

**In the Eocene, the extant genus *Caladomyia* occurred in the Palaearctic
(Diptera: Chironomidae: Tanytarsini)**

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ABSTRACT. The first fossil representative of *Caladomyia* SÄWEDAL, 1981, *C. szadziewskii* sp. n., is described from Eocene Baltic amber. The genus is so far known from extant species distributed in America, mainly in the Neotropical region.

KEY WORDS: Diptera, Chironomidae, *Caladomyia*, taxonomy, biogeography, Eocene, amber.

INTRODUCTION

SÄWEDAL (1981) introduced the name *Caladomyia* for the genus known at present from over 30 extant species. They are mainly recorded in the Neotropical ecozone and the Amazon region, but the genus has a slightly broader distribution, reaching the southern and south-western USA in the north, and central Argentina and Chile in the south (SUBLETTE & SASA 1994, TRIVINHO-STRIXINO & STRIXINO 2000, REIFF 2000, SANSEVERINO & FITTKAU 2007, TRIVINHO-STRIXINO 2012).

In this work we describe a fossil representative of *Caladomyia* – a species dating back to the Eocene. The adult male shows a set of features typical of the extant genus *Caladomyia*, but also these characters which indicate a close relationship with *Tanytarsus* VAN DER WULP. The Eocene Tanytarsini are thus represented by 10 species and 7 genera, all described on the basis of amber inclusions collected in Europe: *Archistempellina* GILKA & ZAKRZEWSKA (extinct), *Corneliola* GILKA & ZAKRZEWSKA (extinct), *Stempellina* THIENEMANN & BAUSE, *Stempellinella* BRUNDIN, *Rheotanytarsus* THIENEMANN & BAUSE,

Tanytarsus (SEREDSZUS & WICHARD 2007, GILKA 2010, 2011, GILKA et al. 2013), and *Caladomyia*, now recorded for the first time outside America.

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MATERIAL AND METHODS

The amber was ground and polished manually (Fig. 1A). Measurements are in μm except the total length (in mm, rounded off to the first decimal place); the lengths of the leg segments were rounded off to the nearest 5 μm ; the leg and venarum ratios (LR, VR) were calculated to the second decimal place. The morphological terminology and abbreviations follow SÆTHER (1980). The photographs were taken using the LAS Montage multifocus with a Leica DM6000 and the free accessible CombineZP image stacking software. The holotype is part of the collection of Christel and Hans Werner Hoffeins, Hamburg, and will be deposited at the Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany.

RESULTS

Caladomyia szadziewskii sp. n., GILKA & ZAKRZEWSKA

Type material

Holotype. Adult male (right fore leg missing) in 11 x 3 x 3 mm piece of Baltic amber (No. 213-3) (Fig. 1A).

Derivation of the name

The specific epithet is dedicated to our mentor, Ryszard Szadziewski.

Diagnosis

LR₁ low, 2.65. Anal point narrowed in mid-length, with deeply incised apex and horizontally expanded lateral enlargements; distal section small, slightly extending beyond lateral enlargements; large spoon-like cavity between margins of anal point bearing single posteriorly directed bar and two spinulae arranged in row. Superior volsella oblique relative to body axis, with broadly rounded apex. Digitus extending beyond superior volsella.

Description

Adult male (n = 1).

Total length c. 2.0 mm; wing length c. 1410 μm .

Head. Eyes bare, with well-developed dorsomedian extensions. Frontal tubercles not observed. Antennal plume fully developed, composed of dense setae covering flagellum (number of flagellomeres and AR impossible to count) (Fig. 1B).

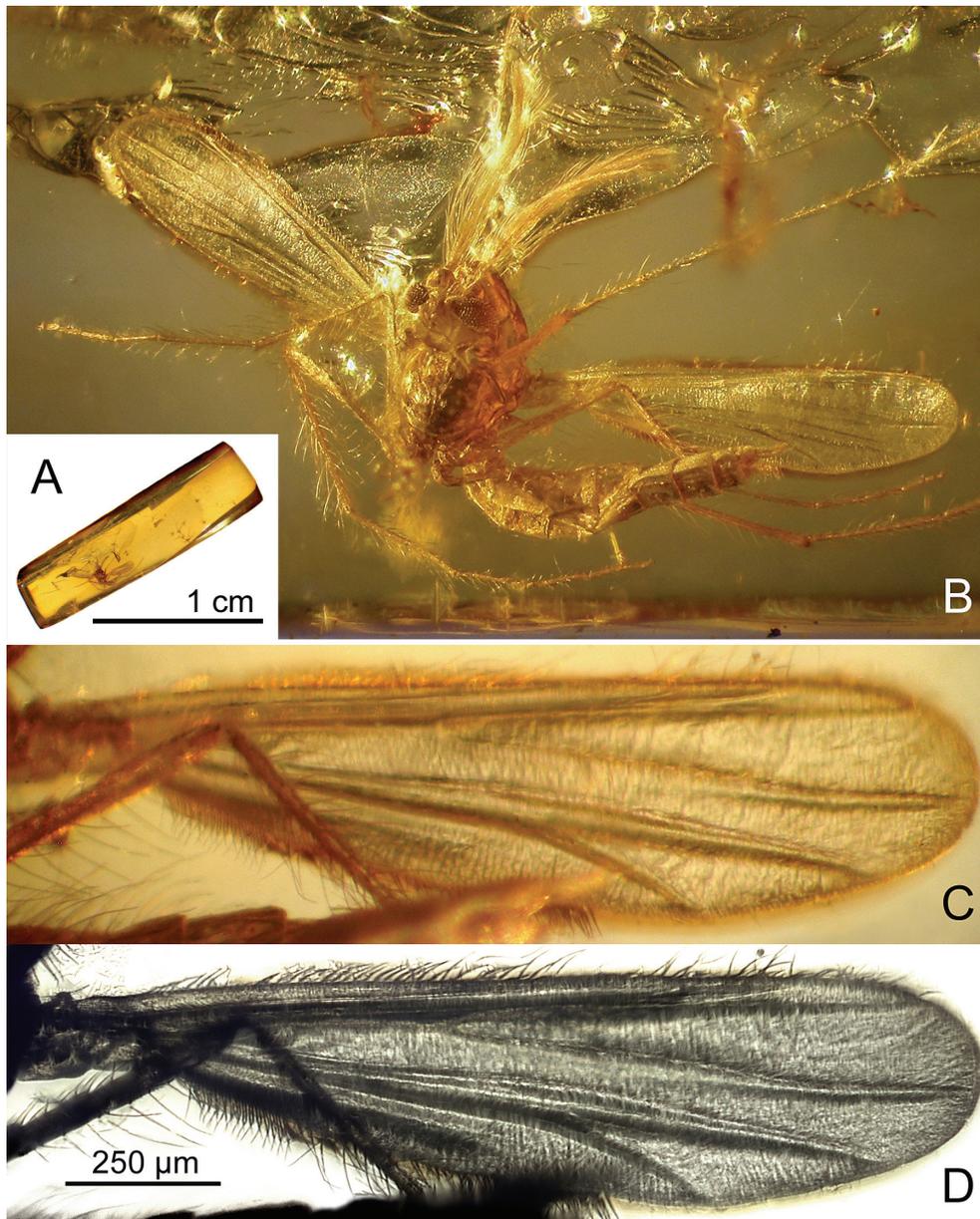


Fig. 1. *Caladomyia szadziewskii* sp. n., holotype, male: A – inclusion; B – habitus; C, D – wing, in reflected (C) and transmitted light (D).

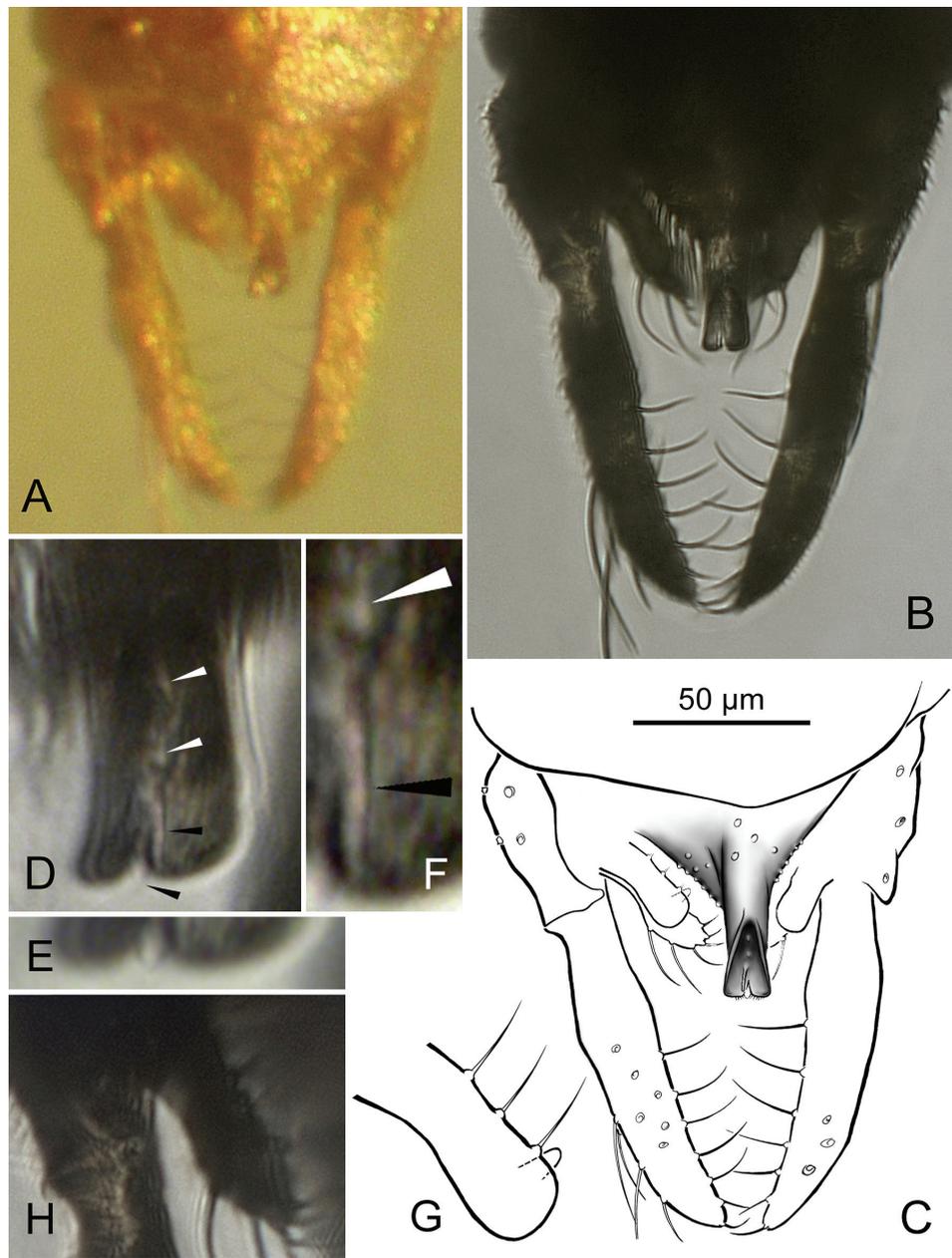


Fig. 2. *Caladomyia szadziewskii* sp. n., holotype, male: A-C – hypopygium in dorsal aspect; D – anal point with spinulae (white arrows), bar and distal extension (black arrows); E – distal extension of anal point (magnified); F – spinula and bar of anal point (magnified); G – superior volsella and digitus; H – inferior volsella.

Wing (Fig. 1C, D). Slender, with anal lobe weak, broadest at 2/3 length, width: 362 μm , length/width ratio 3.89. RM slightly oblique relative to R. FCu placed far distally of RM; VR_{Cu} 1.36. Veins ending as follows (in order from base to tip): An, Sc, Cu_1 under R_1 , R_{2+3} , M_{3+4} , R_{4+5} , M_{1+2} ; ends of R_1 – R_{2+3} and R_{2+3} – R_{4+5} equidistant. Macrotrichia on wing membrane unobservable.

Legs. Fore leg tibia without spur. Tibiae of mid and hind legs with two separated combs, each comb with single spur; mid leg spurs c. 15 μm long, hind leg spurs c. 15–20 μm long. Sensilla chaetica on ta_1 of p_2 not observed. For length of leg segments and leg ratios, see Table 1.

Table 1. Lengths (μm) of leg segments and leg ratios of male *Caladomyia szadziewskii* sp. n.

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR
p_1	-	285	755	425	315	245	110	2.65
p_2	-	-	335–340	165–170	125	85–90	65	-
p_3	605–610	580–595	445–455	245–255	205–215	135–145	75–80	0.76–0.77

Hypopygium (Fig. 2). Gonostylus c. 100–105 μm long, longer than gonocoxite, slender, tapering to slightly curved and posteromedially directed tip. Anal tergite bearing several strong median setae (observable in lateral view). Anal point stout, finely narrowed in mid-length, with deeply incised and horizontally expanded lateral section at apex (lateral enlargements) and small distal section slightly extending beyond lateral enlargements (distal extension); large spoon-like cavity between margins of anal point armed with single posteriorly directed bar and two spinulae arranged in a row; anal point crests not observed; strong, spindle-shaped lateral setae on each side of anal point (Fig. 2A–F). Superior volsella oblique relative to body axis, elongate, with broadly rounded apex and 3 strong setae placed on distinct protuberances on anteromedian margin; digitus present, with blunt tip extending slightly beyond anteromedian margin of superior volsella (Fig. 2B, C, G). Median volsella not observed. Inferior volsella short, reaching 1/4 length of gonostylus, slightly curved, armed with several stout curved setae in distal half (Fig. 2H).

DISCUSSION

The generic diagnosis for adult males of *Caladomyia* by SÄWEDAL (1981) with later emendations (REIFF 2000, SANSEVERINO & FITTKAU 2007, TRIVINHO-STRIXINO 2012) is based on the shape of the hypopygial anal point and its posteriorly directed bars.

However, diagnostics in this genus, based on morphology, and particularly the separation of *Caladomyia* and *Tanytarsus* remain problematic. The structure of the anal point and its bars, atypical of *Caladomyia*, are sometimes confused with one another, and this has resulted in misidentifications and subsequent corrections (TRIVINHO-STRIXINO & STRIXINO 2003, SANSEVERINO & FITTKAU 2007). Interestingly, the new species described above displays a combination of both these structures/characters, i.e. the presence of spinulae and bar, all arranged in a row typical of that consisting of spinulae and common among *Tanytarsus*. Such a combination indicates that these structures are homologous, and that the bar or pairs of bars (in extant species of *Caladomyia*) are actually modified spinulae. The shape of the hypopygial superior and inferior volsellae described in the specific diagnosis of *C. szadziewskii* are recognized as being less advanced in comparison with extant *Caladomyia* and probably indicate plesiomorphous character states.

In view of the lack of other data on fossil records, the answer the questions as to where the genus originated and where the next unknown *Caladomyia* might be found must remain open. Nevertheless, our record of *Caladomyia* in Eocene Baltic amber supplies evidence that (1) the genus evolved c. 40 Ma or earlier, when at least six other genera of the tribe Tanytarsini occurred or co-existed, (2) *Caladomyia* and *Tanytarsus* have a close common ancestor, and (3) the distribution of *Caladomyia* was much wider in the Eocene than at the present (Fig. 3).



Fig. 3. Geographical distribution of *Caladomyia*.

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