Eight Rare Species of Chironomidae (Insecta: Diptera) New to Korea

Han-II Ree*
Department of Parasitology & Institute of Tropical Medicine, College of Medicine, Yonsei University, Seoul 120-752, Korea

ABSTRACT

Eight species of Chironomidae (Diptera) which are new to Korea are described with illustrations. They are extremely rare species in Korea, as only one or two specimens have been collected since 1977 throughout the country. Microchironomus tener, Stictochironomus akizuki and Paratendipes nubilus belong to subfamily Chironominae, and the other five species: Diplacidus cultriger, Limnophyes minimus, Metriocnemus fulvofasciatus and Parametriocnemus stylatus belong to subfamily Orthocladiinae.

Key words: taxonomy, chironomidae, new record, Korea

INTRODUCTION

Since 32 species of Chironomidae were reported for the first time in Korea by Ree and Kim (1981), 28 more species were added during the period of 1981-2003, and Na (2004) described 16 unreported species and 4 new species on her Master degree dissertation. In total, 72 species of Chironomidae have been reported in Korea. Adults were collected by aspirating, sweeping or light traps and slide-mounted with phenol balsam (Ree and Kim, 1981). The slide-specimens are kept in good condition even after thirty years of preparation.

SYSTEMATIC ACCOUNTS

1. Microchironomus tener (Kieffer, 1918) (Fig. 1)
Chironomus tener Kieffer, 1918; Edwards, 1929.
Tendipes (Cryptochironomus) tener: Goetzhebuer, 1937.

Material examined. 1♂ (R-CH-675): Daejeo-dong, Buk-gu, Busan; 21 June 1979 (H.I. Ree).
Description. Male. HEAD: Eye bare, well produced. Frontal tubercle absent. Antenna dark brown, with 11 flagellar segments; AR 1.76. Palp with 4 segments (36 : 94 : 94 : 122 μm). Clypeus with 10 setae. THORAX: Antepronotum well developed, not divided dorsally. Scutum with 6 acrosticals and 7 dorsocentrals each side; scutal tubercle present. Scutellum pale green, with 4 setae. Postnotum yellowish pale green. WING (Fig. 1, A): Wing length 1.54 mm. Membrane bare, with extremely fine punctuation (visible at 400× magnification). All veins pale. Costa not produced. R2+3 ending midway between R1 and R4+5. FCu distal to RM. Squama fringed. Anal lobe moderately developed. LEGS: Femur yellowish green. Frontal tibia and tarsi dark brown. Mid and hind tibiae and tarsi I-III pale green, tarsi IV-V dark brown. Mid and hind tibial combs fused, each comb with a spur. Pulvillus distinct. LR 1.84. ABDOMEN: Pale green. HYPOPYGIIUM (Fig. 1, B): Anal point long, slender, parallel-sided, with 4-5 setae each side at base. Superior volsella elongate, slender, with 3 setae distally (one at apex and two on inner side). Inferior volsella absent. Gonostyli internally expanded at middle and incurved, with short, pale tooth at apex and 6 rather short setae inner-distally.
Remarks. Morphological characteristics of the Korean specimen are mostly coincident with the descriptions of both European and Japanese specimens, except the body size (Edwards, 1929; Pinder, 1978; Sasa and Kawai, 1987). Japanese and Korean specimens are much smaller in size than those of European specimens.

2. Stictochironomus akizuki (Tokunaga, 1940) (Fig. 2)
Chironomus akizuki Tokunaga, 1940.

*To whom correspondence should be addressed
Tel: 82-2-2228-1840, Fax: 82-2-363-8676
E-mail: para@yumc.yonsei.ac.kr

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Description. Female. HEAD: Antenna with 5 segments. Eye with a long and narrow dorsomedial projection. Frontal tubercle absent. Palp with 4 segments (179 : 123 : 125 : 326 μm). 14-18 supraorbitals on each side. Clypeus with 35 setae. THORAX: Dark brown in ground color. Scutum with a small hump (tubercle) on middle; 18 acrosticals, 24 dorsocentrals and 7-9 prealars on each side. Scutellum with 34 setae. WING (Fig. 2, A): Wing length 3.7 mm. Costa not produced, ending above the tip of M₁₋₅. R₂₋₅ well separated from R₁. FCu slightly distal to RM. RM pigmented, with dark spot around. Cu₁ almost straight. Squama fringed. LEGS (Fig. 2, B): Ground color dark brown. Femur with a white ring near apex. Tibia with two broad white rings. Tarsi I-V dark. Combs of mid tibia fused, with two short spurs; combs of hind tibia fused with one short spur. Pulvillus moderately developed (half as long as claws). LR 1.3. ABDOMEN: Tergites dark brown with unclear narrow pale band on hind margins. Cercus shown in Fig. 2, C.

Remarks. This species is widely distributed in Japan, whereas extremely rare in Korea. Only one female was collected in Seoul in 1978. St. akizukii collected in Korea is not clear whether it is St. histrio Fabricius which is very similar to akizukii and widely distributed in Europe, because the male has not been collected in Korea. Hypopygium of the male is the decisive character in adult morphology.

Paratendipes nubilus (Meigen, 1830) (Fig. 3)

Stictochironomus nubilus Meigen, 1830; Goetgebuer, 1928.


Description. Male. HEAD: Eye bare, with well developed darsal projection. Frontal tubercle absent, Antenna light brown, with 13 flagellomeres; pedicel brown; AR 1.6. Clypeus with 11 setae. Palp light brown, with 5 palpomeres (29 : 30 : 130 : 144 : 202 μm). THORAX: Light brown in ground color. Anteropronotum brown, reaching to front margin of scutum. Scutum brown; central and lateral vituae absent. Scutellum light brown, with 4 setae. Postnotum brown. Halter pale. WING (Fig. 3, A): Wing length 1.77

*Paratendipes nubilus* (Meigen, 1830) (Fig. 3)
mm. Costa not produced. RM oblique, not pigmented. R_{2+3} ending well separated from R_{1}. FCu slightly beyond of RM. Postcubitus well developed. Cu_{1} sharply curved at end. An just reaching to FCu. Wing membrane with microtrichiae; dark cloud on cells of r_{2+3}, basal half r_{4+5}, mid m_{1+2}, basal m_{3+4}, above An vein and wing apex. Squama with several hairs. LEGS: LR 1.03. All femurs brown; front tibia pale; mid and hind tibial comb scales fused, with 2 short spines. Pulvillus absent. ABDOMEN: Pale brown, with darker line longitudinally on middle. HYPOPYGIUM (Fig. 3, B): Anal point pale, slender, apically expanded. Gonostylus remarkably concave internally, with short setae inter-apically. Superior volsella broadly, slightly narrowed towards tip, with hook-like tip, 9-10 setae on outer-middle. Median volsella short with numerous simple hairs. Inferior volsella rather short and broad with numerous short bristles apically.

Remarks. This species is very rare not only in Korea but in Japan (Yamamoto, 1995) and in Europe (Goetghebuer, 1928). Yamamoto (1995) reported that this species was found in North Korea.

1sp. Diplocladius cultriger Kieffer, 1908 (Fig. 4)


Description. Male. HEAD: Dark brown in ground color. Eye not produced, reniform, heavily pubescent. Antenna with 13 segments. AR 2.1. Palp 4 segmented (72: 115: 122: 180 μm). Clypeus rectangular, with 12 setae. THORAX: Ground color uniformly dark brown. Dorsocentrals 6-7 on each side, arising from clear pale pit. Scutellum with 7-8 setae. WING (Fig. 4, A): Wing length: 2.5 mm. Wing membrane finely granular under high power magnification. Costa not produced. R_{2+3} separated from both R_{1} and R_{4+5}, ending mid between R_{1} and R_{4+5}. FCu under RM. Cu_{1} curved. Anal vein extending beyond FCu. Squama bare. LEGS: All segments uniformly dark brown. Front tibia with a long terminal spur. Mid tibia with two long terminal spurs. Hind tibia

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with two terminal spurs (one long and the other short) and
11-12 free comb spines. Pulvillus rudimented. LR 0.75.
ABDOMEN: Uniformly dark brown. HYPOPYGIUM (Fig.
4, B): Ninth tergite quadrangular, posterior margin almost
straight. Anal point very small, sharply pointed at tip (look
like a spine). Gonocoxite with long, finger-like inner lobe,
covered with numerous macrotrichiae and 8-9 moderately
long setae apically. Gonostylus forked into two long branch-
es: dorsal one longer with 4 subapical and 3 apical small
setae, and ventral one slightly shorter without setae.
Remarks. Dorsal branch of gonostylus illustrated by Pinder
(1978) is not same as Korean specimens, but similar to that
of Sasa (1984) illustration. Antennal ratio of Korean speci-
mens is 2.1, whereas 1.7-1.9 for Japanese specimens (Sasa,
1984) and nearly 3 for England specimens (Edwards, 1929).

*Limnephys minimus* (Meigen, 1818) (Fig. 5)

*Spaniotoema minima* Meigen, 1818.
*Spaniotoema* (*Limnephys*) *minima*: Edwards, 1929.
*Limnephys hudsoni*: Seather, 1975; Sasa and Kikuchi, 1986;

Material examined. 1♂ (R-CH-353): Mt. Soyo, Dongdu-

Description. Male. HEAD: Eye bare, without dorsomedial
projection. Three vertical setae each side. Antenna with 11
segments; AR 0.52. Palp pale brown, with 4 segments (18 :
46 : 39 : 82 µm). Clypeus with 11 setae. THORAX: Ground
color uniformly brown. Antepronotum moderately develop-
ed, with 2 setae. Scutum with 8 dorsocentrals and 5 prealars
each side. Scutellum with 6 setae. WING (Fig. 5, A): Wing
length 0.86 mm. Membrane covered with microtrichiae.
Costa well produced from end of R₄₊₅. R₂₊₃ running close
to R₅₊₆. FCu distal to RM. M₃₊₄ distinctly curved. An end-
bning before FCu. Anal lobe poorly developed. LEGS: Uni-
formly pale brown. Front tibia with a long terminal spur.
Mid tibia with 2 short terminal spurs. Hind tibia with 11
comb spurs and a long terminal spur. Tarsal segment IV
much shorter than tarsal segment V. Pulvillus absent. LR
0.5. ABDOMEN: All segments uniformly brown. HYPO-
PYGIUM (Fig. 5, B): Anal point absent. Distal margin of
middle portion of 9th tergite slightly produced with several
short setae. Gonocoxite with inner lobe (inferior volsella),
triangular in shape, with numerous short setae. Gonostylus
simple, with 2 stout (dark brown) terminal spurs (one long,
the other short) and a subapical setae.

Remarks. A single specimen collected from Mt. Soyo,
Korea is identified as *Li. minimus*, for structure of the hypo-
pygium and wing are well coincided with those of Japanese and European specimens, except antenal ratio which is a little smaller. AR of the Korean specimen is 0.52, whereas 0.6 for England specimens (Edwards, 1929), 0.71 for Tsuchiama, Japan (Sasa and Kikuchi, 1986), and 0.63 for Aiju, Japan (Sasa, 1993).

**Metriocnemus fulvofasciatus** Kieffer, 1921 (Fig. 6)

_Metriocnemus fulvofasciatus_ Kieffer, 1921; Goetghbeuer, 1950.

**Materials examined.** 2♂ ♂ (R-CH-342, 350); Mt. Soyo, Dongducheon-si, Gyoonggi-do; 12 October 1977 (H.I. Dee).

**Description. Male.** HEAD: Eye bare, dorso medial extension moderately developed. Antenna with 13 flagellomers; last segment slightly swollen, with an apical seta (Fig. 6, C); AR 0.3. Palp dark brown with 4 segments (36:121:107:143 μm), 7-9 postoculars and 9 orbitals each side. Clypeus light brown, with 21 setae. THORAX: Antepronotum light brown, well developed, with 6-7 lateral setae. Scutum brown with unclearly defined dark vittae; numerous long eluted acrosticals, dorsocentals and prealars. Halter pale. WING (Fig. 6, A): Wing length 1.4 mm. Membrane and all veins densely covered with macrotrichiae. Costa strongly extended. R_{2+3} running close to R_{n}, R_{4+5} just above end of M_{2+4}. Cu_{1} slightly distal to RM. Cu_{1} almost straight. An ending slightly distal to FCu. Anal lobe poorly developed. LEG: All segments yellowish brown. LR 0.6. Frontal tibia with a long apical spine; mid tibia with 2 long apical spines; hind tibia with a well developed spine and 9 separated comb spines. Pulvillus vestigial. ABDOMEN: Uniformly light brown. HYPOPYGIUM (Fig. 6, B): Anal point pale, moderately long (36 μm) with slightly tapering point. Gonocoxite long; inferior volsella poorly developed with numerous short hairs. Gonostyulus simple with a strong apical spine and a subapical seta.

**Remarks.** Morphological characters of the Korean specimens well coincide with those of _Metriocnemus fulvofasciatus_ found in Europe (Goetghbeuer, 1950), except the AR difference (0.2 for the former vs 0.5 for the latter).

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**Parametriocnemus stylatus** (Kieffer, 1924) (Fig. 7)

_Metriocnemus stylatus_ Kieffer, 1924; Goetghbeuer, 1950.

_Parametriocnemus stylatus_ Tokunaga, 1939; Pinder, 1978; Sasa, 1981a, b, 1983; Sasa and Okazawa, 1992; Sasa and Hirabayashi, 1993.

**Material examined.** 1♂ (R-CH-997); Daeheung Temple, Haenam-gun, Jeollanam-do; 10 September 1978 (H.I. Dee).

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complex (Sasa, 1998). Cranston et al. (1989) speculated that Parametriorcitenemus would probably be a synonym of Paraphaenocladius.

**Paraphaenocladius impensus** (Walker, 1856) (Fig. 8)
Metriorcitenemus impensus Walker, 1856; Edwards, 1929; Goetghebuer, 1932, 1950.

**Material examined.** 1♂ (R-CH-424): Nokbeon-dong, Seoul; 28 April 1978 (H.I. Ree).

**Description.** Male. HEAD: Eye bare, with dorsal projection. Frontal tubercle absent. Antenna dark brown, with 13 segments; AR 0.73. Palp dark brown, 5 segmented (21:36:86:95:143 μm). Clypeus with 11 setae. THORAX: Antepronotum dark brown, moderately developed. Scutum with dark brown vittae; 18 fairly long acrostichals, 21 dorsocen- trals and 9 prealars. Scutelium dark brown, with 9 setae. Postnotum dark brown. WING (Fig. 8, A): Membrane and veins covered with macrotrichiae. Costa extending beyond tip of R₄₊₅, ending much proximal to tip of M₁₋₄. R₂₊₃ running near R₄₊₅. FCu distal to RM. Cu₄ distinctly curved. An ending distal to FCu. Squama fringed. Anal lobe poorly developed. Wing length 1.5 mm. LEGS: Uniformly light brown. Front tibia with a long terminal spur; mid tibia two short terminal spurs; hind tibia with a long and a short spurs and 11 comb separated spurs. Pulvillus absent. LR 0.78.

**ADOMEN:** Uniformly light brown. HYPOPYGUM (Fig. 8, B). Anal point developed with triangular base, and somewhat angulate at tip. Inner lobe of gonocoxite (inferior volsella) broad with numerous short setae and microtrichiae, and a small additional inner lobe observed ventrally (Fig. 8, C). Gonostylus simple, more or less pararell width, with a strong apical spur, a subapical short spur and 2 subapical setae; 4 short setae inner-laterally.

**Remarks.** This small brown species is common in Europe, but rare in Asia. In Korea only a single specimen was collected at Nokbeon-dong, Seoul in 1978. The description of this species in Japan generally coincides with the Korean specimen, except antepronotum. Four to seven lateral setae of antepronotum are present in Japanese specimens (Sasa and Okazawa, 1992), whereas they are absent in Korean specimen.

**ACKNOWLEDGEMENTS**

This study was supported by the fund for “Arthropods of Medical Importance Bank, Korea”.

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1°Ин알가지봉파구 (산청)

Received May 20, 2007
Accepted October 24, 2007