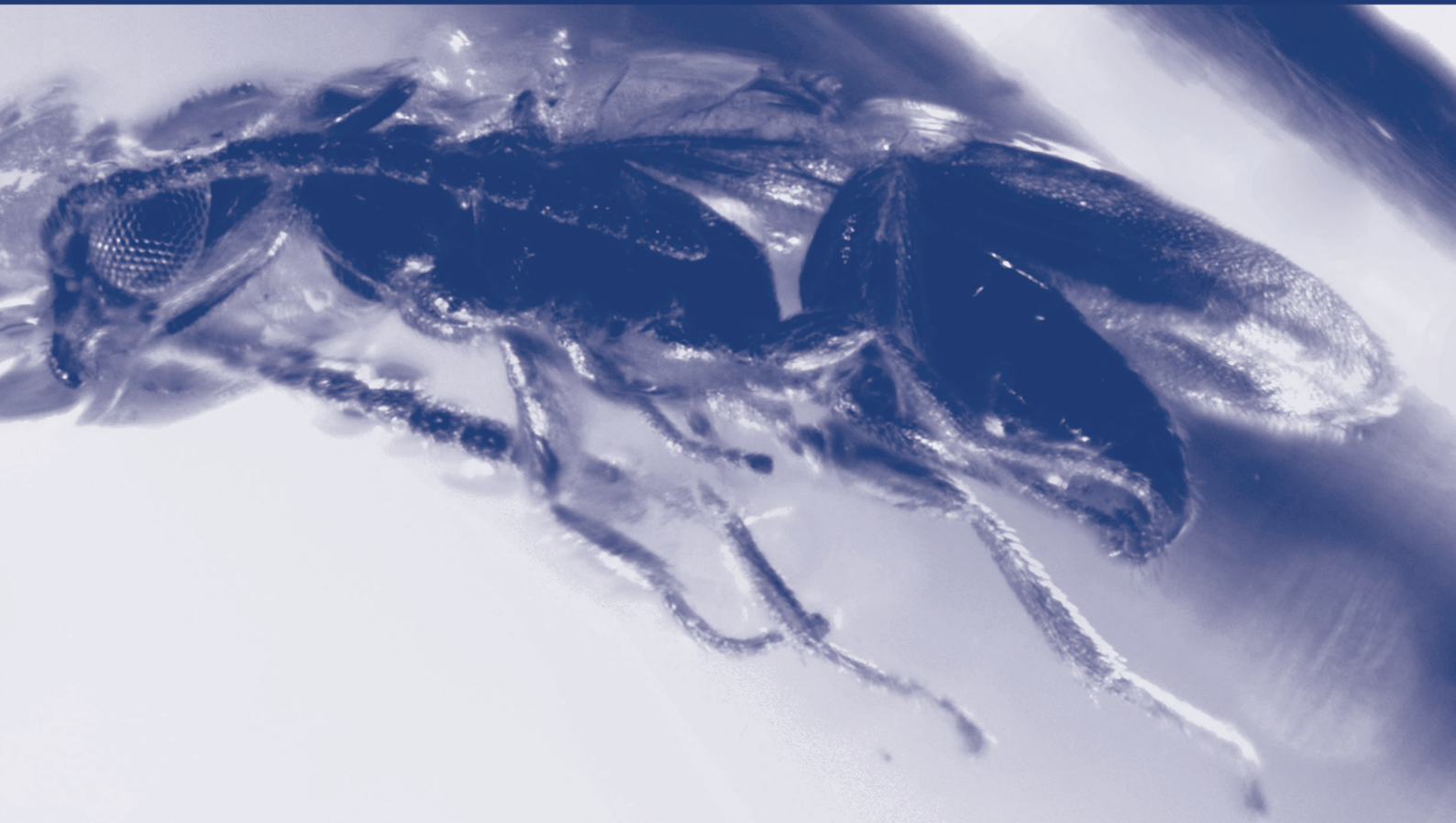


First fossil of the extant flat wasp genus
Dissomphalus Ashmead, 1893
(Hymenoptera: Bethylidae: Pristocerinae)

Elsa FALIÈRES & André NEL



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Dissomphalus schubnelli n. sp., holotype MNHN.F.A71308, habitus left side.

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First fossil of the extant flat wasp genus *Dissomphalus* Ashmead, 1893 (Hymenoptera: Bethylidae: Pristocerinae)

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ABSTRACT

KEY WORDS

Insecta,
earliest Eocene,
amber,
France,
new species.

Dissomphalus schubnelli n. sp., first fossil of the extant pristocerine genus *Dissomphalus* Ashmead, 1893, is described from the Earliest Eocene amber of Oise (France). This genus comprises 424 extant species distributed worldwide (except Antarctica). *Dissomphalus schubnelli* n. sp. is the third described Pristocerinae Mocsáry, 1881 from Oise amber, showing that this subfamily was probably already very diverse at that time.

RÉSUMÉ

Premier fossile du genre actuel de guêpe plate *Dissomphalus* Ashmead, 1893 (Hymenoptera: Bethylidae: Pristocerinae).

MOTS CLÉS

Insecta,
Eocène basal,
ambre,
France,
espèce nouvelle.

Dissomphalus schubnelli n. sp., premier fossile du genre actuel *Dissomphalus* Ashmead, 1893 de la sous-famille Pristocerinae Mocsáry, 1881, est décrit dans l'ambre de l'Éocène basal de l'Oise (France). Ce genre comprend 424 espèces actuelles réparties dans le monde entier (sauf l'Antarctique). *Dissomphalus schubnelli* n. sp. est le troisième Pristocerinae décrit de l'ambre de l'Oise, ce qui montre que cette sous-famille était probablement déjà très diversifiée à cette époque.

INTRODUCTION

Bethylidae Haliday, 1840 are frequently found in Cenozoic amber (Azevedo *et al.* 2018), especially in the earliest Eocene Oise amber of France. We have already recorded one Bethylinae Haliday, 1840 (*Eupsenella eocenica* De Ploëg & Nel, 2004), three Epyrinae Kieffer, 1914 (*Elektroepyrus magnificus* Perrichot & Nel, 2008, *Chlorepyrus gallicus* (Perrichot & Nel, 2008), and *Epyrus moulyi* Falières & Nel, 2018), one Scleroderminae Kieffer, 1914 (*Paleoscleroderma lamarrei* Falières & Nel, 2019), two Pristocerinae Mocsáry, 1881 (*Pristocera alaini* Falières & Nel, 2019, *Eopristocera bilobata* Falières & Nel, 2019), and one Protopristocerinae Nagy, 1974 (*Gynopteron inexpectatus* Falières & Nel, 2019) (De Ploëg & Nel 2004; Perrichot & Nel 2008; Falières & Nel 2018, 2019a, b, c). Thus this hymenopteran family of parasitoids was already well established and diverse in the Paleogene. Here we describe the first representative in this amber of the pristocerine extant genus *Dissomphalus* Ashmead, 1893.

MATERIAL AND METHODS

The fossil was embedded in a small clear piece of amber. It has been prepared using a diamond disk, examined using a Nikon binocular microscope SMZ 1500. Photographs have been taken with an Amscope camera MU900, and the images treated with Adobe Photoshop Element 12.

The nomenclature and classification follow Terayama (2006) and Azevedo *et al.* (2018). The nomenclature of integument sculpture follows Harris (1979).

ABBREVIATIONS

Measurements

DAO	diameter of anterior ocellus;
HE	height of eye;
LFW	length of forewing;
LH	length of head;
OOL	ocello-ocular line;
VOL	vertex-ocular line;
WF	width of frons;
WH	width of head;
WOT	width of ocellar triangle.

Institution

MNHN Muséum national d'Histoire naturelle, Paris.

SYSTEMATIC PALEONTOLOGY

Class INSECTA Linnaeus, 1758
 Order HYMENOPTERA Linnaeus, 1758
 Family BETHYLIDAE Haliday, 1840
 Subfamily PRISTOCERINAE Mocsáry, 1881
 Genus *Dissomphalus* Ashmead, 1893

Dissomphalus schubnelli n. sp.
 (Figs 1–5)

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TYPE MATERIAL. — **Holotype**. ♂; MNHN.FA71308 (PA 16948); MNHN.

TYPE STRATA. — Lowermost Eocene, Sparnacian, level MP7 of the mammal fauna of Dormaal.

TYPE LOCALITY. — Le Quesnoy, Chevreière, region of Creil, Oise department, France.

ETYMOLOGY. — Named after the entomologist Mr Thomas Schubnell.

DIAGNOSIS. — Hypopygium posteriorly triangular, outer median surface flat; clypeus wholly prominent forward, median lobe not well-outlined; dorsal pronotal area short; notauli well-developed and complete; metasomal tergum II longer than I; metasomal tergum II without posterolateral margin strongly incurved; tergal process with pair of dark round pits; no tergal process on tergum III; vein Rs&M of forewing rather oblique.

DESCRIPTION

Male

Body (Fig. 1). 1.25 mm long, not depressed, not strongly foveolate; LFW 0.98 mm; head and mesosoma black; metasoma castaneous lightly iridescent, legs castaneous, antenna castaneous; wings hyaline.

Head (Fig. 3). Smooth, not roughly sculptured; mandible with five apical teeth; five maxillary palpomeres, two or three hardly visible labial palpomeres; no spine on gena; clypeus wholly prominent forward, median lobe not well-outlined; antenna rather long, reaching mid part of metapectal-propodeal complex; 11 flagellomeres, cylindrical but basally narrowed; scape: 0.08 mm long × 0.04 mm wide, pedicel: 0.05 × 0.03 mm, F1: 0.05 × 0.03 mm, F2: 0.06 × 0.03 mm, F3: 0.06 × 0.04 mm, F4: 0.07 × 0.03 mm, F5: 0.05 × 0.04 mm, F6: 0.06 × 0.04 mm, F7: 0.05 × 0.04 mm, F8: 0.05 × 0.04 mm, F9: 0.05 × 0.04 mm, F10: 0.04 × 0.04 mm, F11: 0.08 × 0.04 mm; frons with numerous setae; dorsal part occipital carina present; eye glabrous; WH 0.28 mm; LH 0.34 mm; OOL 0.14; ocellar triangle equilateral.

Mesosoma (Fig. 3A, B). Dorsum smooth, not roughly sculptured but punctured; pronotum with anterior margin of disc apparently not carinate; dorsal pronotal area short; notauli well-developed and complete; parapsidal signum absent or strongly reduced; mesoscuto-mesoscutellar suture opened in its median part, with two lateral foveae, each linked to the suture by thin line; metanotum with medium region narrower than lateral regions, developed medially and overlapping mesoscutellum posteriorly; metanotal groove without foveae but with setae; metapectal-propodeal complex smooth with posterior carina and very small postero-lateral spines.

Forewing (Fig. 2A). Covered with microtricha and bordered with small setae; anterior border not angularly incurved anterior to pterostigma; costal vein present; 2r-rs&Rs vein long and as strong as other veins but not closing cell 2R1; strong vein cu-a more distal than vein M; vein Cu and vein A distal to cu-a; cells R, 1Cu, 2Cu closed; cells 1R1 and 1M absent; no basal stub of Rs+M; poststigmal abscissa of R1

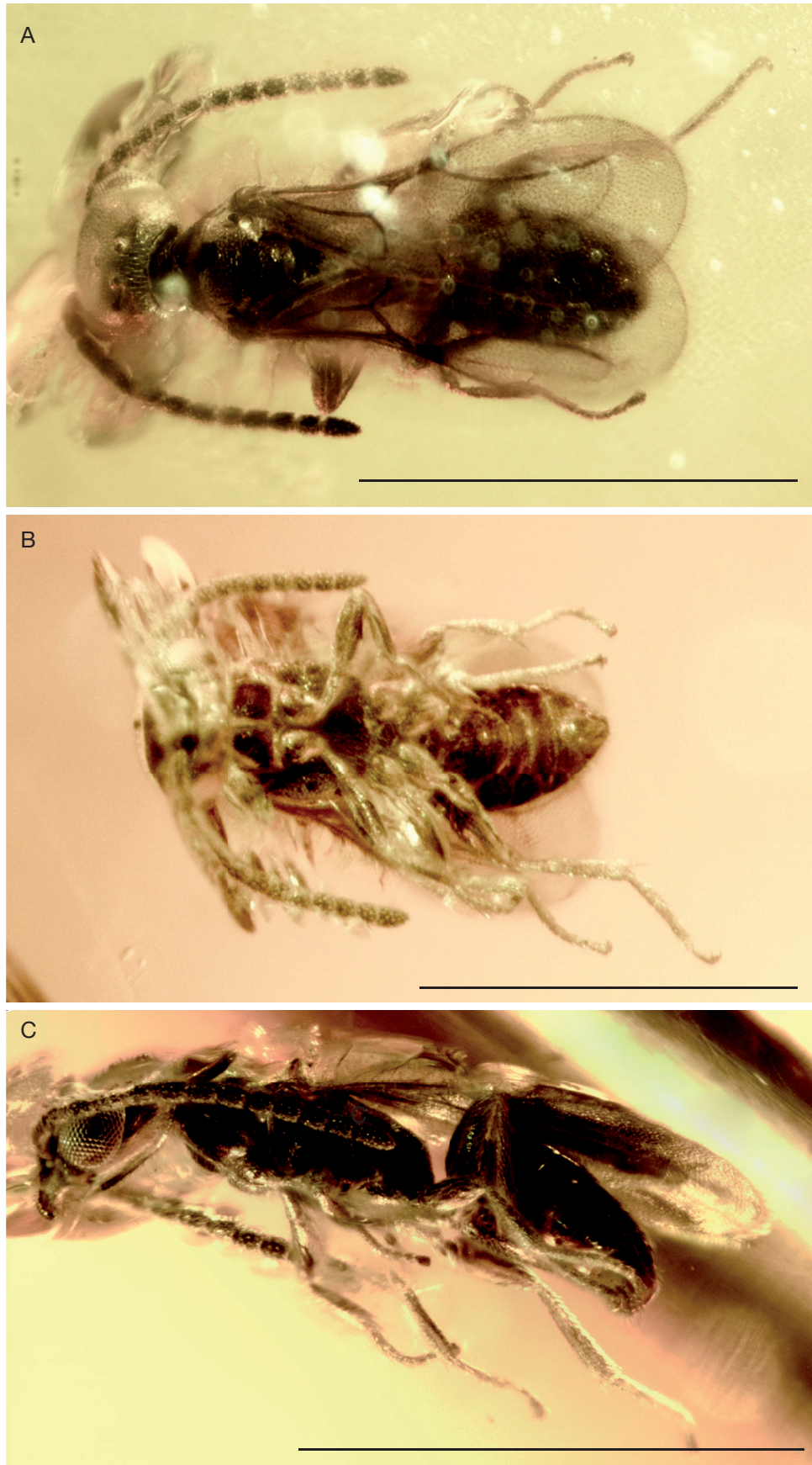


FIG. 1. — *Dissomphalus schubnelli* n. sp., holotype MNHN.FA71308, habitus: **A**, above; **B**, below; **C**, left side. Scale bars: 1 mm.

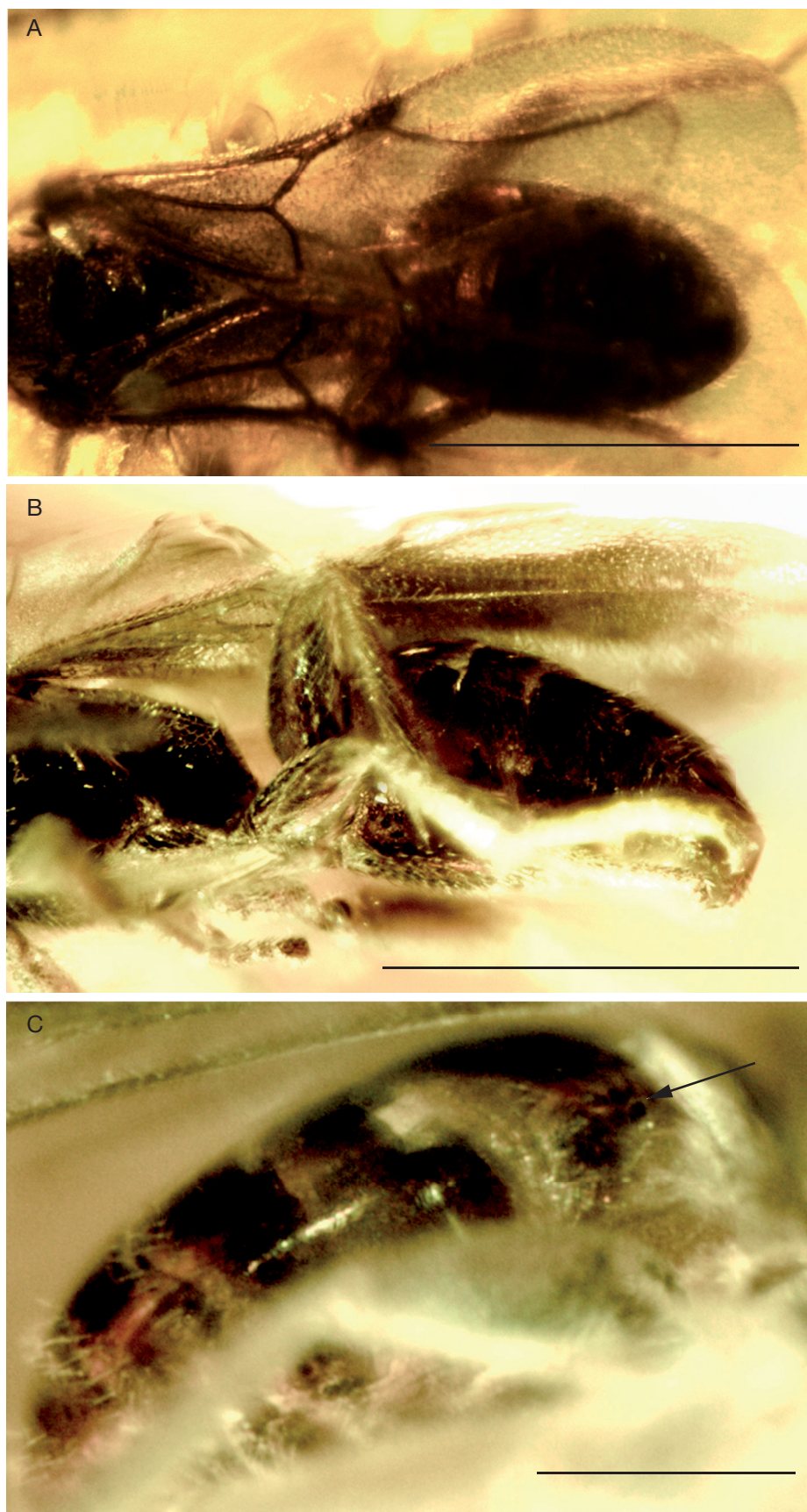


FIG. 2. — *Dissomphalus schubnelli* n. sp., holotype MNHN.F.A71308: **A**, wings; **B**, metasoma left view; **C**, metasoma right view, arrow tergal process. Scale bars: A, B, 0.5 mm; C, 0.2 mm.

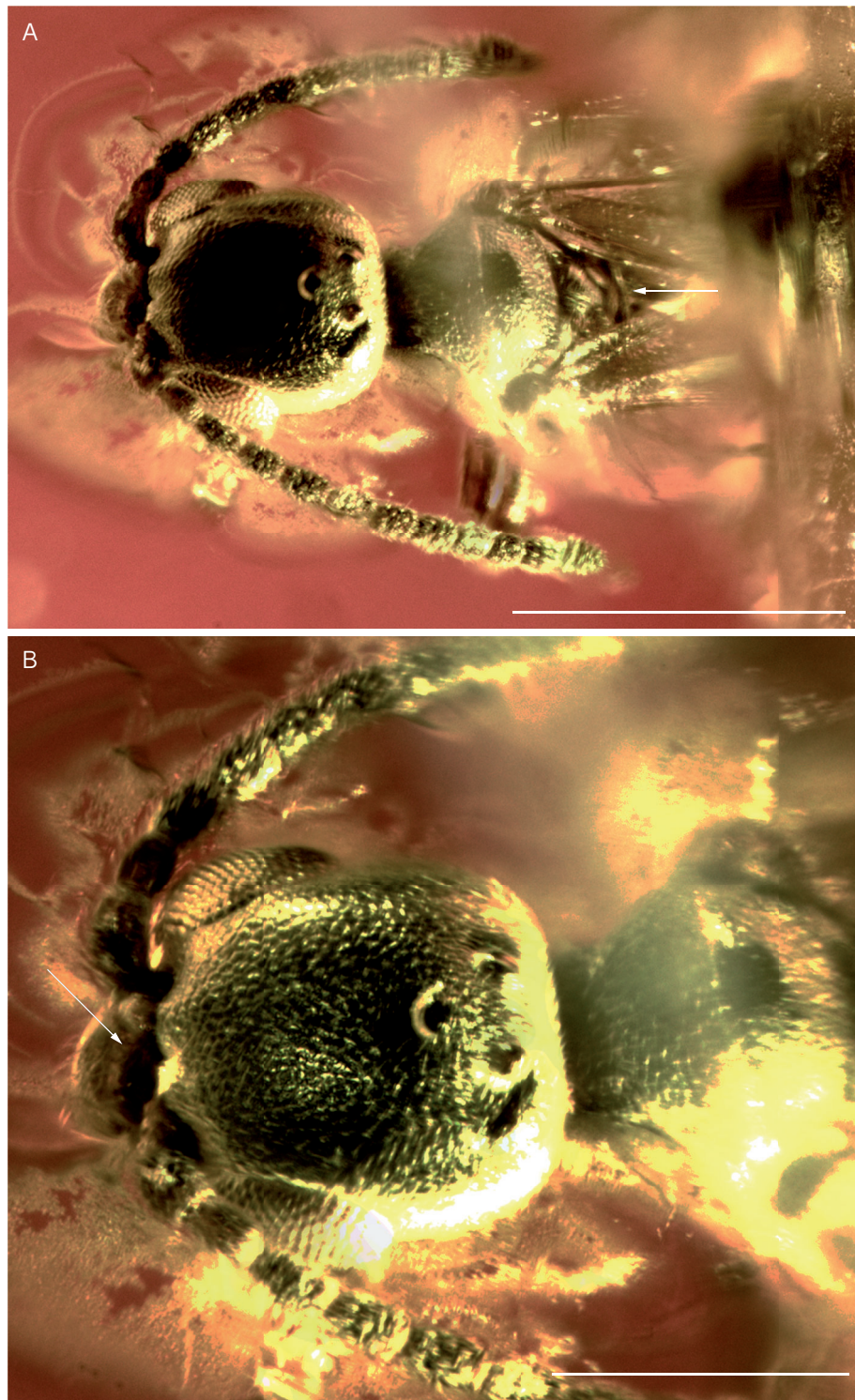


FIG. 3. — *Dissomphalus schubnelli* n. sp., holotype MNHN.F.A71308: **A**, head and anterior part of mesosoma, arrow metanotum; **B**, head, arrow, clypeus. Scale bars: A, 0.4 mm; B, 0.2 mm.

very short, ghost first recurrent vein (FRR) and submarginal cell (cell SMC) present.

Metasoma (Fig. 2B, C). Short petiole; seven tergites, convex, partly covering sternites; posterolateral margin of tergite II without posterolateral margin strongly incurved, with pair

of lateral pits; tergite III without tergal process; hypopygium entire, posteriorly triangular.

Length of tergites. T1 about 0.05 mm, T2 0.12 mm, T3 0.07 mm, T4 0.08 mm, T5 0.07 mm, T6 0.06 mm, T7 0.05 mm.

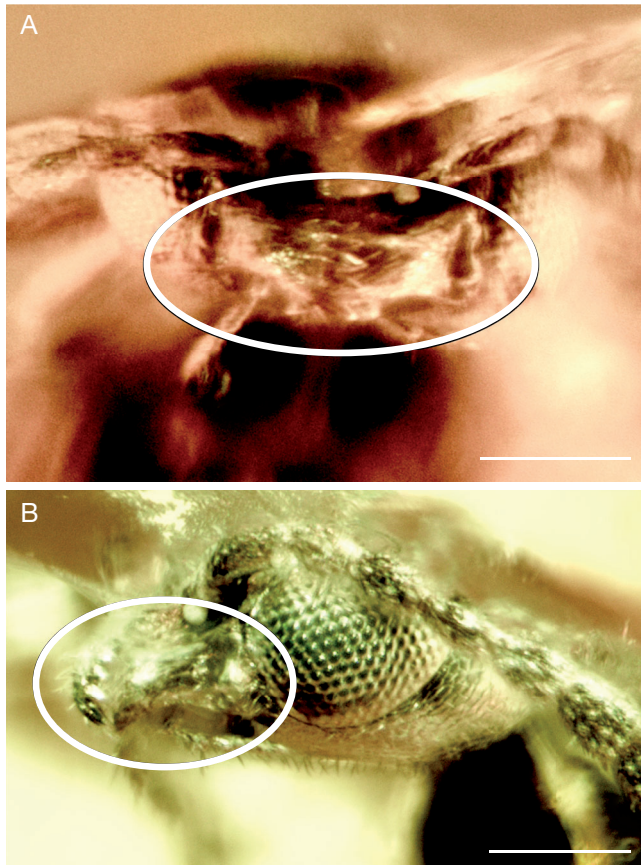


FIG. 4. — *Dissomphalus schubnelli* n. sp., holotype MNHN.F.A71308, mandibles: **A**, front view; **B**, side view; **ellipses**, mandibles. Scale bars: 0.08 mm.

DISCUSSION

Following the key to subfamilies of Azevedo *et al.* (2018), *Dissomphalus schubnelli* n. sp. falls in Pristocerinae because of the following characters: male fully winged; forewing with Rs + M vein absent; metanotum developed medially and overlapping mesoscutellum posteriorly. After the key to pristocerine genera, it would fall near the genus *Dissomphalus* because of the body size smaller than 15 mm; hypopygium not deeply divided into two lobes, posterior margin not incurved, with outer median surface flat; clypeus wholly prominent forward, with median lobe not well-outlined; dorsal pronotal area short; notauli well-developed and complete; metasomal tergum II longer than I; metasomal tergum II without posterolateral margin strongly incurved; with tergal process as a pair of dark round pits; no tergal process on tergum III. Benoit (1956), Terayama (1996) and Azevedo (2014) revised the genus *Trichiscus* Benoit, 1956, closely related to *Dissomphalus*, indicating that the former has tergal processes in the metasomal segment III, consisting of some parallel rows of setae placed on anterior third of lateral surface. These structures are clearly absent in *Dissomphalus schubnelli* n. sp. Thus we tentatively attribute this fossil to the genus *Dissomphalus*.

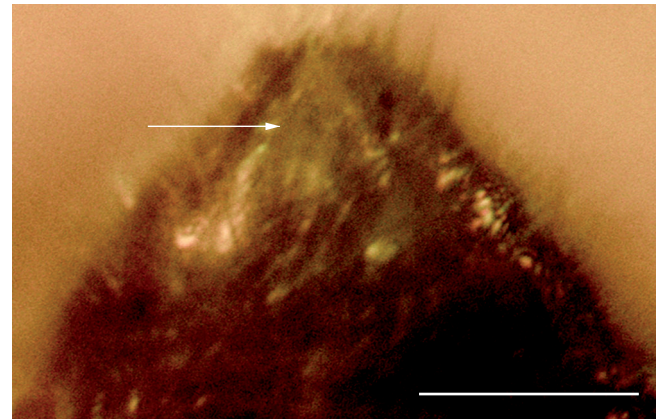


FIG. 5. — *Dissomphalus schubnelli* n. sp., holotype MNHN.F.A71308; **arrow**, hypopygium. Scale bar: 0.05 mm.

At least the Thai, African, and Neotropical species of *Dissomphalus* have a small median concavity on the hypopygium, unlike *Dissomphalus schubnelli* n. sp. (Azevedo 1999, 2003, 2010; Mugarab & Azevedo 2013). Nevertheless it was not possible to compare *D. schubnelli* n. sp. with the extant species because the necessary male genitalia were not visible. *Dissomphalus schubnelli* n. sp. is likely to be a new species because of its antiquity (53 Myrs old), while no extant insect is known to have lived more than 10 Myrs. The vein Rs&M of the forewing is not so vertical in *D. schubnelli* n. sp. as usual for the extant *Dissomphalus* spp. (Azevedo *et al.* 2018: fig. 27F), which could be a significant difference with the extant representatives of the genus. Unfortunately, this structure is generally not figured even in the most recent papers.

CONCLUSION

Dissomphalus schubnelli n. sp. is the first fossil record of this genus and the third Pristocerinae from the Oise amber, suggesting that this subfamily was already very diverse during the earliest Eocene. *Dissomphalus* is a very large genus, distributed over all the continents. There is very few information on the biology of the *Dissomphalus*. Azevedo *et al.* (2018) indicated that some species have been recorded on Bruchinae Latreille, 1802 (Coleoptera), Micromalthidae Barber, 1913 (Coleoptera) and Cecidomyiidae Newman, 1834 (Diptera). A Micromalthidae and several Cecidomyiidae are described from the Oise amber (Nel & Prokop 2006; Kirejtshuk *et al.* 2010), both families potential hosts for *Dissomphalus schubnelli* n. sp.

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