Description of Larval *Nigrobaetis bacillus* (Kluge) (Ephemeroptera: Baetidae) with a Key to the Larvae of the Baetidae in Korea

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INTRODUCTION

The mayfly family Baetidae is one of the most abundant aquatic insect groups in freshwater ecosystems. They are frequently found not only from lotic to lentic ecosystems, but also from clean mountain torrents to polluted urban streams. Despite of this ubiquity of the baetid mayflies, freshwater biologists or ecologists have suffered from their identification because of their insufficient taxonomic knowledge as well as their small body size (5 ~ 10 mm) (Bae, 1997).

Recent taxonomic studies of Korean Baetidae (Park et al., 1996; Bae and Park, 1997, 1998) have enabled the preparation of a comprehensive larval key to the genera and species of the family. We herein also include the description of one additional baetid species previously unknown to Korea. Materials and methods used in this paper are the same as in previous studies (see Park et al., 1996).

DESCRIPTION

Family Baetidae

*Nigrobaetis bacillus* (Kluge) (감장하루살이: 신흥)

(Fig. 1).


*Nigrobaetis bacillus* (Kluge): Waltz et al., 1994: 35.


**Mature larva. Dimensions** (mm): Body length 4.7 ~ 5.5; antennae 2.3 ~ 2.7; forefemora, foretibiae and foretarsi 0.75, 0.5, and 0.5; midfemora, midtibiae andmidtarsi 0.75, 0.5, and 0.3; hindfemora, hindtibiae and hindtarsi 0.8, 0.5, and 0.4; cerci 3.1 ~ 3.6; terminal filament 1.5 ~ 1.7.

**Description**: General body (Fig. 1) dark brown. Head relatively small. Antennae light brown. Labial palpi 3-articled; articles 2.0x length of basal article, apically broader; terminal articles apically round. Thoracic nota without distinct markings. Legs light brown; femora with ca. 8 ~ 9 apically round stout setae on outer margins (Fig. 1); foretibiae as long as foretarsi; mid and hindtibiae longer than mid and hindtarsi; claws brown. Abdominal tergum I, posterior part of IX, and X white; terga II ~ VIII dark brown with light submedian pairs of streaks and dots; posterior margin of abdominal tergum with pointed notches. Gills 1 ~ 7 with rudimentary tracheae. Caudal filaments light brown, without dark band;
terminal filament ca. 0.5x length of cerci.


**Remarks.** The larva of *N. bacillus* can be distinguished from that of *N. acinaciger* Kluge (1983) by the characters of lacking white median line on dorsal body and lacking dark band on cerci. *N. bacillus* possesses gill lamellae on abdominal segment I which are absent in *N. acinaciger*. The generic status of *Nigrobaetis* was revalidated by Waltz and McCafferty (1997).

**Distribution.** Far East Russia (Primorye), Korea.

### KEY TO THE GENERA AND SPECIES OF THE BAEITIDAE OF KOREA

1. Gills one–six paired and gills seven single (in *Procloeon maritimum* gills one–seven single); every 4th segment of caudal filaments prominent (Figs. 2 and 3). ........................................ 2
   - Gills one–seven single; every 4th segment of caudal filaments not prominent (Figs. 4 and 5). ........................................ 5
2. Posterior margin of abdominal tergum X round, with row of spines; lateral spines not enlarged (Fig. 2).
   - *Cloeon dipterum* (두날개하부살이)
     - Posterior margin of abdominal tergum X straight, with row of spines; lateral spines enlarged (Fig. 3). ........................................ 3
   - *Procloeon maritimum* (작은갈고리하부살이)
     - Gills one–six paired and gills seven single. ........................................ 4
4. Claws ca. 1/3x length of tarsi (Fig. 6); body relatively large (8~13 mm).
   - *Procloeon halla* (한라하부살이)
     - Claws ca. 1/2x length of tarsi (Fig. 7); body relatively small (6~8 mm).
   - *Procloeon pennulatum* (갈고리하부살이)
5. Tails two or three; if tails three terminal filament < 0.5x length of cerci. ........................................ 6
   - Tails three with terminal filament > 0.5x length of cerci. ........................................ 8
6. Tails longer than body length; dorsal abdomen with median tubercles (Fig. 8).
   - *Baetella tuberculata* (애호랑하부살이)
     - Tails shorter than body length; dorsal abdomen without tubercles (Fig. 9). ........................................ 7
7. Tails two. ........................................... 11
   - *Acentrella sibirica* (중앙하부살이)
     - Tails three. ........................................... 9
8. Body elongated and laterally compressed; paraprost in ventral terminal abdomen with prolongation (Fig. 10).
   - *Alainites muticus* (길شركات하부살이)
     - Body not elongated and laterally round; paraprost without prolongation (Fig. 11). ........................................ 9
9. Labial palpi enlarged (Fig. 12); terminal maxillary palpi excravate.
   - *Labiobaetis atrebatinus* (임술하부살이)
     - Labial palpi not enlarged (Fig. 13); terminal maxillary palpi not excravate. ........................................ 10
10. Body dark brown. ........................................ 11
    - Body light brown. ........................................ 12
11. Gills on abdominal segment II–VII; gills VI–VIII narrow and apically pointed (Fig. 4); body dorsally with median white stripe.
    - *Nigrobaetis acinaciger* (인자갈가장하부살이)
      - Gills on abdominal segment I–VII; gills VI–VIII oval and apically round (Fig. 5); body dorsally without median white stripe (Fig. 1).
    - *Nigrobaetis bacillus* (갈장하부살이)
12. Hind thorax and wingpads white; abdominal segment II–III and V–VIII with light round markings (Fig. 16); body length < 5mm.
    - *Baetis ursinus* (빙올하부살이)
      - Body color various; body length > 5 mm. ........................................ 13
13. Abdominal posterior margin with round notches (Fig. 14).
    - *Baetis pseudothermicus* (나도고마하부살이)
      - Abdominal posterior margin with pointed notches (Fig. 15). ........................................ 14
14. Abdominal tergum II–VIII with distinct dark submedian streaks and dots (Fig. 17).
    - *Baetis silvaticus* (강초하부살이)
      - Abdominal tergum II–VIII without distinct dark submedian streaks and dots (Fig. 18).
    - *Baetis fuscatus* (계동하부살이)

### ABSTRACT

A comprehensive larval key to the genera and species of Korean Baetidae (Ephemeroptera) is provided for 14 previously known and one newly recorded species in eight genera. For the additional species, *Nigrobaetis bacillus* (Kluge), lar-
Fig. 1. *Nigrobaetis bacillus*, larval habitus.
val description is provided with its larval habi-
tus.

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