

Descriptions of larvae of the Central European *Eutomostethus* species (Hymenoptera: Symphyta: Tenthredinidae)

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Abstract. The larvae of *Eutomostethus punctatus* (Konow, 1887) and *E. gagathinus* (Klug, 1816) are described and illustrated for the first time, and the larvae of *E. ephippium* (Panzer, 1798) and *E. luteiventris* (Klug, 1814) are redescribed. Their larval biology is summarized and evaluated. *Carex hirta* (Cyperaceae) is the first verified larval host plant of *E. gagathinus*, and *C. brizoides* (Cyperaceae) for *E. punctatus*.

Key words. Hymenoptera, Symphyta, Tenthredinidae, Blennocampinae, *Eutomostethus*, larva, host plant, Czech Republic, Palaearctic Region

Introduction

The genus *Eutomostethus* Enslin, 1914, with about 100 described species, is distributed in the Palaearctic and Oriental Region (TAEGER et al. 2010). Four or five species occur in Europe (TAEGER & BLANK 2013) and four are currently recorded in the Czech Republic (BENEŠ 1989). In the comprehensive work of LORENZ & KRAUS (1957) larvae of two species of *Eutomostethus* (*E. ephippium* Panzer, 1798 and *E. luteiventris* Klug, 1814) were described and keyed, with their food plants noted. The larvae of the other two species (*E. punctatus* (Konow, 1887) and *E. gagathinus* (Klug, 1816)) remained unknown and are described here for the first time. The fifth European species, *E. nigrans* (Konow, 1887), is not included here, because its taxonomic status is not yet satisfactorily resolved. The known host plants of *Eutomostethus* belong to the monocot families Juncaceae, Poaceae and Cyperaceae (TAEGER et al. 1998). The larvae of *Eutomostethus* are easily distinguished from similar-looking *Dolerus* larvae associated with the same host plants by the following diagnostic characters: a) symmetrical labrum, b) six setae (3+3) on clypeus; c) one seta on mandibles; d) protuberant suprapedal lobe of the prothorax.

This paper is a further contribution to a series of articles (MACEK 2012a,b; 2013) dealing

with previously unknown or undescribed larvae of sawflies. Material reared from larvae collected in the field during the last decade is evaluated, thus enabling presentation of the first or revised descriptions of larvae and verified information on their host plants.

Material and methods

The larvae of all species were collected in the field and reared in captivity to the adult stage in order to identify them and verify their host plant affiliation. This study was carried out in the Czech Republic. The images of living larvae were taken with a NIKON Coolpix 4500 camera. For light microscopic imaging of mounted larvae from alcohol the series of digital photos were taken with a OLYMPUS DP camera attached to a OLYMPUS SZX microscope. Composite images with an extended depth of field were created using the software CombineZP and subsequently processed with other graphic programs. All pictures saved in a digital image archive as well as in alcohol mounted larvae are maintained by the National Museum, Praha, Czech Republic (NMPC).

The material was collected and identified by the author of the current paper. The reared and collected adults, and also larvae preserved in alcohol, are deposited in NMPC. Morphological terms are based on the comprehensive study of VIITASAAARI (2002). Map field codes of the grid mapping system of Central Europe as indicated in parentheses follow PRUNER & MÍKA (1996).

Abbreviations: NR – Nature Reserve, PLA – Protected Landscape Area.

Results

Eutomostethus ephippium (Panzer, 1798)

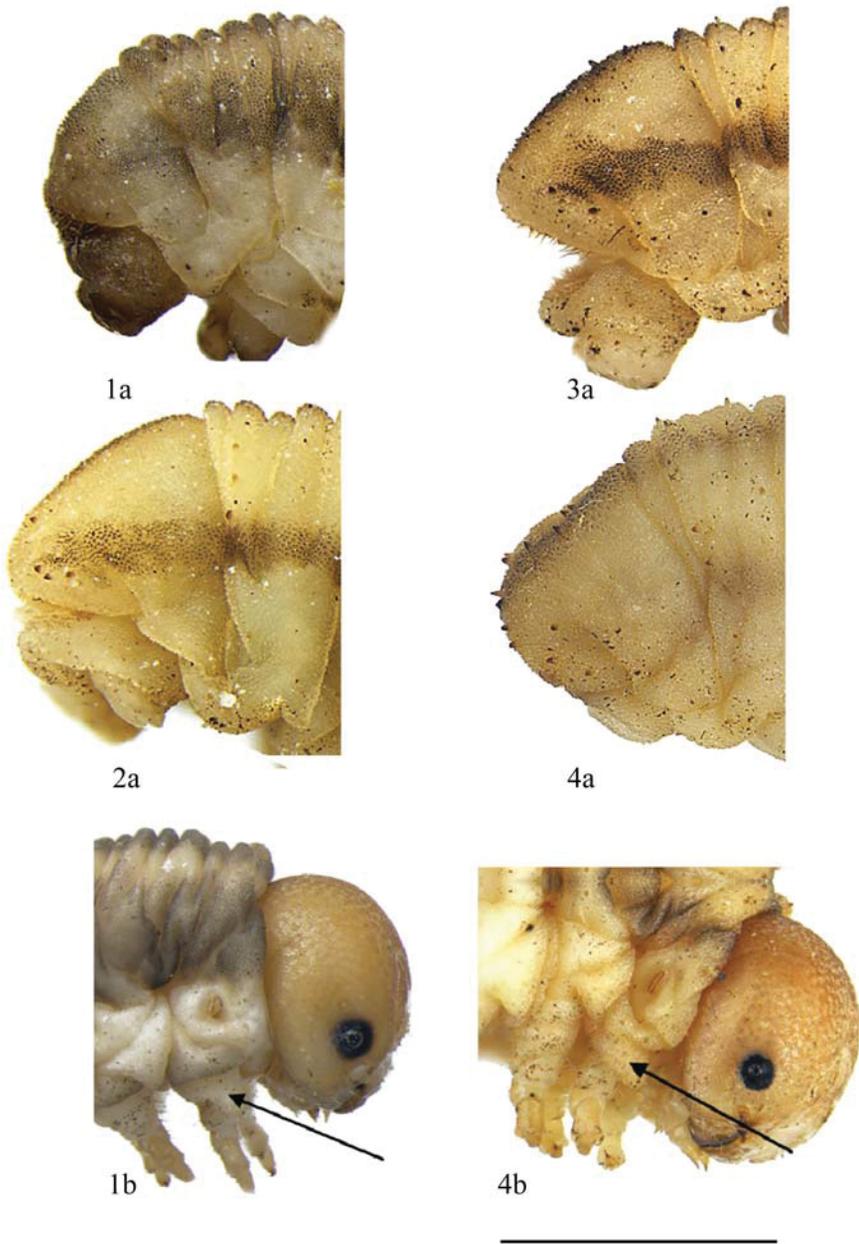
(Figs 1, 6)

Material examined. CZECH REPUBLIC: BOHEMIA CENTR.: Právoúín env., Částrovice (6355), 27.vii.2010, larvae on *Poa* sp.; J. Macek lgt. & det. (NMPC).

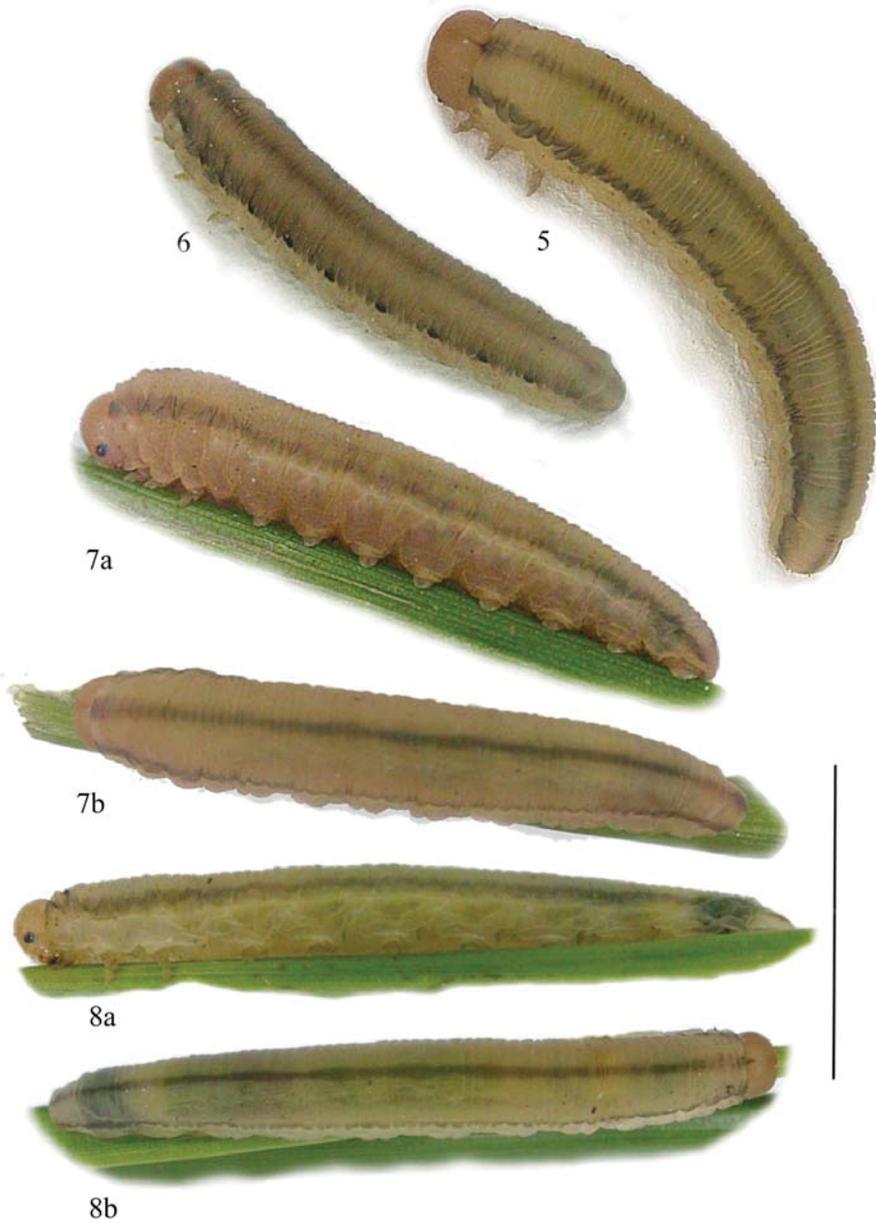
Description of the last instar larva. Body length 9–10 mm. Head amber yellow with nebulous blackish stripe alongside coronal suture, head surface granulose, in upper half with scattered tiny setae, and a row of longer setae alongside the epistomal suture; clypeus with six setae; labrum symmetrical, deeply emarginated, with eight setae; mandibles with one seta, palpifer with three setae, maxillar palpus with one seta, stipes with one seta; body slender, slightly tapered caudally; upper parts of body grey-yellowish, lower parts whitish with dark, nebulous, dorsal and supraspiracular longitudinal stripes and intermittent black spot above each spiracle; cuticle finely granulose; trochanter as long as femur, with scattered long hair-like setae, third abdominal segment with six annulets; second and fourth annulets, subspiracular and surpedal lobes, and anal segment with several tiny cylindrical setae; all conical setae (= glandubae) missing.

Notes on identification. The larvae of *Eutomostethus ephippium* differ from those of other *Eutomostethus* species in black spots above the spiracles and in the absence of glandubae on the annulets.

Bionomics. Habitat: mesophile and humid meadows, pastures, humid grasslands, alluvial



Figs 1–4. Mounted larvae from alcohol. 1 – *Eutomostethus ephippium* (Panzer, 1798); 2 – *E. luteiventris* (Klug, 1816); 3 – *E. punctatus* (Konow, 1887); 4 – *E. gagathinus* (Klug, 1816). Lettering: a – the cuticular sculpture of the anal segment; b – the prothorax, the arrow indicating the protuberant suprapedal lobe. Scale bar: 2 mm.



Figs 5–8. Living last instar larvae (a – lateral view; b – dorsal view). 5 – *Eutomostethus gagathinus* (Klug, 1816); 6 – *E. ephippium* (Panzer, 1798); 7 – *E. punctatus* (Konow, 1887); 8 – *E. luteiventris* (Klug, 1816). Scale bar: 5 mm.

meadows, grassy forest margins; probably polyvoltine; flight period May to September, larval period May to October; host plants: *Poa* spp. and other soft grasses (CONDE 1934; this paper).

Discussion. The development with the description of larvae is given by CONDE (1934) and some additional characters are given by LORENZ & KRAUS (1957). The redescription is provided here for completeness, to facilitate its comparison with those of the larvae of the other *Eutomostethus* species. Compared to their congenics, the larvae of *E. ephippium* are unique in the absence of glandubae on the annulets, and in their association with soft grasses (Poaceae). In contrast, larvae of *E. luteiventris*, *E. gagathinus* and *E. punctatus* possess glandubae and they are associated with rushes (*Juncus*) and sedges (*Carex*).

Eutomostethus luteiventris (Klug, 1816)

(Figs 2, 8)

Material examined. CZECH REPUBLIC: BOHEMIA BOR.: Louny distr., Brodec (5748), 4.viii.2012, larvae on *Juncus effusus*. BOHEMIA CENTR.: Křivoklátsko PLA, Prameny Klíčavy NR (5848), 12.vii.2010, larvae on *Juncus effusus*. All J. Macek lgt. & det. (NMPC).

Redescription of the last instar larva. Body length 12–14 mm. Head amber yellow with blackish strip alongside coronal suture, head surface granulose, in upper half with scattered tiny setae and a row of longer setae alongside epistomal suture; clypeus with six setae, labrum symmetrical, deeply emarginated anteriorly with eight setae, mandibles with one seta, palpifer with three setae, maxillar palpus with one seta, stipes with one seta; body slender, slightly tapered caudally; body in upper part grey-yellowish, in lower part paler with dark dorsal and subspiracular longitudinal stripes; pale spiracles placed in whitish line bordering the dark supraspiracular strip; cuticle finely granulose; trochanter as long as femur, with scattered long hair-like setae, third abdominal segment with six annulets; second and fourth annulets, subspiracular and surpedal lobes, and anal segment with several very tiny, and inconspicuous, blunt setae, fourth annulet with two or four conical glandubae, first and second postspiracular lobes with one glanduba each; anal segment with six glandubae alongside posterior margin; suranal lobe with a row of tough setae on posterior margin.

Notes on identification. Compared to the similar larvae of *E. punctatus* and *E. gagathinus*, those of *E. luteiventris* differ in the surface sculpture of the anal segment (see Fig. 2a).

Bionomics. Habitat: humid meadows, marshes, fens, shore vegetation alongside pools, brooks and rivers from planar to montane zone; univoltine, occasionally bivoltine (WEIFFENBACH 1985), flight period mid May to the end of June (occasionally also from July to August); larval period from July to August. Host plants: *Juncus effusus*, *J. conglomeratus* (LISTON 1997, PSCHORN-WALCHER & ALTENHOFER 2000). I swept larvae on *Juncus effusus* beside the shore of the pool on the forest path near Louny, and in Prameny Klíčavy NR in August (see Material examined). The female oviposits into young sterile shoots of the food plant. The larva starts mining upwards in the pulp, until the last larval instar, then feeds externally on young shoots of the host plant. The infested stems turn yellow and become very fragile. The larva hibernates at prepupal stage in the soil, in an earthen cell (CONDE 1934, KONTUNIEMI 1960).

Discussion. The larval development with the description of larvae is given by CONDE (1934), and additional characters by LORENZ & KRAUS (1957). The purpose of the present redescription provided here is completeness, so it could be easily compared with the descriptions of the larvae of the other *Eutomostethus* species.

***Eutomostethus punctatus* (Konow, 1887)**

(Figs 3, 7)

Material examined. CZECH REPUBLIC: BOHEMIA CENTR.: Křivoklátsko PLA, Prameny Klíčavy NR (5848), 14.viii.2011, larvae on *Carex brizoides*; J. Macek lgt. & det. (NMPC).

Description of the last instar larva. Body length 12–13 mm. Head amber yellow, head surface granulose, in upper half with scattered tiny setae, and a row of longer setae alongside epistomal suture; clypeus with six setae, labrum symmetrical, deeply emarginated with eight setae, mandibles with one seta, palpifer with three setae, maxillar palpus with one seta, stipes with one seta; upper parts of body grey-yellowish, lower parts whitish, dark nebulous dorsal longitudinal stripes and lower white margined supraspiracular stripes; cuticle granulose; prothoracic suprapleural lobe protuberant, first prothoracic annulet with two glandubae; third abdominal segment with six annulets; second and fourth annulets with scattered tiny cylindrical setae; fourth annulet with two or four glandubae, first and second postspiracular lobe with one glanduba each, subspiracular and suprapedal lobes with one glanduba and numerous tiny blackish cylindrical setae; fourth annulet of the ninth abdominal segment with six glandubae, anal segment with two prominent glandubae in middle, suranal lobe with four glandubae; suranal and subanal lobes densely pubescent.

Notes on identification. *Eutomostethus punctatus* differs from the similar species *E. gagathinus* and *E. luteiventris* in the surface sculpture of the anal segment (see Fig. 3a).

Bionomics. Habitat: mesophile and humid deciduous and coniferous forests, alder carrs with stands of sedges; univoltine; flight period May to June, occasionally July to August, larval period July to September; host plants: *Carex* sp. (VERZHUTSKI 1981), *C. paniculata* (LISTON 1995), *C. brizoides* (new record). Mature larvae build for hibernation a fragile parchment cocoon covered with soil particles, in which they also pupate.

Discussion. VERZHUTSKI (1981) and LISTON (1995) mention food plants but without details about the source of these statements. I swept several females on *C. brizoides* in the bog spruce forest of Prameny Klíčavy National Reserve, Křivoklátsko Protected Landscape Area in Central Bohemia, Czech Republic in June. On the second visit in August I swept in the same place the larvae feeding on *C. brizoides*.

***Eutomostethus gagathinus* (Klug, 1816)**

(Figs 4, 5)

Material examined. CZECH REPUBLIC: BOHEMIA BOR.: Krušné hory Mts., Přebuz (5641), 12.viii.2011, larvae on *Carex hirta*; J. Macek lgt. & det. (NMPC).

Description of the last instar larva. Body length 12–13 mm. Head amber yellow, granulose with small dark spot in middle of occiput on coronar suture; head in upper half with scattered tiny setae and a row of longer setae alongside epistomal suture; clypeus with six setae, labrum symmetrical, deeply emarginated with eight setae, mandibles with one seta, palpifer with three setae, maxillar palpus with one seta, stipes with one seta; body in upper part grey-yellowish, in lower part paler; dark dorsal longitudinal and underneath white margined supraspiracular strips; cuticle granulose; prothoracic suprapleural lobe protuberant; first prothoracic annulet with four glandubae; third abdominal segment with six annulets; second and fourth annulets with scattered tiny cylindrical setae; fourth annulet with four glandubae, first and second

postspiracular lobes with one glanduba each, subspiracular and suprapedal lobes with one glanduba and numerous tiny blackish cylindrical setae; fourth annulet of the ninth abdominal segment with six glandubae, anal segment with numerous scattered glandubae over major part of segment, suranal lobe with four glandubae, posterior margin of suranal and anal lobes densely pubescent.

Notes on identification. *Eutomostethus gagathinus* differs from the similar larvae of *E. punctatus* and *E. luteiventris* in the surface sculpture of the anal segment (see Fig. 4a).

Bionomics. Habitat: mesophile and humid meadows, marshes, open grasslands and wetlands from planar to montane zone; univoltine; flight period May to August; larval period July to September; host plants: *Juncus* sp. (LACOURT 1999), *Carex paniculata* (LISTON 2011), *C. hirta* (new record). Mature larvae build for hibernation a fragile parchment cocoon covered with soil particles, in which they also pupate in the next spring.

Discussion. LACOURT'S (1999) mention of *Juncus* as a food plant is questionable since his information source is not given. LISTON (2011) assumes *C. paniculata* to be probable larval food plant, due to having observed abundant specimens flying around the stands of this plant. I swept some adults on a humid meadow with abundant stands of *C. hirta* near the village Přebuz in Krušné hory Mountains, North Bohemia, Czech Republic. On a subsequent visit to the same place in August I swept several *Eutomostethus* larvae from *Carex hirta* which were successfully reared in captivity to adult stage and belong to *E. gagathinus*.

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