

A new species of *Bryophaenocladius* Thienemann, 1934 (Diptera, Chironomidae, Orthoclaadiinae) from Baltic amber

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The male of *Bryophaenocladius beuki* n. sp. from Baltic amber is described and figured. The species has long, decumbent acrostichals starting close to antepnotum, a well-developed, broadly rounded inferior volsella and a long, narrow anal point with hyaline apical part. It can be distinguished from the only other known fossil species of *Bryophaenocladius* Thienemann, 1934 from Baltic amber, *B. circumclusus* Seredzsus & Wichard, 2007, on the shape of the anal point as this species has a broad-based, triangular, slightly elongated anal point.

Key words: Chironomidae, Orthoclaadiinae, *Bryophaenocladius beuki*, new species, Baltic amber, Eocene, Lithuania.

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Introduction

Baltic amber is a fossil tree resin originating in the mid Eocene (36–40 MYA) in northeastern Europe. This amber is extremely rich in fossil insect inclusions, providing us with an invaluable source of knowledge about the biodiversity, climate and ecosystems in the Eocene. Insect inclusions in Baltic amber have been extensively studied during the last 100 years and many aquatic insect species have been described (Wichard *et al.* 2009). Diptera are among the most abundant insect inclusions in Baltic amber and comprise 45% of all inclusions. Of the Diptera inclusions, the non-biting midges, Chironomidae, comprise 77% and about 91% of these belong to the subfamily Orthoclaadiinae (Wichard *et al.* 2009, Zelentsov *et al.* 2012). The larvae of extant Orthoclaadiinae inhabit a wide

range of habitats from running and standing waters to semi-terrestrial or terrestrial habitats. Orthoclaadiinae is a very diverse subfamily with about 175 valid extant genera and the larvae of the different genera are often found in different situations. Given that the fossil midges utilized the same type of habitats as the extant ones we can learn much about the aquatic or semiaquatic ecosystems in the amber forests (Seredzsus & Wichard 2007).

Up to now 17 species of Orthoclaadiinae have been formally described from Baltic amber, but this represents only a small proportion of the known species diversity preserved in the Baltic amber. Below we describe the male of a new species from Baltic amber from Lithuania and tentatively place it in the genus *Bryophaenocladius* Thienemann, 1934. *Bryophaenocladius* is a species-rich

genus with about 115 described extant species (Ashe & O'Connor 2012). However, only one *Bryophaenocladius* species, *B. circumclusus* Seredzsus & Wichard, 2007, has been described from Baltic amber so far.

Material and Methods

The fossil was studied using a Nikon Optiphot 2 microscope; the measurements were taken with the aid of a scale in the eyepiece. The photos were taken using a Leica DM 400 B LED microscope fitted with a Leica DFC 450C compact camera. The general terminology follows Sæther (1980).

The type is housed in the Maastricht Natural History Museum, Maastricht, The Netherlands.

***Bryophaenocladius beuki* sp. n.**

(Figures 1–5)

Type material: Holotype male: LITHUANIA, Baltic amber (No: 1165135055).

The holotype (Figure 1) is comparatively well preserved with most body parts intact. The amber is, however, rather cracked, which makes some structures difficult to observe.

Etymology: Named after Dr. Paul Beuk, who brought the piece of amber to our attention.

Diagnostic characters: The species has long, decumbent acrostichals starting close to antep pronotum, a well-developed, broadly rounded inferior volsella and a long, narrow anal point with hyaline apical part. It can be distinguished from the only known fossil species, *B. circumclusus*, on the shape of the anal point as the latter has a broad-based, triangular, slightly elongated anal point.

Description. *Male* (n = 1). Total length 2.52 mm. Wing length 1.64 mm. Total length / wing length 1.53.

Antenna. With 13 flagellomeres, AR = 1.22. Length (in µm) of flagellomeres 1–13 as: 20, 40, 30, 40, 40, 40, 40, 40, 40, 50, 40, 550.

Head. Inner verticals not visible, outer verticals apparently 4, postorbitals 6. Clypeus normal, with about 12 setae. Lengths (in µm) of palpomeres 2–5: 60, 130, 150, 140. Apex of palpomere 3 without projection.

Thorax. Apparently with 6 lateral antepnotals. Dorsocentrals 36, long, anterior in three to four rows, posterior biserial. Acrostichals 33, long, decumbent, biserial, beginning close to antepnotum. Scutellum with 24 setae, biserial.

Wing (Figure 2). VR = 1.17. Costa not extended, R₄₊₅ ends slightly distal to end of M₃₊₄.

Legs. Spur of fore tibia 40 µm long (Figure 3); spurs of mid tibia 80 µm long with distinct lateral denticles and not visible; hind tibial spurs and comb not visible. Pseudospurs and pulvilli absent. Leg measurements as in Table 1.

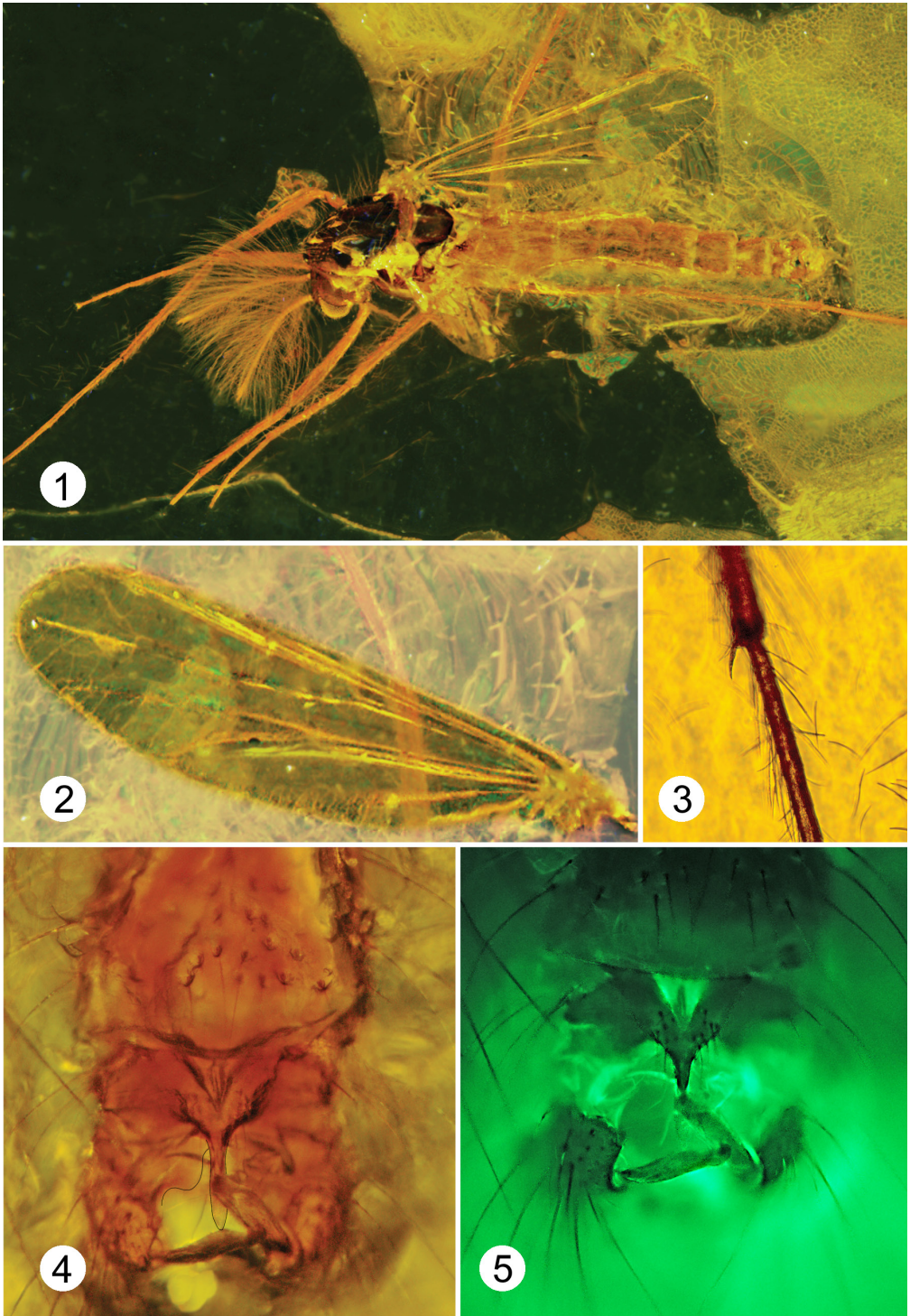
Hypopygium (Figures 4–5). Anal point long, narrow, apically hyaline, with rounded apex, 100 µm long, 40 µm wide at base, 20 µm wide medially, 18 µm wide at apex. Virga with 2 spines, clearly visible through tergite IX. Gonocoxite 110 µm long. Inferior volsella well-developed, broadly rounded, about 48 µm wide, ending about 40 µm above apex of gonocoxite. Gonostylus club-shaped, 90 µm long; megaseta 10 µm long. HR = 1.2. HV = 2.8.

Discussion

Bryophaenocladius is a species rich genus and the species are quite variable in many morphological features. However, the genus can be recognized on the strong, decumbent acrostichals commencing close to anterior scutum and the hyaline anal point. Many *Chaetocladus* Kieffer, 1911 species also have a well-developed, triangular or parallel-

TABLE 1. Lengths (in µm) and proportions of legs of *Bryophaenocladius beuki* n. sp., male (n = 1).

| | fe | ti | ta ₁ | ta ₂ | ta ₃ | ta ₄ | ta ₅ | LR | BV | SV |
|----------------|-----|-----|-----------------|-----------------|-----------------|-----------------|-----------------|-------|-------|-------|
| p ₁ | 740 | 760 | 460 | 300 | 240 | 140 | 80 | 0.605 | 2.579 | 3.261 |
| p ₂ | 660 | 480 | 260 | 180 | 120 | 60 | 60 | 0.542 | 3.333 | 4.385 |
| p ₃ | 740 | 820 | 540 | 240 | 200 | 140 | 60 | 0.659 | 3.281 | 2.889 |



FIGURES 1–5. *Bryophaenocladus beuki* n. sp., male. **1.** Holotype (Maastricht Natural History Museum, no: 1165135055). **2.** Wing. **3.** Spur of fore tibia. **4–5.** Hypopygium, dorsal view.

sided anal point with hyaline apex. However, the two genera can be separated as *Chaetocladus* has more prominent denticles on the mid and hind tibial spurs and comparatively short acrostichals. We place the new species tentatively in *Bryophaenocladus* mainly based on the long, decumbent acrostichals. In hypopygial features it is rather similar to several extant species like e.g. the European *B. vernalis* (Goetghebuer, 1921).

The larvae of *Bryophaenocladus* are usually found in terrestrial habitats, but the larvae of *B. subvernalis* (Edwards, 1929) have been recorded from the shores of alpine lakes and *B. chrissichuckorum* Epler, 2012 from ephemeral pools (see Andersen et al. 2013).

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