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Description of the Larva of *Anchycteis brunneicornis* (Coleoptera, Ptilodactylidae, Anchytarsinae), with Key to Genera of Aquatic Larva of Japanese Ptilodactylidae

Masakazu HAYASHI

Hoshizaki Green Foundation, Okinoshima, Sono, Izumo, 691–0076 Japan

and

Satoru NAKAMURA

Iwate Prefectural Museum, Matsuyashiki, Ueda, Morioka, 020–0102 Japan

Abstract Undetermined larvae of Ptilodactylidae are commonly found from mountain streams in Tôhoku District, northern Japan. The larvae are assigned to *Anchycteis brunneicornis* (LEWIS) by laboratory rearing. Larval morphology is described based on laboratory-reared and field-collected specimens.

The genus *Anchycteis* HORN includes three species in Japan: *A. brunneicornis* (LEWIS), *A. monticola* (NAKANE), and *A. miyatakei* (NAKANE) (SATÔ, 2006). However, their larval morphology has been unknown. Only a North American species, *A. velutina* HORN larva is illustrated by LAWRENCE (1991). In this study, we reared larvae of *A. brunneicornis* in the laboratory to describe their larval morphology.

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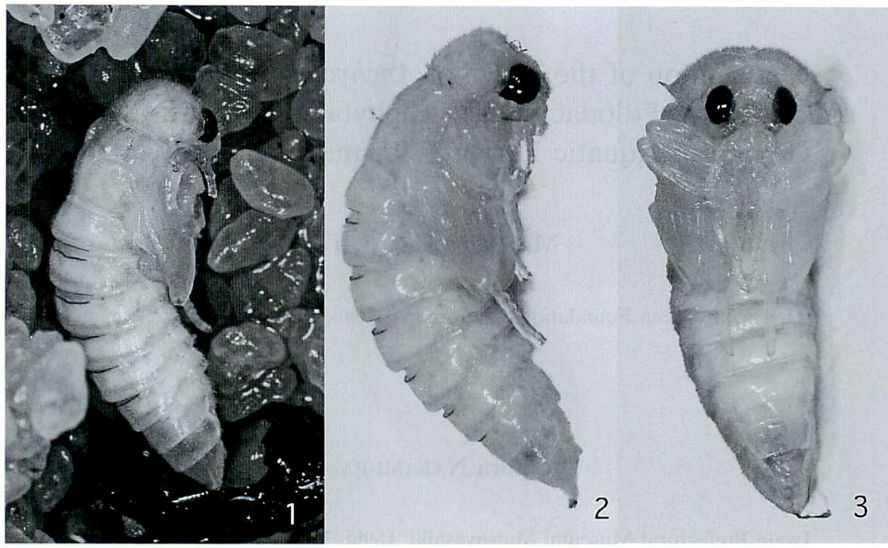
Materials and Methods

Observation and description of external morphology.

Larvae were collected from Iwate and Yamagata Prefectures, Honshu, Japan. The specimens were stored in dry conditions, or fixed in 70 or 99% ethanol, and were deposited at the Hoshizaki Institute of Wildlife Protection, Izumo, Shimane Prefecture, Japan. External larval morphology was examined and photographed under a stereoscopic microscope or a light microscope. Terminology for morphological features of larvae followed SPANGLER (1983) and LEE *et al.* (2005).



Figs. 1–3. Pupa of *A. brunneicornis*. —— 1, Pupated in wet sands; 2, lateral view; 3, ventral view.

Rearing of larvae.

Larvae for rearing were collected from one localitiy, Matsu-kawa Riv., Yunomata-kôen, Matsuo, Hachimantai City, Iwate Prefecture, Japan, on 21 April 2008. Our rearing method followed the breeding system of Psephenidae by SATÔ (1972); larvae were kept in a small tank with shallow water, coarse sand, and gravel. Emerged adults were identified to species.

Results

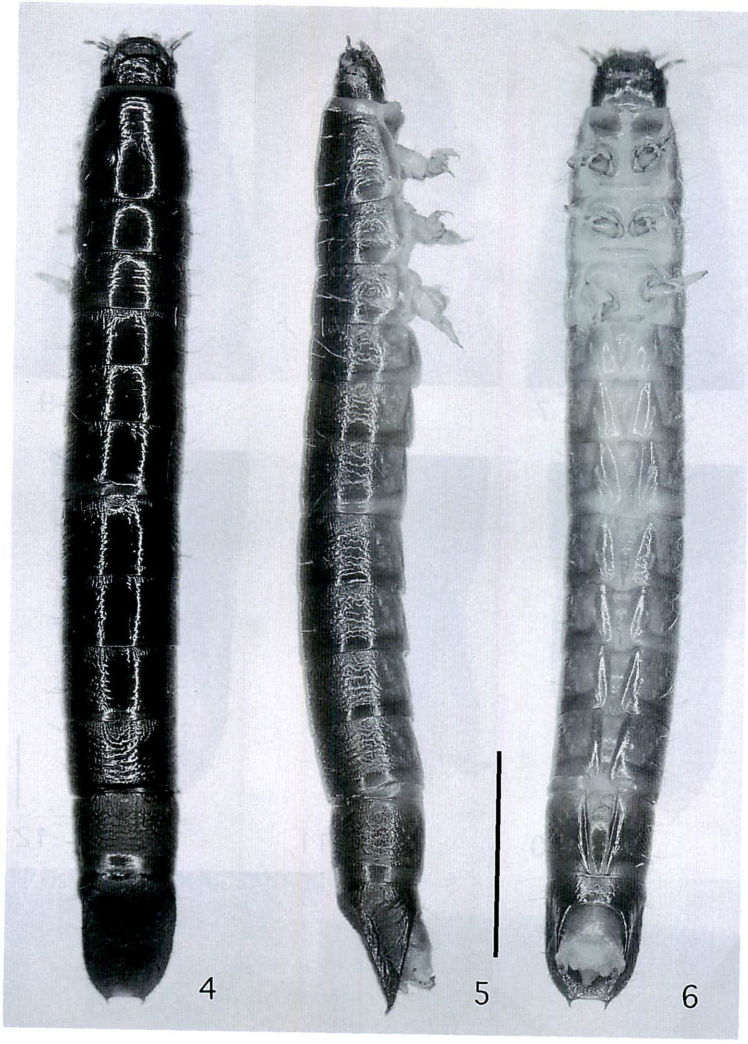
In the laboratory rearing, two *A. brunneicornis* adults emerged: one larva pupated on 10 June 2008 and emerged on 20 June 2008; another larva pupated on 11 June 2008 and emerged on 20 June 2008. These larvae pupated in the wet sands. The pupae are characterized by a pair of pronotal styli on posterolateral angle, cuticular setae, and gin-traps (Figs. 1–3).

Description of Larva

Anchycteis brunneicornis (LEWIS, 1895)

(Figs. 4–24)

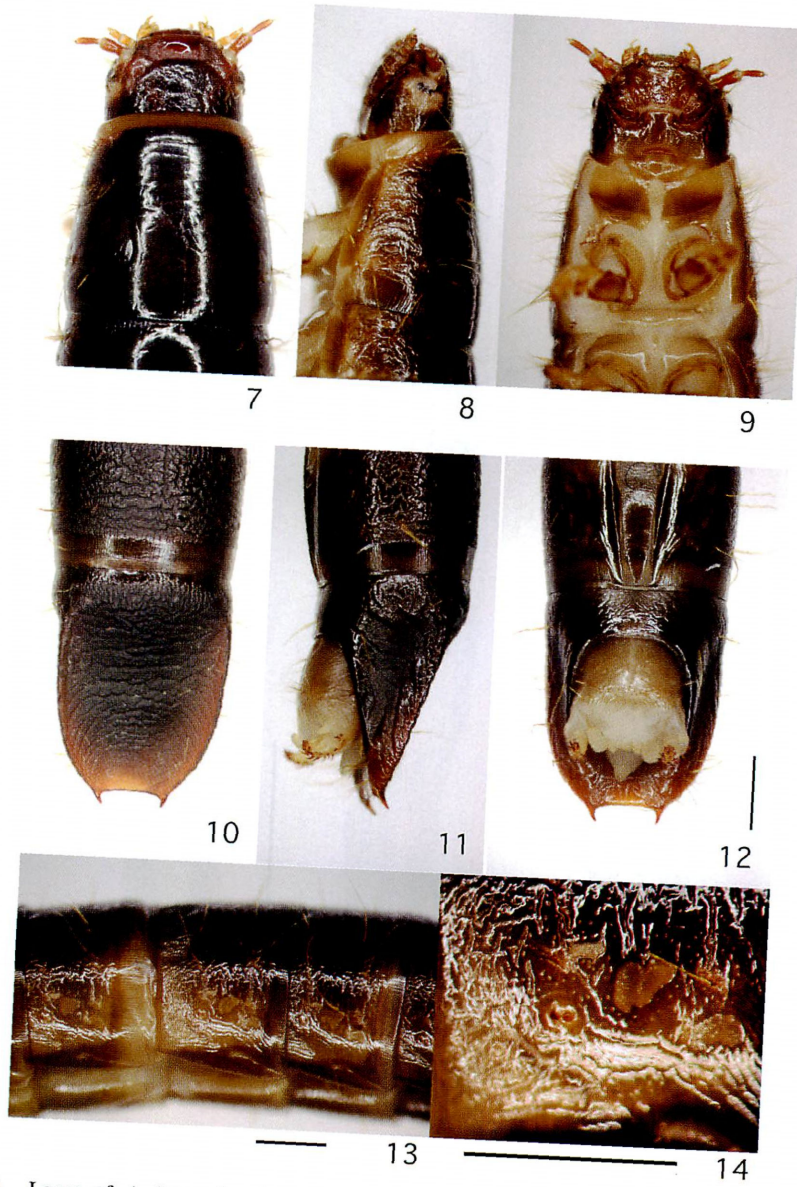
Body elongate and parallel-sided from dorsal view; most abdominal segments semicylindrical, moderately flattened ventrally; color, dark brown dorsally but gradually changing to light colored laterally, creamy yellow ventrally; dorsal and lateral surfaces



Figs. 4–6. Larva of *A. brunneicornis*. —— 4, Dorsal view; 5, lateral view; 6, vetral view. Scale bar= 5.0 mm.

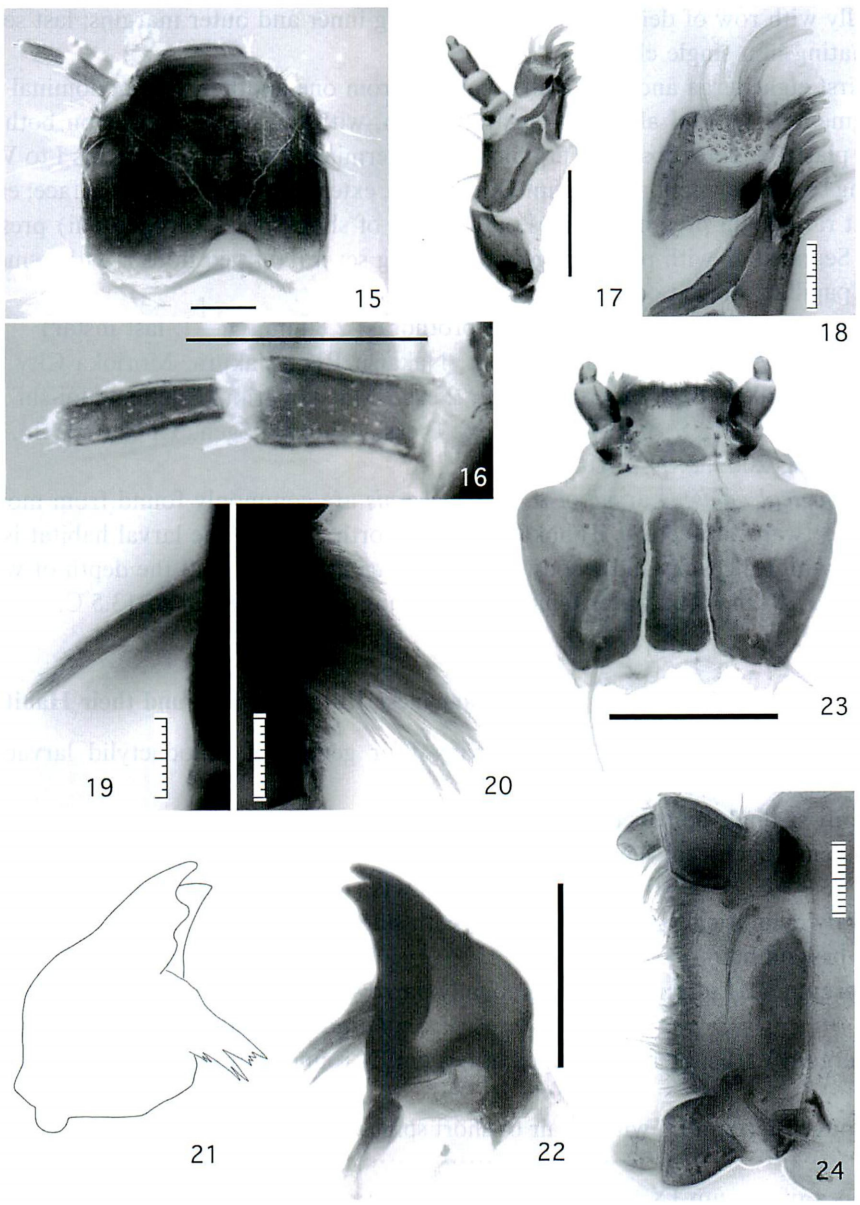
entirely smooth and shiny, but abdominal segments VII to IX more or less dull; sparsely setaceous without pubescent hairs.

Head visible from above; broader than length; frons and vertex irregularly punctate; posterior edge with abrupt median emargination; epicranial stem absent; frontal arms contiguous at base; frontoclypeal suture distinctly impressed. Anntena 3-segmented, 1st slightly longer than 2nd, 3rd evidently short; antennal length about 0.5 times as long as head width. Mandible tridentate at apex, bearing brushes and hairs in inner margin of ventral surface, with articulated pubescent process in inner-middle



Figs. 7–14. Larva of *A. brunneicornis*. —— 7–9, Head and prothorax; 10–12, abdominal segments VIII–X; 13, abdominal segments III–V; 14, spiracle on segment IV. 7, 10, Dorsal view; 9, 12, dorsal view; others, lateral view. Scale bars = 1.0 mm.

margin of dorsal surface. Maxilla with separate galea and lacinia; cardines well separated from one another; maxillae and labium separated. Labium with postmentum divided into three parts.



Figs. 15–24. Larva of *A. brunneicornis*. —— 15, Head, 16, antenna; 17–18, maxilla; 19–22, right mandible (19, articulated pubescent process; 20, brushes and hairs); 23–24, labium. Scale bars= 0.5 mm in 15–17, 21–23; 0.01 mm in others.

Thorax with dense setae on lateral sides; spiracles on sides of mesothorax. Prothorax about 1.5 times as long as mesothorax. Mesothorax as long as metathorax; similar to metathorax. Legs 4-segmented, short and stout; second and third segments

ventrally with row of dense, robust, spines along inner and outer margins; last segment terminating in a single claw.

First eight terga and sterna all separated from one another; free abdominal sterna on segments I to VIII all about equal in width, with biforous spiracles on both sides; lateral plastron plates absent. Tergum VIII subterminal; similar to segments I to VII not forming spiracular siphon. Tergum IX terminal, extending onto ventral surface; entirely flat but raised rim present on sides only; a pair of short spines (urogomphi) present in apex. Segment X with paired pygopods bearing several curved hooks; with osmoregulatory papillae; hinged operculum and anal gills absent.

Body length: ca. 20 mm; width of prothorax: 2.8 mm. (n＝1; last instar)

Larval specimens examined. 5 exs., Nakatsu Riv., Yakura, Morioka City, Iwate Pref., 7–IV–2008, S. NAKAMURA leg.; 2 exs., Matsuoyoriki, Hachimantai-shi, Iwate Pref., 21–IV–2008, S. NAKAMURA leg.; 3 exs., Chôkai-kôgen, Chôkai-machi, Akita Pref., 16–IX–2007, J. NAKAJIMA leg.

Ecological notes. Larvae of *A. brunneicornis* are commonly found from mountain region in Iwate Prefecture, Tôhoku District, North Japan. The larval habitat is small streams with leaf packs and woody debris of *Quercus crispula* and the depth of water is about 5 to 20 cm. The water temperature during June shows 9.4 to 13.5℃.

Key to Genera of Aquatic Larva of Japanese Ptilodactylidae and their Habitats

In Japan, we collected the following four genera of ptilodactylid larvae from aquatic habitats.

1a Body strongly convex dorsally, flattened ventrally; both sides of body with long and dense pubescent hairs……*Drupeus* LEWIS (mountain stream; vertical wet rocks)

1b Body cylindrical or semicylindrical; both sides of body without long and dense pubescent hairs ……2

2a Tergum VIII terminal. Apex gradually narrowed, forming spiracular siphon……*Paralichas* WHITE (marsh; paddy field)

2b Tergum VIII subterminal. Apex of tergum IX rounded or truncate from above……3

3a Apex of tergum IX with a pair of short spines (urogomphi)……*Anchycteis* HORN (mountain stream)

3b Apex of tergum IX rounded without spines……*Epilichas* WHITE (mountain stream)

要　　約

林　成多・中村　学: エゾヒゲナガハナノミ *Anchycteis brunneicornis* (LEWIS, 1895)（甲虫目ナガハナノミ科）の幼虫記載および日本産ナガハナノミ科の水生幼虫の属までの検索. —— 東北地

方の河川上流部には，ナガハナノミ科の大型幼虫が生息しており，とりわけ岩手県では普通にみられるが，これまで成虫との対応関係は不明であった．2008年4月21日に岩手県八幡平市松尾で採集した終齢幼虫を室内で飼育した結果，エゾヒゲナガハナノミの成虫2頭が羽化した．本種の幼虫は，背面からみて腹部に9節が認められ，第9節背板の先端には尾突起があることから，同様な環境に生息する *Epilichas* 属とは容易に識別できる．これらの属も含め，国内では4属の幼虫が水生で湿地や源流，滝の壁面などに生息しており，属までの検索表を作成した．

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Calophagus pekinensis LESNE, 1902, a Bostrichid Beetle new to the Japanese Fauna

Jerzy BOROWSKI[1] and Piotr WĘGRZYNOWICZ[2]

[1] Division of Forest Protection and Ecology, Warsaw University of Life Sciences, Nowoursynowska 159/34, 02–776 Warsaw, Poland
e-mail: jerzy_borowski@sggw.pl
[2] Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw, Wilcza 64 00–679 Warsaw, Poland
e-mail: piotr@miiz.waw.pl

French entomologist Pierre LESNE described a new genus based on a single species, *Calophagus pekinensis* in 1902. Five type-specimens were collected in the north of China, more specifically in the surroundings of Beijing (LESNE, 1902; BOROWSKI & WĘGRZYNOWICZ, 2007). The genus *Calophagus* belongs to the tribe Xyloperthini and subfamily Bostrichinae of the family