

***Ecdyonurus baekdu* n. sp., an Ecdyonurid Mayfly (Ephemeroptera: Heptageniidae) from Korea**

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ABSTRACT

A larva of ecdyonurid mayfly, *Ecdyonurus baekdu* n. sp. is described from N. Korea. This larva is characterized by a median ridge on each abdominal tergum 1-9 as like an acute posterior spine from the lateral view.

Key words: *Ecdyonurus baekdu*, Ephemeroptera, Insecta, taxonomy, Korea

INTRODUCTION

Although mayfly fauna of the Korean peninsula has been intensively studied since 1980s (see Bae, 1997), that of the northern part has been investigated relatively recently (Bae and Soldán, 1997; Bae and Andrikovics, 1997). The family Heptageniidae of Korea was mainly studied by Yoon and Bae (1984) and Braasch and Soldán (1988).

In 1986, as a part of Czech collecting expedition to North Korea, T. Soldán collected unique mayfly larvae from Baekdusan (Paektu Mt.) near the border between Korea and China. I herein describe the species with some taxonomic discussions.

DESCRIPTION

***Ecdyonurus baekdu* n. sp. 백두하루살이 (신칭) (Fig. 1)**

Type materials. Holotype: Grown larva (not fully grown) (in alcohol, BAE-323), Korea (North), Hamgyongbuk-do (Ryanggang-do), Li Huong Su River, alt. 1000m, 1986-VI-24, T. Soldán,

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deposited at Seoul Women's University (SWU). Paratypes: 5 larvae, Same data as holotype, SWU (2 L) & Institute of Entomology, Czech Academy of Sciences, České Budějovice (3 L).

Other reference materials examined. *Ecdyonurus zhiltzovae* Tshernova: Holotype (male imago, 14 VI 1966), Paratypes (1 female imago, 5 VI 1966; 9 larvae, 26 V 1966), Southern Kazakhstan (see Tshernova, 1972 for detailed localities). *Ecdyonurus aurarius* Kluge: Holotype (male imago, 23-24 VII 1980), Paratypes (30 larvae, 26 VII 1980), Far East Russia (Primorye) (Kluge, 1983 for detailed localities).

Grown larva. Body length 7.6mm; head length 1.8mm; head width 2.8mm; thorax length 1.9mm; abdomen length 3.9mm; caudal filaments 12.5mm. Dorsal body ground color brown; ventral body ground color white. **Head.** Head oval, dorsally brown; vertex with pair of slightly light band between compound eyes. Compound eyes nearly hemispheric, black. Ocelli white with circumferentially black and C-shaped marking. Antennae brown, 1.2mm long. Labrum ca. 0.4x width of head, dorsally with dense hairlike setae, anteriorly concave and laterally tapering and slightly curved. Mandibles with dense hairlike setae on anterolateral margin. Maxillae with ca. 18 comblike setae on crown, with scattered hairlike setae on ventral surface; outer margin of maxillary palp segment 2 and 3 with long hairlike setal field; maxillary palp segment 3 ca 0.2x length of segment 2. Glossae stalked and apically round, ventrally with dense hairlike setal field on apicomesial area; paraglossae with well developed scraping setae on anterolateral margin; terminal segment of labial palp with well developed scraping setae on outer margin. **Thorax.** Thorax brown with scattered dark brown markings around basal wingpads; pronotum greatly expanded laterally (Fig. 1). Legs dorsally yellowish brown; forefemora 2.1mm; foretibiae 2.1mm; foretarsi 0.7mm; foreclaws 0.2mm; midfemora 2.3mm; midtibiae 1.8mm; midtarsi 0.5mm; midclaws 0.2mm; hindfemora 2.5mm; hindtibiae 1.9mm; hindtarsi 0.5mm; hindclaws 0.2mm. Femora (Fig. 1) dorsally with scattered dark brown stout setae (apically pointed) except apical half of median area; inner margin with stout setae; outer margin with a row of long hairlike setae. Tibiae bare, dorsally with distinct longitudinal ridge (longitudinal ridge with sparse stout setae), with sparse stout setae along inner margin; foretibiae with weakly developed hairlike setae; midtibiae with a row of hairlike setae dorsally along longitudinal ridge and a row of hairlike setae along outer margin; hindtibiae with dense hairlike setal field along outer margin. Tarsi slightly darker; mid and hindtarsi with hairlike setal field along outer margin. Claws with two teeth (apical tooth larger). **Abdomen.** Dorsal abdomen brown, without distinct marking; tergum 1-9 with distinct median ridge elevated as like an acute posterior spine from the lateral view (spine on tergum 5-7 larger); each abdominal segment with rowed marginal spines posteriorly, alternating a long spine with 1-2 short spines. Abdominal segment 1-6 with both gill lamellae and tufts of filamentous gills (each tuft with ca. 5-10 filaments); abdominal segment 7 with only gill lamellae; gill lamellae dark grey, more elongated on segment 1 and 7, and with arrowlike accessory lobe on segment 5-6 (Fig. 1). Caudal filaments relatively long, ca. 1.6x length of body; each segment with whorls of stout setae distally.

Adult. Unknown.

Etymology. The trivial name *baekdu* is named after the type locality "Baekdusan," the highest mountain (2744m) in the Korean peninsula. The name also alludes the alpine distribution of the species.

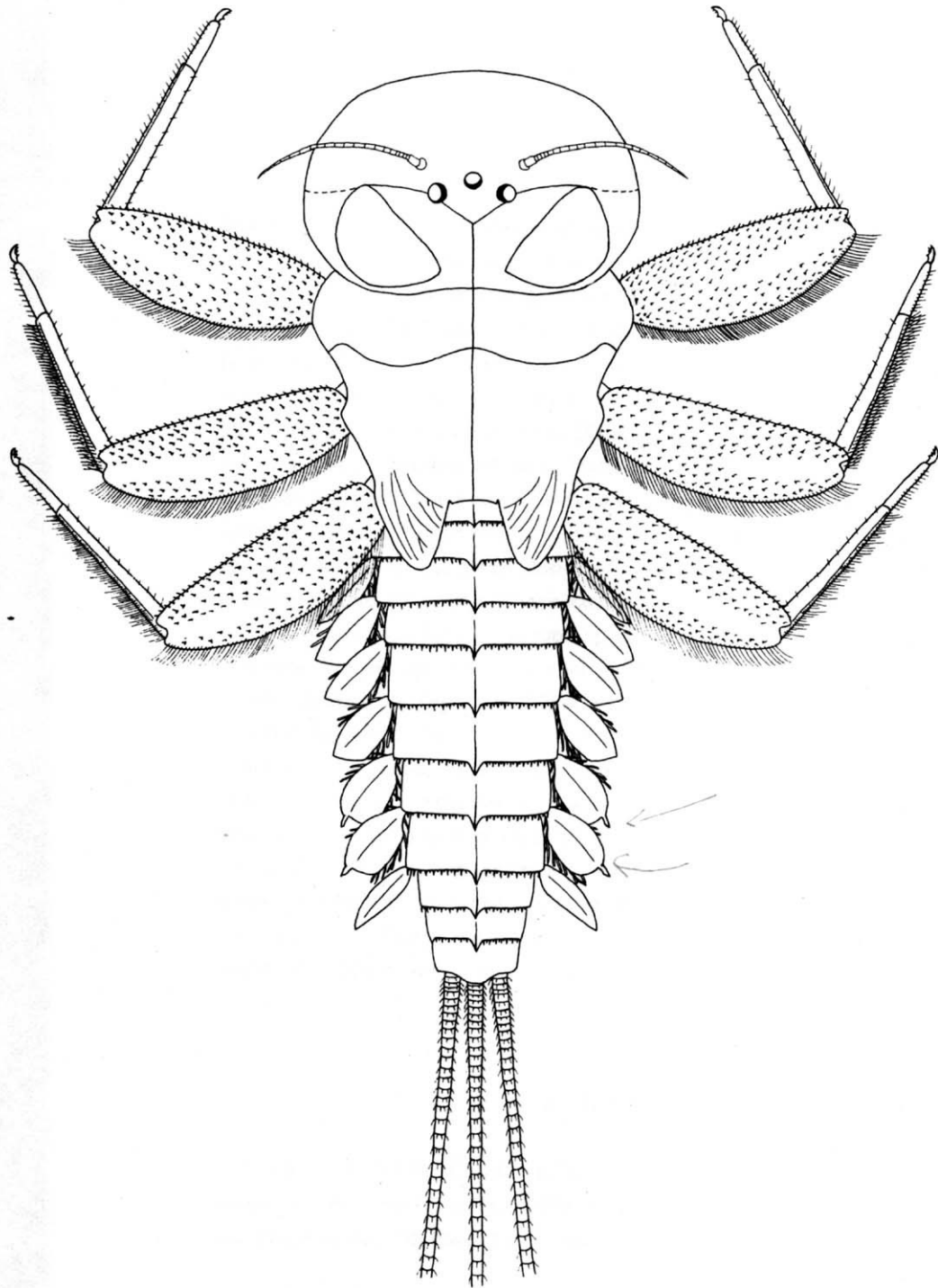


Fig. 1. Larva of *Ecdyonurus baekdu*.

Diagnosis. The larva of *Ecdyonurus baekdu* is distinguished from other ecdyonurid mayflies (except *E. zhiltzovae*) by the possession of the median abdominal ridge on the abdominal tergum 1-9 (Fig. 1), and can easily be distinguished from *E. zhiltzovae* by the possession of the accessory lobe on the gill lamellae 5-6 (Fig. 1) and by smaller body size (<10.0mm).

Remarks. *Ecdyonurus baekdu* has a unique larval character of median ridge on the abdominal terga. This character has not been found in any other ecdyonurid mayflies, but known only in *E. zhiltzovae* from southern Kazakhstan (Tshernova, 1972). Some larval specimens of *E. aurarius* from Far East Russia (see Other reference materials examined, above) possess a rudimentary median ridge on dorsal abdomen, but it never develops into distinct spine at each abdominal segment. Among the adult specimens collected from Paektusan area in North Korea (Bae and Soldán, 1997; Bae and Andrikovics, 1997), any adults close to *E. zhiltzovae* or *E. aurarius* were not found as examined above (see Other reference materials examined).

Bleptus fasciatus Eaton, the type species of the monotypic genus *Bleptus*, possesses similar abdominal spines, whereas a few species of *Epeorus* possess either median spines (e.g., *Epeorus tibertius* Braasch and Soldán, 1984) or a pair of submedian spines (e.g., *Epeorus bifurcatus* Braasch and Soldán, 1979; *Iron martinus* Braasch and Soldán, 1984; *E. aculeatus* Braasch, 1990). Tshernova (1976) used this character as a key character of *Notacanthurus* Tshernova. Although this abdominal spines or tubercles are not in common in Heptageniidae, those are found frequently in other taxa of Ephemeroptera, especially in pannota mayflies.

Ecdyonurus baekdu was previously reported as *Ecdyonurus* sp. A (Bae and Soldán, 1997). The larvae were found from a high mountain stream at 1000m above sea level. Detailed habitat of the species was described in Bae and Soldán (1997). *E. zhiltzovae* was also found from a high mountain stream at 2-3000m above sea level where the habitat is similar to that of *E. baekdu* (Kluge, pers. comm.).

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한국산 참납작하루살이속(하루살이목: 납작하루살이과)의 1신종,
Ecdyonurus baekdu

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요 약

북한산 참납작하루살이속 신종인 *Ecdyonurus baekdu*의 유충을 기재한다. 이종의 유충은 제 1-9배마디에 각자 중앙선을 따라 하나의 융기선을 가지고 있어서 옆에서 볼 때에 뒤쪽으로 향한 하나의 가시모양을 한 것이 특징적이다.