EY22447), is in such poor condition that it is not possible to actually view the genitalia. It is worth mentioning that the microscope preparation numbers given by Dessart & Cancemi (1987) do not match the actual preparation numbers given on the specimen.

There is also a female (MNHN EY 25341) and male (MNHN EY 25342) paratype, both of which are glued to cardstock. Whole-body images were taken of the male paratype in place of the allotype. The female paratype was not imaged.

***Conostigmus leviventris* Kieffer, 1907**

Fig. 20

Conostigmus Leviventris Kieffer, 1907a: 139, ♀. MNHN.

Conostigmus leviventris – Kieffer 1914c: 174, 200. Description, keyed.

Material examined

Paralectotype

FRANCE • ♀; “PATRIE. France: Arras en juin (De Gaulle): Amiens en juin (Carpenter)” (Kieffer 1907a: 139); MNHN EY25346.

Distribution

Palaearctic.

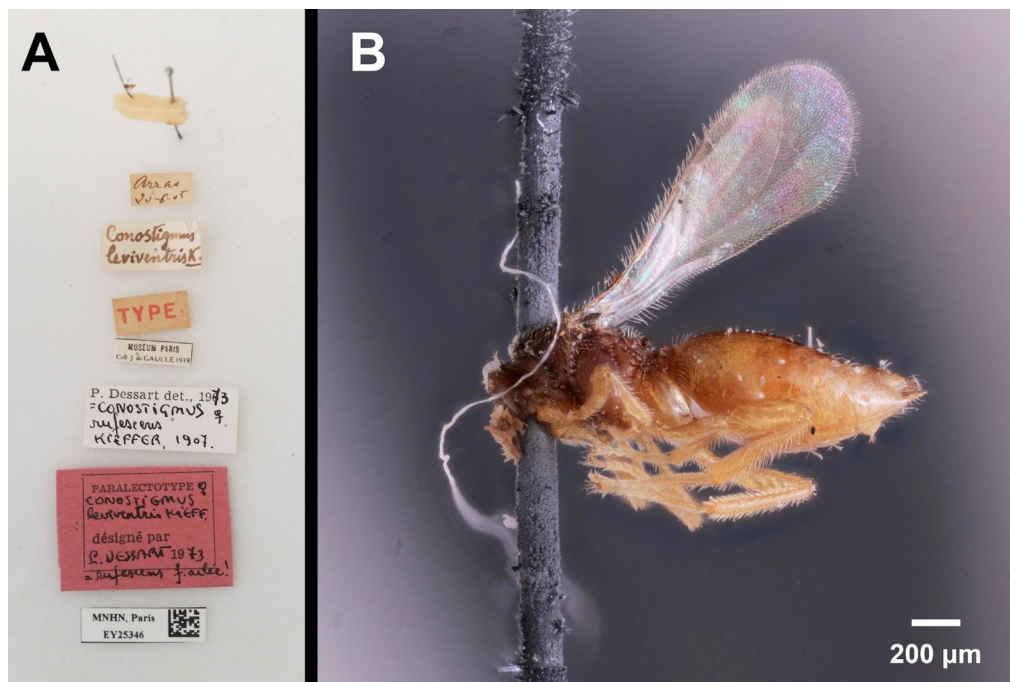


Fig. 20. *Conostigmus leviventris* Kieffer, 1907. **A.** Labels. **B.** Paralectotype, ♀, lateral habitus (MNHN EY25346).

Comments

Kieffer (1907a) described the female of the species, but it is unknown how many specimens Kieffer observed or where the specimen(s) are. There is a double point-mounted female specimen at the MNHN (MNHN EY25346) with locality information matching that given in Kieffer (1907a). Dessart left a label on this specimen in 1973 designating it the female paralectotype of *Conostigmus leviventris*, while also leaving the comment “= rufescens f. ailee!”. However, Dessart never formally synonymized *C. leviventris* with *C. rufescens*. The identity and whereabouts of the implied lectotype are unknown. The female specimen is double point mounted and in poor condition. Unfortunately, the specimen is missing its head, and the pin it is double point-mounted on has begun to rust.

Conostigmus pedester Kieffer, 1913 Figs 21–22

Conostigmus pedester Kieffer, 1913b: 13, ♂, ♀. MNHN.

Conostigmus pedester – Kieffer 1914c: 177, 215. Description, keyed. — Dessart 1966a: 24. Lectotype designation, description; 1997a: 62, 125. Description, keyed.

Material examined

Lectotype

KENYA • ♀; “AFRIQUE ORIENTALE ANGLAISE: mont Kénya: prairies alpines: a une altitude de 3.300 et 3.700 m., 27 janvier 1912, st. no 43. -- escarpements rocheux sur la rive gauche de Haugsburg vallée, altitude de 3.650 m., 31 janvier 1912, st. no 44; tamisages” (Kieffer 1913b: 14); MNHN EY25354, EY22452, EY22453.

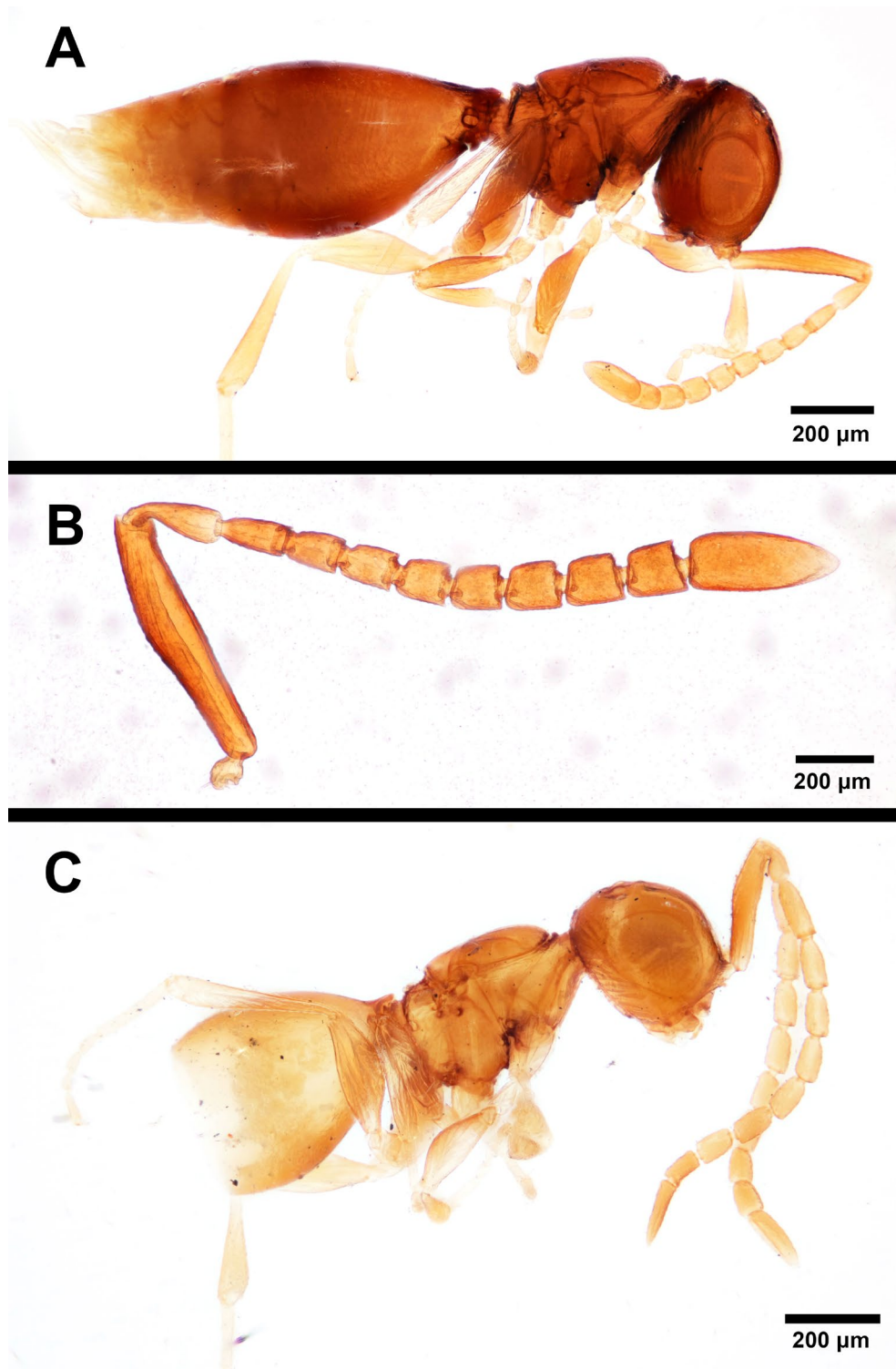


Fig. 21. *Conostigmus pedester* Kieffer, 1913. **A–B.** Lectotype, ♀. **A.** Specimen in ethanol, lateral view (MNHN EY25354). **B.** Left antenna (MNHN EY22452). **C.** Paralectotype, ♂, in ethanol, lateral view (MNHN EY25356).

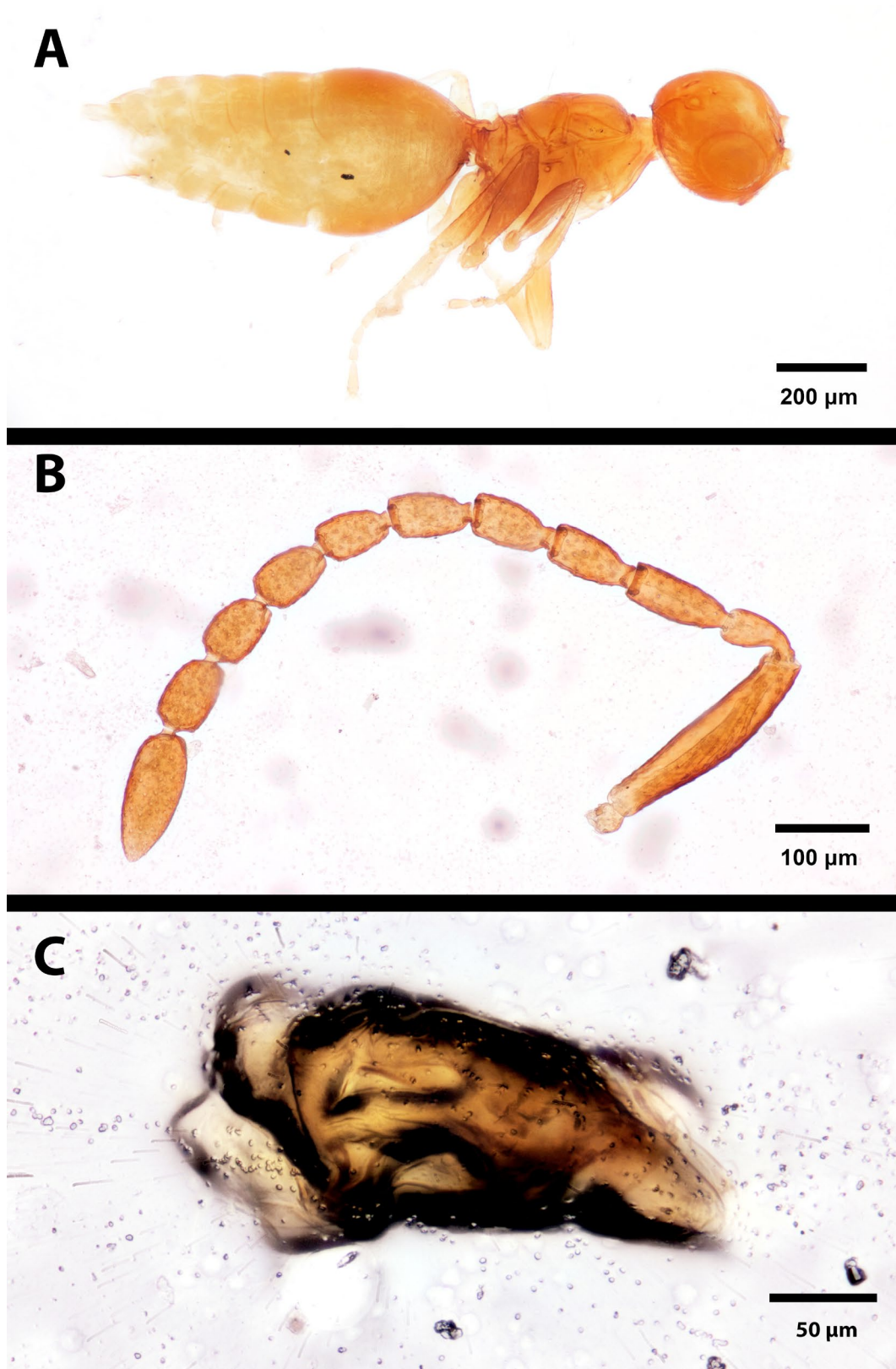


Fig. 22. *Conostigmus pedester* Kieffer, 1913, allolectotype, ♂. **A.** Lateral habitus (MNHN EY25353). **B.** Left antenna (MNHN EY22450). **C.** Genitalia, lateral view, in poor condition (MNHN EY22451).

Allolectotype

KENYA • ♂; same data as for lectotype; MNHN EY25353, EY22450, EY22451.

Paralectotypes

KENYA • 1 ♂; same data as for lectotype; MNHN EY25356 • 2 ♀♀; same data as for lectotype; EY25355.

Note

The specimens do not include individual labels with locality information, so it is uncertain which specimens came from which locality.

Distribution

Afrotropical.

Comments

Kieffer (1913b) described both the male and female of *Conostigmus pedester* from specimens collected by Ch. Alluaud and R. Jeannel on their 1911–1912 African expedition. Dessart (1966a) redescribed and illustrated the species. There are five specimens in all at the MNHN, two males and three females. Dessart (1966a) designated a female lectotype and male allolectotype, with the remaining specimens as paralectotypes. The type information is missing from the specimens, but is provided in Dessart (1966a).

The female lectotype is in ethanol (vial MNHN EY25354). There are two slide preparations (prép. no. 6506/042), one with the left antenna (MNHN EY22452) and one with a reduced wing (MNHN EY22453).

The male allolectotype is also in ethanol (vial MNHN EY25353). There are two slide preparations (prép. no. 6506/041), one with the left antenna (MNHN EY22450) and the other with the male genitalia in poor condition (MNHN EY22451). The right antenna is missing.

The male paralectotype is in ethanol (vial MNHN EY25356) and bears a determination label from Kieffer marked with “Type 44”. The metasoma is missing the end segments and genitalia, which was noted in Dessart (1966a). The two female paralectotypes are together in the same ethanol vial (MNHN EY25355), and bear a determination label from Kieffer marked with “Type 43”. The two female paralectotypes were not imaged.

Genus *Dendrocerus* Ratzeburg, 1852

Dendrocerus omostenus Dessart, 1979

Fig. 23

Dendrocerus omostenus Dessart, 1979b: 34, ♀. MNHN.

Dendrocerus omostenus – Fergusson 1980: 301. Possibly a species of *Conostigmus*.

Material examined

Holotype

ALGERIA • ♀; “«Oran, 7-4-1958 / J. Bar- bier», «1069», «Prép. microscopiques N° 7707 /081»” (Dessart 1979b: 38); MNHN EY25348, EY22455, EY22456.

Distribution

Palaearctic.

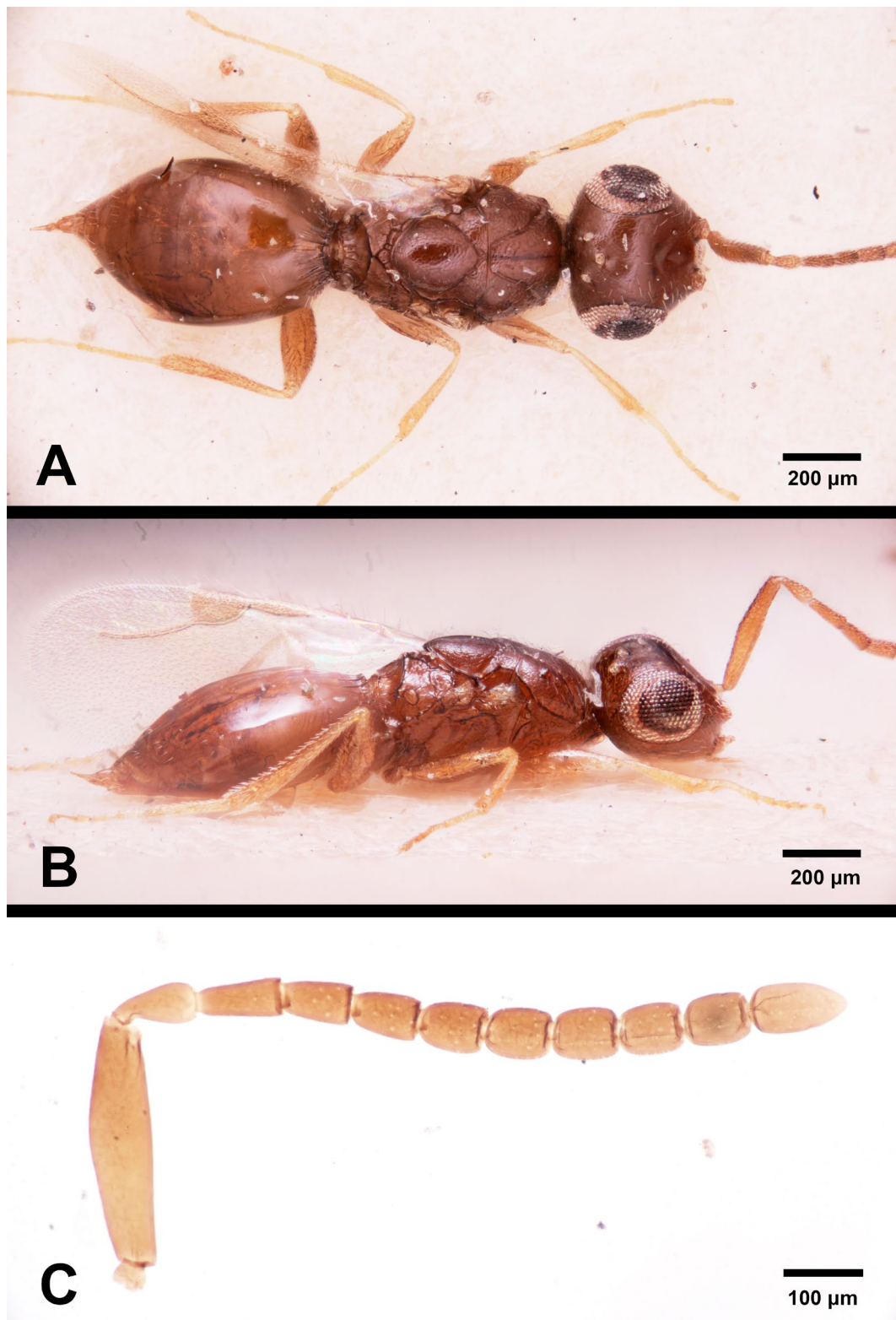


Fig. 23. *Dendrocerus omostenus* Dessart, 1979, holotype, ♀. A. Dorsal habitus (MNHN EY25348). B. Lateral habitus. C. Right antenna (MNHN EY22455).

Comments

Dessart (1979b) described this species from a single female specimen. In his publication, he explains that he placed the species in the genus *Dendrocerus* mainly because of the ocellar triangle, which is an isosceles triangle and has a broad base in this species, whereas in species of *Conostigmus* the ocellar triangle is more equilateral. He notes that the species also lacks a sternaulus, which is sometimes present in *Conostigmus* but always absent in *Dendrocerus*. However, he does admit that the species bears similarities to the genus *Conostigmus*, notably in the scape, the presence of the supraclypeal depression, and the slim appearance of the noutalices and the mesosoma (Dessart 1979b).

The single female specimen is card mounted (MNHN EY25348), with two slide preparations (prép. no. 7707/081) of the right antenna (MNHN EY22455) and the right fore and hind wings (MNHN EY22456).

Dendrocerus remaudierei Dessart, 1974
Figs 24–25

Dendrocerus (Macrostigma) remaudierei Dessart, 1974: 76, ♀, ♂. **IPCP, MNHN, MHNG, ISNB.**

Dendrocerus (Macrostigma) remaudierei – Alekseev 1978: 672, 674. Description. — Kiriyak 1978: 41. Keyed. — Alekseev & Radchenko 2001: 10, 11. Keyed.

Dendrocerus remaudierei – Fergusson 1980: 301. Diagnosis. — Dessart & Gärdenfors 1985: 209. Keyed.

Material examined

Holotype

FRANCE • ♂; “«Sur Salix/9 km E. Varaville/(Calvados) 16-IX-72/Ecl. 21-X-1972: Réc. G. Remaudière» et «P. Dessart det. 1973/Dendrocerus/remaudierei/sp. n.»” (Dessart 1974: 83); MNHN EY25335, EY22468, EY22469, EY22472.

Allotype

FRANCE • ♀; same data as for holotype; MNHN EY25336, EY22470, EY22471.

Paratypes

FRANCE • 2 ♂♂; same data as for holotype; MNHN EY25337, EY25338.

Distribution

Palaearctic.

Comments

Dessart (1974) described this species from male and female specimens. The species was named after Dr. G. Remaudière, who reared the specimens from aphids. Dessart reported that the holotype, the allotype, one female paratype, and seven male paratypes were given to Dr. Remaudière at the IPCP: in addition, Dessart (1974) reports a male paratype and a female paratype deposited at the MHNG, and four additional female paratypes and four male paratypes at the ISNB.

It appears that the specimens deposited at the IPCP were moved to the MNHN, likely following Dr. Remaudière’s retirement. CT found four specimens, including the holotype, the allotype and two male paratypes at the MNHN. CT contacted the IPCP but was told that the specimens are not there; it is uncertain what happened to the remaining six paratype specimens.

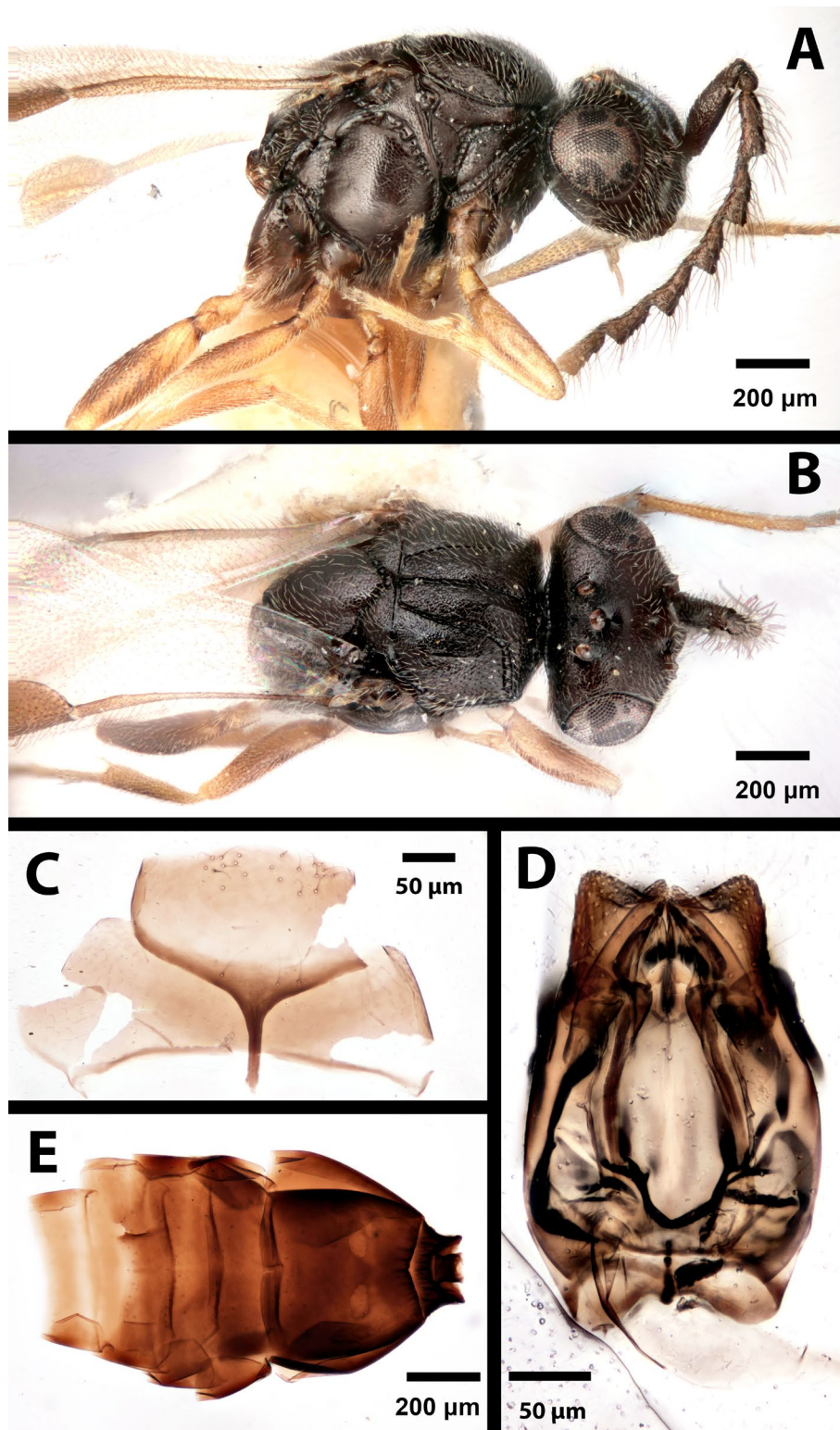


Fig. 24. *Dendrocerus remaudierei* Dessart, 1974, holotype, ♂. **A.** Lateral habitus (MNHN EY25335). **B.** Dorsal habitus (MNHN EY25335). **C.** Dorsal view of male S9 (MNHN EY22468). **D.** Ventral view of male genitalia (MNHN EY22469). **E.** Ventral view of metasoma (MNHN EY22468).

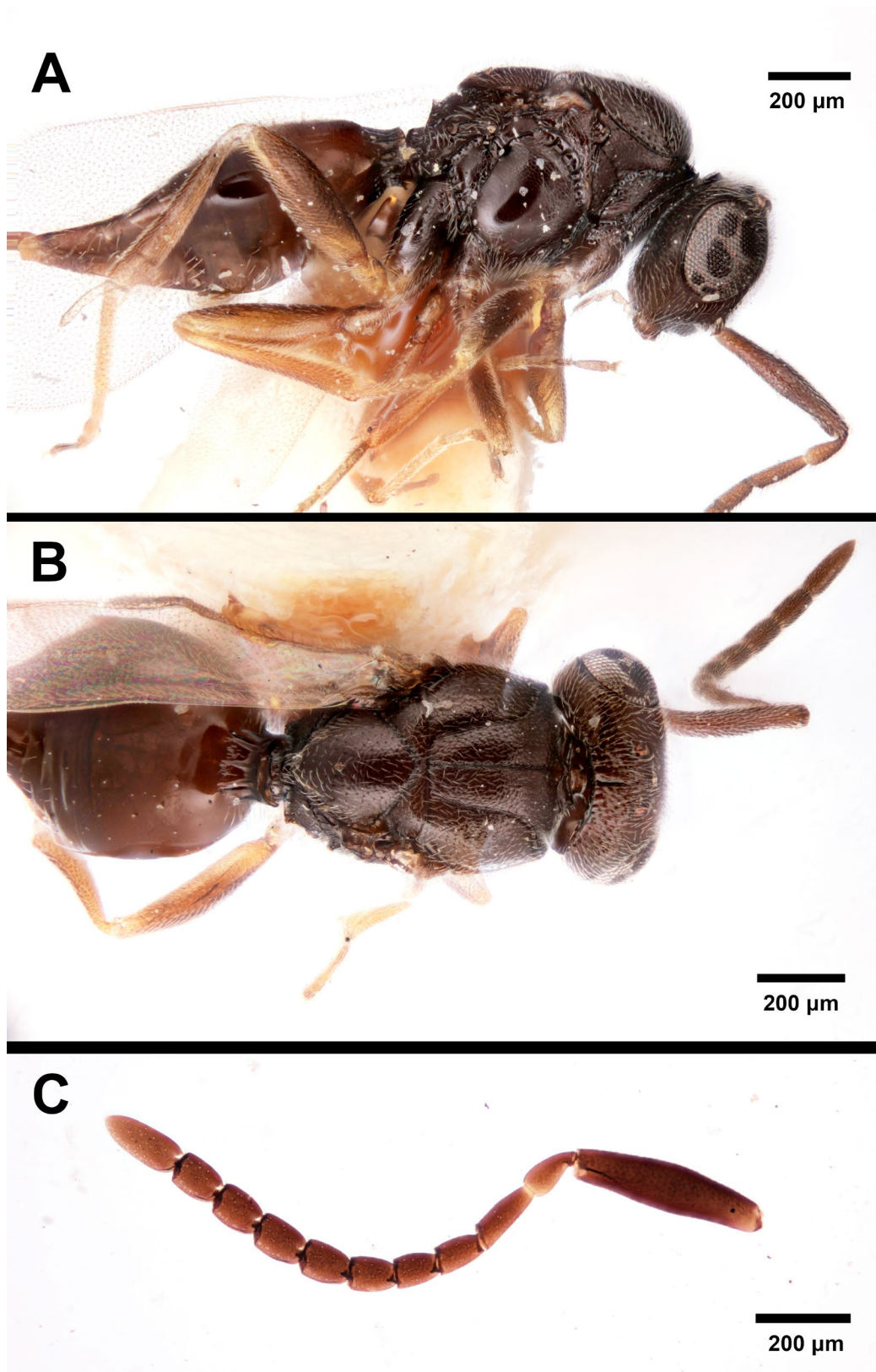


Fig. 25. *Dendrocerus remaudierei* Dessart, 1974, allotype, ♀. **A.** Lateral habitus (MNHN EY25336). **B.** Dorsal habitus (MNHN EY25336). **C.** Lateral view of the right antenna (MNHN EY22471).

The male holotype specimen has three associated microscope preparations (prép. no. 7301/191). One slide (MNHN EY22469) contains the male genitalia, which are in poor condition; the second (MNHN EY22468) contains the metasoma and fragments. The last slide (MNHN EY22472) with the right antenna is broken, with the pieces gathered together in an envelope. The remainder of the specimen is point mounted (MNHN EY25335).

The female allotype is also point mounted (MNHN EY25336) and has two slide preparations (prép. no. 7301/194), with one slide containing the right fore and hind wings (MNHN EY22470) and the other slide containing the right antenna (MNHN EY22471). There are also two male paratypes that are point mounted (MNHN EY25337 and MNHN EY25338) and were not imaged.

Putative types and other specimens of note

Aphanogmus aphidi (Risbec, 1955)

Fig. 26

Ceraphron aphidi Risbec, 1955: 216, 219, ♂, ♀. Keyed. **PBZT?, MNHN.**

Ceraphron aphidi – Risbec 1956: 833. Variation.

Aphanogmus aphidi – Dessart 1962: 297. Generic transfer, description; 1989: 215. Diagnosis.

Material examined

Syntype

MADAGASCAR • ♀; “Bekily VIII 1933. A. SEYRIG” (Risbec 1955: 221); MNHN EY22474.

Other specimens

MADAGASCAR • 8 ♀♀, 1 ♂; MNHN EY22459 • 15 ♀♀; Lac Alaotra; MNHN EY22460 • 5 ♂♂, 8 ♀♀; MNHN EY22461 • 4 ♀♀; MNHN EY22462.

Distribution

Afrotropical.

Comments

Risbec (1955) originally described the species *Ceraphron aphidi* from male and female specimens collected in Tsimbazaza, located in Antananarivo, Madagascar. However, no repository for these specimens was ever indicated. The type information was given as follows: “Localité et hôtes. Tsimbazaza. Parasites de pucerons sur les feuilles de *Schinus mollis* 5 ♀, 1 ♂. Sortie des adultes 19.6.1952. N° 1071.” (Risbec 1955: 220). A second set of locality information, presumably of more paratypes, is given as follows: “Même localite. Parasites de pucerons sur les feuilles de *Bauhinia* sp. Elevage du 12.7.1951. Sortie des adultes 6.8.1951. N°912. RENAUD PAULIAN” (Risbec 1955: 221). On a fresh line, what appears to be a third set of locality information is given as “Bekily VIII 1933. 12 females. A. SEYRIG” (Risbec 1955: 221).

Dessart (1962) acquired a loan of specimens on a microscope preparation that was deposited at Antananarivo, possibly the PBZT in Antananarivo, Madagascar. The microscope preparation Dessart viewed was labeled only with the words “*Ceraphron aphidi* RISBEC”, but contained five females and one male specimen, corresponding with the first series of types described by Risbec (1955). Dessart (1962) assumed these specimens to be the one male and five female specimens cited in Risbec (1955), and moved the species from *Ceraphron* to *Aphanogmus* based on antennal characters.

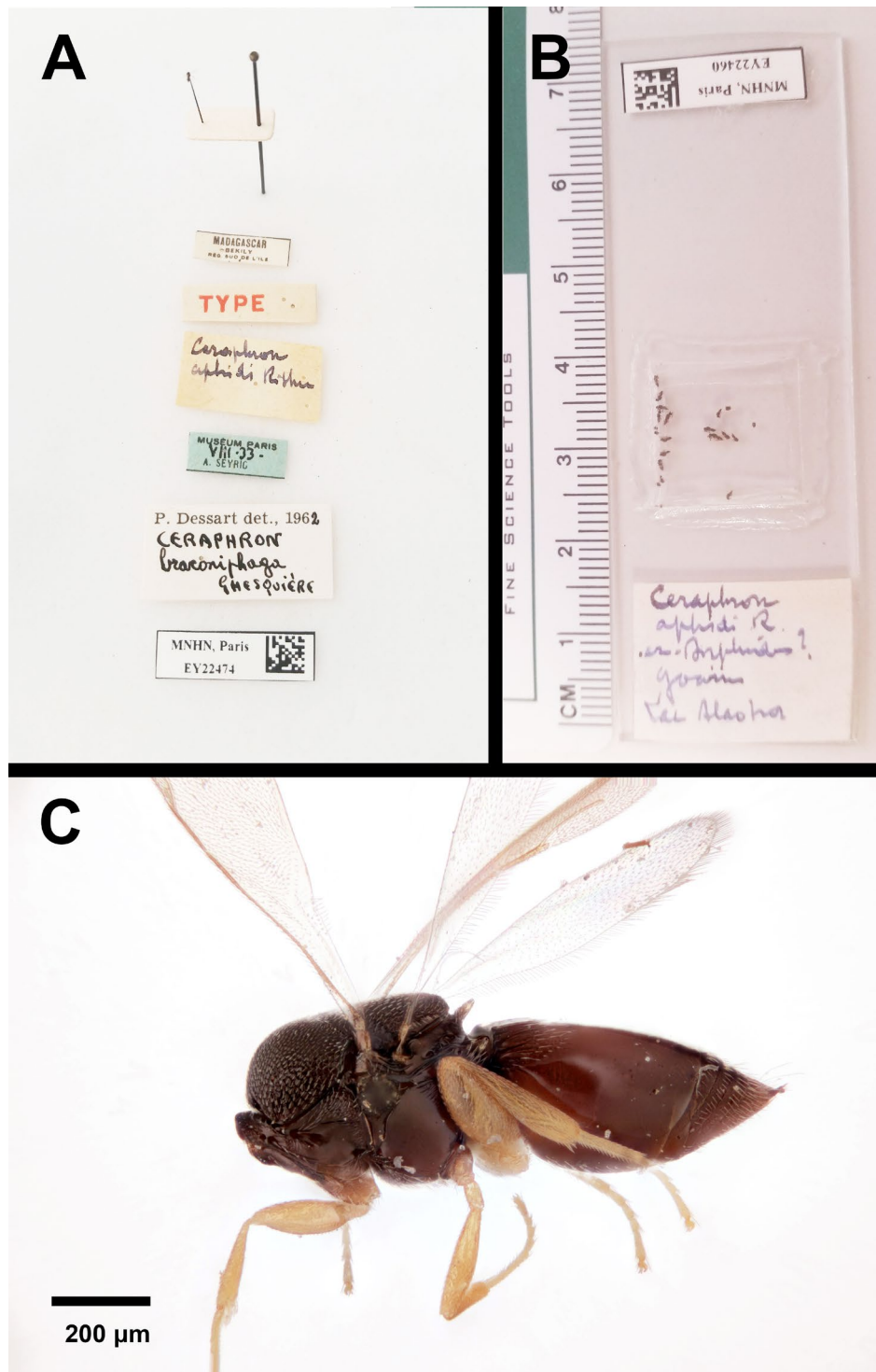


Fig. 26. *Ceraphron aphidi* (Risbec, 1955). **A.** The double-point mounted syntype female and labels, showing the “TYPE” label (MNHN EY22474). **B.** One of the lots of specimens labeled as *Ceraphron aphidi* (Risbec, 1955), and mounted on slides in glycerine, presumably by Risbec (MNHN EY22460). **C.** Lateral habitus of the double-point mounted syntype female (MNHN EY22474).

At the MNHN, CT discovered one double point mounted female specimen labeled as *Ceraphron aphidi* Risbec and bearing a label saying “TYPE” (MNHN EY22474). The locality information on this specimen matches one of those given in Risbec (1955), and it is likely one of the twelve females mentioned in this publication. It is uncertain who put the type label on this, or where the other specimens from the same locality are, but based on the matching locality label information, we presume this to be one of the missing syntypes. This specimen is absent from the discussion of the species in Dessart (1962), but we know that Dessart viewed it, because he added a label to it in 1962 (presumably after the publication) identifying it as *Ceraphron braconiphaga* Ghesquière, 1942. Though later Dessart (1971) synonymized *Ceraphron braconiphaga* with *Aphanogmus fijiensis*, he makes no mention of this specimen in that publication, and never officially synonymized the species *Aphanogmus aphidi* with *Aphanogmus fijiensis* during his lifetime (Johnson & Musetti 2004).

In the slide collection, CT also found a case of Risbec slides containing four slides labeled as *Ceraphron aphidi* Risbec. Each slide preparation had multiple specimens floating freely in glycerine, protected by an additional glass coverslide attached with wax along the edges. These slides do not appear to be types according to their limited locality information, but they appear to be prepared in the same way as the other Risbec slides mentioned in Dessart (1962). Though we know Dessart viewed the double point mounted specimen, there is no indication that he ever saw these four slide-mounted specimen lots at the MNHN. Perhaps if he had been able to study these specimens, he would have been able to confirm whether these specimens are actually *Ceraphron braconiphaga* or *Aphanogmus fijiensis*.

***Ceraphron testaceus* (Risbec, 1953)**

Fig. 27

Ceranogmus testaceus Risbec, 1953a: 560, Fig. 4, ♂.

Ceraphron testaceus – Dessart 1962: 300. Generic transfer.

Ceraphron (?) testaceus – Dessart 1989: 224. Keyed.

Material examined

Holotype

CÔTE D’IVOIRE • ♂; “Adiopodoumé. Sur galles de *Phytolyma lata* 7-1951. A Ledoux.” (Risbec 1953a: 563); MNHN EY22457.

Other material

COUNTRY UNKNOWN • 1 ♂; MNHN EY22458.

Distribution

Afrotropical.

Comments

Risbec (1953a: 560) described the new genus *Ceranogmus* as a “Genre voisin de *Ceraphron* et *Aphanogmus*”. Risbec (1953a) described the species *Ceranogmus testaceus* Risbec as the type species for this genus, providing a detailed description and illustration. The species was described based on a single male with the following locality information: “Adiopodoumé. Sur galles de *Phytolyma lata* 7-1951. A Ledoux.” (Risbec 1953a: 563). A type repository was never indicated for the specimen.

Dessart synonymized this genus with *Ceraphron* (Dessart 1962) and later included the species *Ceraphron testaceus* in a key to African species, but these were based largely on the description and the illustrations of *Ceranogmus testaceus* that Risbec (1953a) provided. It is clear from his writing and the question

marks peppered throughout it that Dessart never found or observed the type specimen for the species for himself.

CT found 2 slides labeled “*Ceranogmus testaceus* Risbec” in the same case of Risbec material containing the *Ceraphron aphidi* slides in the MNHN collections. Like the slides for *Ceraphron aphidi*, each slide preparation had one or multiple specimens floating freely in glycerine, protected by an additional glass cover slide attached with wax along the edges. One slide, MNHN EY22457, has information that matches the locality information given for the type in Risbec (1953a). The slide contains a male specimen with the head detached. Since Risbec did not always label his type specimens (David G. Notton pers. comm.), it very likely that this specimen is the missing holotype, and we consider it as such. The second slide (MNHN EY22458) also contains a male specimen with the head detached, but the collection information does not match.

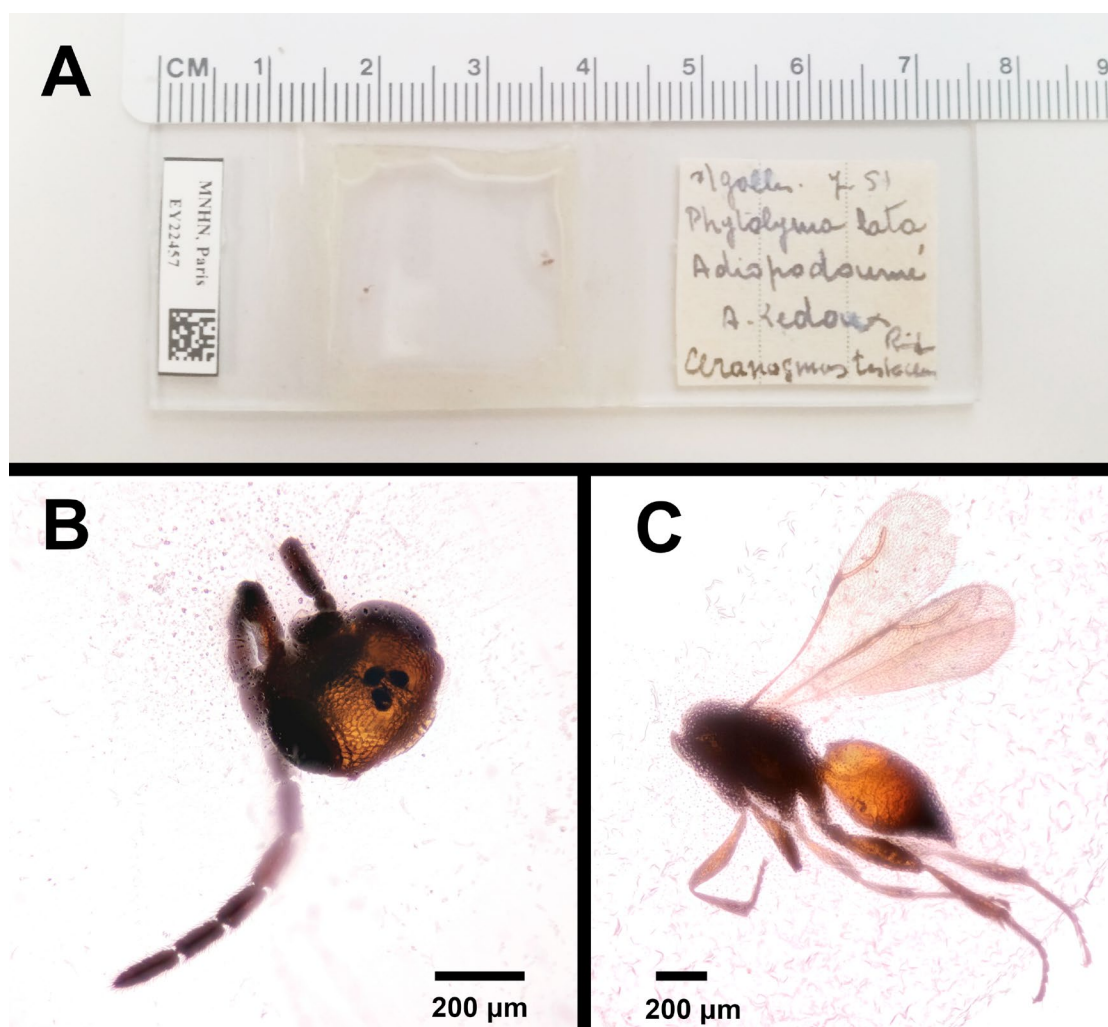


Fig. 27. The rediscovered male holotype of *Ceraphron testaceus* (Risbec, 1953) (MNHN EY22457). **A.** The slide preparation, which consists of glycerine underneath a glass coverslip sealed with wax. **B.** A dorsal view of the head and antennae of the male specimen. **C.** A lateral habitus of the body, legs and wings. Imaging was difficult due to the state of the preparation.

Conostigmus gestroi Kieffer, 1907

Fig. 28

Conostigmus Gestroi Kieffer, 1907b: 159, ♀.

Conostigmus kaszabi Szabo, 1979: 89, ♀. HNHM. Synonymized with reservations by Dessart (1983).

Conostigmus gestroi – Kieffer 1914c: 176, 208. Description, keyed. — Dessart 1983: 115. Synonymy.

Conostigmus kaszabi – Dessart 1983: 115, 116. Junior synonym of *Conostigmus gestroi* Kieffer, 1907.

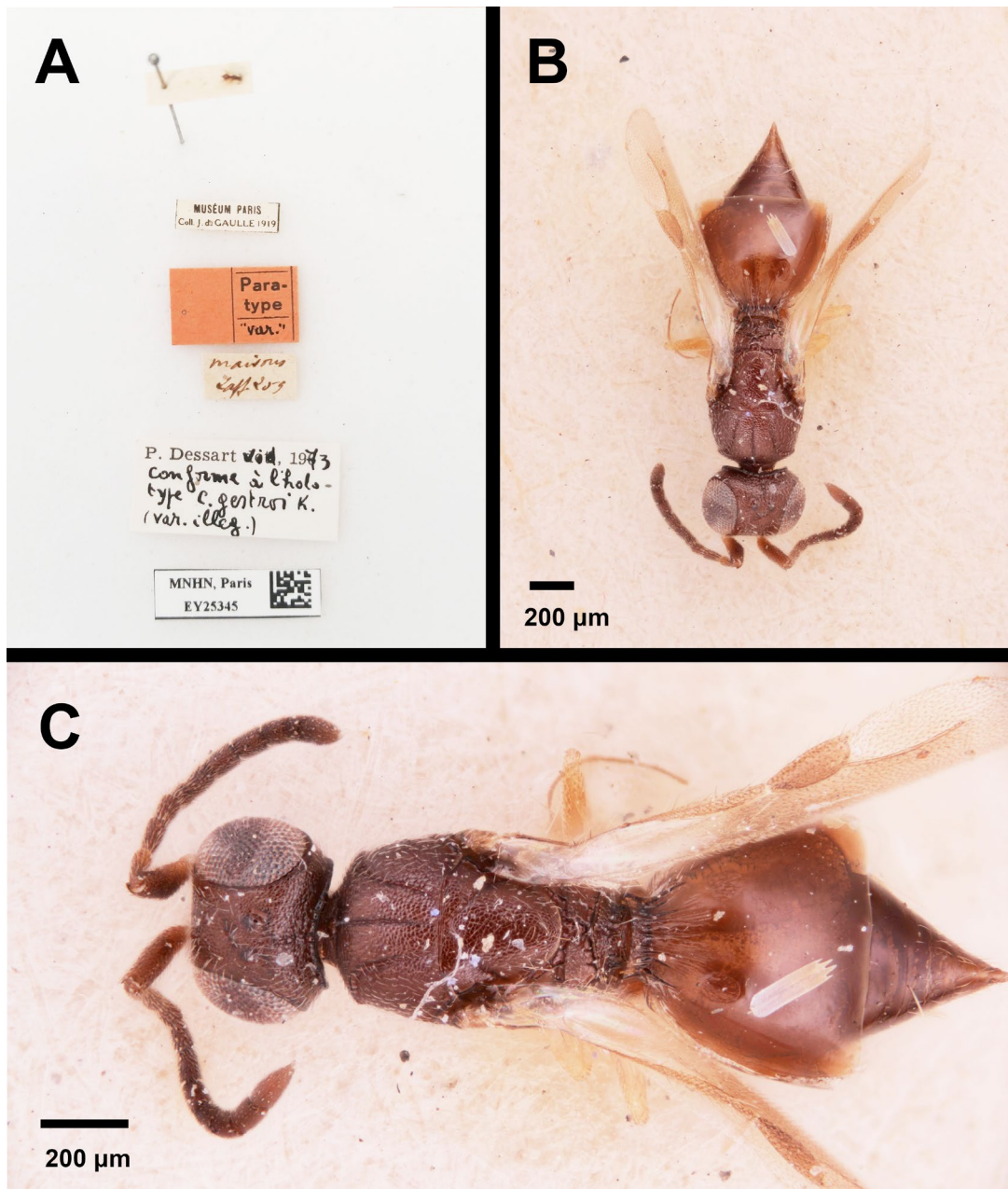


Fig. 28. *Conostigmus gestroi* Kieffer, 1907, female variety (MNHN EY25345). **A.** The labels with the specimen, including Dessart’s label considering it a “var. illeg.”. **B.** Dorsal habitus. **C.** A closer dorsal view.

Material examined

FRANCE • 1 ♀; “PATRIE. France: Maisons-Lafitte (De Gaulle), variété à tête chagrinée et parsemée de points très distincts, flagellum mince, filiforme, hanches brun noir (Kieffer 1907b: 159); MNHN EY25345.

Distribution

Palaearctic.

Comments

When Kieffer (1907b: 159) described the species *Conostigmus gestroi* from a female, he noted the existence of a “variété à tête chagrinée et parsemée de points très distincts, flagellum mince, filiforme, hanches brun noir,” collected from France at “Maisons- Laffite (De Gaulle)”. Although the location of the holotype of the species is unknown, Dessart found a female specimen in the MNHN that was consistent with the variety Kieffer described. Dessart viewed and left a label on the specimen in 1973 considering it a “var. illeg.”. Though Dessart hesitantly synonymized *Conostigmus kaszabi* with *C. gestroi* (1983), this publication does not comment on the MNHN specimen or mention *C. gestroi* as a “var. illeg.”

The female specimen is card mounted (MNHN EY25345) and in good condition, with no pieces missing.

Conostigmus muesebecki (Dessart & Masner, 1965)

Ecnomothorax muesebecki Dessart & Masner, 1965: 277, 287, ♂, ♀. USNM. Keyed.

Material examined

None (see Comments).

Distribution

Nearctic.

Comments

Johnson & Musetti (2004) report that the male and female type specimens of *Ecnomothorax muesebecki* are deposited at the MNHN. However, this is a mistake in the catalog. These specimens are actually deposited in the National Museum of Natural History (USNM) in Washington, D.C., as specified in the original publication (Dessart & Masner 1965).

Dendrocerus serricornis (Boheman, 1832)

Fig. 29

Ceraphron serricornis Boheman, 1832: 334, ♂. MZLU.

Ceraphron serricornis Zetterstedt, 1840: 413, ♂. MZLU. Preoccupied by *Ceraphron serricornis* Boheman, 1832. A junior objective synonym of *Ceraphron serricornis* Boheman, 1832, synonymized by Dessart (1972c).

Ceraphron Piceae Ratzeburg, 1852: 179. Type apparently destroyed. Synonymized by Dessart (1972c).

Ceraphron lapponicus Thomson, 1858: 290, ♀. NHRS. Synonymized by Dessart (1972c).

Lygocerus Subramosus Kieffer, 1907a: 39, ♂, ♀. Synonymized with reservations by Dessart (1972c).

Lygocerus pinicola Muesebeck, 1959: 92, ♂, ♀. USNM. Synonymized by Dessart (1996).

Atritomellus zetterstedti Ghesquière, 1960: 208. Replacement name for *Ceraphron serricornis* Zetterstedt, 1840. Synonymized by Dessart (1972c).

- Ceraphron serricornis* Boheman – Thomson 1858: 292. Description.
Lygocerus serricornis (Boheman) – Marshall 1868: 158. Generic transfer. — Kieffer 1909: 8. Generic transfer; 1914c: 147, 156. Description, keyed.
Lygocerus lapponicus – Dalla Torre 1898: 534. Generic transfer. — Kieffer 1914c: 148, 159. Description, keyed.
Megaspilus piceae – Kieffer 1906: 256. Generic transfer.
Lygocerus Lapponicus – Kieffer 1907a: 56. Description.
Lygocerus Piceae – Kieffer 1907a: 65. Description.
Ceraphron Serricornis Zetterstedt – Kieffer 1907b: 261. Description.
Dendrocerus serricornis (Zetterstedt) – Kieffer 1909: 6. Generic transfer.
Atritomellus serricornis (Zetterstedt) – Kieffer 1914c: 142, 143. Generic transfer, description, keyed.
Lygocerus subramosus – Kieffer 1914c: 146, 151. Description, keyed.
Lygocerus piceae – Kieffer 1914c: 162. Description.
Dendrocerus (Macrostigma) subramosus – Dessart 1966b: 13. Generic transfer, subgeneric assignment.
Dendrocerus (?Atritomellus) zetterstedti: Dessart 1966b: 13. Generic transfer, subgeneric assignment.
Lygocerus (Lygocerus) lapponicus – Hellén 1966: 10, 13. Description, subgeneric assignment, keyed.
Lygocerus pinicola – Masner & Muesebeck 1968: 113. Type information. — Dessart 1996: 289. Junior synonym of *Dendrocerus serricornis* (Boheman, 1832).
Dendrocerus (Macrostigma) serricornis (Boheman) – Dessart 1972c: 31, 43, 251, figs 145–154. Description, illustration, synonymy, type information, keyed, subgeneric transfer. — Teodurescu 1973: 67. Description. — Alekseev 1978: 671, 675. Description. — Alekseev & Radchenko 2001: 10, 11. Keyed.
Ceraphron serricornis Zetterstedt – Dessart 1972c: 253. Junior synonym of *Dendrocerus (Macrostigma) serricornis* (Boheman, 1832).
Atritomellus zetterstedti – Dessart 1972c: 253, 267. Junior synonym of *Dendrocerus (Macrostigma) serricornis* (Boheman, 1832).

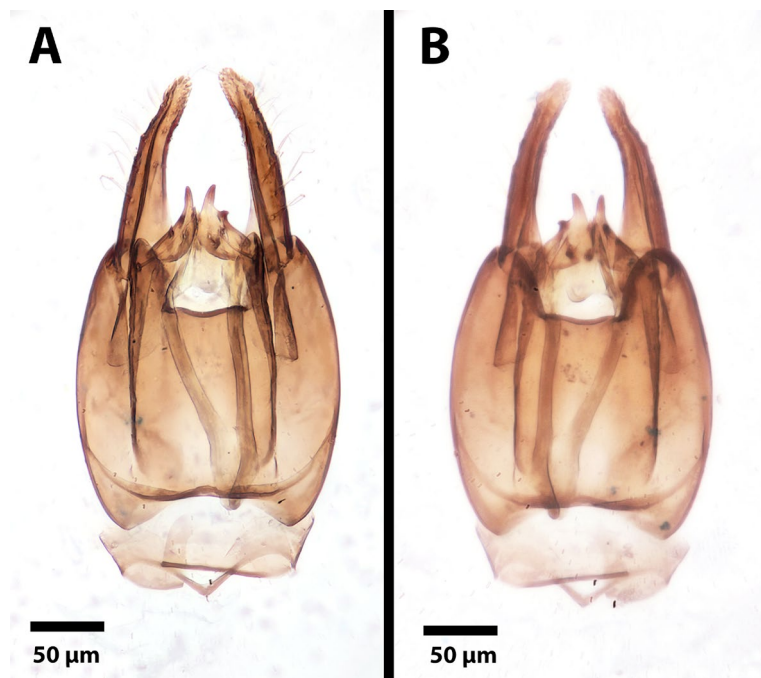


Fig. 29. The male genitalia for *Dendrocerus serricornis* (Boheman, 1832), from the slide preparation (prép. no. 7403/221) Dessart made in 1974 (MNHN EY22454). **A.** Ventral view. **B.** Dorsal view.

Ceraphron lapponicus – Dessart 1972c: 253, 262, 263. Junior synonym of *Dendrocerus (Macrostigma) serricornis* (Boheman, 1832), type information.

Ceraphron piceae – Dessart 1972c: 253, 262. Junior synonym of *Dendrocerus (Macrostigma) serricornis* (Boheman, 1832).

Lygocerus subramosus – Dessart 1972c: 253, 265. Junior synonym of *Dendrocerus (Macrostigma) serricornis* (Boheman, 1832).

Dendrocerus (? *Atritomellus*) *zetterstedti* – Dessart 1972c: 267. Junior synonym of *Dendrocerus (Macrostigma) serricornis* (Boheman, 1832).

Dendrocerus serricornis (Boheman) – Dessart 1978: 299. Diagnosis. — Fergusson 1980: 263, 265, 290. Description, synonymy, keyed.

Material examined

COUNTRY UNKNOWN • 1 ♂; MNHN EY22454.

Distribution

Nearctic and palearctic.

Comments

CT found one slide preparation (prép. no. 7403/221) containing only the male genitalia (MNHN EY22454) that Dessart made in 1974. The rest of the specimen could not be located. Though this specimen is not a type, we felt it was a valuable specimen to image since there are no photographs of *Dendrocerus serricornis* to date. Dessart (1972c) provides illustrations of the male genitalia, which correspond well with the genitalia imaged.

Discussion

With the majority of Ceraphronoidea species descriptions consisting solely of written text published over a century ago, taxonomists must be able to view type specimens to conduct research on the superfamily. However, the type specimens of Ceraphronoidea are scattered across different collections around the world, making it difficult and expensive for researchers to study them firsthand for ongoing studies in biocontrol, the evolution of Hymenoptera, and more. Our aim is to remove the barriers obstructing research on Ceraphronoidea by photographing the type specimens at the MNHN and making these images available to those who wish to study them. In providing these images, as well as our own comments and insights on the species and specimens photographed, we hope to help guide those working on this diverse and fascinating group of parasitoid wasps in the future.

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Electronic supplementary material

[Supplementary File 1](#)

A complete list of all examined Ceraphronoidea specimens from the Muséum national d'Histoire naturelle, Paris (MNHN). In the “Collecting Event/Verbatim Label” column, the symbol “||” is used to indicate separate lines on the same label and the symbol “++” is used to indicate a separate label.

[Supplementary File 2](#)

A Darwin Core file containing the metadata of the specimens from [Supplementary File 1](#), using the template provided by GBIF for upload using the Integrated Publishing Toolkit (<https://www.gbif.org/news/82852/new-darwin-core-spreadsheet-templates-simplify-data-preparation-and-publishing>).