



First record of the march fly genus *Plecia* (Diptera: Bibionidae) in Dominican amber

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With 2 figures

Abstract: The fossil march fly *Plecia pristina* HARDY, 1971, that was previously only known from Mexican Chiapas amber, is briefly described as first record of the genus *Plecia* and second species of the family Bibionidae from Dominican amber.

Key words: Diptera, Bibionidae, *Plecia*, Dominican amber, Tertiary, Miocene, fossil insects.

1. Introduction

Flies of the family Bibionidae are among the most abundant insects in Tertiary fossil assemblages (WEDMANN 1998; COLLOMB et al. 2008) and numerous species have been named from Palaeartic and Nearctic deposits. In contrast, bibionids are relatively uncommon in amber (BRASERO et al. 2009; SKARTVEIT 2009; ZHERIKHIN et al. 2009) and rather few species have been described from this medium (MEUNIER 1907; HARDY 1971; WALLER et al. 2000; GEE et al. 2001; SKARTVEIT 2009). Amber fossils often show excellent preservation of anatomical details and thus can be studied almost like specimens of extant species, in contrast to compression fossils where many important characters are generally unavailable.

The genus *Plecia* WIEDEMANN, 1828 is a speciose, tropical and subtropical (SKARTVEIT 1997; COLLOMB et al. 2008) group of flies with a particularly rich fossil record. In the current fauna, the genus is confined to areas with warm climates; its distribution extends north to the southeastern USA (DENMARK et al. 2010) and to the Primorye region of Russia (KRIVOSHEINA & KRIVOSHEINA 1998). In the Tertiary, the genus obviously had a much wider distribution and large numbers

of specimens are found in some fossil deposits in Europe (e.g., THÉOBALD 1937; WEDMANN 1998; COLLOMB et al. 2008), North America (e.g., MELANDER 1949) and Asia (e.g., ZHANG 1993). A number of species are also known from European amber (MEUNIER 1907; GEE et al. 2001; SKARTVEIT 2009). However, thus far only *Plecia pristina* HARDY, 1971 has been described from New World Amber. This species was described from the Miocene amber of Chiapas, Mexico.

In the last couple of decades a very substantial material of fossil insects has been obtained from amber mined in the Dominican Republic (POINAR & POINAR 1994). This amber often yields specimens of spectacularly high quality. In contrast to the situation with the Baltic amber inclusions, the climate in the Dominican Republic is believed to have changed relatively little since the deposits were formed, and the continued survival of some of the species found in amber seems possible, though as far as we are aware of no case of this has been reported. The Recent fauna of the Dominican Republic includes at least one species of the genus *Plecia*, *Plecia fasciapenna* FITZGERALD, 1998. However, only a single species of bibionid, *Dilophus matilei* WALLER et al., 2000 has thus far been described from Dominican amber.



Fig. 1. *Plecia pristina*, three males (total length of middle specimen 6.0 mm), SMNS Do-3784-M.

Presently, in the absence of DNA barcoding data, only males of the genus *Plecia* can be identified with certainty to species, relying on the genitalia, which fortunately show a substantial morphological divergence in this genus. With Recent material this is generally a minor problem since most collecting methods give male-biased samples anyway. The Recent Neotropi-

cal species were reviewed by HARDY (1945), since then the only substantial addition to the known fauna is the work of FITZGERALD (1998) who described a further 18 species. Since 1998, only one further species has been described by BRAVO et al. (2001).

Currently, we report for the first time specimens of the genus *Plecia* from Dominican amber.



Fig. 2. *Plecia pristina*, male (total length ca. 5.5 mm), SMNS Do-1307-K.

2. Studied material

Plecia pristina HARDY, 1971
Figs. 1-2

Material: SMNS Do-3784-M – three males in a medium-sized piece of amber (Fig. 1). SMNS Do-1367-K – one male in a small, slightly opaque piece of amber. SMNS Do-1307-K – one male in a small piece of amber (Fig. 2).

These male specimens conform well to the description of HARDY (1971). They are medium-sized *Plecia* specimens with orange-red thorax, the antenna has an eight-segmented flagellum consisting of subspherical segments. The wings are rather narrow, clear except for a small, dark pterostigma, the vein R_{2+3} is short and curved. The terminalia fit HARDY's descriptions and drawings well. The epandrium has a short, mesal process and rounded lateral lobes, the gonocoxosternite has digitiform lateral and mesal lobes, and the gonostylus is relatively small, simple and hook-shaped.

Unidentified material: SMNS Do-2817-D – one male and one female, specimens appear to be covered in mould (probably being partly decayed before being covered by resin), morphological characters generally impossible to see, also obscured by numerous cracks in the resin.

3. Discussion

The occurrence of a species described from Chiapas amber in Dominican amber is not unexpected since both deposits are of early to mid-Miocene age (approximately 20-15 myp, ITURRALDE-VINENT & MACPHEE 1996; KRAEMER 2007), from the same climatic zone and also originate from the same genus of tree (*Hymenaea* sp.), suggesting quite similar ecological conditions. It is noteworthy that bibionid fossils, which are very abundant in some Tertiary lacustrine sediments, are scarce in amber. This is most likely due to the

ecology and behavior of the group: bibionids are more typical of grasslands than of forest habitats, and tend to swarm in open areas, not in closed forest where they would be likely to come in contact with fresh resin. On the other hand, swarming bibionids, being clumsy fliers, often end up in water and are thus likely to be preserved in lacustrine sediments.

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