

Macrosiagon deuvei n. sp. (Coleoptera: Ripiphoridae) from the French Eocene amber

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Abstract. *Macrosiagon deuvei* n. sp., the second fossil representative of this extant genus of Ripiphoridae: Ripiphorinae: Macrosiagonini is described from the lowermost Eocene amber of Oise (France). The new species is compared with the extant species of the genus. Taxonomic position of other two fossil representatives of the family described from France by Perrichot *et al.* (2004) is discussed. The genus *Paleoripiphorus* Perrichot *et al.* 2004 is tentatively transferred from Ripiphorinae to Ripidiinae.

Résumé. *Macrosiagon deuvei* n. sp. (Coleoptera: Ripiphoridae) de l'ambre éocène français. *Macrosiagon deuvei* n. sp., le second représentant fossile de ce genre moderne de Ripiphoridae: Ripiphorinae: Macrosiagonini est décrit de l'ambre de l'Eocène basal de l'Oise (France). La nouvelle espèce est comparée avec les espèces actuelles du genre. La position taxonomique de deux autres représentants fossiles de la famille décrits de France par Perrichot *et al.* (2004) est discutée. Le genre *Paleoripiphorus* Perrichot *et al.* 2004 est provisoirement transféré des Ripiphorinae vers les Ripidiinae.

Keywords: Taxonomy, Insecta, Coleoptera, Ripiphoridae, Ripiphorinae, *Macrosiagon*, new species, lowermost Eocene, amber, France.

Ripiphoridae are rather rare in the fossil record, with Cenozoic taxa described or cited from the Eocene Baltic amber, the Oligocene of Germany, and the Miocene Dominican amber (Kaupp *et al.* 2001). Mesozoic record comprises one species from the Burmese amber and two from France (all in Albo-Cenomanian) (Perrichot *et al.* 2004). Thus, the present discovery in the lowermost Eocene amber of the second known and the most accurate fossil representative of the extant genus *Macrosiagon* Hentz 1830 described below is of great interest for the reconstruction of the history of this group.

Family Ripiphoridae

Macrosiagon deuvei n. sp.

Material. Holotype PA 2519 (female) (Figs 1, 2, 3), paratype PA 1745 (female) (Fig. 4), mounted in Canada Balsam, deposited in the Laboratoire de Paléontologie, Muséum National d'Histoire Naturelle, Paris.

Etymology. After our colleague Dr Thierry Deuve, in reference of his work on extant Coleoptera.

Occurrence. Lowermost Eocene, in amber, *circa* - 53 M.a., Sparnacian, level MP7 of the mammal fauna of Dormaal (Nel *et al.*, 1999), Farm Le Quesnoy, Chevière, region of Creil, Oise department (north of France).

Description. Body completely dark, without spots; 3.08 (holotype)–3.2 (paratype) mm long; head 0.4–0.4 mm high, 0.76–0.80 mm long; mouthparts not atrophied, functional, i.e. mandible 0.08–0.09 mm long, two long palpomeres visible; eye 0.48–0.50 mm long, 0.28–0.30 mm wide, entire, with only a small inner indentation; antenna inserted slightly below the middle of eye, 11-segmented, with segments 1-2 simple, segments three to ten serrate, and segment eleven simple, first segment 0.14–0.13 mm long, second 0.06–0.05 mm long; rather elevated vertex, 0.12–0.12 mm high, but narrower than eye's length.

Thorax 1.88–1.90 mm long, pronotum 1.08–1.1 mm long, 0.6–0.7 mm high, distinctly narrower anteriorly, with two strong postero-lateral spines, 0.12–0.10 mm long; prothorax produced horizontally between the fore coxae as a tongue-like flap, which extends behind the coxal cavities (visible in the holotype, hidden by legs in the paratype).

Elytra 3.08–3.12 mm long, acute apically, covering the abdomen.

Legs yellow brown; claws of legs simple; fore leg: femur 0.88–0.90 mm long, 0.28–0.29 mm wide, tibia 0.50–0.52 mm long, 0.24–0.25 mm wide, tarsi not preserved in holotype, 0.72 mm long in paratype; median leg: femur 0.87–0.88 mm long, 0.20–0.21 mm wide, tibia 0.92–0.93 mm long, 0.20–0.21 mm wide, tarsi 1.60–1.62 mm long, 0.10–0.10 mm wide, five-segmented; hind leg: femur 1.10–1.12 mm long,

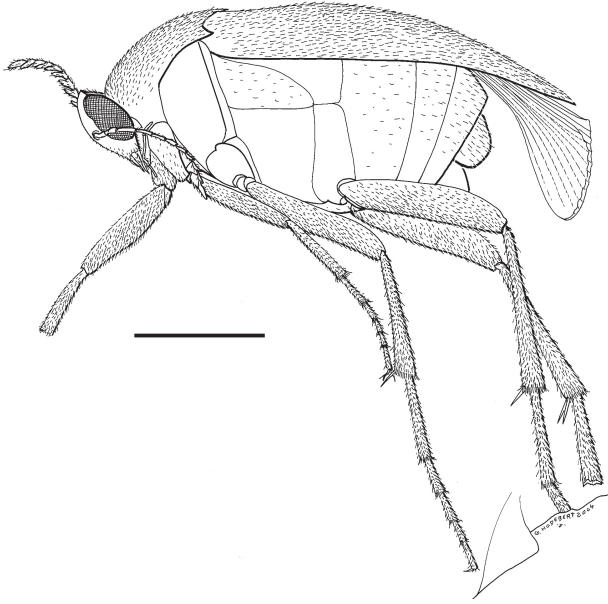


Figure 1
Macroisiagon deuwei n. sp., holotype PA 2519, drawing of general habitus (scale bar represents 1 mm).

0.20–0.21 mm wide, tibia 0.76–0.76 mm long, 0.12–0.15 mm wide, only the two basal tarsomeres preserved in holotype, 1.24 mm long in paratype; tibial spines formula 1-2-2, tibial spines simple, tarsal formula 5-5-4 (preserved in paratype). Abdomen 1.20–2.12 mm long; genital structures only partly visible in the holotype; four last segments produced in a long ‘tube’ in the paratype, 0.92 mm long.

Discussion

The holotype and the paratype are identical in their preserved and visible parts, thus we consider that they belong to the same species. The classification of Ripiphoridae is based on rather old works of Rivnay (1929), Selander (1957) and Viana (1971). Following the key to subfamilies of Viana (1971), *Macroisiagon deuwei* n. sp. would fall in the Ripiphorinae because of the following characters: mouthparts not atrophied, functional; elytra dehiscent and acuminate, female antenna serrate, unipectinate from third segment to apex. Yablokov-Khnzoryan (1986) added the monobasic tribe Eorhipidiini that has filiform antennae, mouthparts reduced and non-functional, and shortened elytra; nowadays it is placed as incertae sedis (Kaupp *et al.* 2001).

Within the subfamily Ripiphorinae, *M. deuwei* n. sp. falls in the genus *Macroisiagon* because of the following characters: vertex elevated; pronotum without median furrow; antennae inserted directly in front of the eyes; presence of a spine on fore tibia and two on mid and

hind tibiae. In the shape of the body, it is almost identical with many extant species of the genus.

The genus *Macroisiagon* is widely distributed in all continents (except of Antarctic) as well as in many islands e.g. Mediterranean Isl., Madagascar, Sri Lanka, Taiwan, Japan, Andaman Isl., Indonesian Isl., New Caledonia, Cuba and Antilles. Although some extant species are distributed through several continents (Batelka 2003, 2004; Falin 2004) no one is known to be distributed in Old and New World simultaneously. Except important attempt to establish species group for three New World species (Falin 2004), there is no idea of phylogenetical relationships within the genus. In the Palaearctic and Oriental regions there are about 20 species (J. Batelka, unpublished) as several tens of synonyms were recently recognised (Batelka 2003, 2004, in prep.).

M. deuwei n. sp. is according to the traditionally used characters such as presence or absence of a pronotal process and the shape of the hind tarsomeres, easily defined as a species with absence of a pronotal process and not shortened the 2nd hind tarsal segment. Both characters *M. deuwei* n. sp. shares with recent taxa *M. pusillum* (Gerstaecker 1855), *M. ferrugineum* (Fabricius 1775), *M. nasutum* (Thunberg 1784), *M. praeustum* (Gebler 1829), *M. spinicolle* (Fairmaire 1893) and *M. axillare* (Gerstaecker 1855) from the Old World as well as with some other New World species (Falin 2004). As above listed species, because of their other features, most probably do not belong to one species group, relationships of *M. deuwei* n. sp. with extant species of the genus are difficult to establish until revision of the genus.



Figure 2
Macroisiagon deuwei n. sp., holotype PA 2519, photograph of the left side (scale bar represents 1 mm).

Conclusions

The fossil record of the genus *Macrosiagon* is very scarce. *M. ebboi* Perrichot *et al.* 2004 (Late Albian of France) is based on an incomplete specimen which belongs to Macrosiagonini and tentatively attributed to this genus. The second species is the doubtful *M. geikiei* (Scudder 1890) (Early Oligocene, Florissant, USA), which was originally placed in the genus *Ripiphorus* Bosc 1791, later in *Macrosiagon* by Wickham (1920), and considered as a fossil with uncertain position (Kaupp *et al.* 2001). Therefore, *M. deuwei* n. sp. is the most reliable fossil representative of the extant genus *Macrosiagon*.

Besides *M. ebboi*, there is only one further fossil representative of the family known in France – the monotypic genus *Paleoripiphorus* Perrichot *et al.* 2004 with species *P. deploegi* Perrichot *et al.* 2004 (French uppermost Albian), originally placed within the subfamily Ripiphorinae (Perrichot *et al.*, 2004). Based on additional study of some characters, the placement of the genus is re-evaluated. The following characters suggest it could be more related to some fossil and extant genera of Ripidiinae:

- the species possessing small group of ommatidia along posterior margin of eye which is characteristic for the most of the extant genera in Ripidiinae, except of *Quasipirhidius* Zaragoza 1991, *Pseudorhipidius* Chobaut 1894, *Falsorhipidius* Pic 1947, *Pirhidius* Besuchet 1957 and *Blattivorus* Chobaut 1891 (Kaupp *et al.* 2001), but they do not occur in any other subfamily of Ripiphoridae;

- eyes roughly faceted, very large, nearly meeting on dorsal side of head which is characteristic for all of the extant genera in Ripidiinae but do not occur in Ripiphorinae at all and could be therefore considered as symplesiomorphic character;

- relationship with extant *Ripiphorus* species is also questionable because of simple tarsal segments, not modified; presence of small tibial spurs seems to be plesiomorphic character as in extant genera of Ripidiinae they are missing (Kaupp *et al.* 2001);

- the male of this species is characteristic by having biflabellate antennae what is otherwise typical for males in Ripiphorinae, however the processes are flat, arranged close one to another as in all Ripidiinae, not rounded with crown-like arrangement as in males of *Ripiphorus*. Last but not least, antennae in males of Ripidiinae are quite variable – the genera with 8, 9, 10 (also in *Paleoripiphorus*) and 11-segmented antennae are known (Kaupp *et al.* 2001).

Due to the above mentioned facts and arguments we provisionally transfer the genus *Paleoripiphorus*



Figure 3
Macrosiagon deuwei n. sp., holotype PA 2519, photograph of the right side (scale bar represents 1 mm).

from Ripiphorinae to Ripidiinae. As a phylogenetic analysis of the family is still lacking, this needs confirmation. It would be the first representative of the subfamily known to have biflabellate antennae, however Kaupp *et al.* (2001) suggested that the description and figure of *Aporrhapis* Pascoe 1887 “would not fully exclude the interpretation of biflabellate antennae”, although nothing precise is indicated in this sense in



Figure 4
Macrosiagon deuwei n. sp., paratype PA 1745, photograph of the left side (scale bar represents 1 mm).

Pascoe (1887). Biflabellate antennae of *Paleoripiphorus* are considered as derived character (apomorphic) and thus the species could not represent direct ancestor of the extant Ripidiinae.

As far as known, Ripidiinae are associated with Blattodea. Although we do not know anything about the host of *Paleoripiphorus*, from available information, we assume that its association with Blattodea is possible. First, some Ripidiinae are known to climb on the trees as do they hosts (Riek 1955; Brustel & Rogé 1999) and cockroaches are abundantly preserved in amber (cf. Kaupp *et al.*, 2001). Second, one larva of Blattodea and the leg of another blattodean in the same piece of amber is preserved with *Paleoripiphorus* and totally 13 specimens of Blattodea in 400 inclusions in the type locality were found (Perrichot *et al.* 2004). On the other hand, *Ripiphorus* species are known to visit certain blossoms, as do their hosts from Apoidea, so their preservation in amber is less probable.

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