



Contribution to the knowledge of the fossil subgenus *Nestormeus* Godunko, 2004 (Ephemeroptera: Heptageniidae: *Ecdyonurus*) from the Baltic amber (Eocene)

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Abstract

A female imago of *Ecdyonurus groehnorum* **sp. nov.** from the Baltic amber (Eocene) is described and illustrated. We have placed this new species within the early described subgenus *Nestormeus* Godunko, 2004 because of the presence of the short, curved lateroparapsidal sutures on the mesonotum, which are noncontiguous with the medioparapsidal sutures.

Key words: Ephemeroptera, Heptageniidae, *Ecdyonurus*, *Nestormeus*, new species, Eocene, Baltic amber

Introduction

For the first time the information about the availability of fossil representatives of the genus *Ecdyonurus* Eaton, 1868 was published by Zhang (1989). However, the analysis of this information does not allow us with certainty to attribute the larva, described and illustrated by J. Zhang, to this genus (for details see Godunko 2004: 323–324). The first reliable finding of the genus *Ecdyonurus* from the Baltic amber (Eocene) was reported by Godunko (2004: 323–328, Figs 1–4). That paper included the description of a female imago of the new species *E. leopoliensis* Godunko, 2004, attributed by the author to the monotypical subgenus *Nestormeus* Godunko, 2004, designated on the basis of the structural peculiarities of the lateroparapsidal sutures of mesonotum.

The description and illustration of a new fossil species *E. groehnorum* **sp. nov.** from Baltic amber, belonging to the previously monotypical subgenus *Nestormeus* are given. The distinguishing characters, enabling the separation of the new species from *E. leopoliensis* are discussed.

The morphological terminology follows that of Kluge (1994, 2004).

Taxonomy

Family Heptageniidae Needham, 1901

Genus *Ecdyonurus* Eaton, 1868 s. l.

Subgenus *Nestormeus* Godunko, 2004

Ecdyonurus (*Nestormeus*) *groehnorum* **sp. nov.**

(Figs 1–6)

Description. Female imago. Measurements: see Table 1.

TABLE 1. Morphometrics of holotype (female imago) of *Ecdyonurus (Nestormeus) groehnorum* **sp. nov.** from the Baltic amber (Eocene).

Characters	(mm)
Length of body	5.33
Length of right fore leg	3.95
Length of femur	1.53
Length of tibia	1.38
Length of tarsus	1.04
Segment I	0.15
Segment II	0.28
Segment III	0.25
Segment IV	0.18
Segment V	0.18
Length of left fore leg	3.86
Length of femur	1.50
Length of tibia	1.40
Length of tarsus	0.96
Segment I	0.15
Segment II	0.28
Segment III	0.23
Segment IV	0.15
Segment V	0.15
Length of right middle leg	3.52
Length of femur	1.63
Length of tibia	1.23
Length of tarsus	0.66
Segment I	0.13
Segment II	0.15
Segment III	0.13
Segment IV	0.10
Segment V	0.15
Length of left middle leg	3.50
Length of femur	1.58
Length of tibia	1.28
Length of tarsus	0.64
Segment I	0.13
Segment II	0.13
Segment III	0.13
Segment IV	0.10
Segment V	0.15
Length of right hind leg	3.20
Length of femur	1.58
Length of tibia	1.05

to be continued.

TABLE 1. (continued)

Characters	(mm)
Length of tarsus	0.57
Segment I	0.13
Segment II	0.13
Segment III	0.10
Segment IV	0.08
Segment V	0.13
Length of right fore wing	5.93
Length of left fore wing	5.75
Length of right hind wing	-
Length of left hind wing	2.13
Hind/fore wings length ratio	0.36
Length of cerci	8.00*

*Completely preserved right cercus only. Left cercus damaged, the length of preserved part is 2.4 mm.

Body pale. Head uniformly brownish pigmented. Eyes noncontiguous, widely separated.

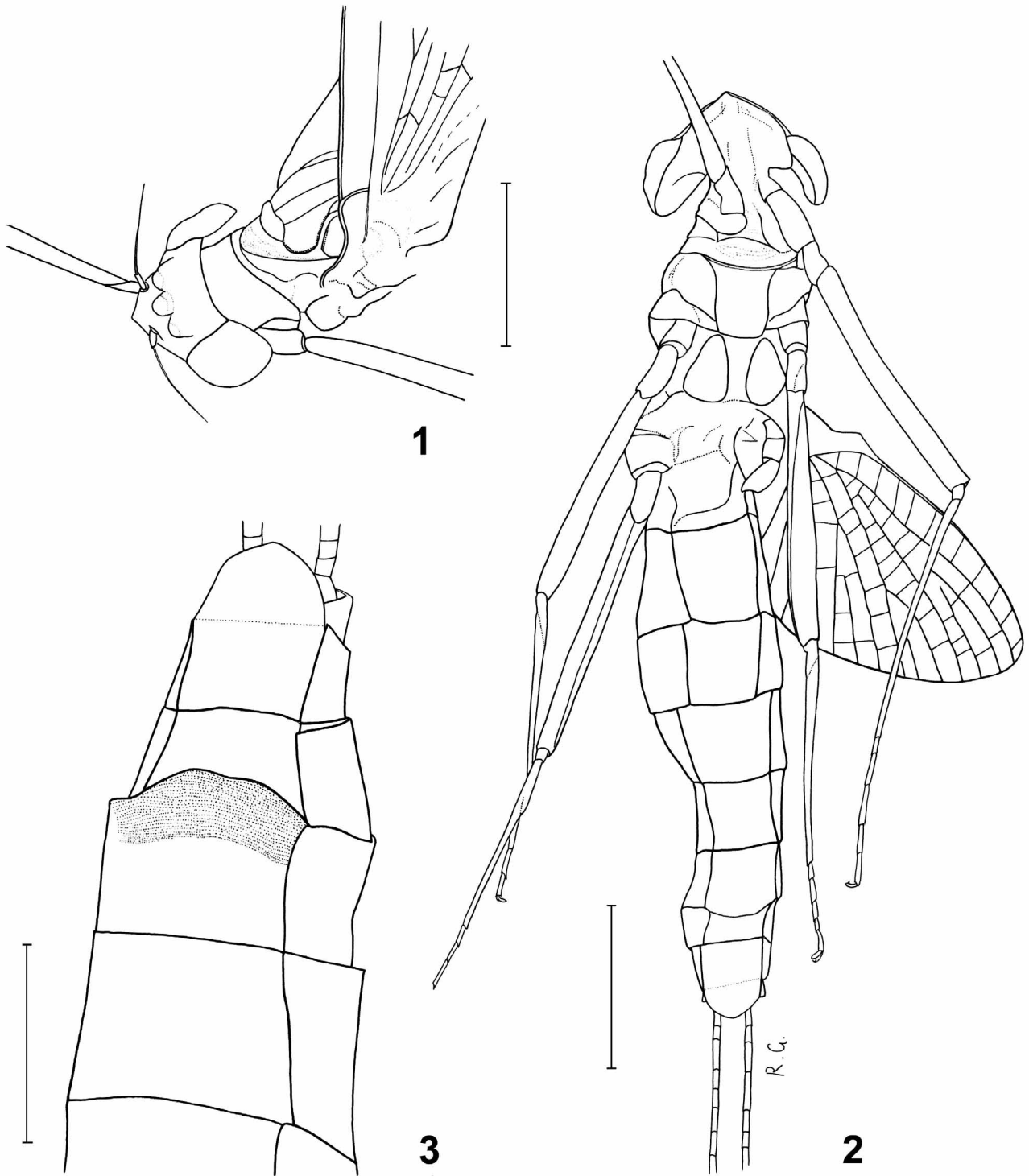
Thorax light brown to brown with paler pronotum. Some brownish smudges around mesonotal sutures. Ventral side of thorax with the same color as dorsal one. Mesonotal suture deep, well visible, stretched backward medially. Medioparapsidal suture is well visible from the left side of the body only. Lateroparapsidal sutures deep and slightly curved, noncontiguous with medioparapsidal sutures (Fig. 1). Proximal part of mesonotum invisible from dorsal view. Median impression of furcasternum of mesothorax with sub-parallel margins, narrowed posteriorly and distinctly divergent in anterior part. Prosternum without any transversal ridge, typical of *Ecdyonurus* s. l. (Fig. 2, 5).

Both pairs of wings translucent and opaque (Fig. 6). Cubital field of fore wings with two pairs of intercalary veins. Hind wings with RS, MA and MP triads. Hind right wing damaged. Wing venation well preserved, with typical structure of the family Heptageniidae (see Kluge 2004: 380–384). Patella-tibial suture is distinct enough in middle and hind legs. Tarsi of all legs are 5-segmented, with dissimilar tarsal claws (one pointed and one blunt claw).

Abdominal segments slightly deformed. Abdominal terga and sterna paler than thorax. Subgenital plate large, well developed, with visible apically impression. Subanal plate elongate, rounded, apically with marked tip (Figs 3, 4). Cerci preserved, longer than body (see Table 1).

Affinities. *Ecdyonurus groehnorum* **sp. nov.** belongs to the subgenus *Nestormeus* within the genus *Ecdyonurus*, which can be distinguished from the other representatives of this genus by the combination of the following characters: (1) median impression of furcasternum of mesothorax with sub-parallel margins, narrowed posteriorly and distinctly divergent in its anterior part (see Kluge 2004), and (2) lateroparapsidal sutures deep and slightly curved, noncontiguous with medioparapsidal sutures (see Godunko 2004).

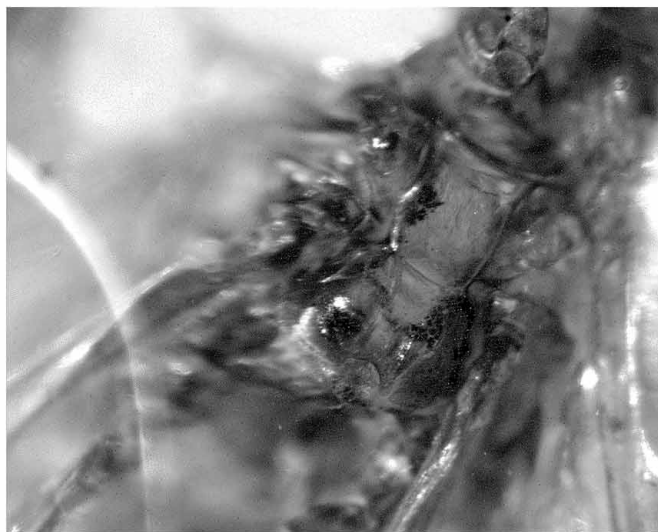
The new species can be easily distinguished from the earlier described *E. leopoliensis* by the shape of the subanal and (especially) the subgenital plates. In contrast to *E. leopoliensis*, which can be characterized by the presence of a rounded apically subgenital plate without any impression, *E. groehnorum* **sp. nov.** bears a visible impression on the tip of the subgenital plate. The subanal plate of the new species is elongate with the tip marked apically, in contrast to the short and uniformly rounded subanal plate of *E. leopoliensis*. Other characters of the holotype of *E. groehnorum*, i.e. body measurements and general aspects of coloration, are close to *E. leopoliensis*.



FIGURES 1–3. *Ecdyonurus (Nestormeus) groehnorum* sp. nov., holotype, female imago: 1, head and thorax laterally and dorsally; 2, body ventrally; 3, tip of abdomen ventrally; 1–2: scale bars = 1 mm; 3: scale bar = 0.5 mm.



4



5



6

FIGURES 4–6. *Ecdyonurus (Nestormeus) groehnorum* **sp. nov.**, holotype, female imago: 4, tip of abdomen ventrally; 5, mesothorax ventrally; 6, body ventrally.

In the previous publication on the subgenus *Nestormeus*, the prothorax structure has not been described, because the anterior part of the type specimen of *E. leopoliensis* is invisible in ventral view (Godunko 2004: 326, Fig. 2). Thus, the examination of the prothorax peculiarities in *E. groehnorum* **sp. nov.** may contribute to the diagnosis of this fossil subgenus, showing the presences of the prosternum without a transversal ridge (typical of *Ecdyonurus* s. l., see Kluge 2004).

Type. Holotype: female imago in the Baltic amber (Eocene), with well preserved body, being well visible from ventral view, and partly from dorsal and lateral views. The holotype is housed in the collection of the Geological-Palaeontological Museum, University of Hamburg (Germany), S.G.P.I.H. no. 4451 (ex coll. Carsten Gröhn no. 76).

Etymology. The new species is named in honor of Jutta and Carsten Gröhn with hearty gratitude for supporting my stay in Hamburg.

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