

Fossil *Tipulomorpha* (Diptera, Nematocera) from Baltic amber (Upper Eocene). – Revision of the genus *Helius* LEPELETIER et SERVILE (*Limoniidae*).

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Received: 25 Nov. 1992

Accepted for publication: 28 Dec. 1992

KRZEMIŃSKI W. 1993. Fossil *Tipulomorpha* (Diptera, Nematocera) from Baltic amber (Upper Eocene). – Revision of the genus *Helius* LEPELETIER et SERVILE (*Limoniidae*). Acta zool. cracov. 35(3): 597-601.

Abstract. The revision of fossil species of the genus *Helius* (*Limoniidae*) from Baltic amber is presented. A neotype of *Helius minutus* (LOEW) is designated and the new species *Helius formosus* described.

Key words: *Tipulomorpha*, *Limoniidae*, *Helius*, Baltic amber.

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The genus *Helius* LEPELETIER et SERVILE belongs to the subfamily *Limoniinae*. Recently the genus comprises about 200 species of worldwide distribution, mainly occupying South and South-East Asia.

Fossil representatives of the genus were first recorded by LOEW (1850), who listed 4 species from the BERENDT collection (Baltic amber, Upper Eocene), but named only two of them: *Helius pulcher* (LOEW) and *Helius minutus* (LOEW), and gave the characters distinguishig them.

Helius pulcher (LOEW) was redescribed by MEUNIER (1906). Unfortunately, the autor did not base his description on the LOEW's type specimen, but on the other specimen from a different collection. This specimen was designated as a lectotype of *Helius pulcher* by ALEXANDER (1931) who supposed that LOEW's material had been lost. Besides, this author erroneously attributed the species name to MEUNIER and not to LOEW. Another species, *Antocha succinea* MEUNIER 1906, was made by ALEXANDER (1931) the junior synonym of *Helius pulcher*. KRZEMIŃSKI (1985), basing upon the descriptios of MEUNIER and ALEXANDER, described a species *Helius abditus*.

It has succeeded now to collect and re-study all the materials in question. Apparently, MEUNIER had designated by mistake the wrong specimen for the redescription of *Helius pulcher* which resulted in a series of further misinterpretations.

After having analysed such features as: palpi, antennae and rostrum proportions, and male hypopygium I can state that all the specimens classified by MEUNIER (1906), ALEXANDER (1931) and KRZEMIŃSKI (1985) to *Helius pulcher*, *Helius succineus* and

Helius abditus, respectively, belong to the species *Helius minutus* (LOEW), while the true *Helius pulcher* (LOEW) differs conspicuously in the male hypopygium and other features (see the species descriptions).

Apart from the Baltic amber, three other fossil representatives of the genus were recorded by SCUDDER (1984) (North America, Oligocene). However, the revision of the holotype revealed that all they belong to the genus *Dicranomyia* (KRZEMIŃSKI 1991).

HENRIKSEN (1922) reported the find of two specimen (Denmark, Eocene), one of which – a single wing – served as the base for the description of *Helius thybotica* (HENRIKSEN); however, a sole wing is not sufficient to distinguish this genus; probably this species also belongs to the genus *Dicranomyia*. STATZ (1934) described from Rott (West Germany, Upper Oligocene) *Elephantomyia weigandi* STATZ – a species undoubtedly belonging to the genus *Helius*. In 1944 this author described also from Rott a second species, *Helius tenera* STATZ. Since the first description is based upon a single female and the second on a single male, there is a possibility that both belong the same species.

KRZEMIŃSKI (1991) described the first North American fossil *Helius* from Montana (Oligocene).

RAYNER and WATERS (1990) described *H. botswanensis* from the Upper Cretaceous of Botswana (South Africa) which is the oldest genus representative aged ca. 93 Ma.

Other fossil *Helius* species were found in the Saxonian amber (Lower Miocene) (KRZEMIŃSKI and KUTSCHER – in preparation).

Family: *Limoniidae*

Subfamily: *Limoniinae*

Genus: *Helius* LEPELETIER et SERVILLE, 1828

Synonym: *Rhamphidia* MEIGEN

Helius pulcher (LOEW, 1850)

D i a g n o s i s. Male: wing length ab. 6 mm. Rostrum ab. 1/5 longer than the rostrum; palpi 1/4 shorter than the rostrum. Outer dististyle narrowing toward the tip and acutely pointed, slightly curved inwardly. Interbasal processes absent.

D e s c r i p t i o n. Female: rostrum (Fig. 1) ab. 1/5 longer than the head. Antennae of the male (Fig. 2) 16-segmented, slightly more than twice exceeding the rostrum; scape long, cylindrical; pedicel broad, barrel-like; first flagellomere broad, barrel-like; 1st to 7th flagellomeres provided with single, long bristles ab. 1/2 longer than the segments that bear them; 8th to 13th flagellomeres with three long bristles almost three times longer than those segments; the last flagellomere without long bristles. Antennae of the female shorter than those of a male, only 1.75 times longer than the rostrum. Palpi of a male 1/4 shorter than the rostrum, last segment 1/2 longer than the preceding one, while female palpi are 1/5 longer than the rostrum and the last segment is 1/6 longer than all the preceding taken together. Wing (Fig. 3): stigma big, oval. Vein Sc ending opposite the fork of Rs; cross-vein *sc-r* at the end of Sc; cross-vein *r-r* absent; *R*₁ ending opposite the *R*₂₊₃ middle; *d* cell short and broad; cross-vein *m-cu* just beyond the fork of *Mb*; *A*₂ rather long and straight.

Male hypopygium (Fig. 4): the position of the specimen does not allow to make the general, overall picture; in spite of this the details are well visible. The outer dististyle rather long (almost reaching 2/3 of the inner dististyle length), broad basally, narrowing

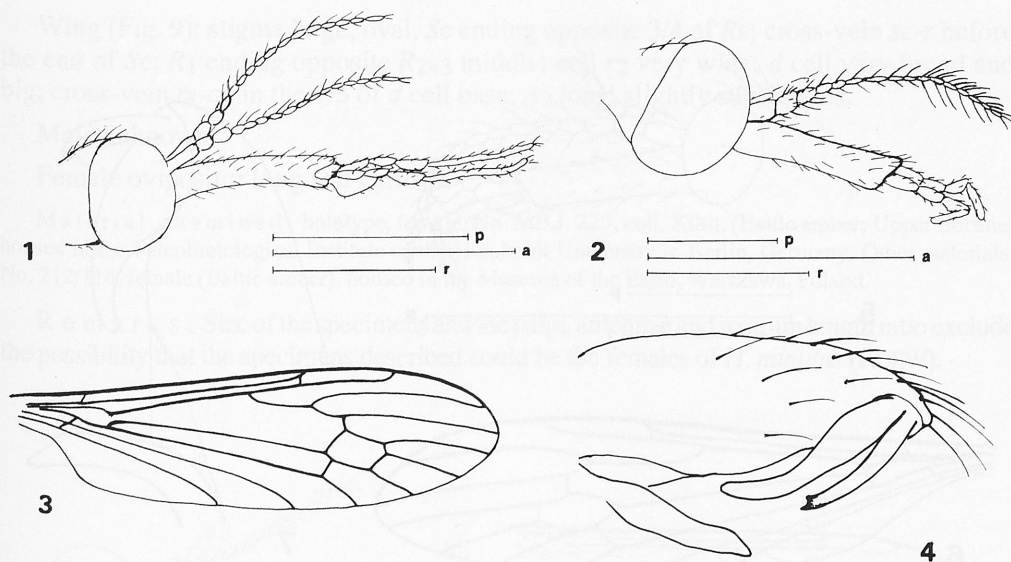


Fig. 1 - 4. *Helius pulcher* (LOEW): 1 – female head, p, a, r – relative length proportions of palpus, antenna and rostrum, resp., 2 – male head, p, a, r as in Fig. 1.; 3 – wing, 4 – male hypopygium.

gradually toward the end, acutely pointed and slightly curved to the inside in its 2/3 length. Inner dististyle broad, strongly curved inside. Interbasal processes absent.

Female: ovipositor long and narrow.

Material examined: holotype No MB.J. 359, male – coll. Brendt. No. MB.J. 358, female – coll. BERENDT (Baltic amber, Upper Eocene). Both specimens housed in the Paleontological Institute of the HUMBOLDT University in Berlin, Germany.

Helius minutus (LOEW, 1850)

Synonyms: *Rhamphidia pulchra* LOEW (MEUNIER); MEUNIER, 1906: 364

Antocha succinea MEUNIER, 1906: 367

Helius pulcher (MEUNIER); ALEXANDER, 1931: 42-3

Helius abditus KRZEMIŃSKI, 1985: 116

D i a g n o s i s. Male: winglength 4.4-4.8 mm. Rostrum ab. 1/5 longer than the head. Antennae more than twice exceeding the rostrum; palpi are equal rostrum or slightly longer. Outer dististyle short, straight, with two broad spikes apically. Large interbasal processes present.

D e s c r i p t i o n. Head (Fig. 5): rostrum ab. 1/5 longer than the head. Antennae of the male generally 15-segmented, more than twice exceeding the rostrum; scape large, cylindrical; pedicel barrel-like, broad; first flagellomere broad, short; the remaining flagellomeres cylindrical, with two long bristles 1,5-2 times longer than the segments that bear them. Last flagellomere without long bristles. Palpi as long as the rostrum or slightly longer; last segment almost equal two preceding taken together.

Wing (Fig. 6): stigma big, oval. *Sc* ending opposite 1/3 of *R*_s; cross-vein *sc-r* at the end of *Sc*; cross-vein *r-r* absent; *R*₁ ending opposite 1/4 of *R*₂₊₃; *d* cell elongated; cross-vein *m-cu* far beyond *Mb* (almost in 1/3 of *d* cell base); *A*₂ long and straight.

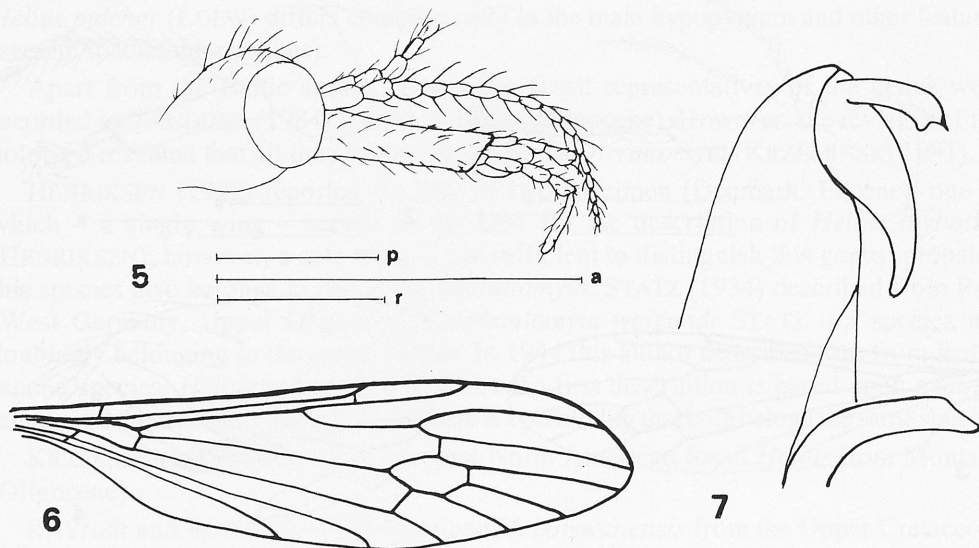


Fig. 5 - 7. *Helius minutus* (LOEW): 5 - male head, p, a, r as in Fig. 1., 6 - wing, 7 - hypopygium.

Male hypopygium (Fig. 7): outer dististyle short, broad, with two broad spikes apically. Inner dististyle rather short, lobate. Basistyle basally provided with large, broad process terminating into a narrow, acute spine.

Female unknown.

Material examined: neotype, male No. 7895 (Baltic amber, Upper Eocene), housed in the Museum of the Earth, Warszawa, Poland. Other specimens: MB.J.224, male, coll. KÜHL, housed in the Paleontological Institute of the Humboldt University in Berlin, Germany; two specimens No. K-4265, Z-253, male and No. K-1696, Z-4557, male - both housed in the Paleontological Institute in Göttingen, Germany.

Remarks. The venation of the specimen No. K-4265, Z-253 differs from the other specimens in the following details: *Sc* ending opposite *Rs* midlength; *R*₁ ending opposite *R*₂₊₃ midlength; *d* cell very short and broad; cross-vein *m-cu* in the middle of *d* cell base.

Helius formosus sp. n.

Diagnosis. Female: wing length 5.7 mm. Rostrum less than twice exceeding the head. Antennae only 1/5 longer than the rostrum, palpi 1/4-1/5 shorter than the rostrum; last palpal segment almost 1/4 longer than all the preceding taken together.

Description. Head (Fig. 8): rostrum less than twice as long as the head. Antennae 16-segmented, short, only ab. 1/5 longer than the rostrum; scape cylindrical, big; pedicel big, its distal part conspicuously widened; first flagellomere barrel-like, flagellomeres 2nd to 5th are oval, short, while the 6th to 10th are elongated, cylindrical, provided with two bristles; flagellomeres 11th to 15th are provided with an additional third bristle 2-3 times longer than the segments bearing them, last one at least twice exceeding its predecessor. Palpi: the last but one segment expanded; the last one 1/5 longer than all the preceding taken together.

Wing (Fig. 9): stigma large, oval. *Sc* ending opposite 3/4 of *Rs*; cross-vein *sc-r* before the end of *Sc*; *R*₁ ending opposite *R*₂₊₃ middle; cell *r*₂ very wide; *d* cell very broad and big; cross-vein *m-cu* in the 1/3 of *d* cell base; *A*₂ long, slightly subsinuous.

Male unknown.

Female ovipositor long and narrow.

Material examined: holotype, female, No. MBJ. 225, coll. KÜHL (Baltic amber; Upper Eocene) housed in the Paleontological Institute of the Humboldt University in Berlin, Germany. Other materials: No. 212/116, female (Baltic amber), housed in the Museum of the Earth, Warszawa. Poland.

Remarks. Size of the specimens and the palpi, antennae and rostrum length ratio exclude the possibility that the specimens described could be the females of *H. minutus* (LOEW).

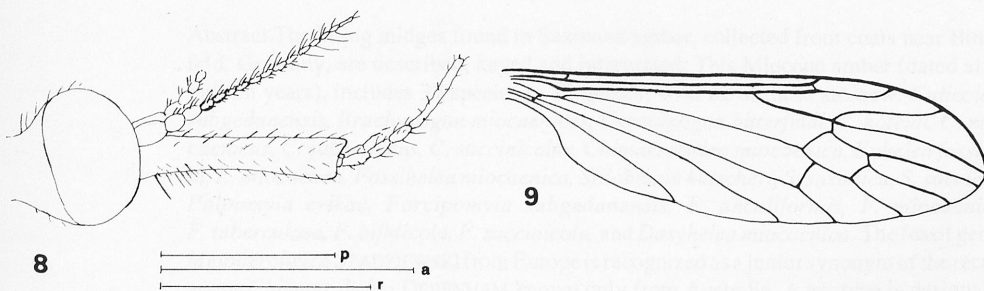


Fig. 8 - 9. *Helius formosus* sp. n.: 8 - female head, p, a, r as in Fig. 1.; 9 - wing.

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