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One New and Six Unrecorded Species of Chironomidae (Insecta: Diptera) in Korea

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ABSTRACT

One new species and six unrecorded are described with illustrations based on the specimens collected in 1970s-1990s in Korea. The genera *Phaenopsectra*, *Xenochironomus*, and *Smittsia* are reported for the first time in Korea.

Key words: new species, Chironomidae, Korea

INTRODUCTION

Non-biting midges, the family Chironomidae (Diptera), include a large numbers of species, whose larvae are found in almost all types of waters. In Japan, more than 1,060 new species had been described from late 1970s to 2002 (Kobayashi and Endo, 2008). Therefore, at least several hundreds species would be expected to be found in Korea. So far, only 80 species have been reported, including 18 new species in Korea. Among slide-mounted old specimens, one new and seven unrecorded species are described with illustrations.

SYSTEMATIC ACCOUNTS

Subfamily Chironominae Macquart

Genus *Einfeldia* Kieffer

[1]***1. *Einfeldia pagana* (Meigen, 1838) (Fig. 1)**

Chironomus paganus Meigen, 1838, p. 7; Edwards, 1929, p. 120.

Chironomus (*phytochironomus*) *paganus*: Goetghebuer, 1928, p. 385.

Einfeldia pagana: Pinder, 1978, p. 120; Yamamoto, 1982, p. 302; Sasa, 1993, p. 70.

Material examined. 1♂ (R-CH 440): Sinlim-dong, Gwanak-gu, Seoul; 10 Oct., 1977 (H.I. Ree).

Diagnosis. Medium sized, light green midge (wing length 3.5 mm). Anal point of hypopygium rather short and broad. Superior volsella broad and pubescent basally with a bare hook-like process. AR 2.7.

Description (Male). HEAD: Eye black, bare, with highly produced projection dorsomedially; 14-16 postoculars each side. Antenna dark brown, 11 segmented; AR 2.7. Palp pale brown, 4 segmented: 46, 118, 136, 193 μm. Clypeus with 17 setae. THORAX: Ground color yellow light. Scutal vittae redish brown, unconspicuous; 4 acrosticals on posterior portioon, 16 dorsocentrals each side. Scutellum pale, with 23 setae. Postnotum yellowish. WING (Fig. 1A): Membrane bare. Wing length 3.5 mm. Costa not produced. R_{2+3} end near from R_1. FCu slightly distal to RM. Cu_1 almost straight. Anal lobe moderately developed (not produced). Squama fringed. LEGS: Greenish yellow with following segments dark: distal 1/3 of tarsus II and tarsi III-V of frontal leg, and distal half of tarsus II and tarsi III-V of mid and hind legs. Pulvillus developed. Both mid and hind comb scales with two short spurs. LR 1.4. ABDOMEN: Uniformly light green. HYPOPYGIUM (Fig. 1B): Anal point rather short and broad, with more or less same width. Inferior volsella sylindrical, rather short as same length as anal point, with numerous apical setae. Superior volsella (Fig. 1C) broad and pubescent basally, terminating in a bare, hook-like process. Gonostylus rather slender, slightly tappered apically, with 6 short setae distally.

Remarks. Anal point of European specimens is broader than those of Korean and Japanese ones (Pinder, 1978; Sasa, 1993), and Korean specimen is larger than Japanese specimens (3.5 mm vs 2.3 mm), which would be geographical variations. All other characters of the Korean specimen well agree with those of European and Japanese ones.

Subfamily Chironominae Macquart

Genus *Harnischia* Kieffer

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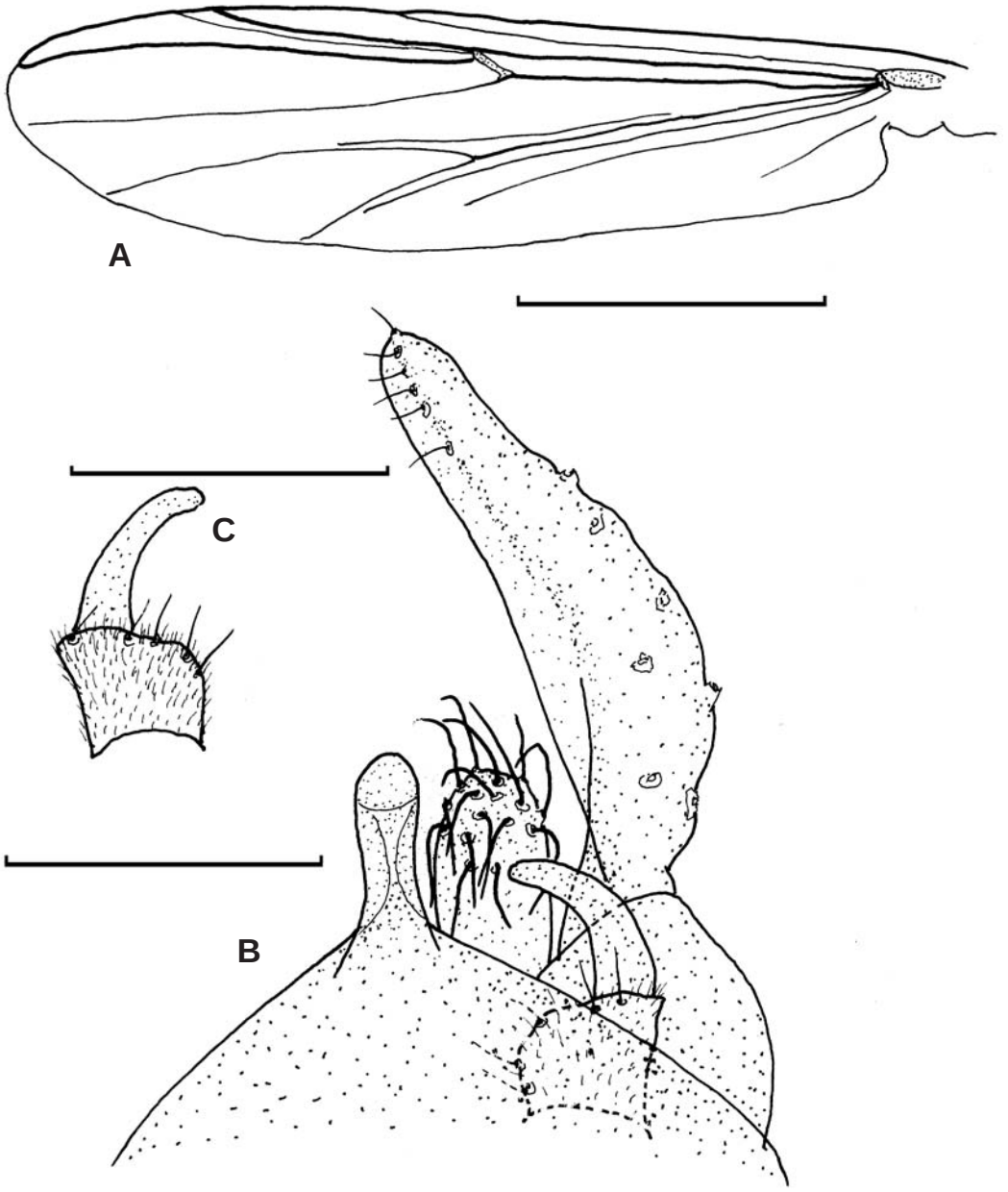

Fig. 1. Male of *Einfeldia pagana* (Meigen). A, wing; B, hypopygium; C, sulperior volsella. Scale bars=1 mm (A), 0.1 mm (B, C).

[1]***2. *Harnischia japonica* Hashimoto, 1984 (Fig. 2)**

Harnischia japonica Hashimoto, 1984, p. 262; Sasa, Kawai and Ueno, 1988, p. 32; Sasa and Okazawa, 1990, p. 31; Sasa, 1994, p. 72.

Material examined. 1♂ (R-CH 2662): Wontong, Inje-gun, Gangwon-do; 2 Oct. 1988 (H.I. Ree).

Diagnosis. Small, greenish midge (wing length 1.9 mm). AR 2.1. LR 2.3. Gonocoxite with a produced inner lobe bearing numerous hairs. Gonostylus rather short, fused with gonocoxite at base, inner margin slightly concaved, distally rounded.

Description (Male). HEAD: Eye bare, with long, parallel-sided dorsomedial extension. Frontal tubercle absent. 6-7 postoculars each side. Clypeus with 21 setae. Antenna dark brown, with 11 flagelomeres; AR 2.1. Palp pale dark brown,

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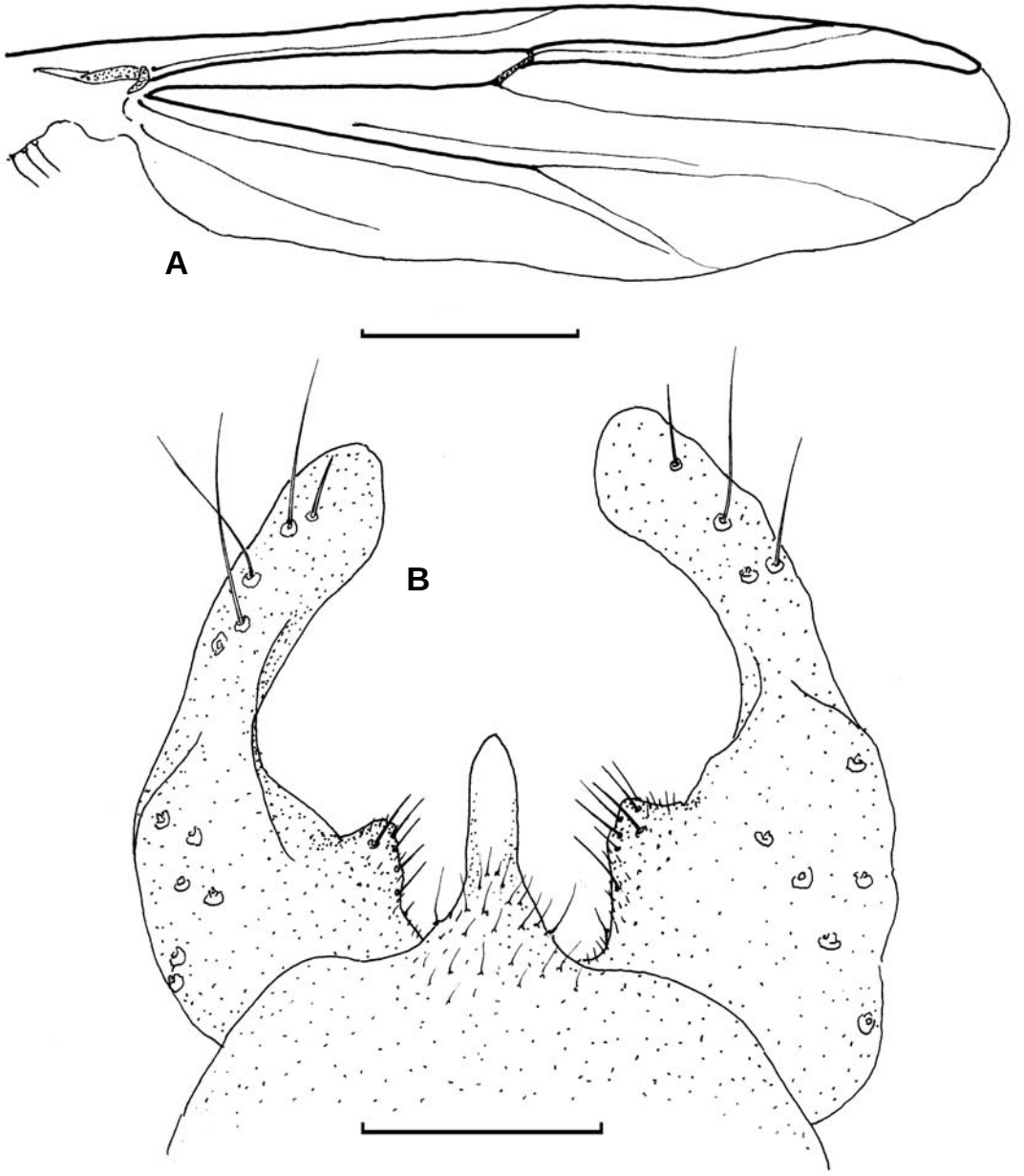

Fig. 2. Male of *Harnischia japonica* Hashimoto. A, Wing; B, hypopygium. Scale bars=0.5 mm (A), 0.1 mm (B).

with 4 segments: 0.6, 2.3, 2.6, 3.5 μm. THORAX: Ground color yellowish brown. Antepronotum yellowish green, notched, divided medially. Scutum light brown, without vittae; 11 acrosticals; 10 dorsocentrals; scutal tubercle very small (not distinct). Scutellum yellowish green, with 6 setae. Postnotum yellowish green. WING (Fig. 2A): Membrane bare, with very fine punctuation. Costa not extended. R_{2+3} ending close to R_1. Cu_1 straight. FCu slightly distal to RM. Only vein R setose. Anal lobe moderately developed. Squama fringed. Wing length 1.9 mm. LEGS: All segments yellowish brown, except tibia, distal half of tarsus I and tarsi II-V of front leg darker. Two combs of mid and hind tibiae almost contiguous, each with 1 short spur. Pulvillus moderately developed. LR 2.3. ABDOMEN: yellowish green. HYPOPYGIUM (Fig. 3B): Anal point bare, appically rounded, with short setae basally. Superior and inferior volsellae absent. Gonocoxite slightly longer than anal point, with a produced inner lobe bearing numerous hairs. Gonostylus rather short, fused with gonocoxite at base, inner margin slightly concaved, distally rounded, without apical or inner-lateral

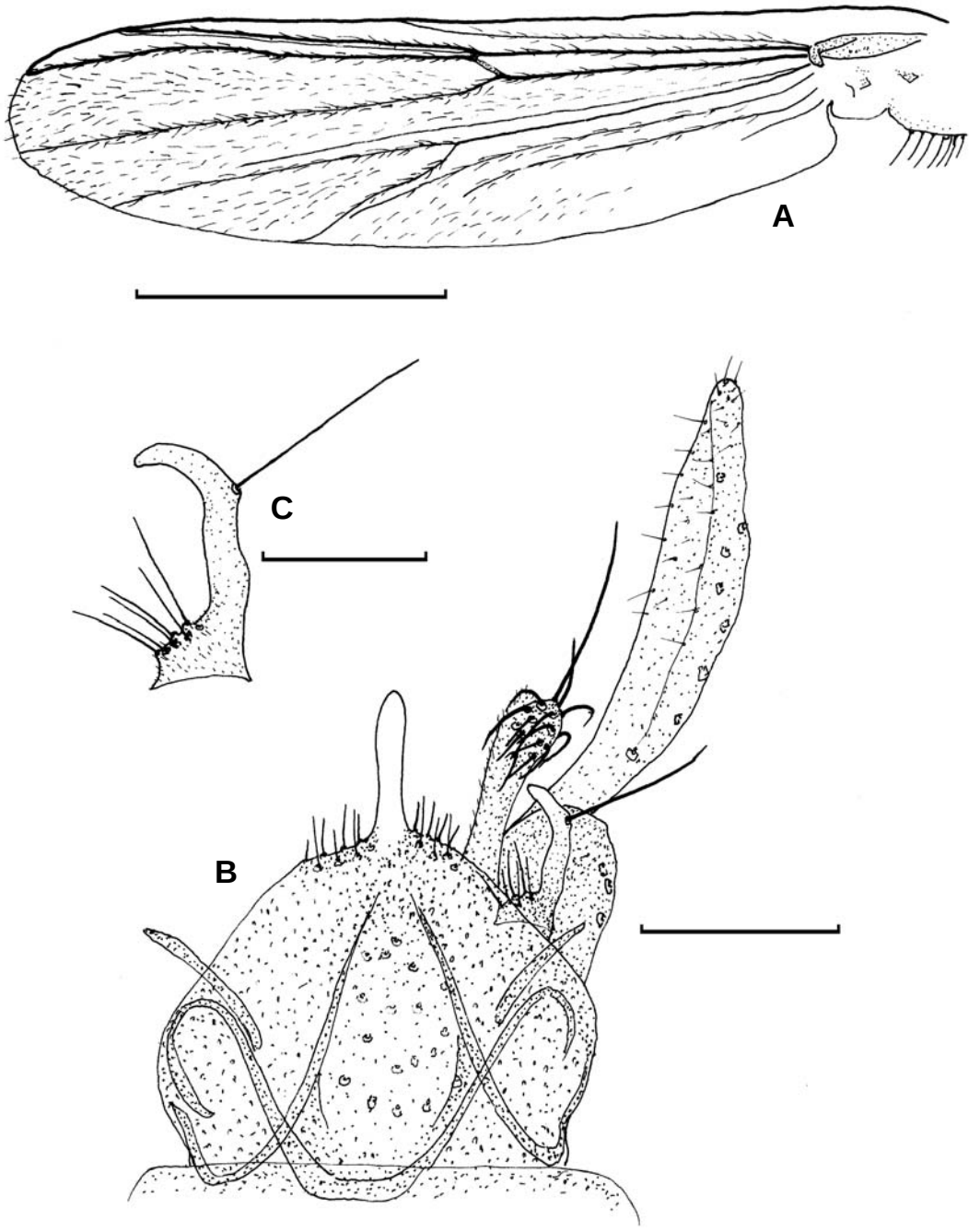

Fig. 3. Male of *Phaenopsectra flavipes* (Meigen). A, wing; B, hypopygium; C, sulperior volsella. Scale bars=1 mm (A), 0.1 mm (B), 0.05 mm (C).

setae.

Remarks. Only one male of this species was collected in Korea, most characters of which are well coincided with those of Japanese specimens. This species is very rare in both Japan and Korea.

Subfamily Chironominae

Genus *phaenopsectra* Kieffer

[1]***3. *Phaenopsectra falavipes* (Meigen, 1818) (Fig. 3)**

Chironomus flavipes Meigen, 1818, p. 50.

Pentapedilum (*Phaenopsectra*) *flavipes*: Goetghebuer, 1928,

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p. 106; Edwards, 1929, p. 375; Hashimoto, 1983, p. 18.
Phaenopsectra flavipes: Pinder, 1978, p. 134; Sasa and Kikuchi, 1986, p. 22.

Material examined. 2♂♂ (R-CH 3484, 3485): Jinhae-si, Gyeongsangnam-do; 13 Aug. 2005 (W.J. Lee).
Diagnosis. Small to medium-sized dark brown species. Wing length 2.6 mm. Legs uniformly pale, except darker tips. Superior volsella pale, slightly curved, apically somewhat hooked, bering a long lateral seta arising at about middle. AR 1.6.
Description (Male). HEAD: Eye bare with dorsomedian extension. Frontal tubercle absent. Antenna pale dark brown, with 13 segments; AR: 1.6. Clypeus with 19 setae on mostly middle portion. Palp pale dark brown, 4 segmented: 75, 187, 186, 261 μm (1 : 2.5 : 2.5 : 3.5). THORAX: Antepronotum narrowed dorsally. Scutum dark brown, vittae unconspicuous; 18 acrosticals; 18 dorsocentrals each side; 5 prealars. Scutellum dark brown with 13 setae in single row. Postnotum dark brown. WING (Fig. 3A): Wing length 2.6 mm. Membrane with macrotrichiae, more densely covered apically. Costa not produced. R_{2+3} ending very close to end of R_1. FCu distal to RM. Cu_1 almost straight. Anal lobe moderately developed. All veins except R_{2+3} setose. LEGS: All segments uniformly pale, except tips (tarsus V stightly darker). Pulvillus not developed. Anterior tibia with a large, pale scale, distally rounded; mid and hind tibiae with shallow, fused comb with a spur. ABDOMEN: All tergites dark brown, darker in middle. HYPOPYGIUM (Fig. 3B): Anal point long, narrow parallel-sided. Superior volsella (Fig. 3C) pale, slightly curved, apically somewhat hooked, bearing a long lateral seta arising at about middle. Inferior volsella finger-like, slightly swollen appically, bearing a long apical seta and numerous recurved setae. Gonostylus long, slender, inner margin concave slightly at base.
Remarks. The genus *Phaenopsectra* (Meigen) is reported for the first time in Korea. This genus is very similar to genus *Pentapedilum*, two species of which were reported in Korea (Ree and Kim, 1988). The inner subapex of the gonostylus has short setae only in the *Phaenopsectra*, whereas these setae of *Pentapedilum* are very long and strong (as long as outer setae on the gonocoxite) and evenly distributed (Cranston et al., 1989).

Subfamily Chironominae Macquart
Genus *Xenochironomus* Kieffer
[1]***4. Xenochironomus xenolabis* (Kieffer, 1916) (Fig. 4)**
Chironomus xenolabis Kieffer, 1916, p. 526.
Chironomus (*Xenochironomus*) *xenolabis*: Goetghebuer, 1928, p. 71; Edwards, 1929, p. 385.
Xenochironomus xenolabis: Pinder, 1978, p. 140; Yamamoto, 1995, p. 114; Sasa, 1998, p. 27.

Material examined. 2♂♂ (R-CH 243, 244): Ichon-dong, Yongsan-gu, Seoul; 20 Sept. 1977 (H.I. Ree)
Diagnosis. Medium-sized green species. Wing length 2.7 mm. L.R. 1.5. Second segment of palp longer than 3rd segment, with numerous irregularly directed long seta. Anal point of hypopygium relatively shot and very broad. Sulperior volsella extremely short (almost flattened).
Description (Male). HEAD: Compound eye black, bare with dorsal projection. Antenna 11 segmented, dark brown; AR: 2.8. Palp light brown, 4 segmented: 45, 209, 144, 227 μm (1 : 4.7 : 3.2 : 5.1); 2nd segment with numerous irregularly directed long setae (Fig. 4C). Clypeus rectangular with 13 long setae, arranged at upper half region. THORAX: Ground color yellowish green. Antepronotum lobes much reduced, dorsally separated. Scutum with orange brown, vittae unconspicuous; 16 acrostichals; 15 dorsocentrals. Scutellum with 14 setae. WING (Fig. 4A): Membrane bare, with very fine punctuation. Costa not extended; R_{2+3} running midway between R_1 and R_{4+5}. FCu slightly distal to RM. R and R_1 setose. Anal lobe moderately developed. Squama bare. Wing length 2.7 mm. LEGS: All segments light green, except tarsi V, IV and distal half of III darker. Combs of tibia contiguous each with spur. Pulvillus developed. LR 1.5. ABDOMEN: Uniformly light green. HYPOPYGIUM (Fig. 4B): Anal point very broad (short and broad), strongly curved ventrally. Superior volsella very short and widely flattend, with 2-3 setae. Inferior volsella slender, long and parallel-sided. Gonostylus long, moderately broadened distally, with 5-6 short setae on distal inner margin.
Remarks. Xenochironomus xenolabis seems to be very rare, because only several specimens were found in Europe (England and France) and Japan. Two males of this species were collected in Korea in 1977.

Subfamily Orthocladiinae Edwards
Genus *Smittia* Holmgren
[2]***5. Smittia nudipennis* Goetghebuer, 1913 (Fig. 5)**
Smittia nudipennis Goetghebuer, 1913, p. 19; Pinder, 1978, p. 96; Sasa, 1985, p. 122; 1988, p. 49; Sasa and Kamimura, 1987, p. 41; Sasa and Kawai, 1987, p. 53; Sasa and Okazawa, 1991, p. 62.
Spaniotoma (*Smittia*) *nudipennis*: Edwards, 1929, p. 357; Tokunaga, 1939, p. 312.

Materials Examined. 3 males (R-CH 403, 421, 422): Nog-

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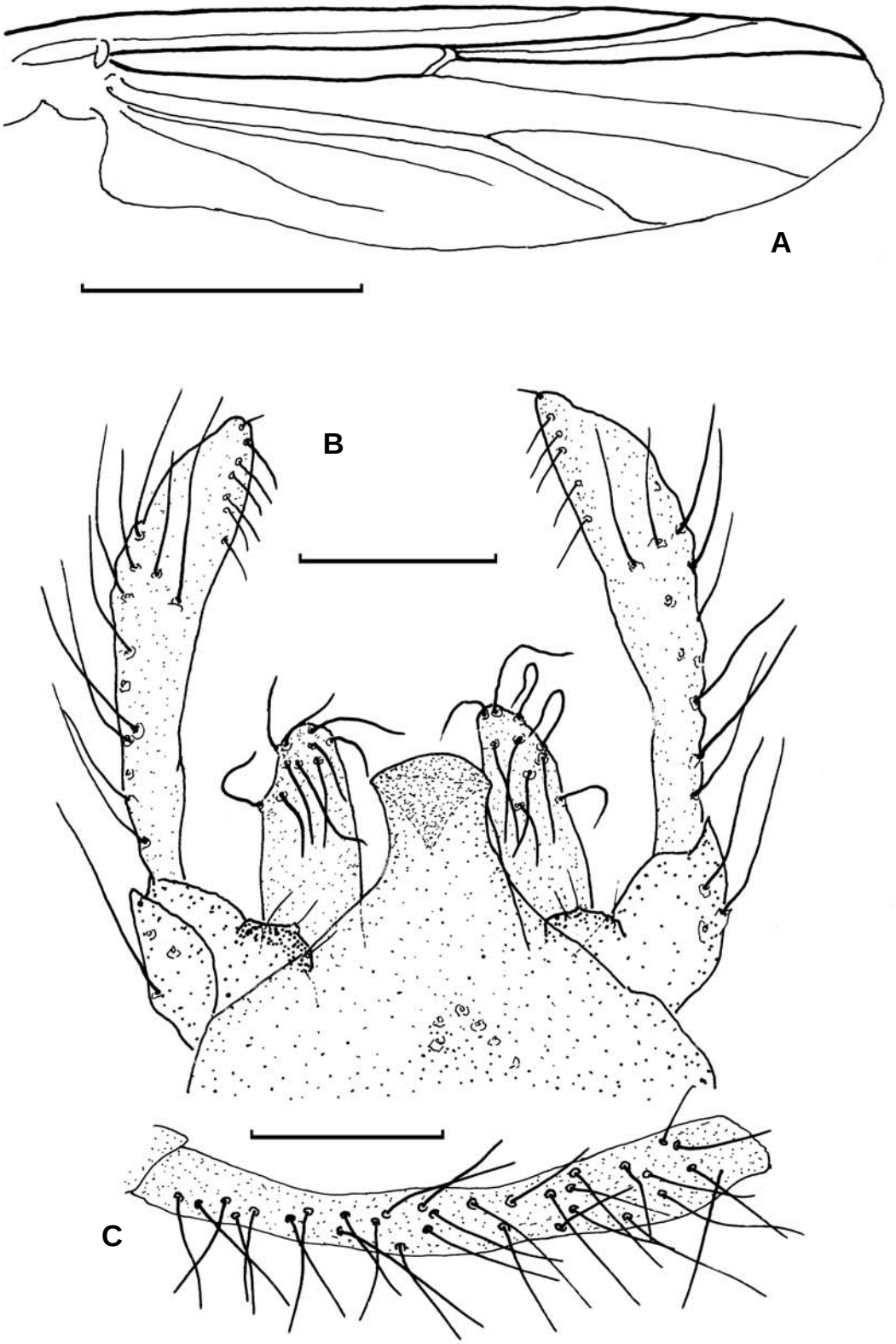

Fig. 4. Male of *Xenochironomus xenolabis* (Kieffer). A, wing; B, hypopygium; C, 2nd segment of palp. Scale bars=1 mm (A), 0.1 mm (B, C).

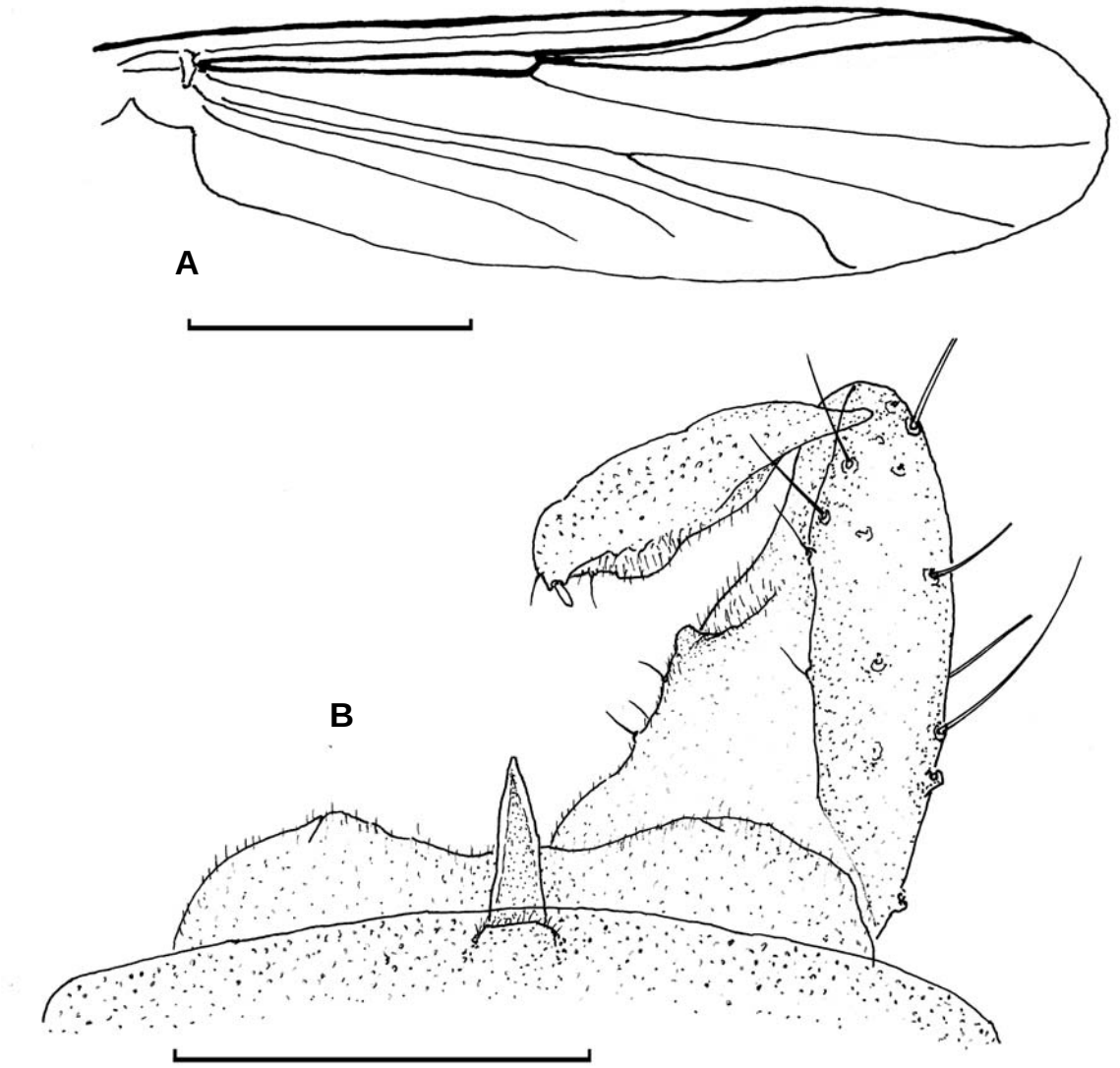

Fig. 5. Male of *Smittia nudipennis* Goetghebuer. A, wing; B, hypopygium. Scale bars=0.5 mm (A), 0.1 mm (B).

beon-dong, Seoul; 14 Apr. 1978 (H.I. Ree). 1♂ (R-CH 2663): Wontong, Inje-gun, Gangwon-do; 2 Oct. 1988 (H.I. Ree).

Diagnosis. Rather small sized black species. Wing length 1.75 mm. Anal point tapered, with sharply rounded apex. Gonocoxite with small conical inner lobe on middle. AR 1.7. LR 0.55.

Description (Male). HEAD: Almost black. Eye reniform, with numerous microtrichiae, hardly extending ommatidia. Antenna dark brown, 13 segmented, with a subapical seta; AR: 1.71. Clypeus shield form with 10 setae. 8 postoculars each side. Palp 4 segmented: 46, 89, 96, 139 μm (1 : 1.9 : 2.1 : 3.0). THORAX: Antepronotum dark, moderately developed. Scutum dark; 7 minute acrosticals; 8-9 dorsocentrals and 6 prealars each side. Scutellum dark with 5-6 setae. Postnotum dark. WING (Fig. 5A): Wing length 1.75 mm. Costa highly produced. R_{2+3} running and ending midway between R_1 and R_{4+5}. Cu_1 strongly curved. FCu far distal to RM. An well developed, extended beyong FCu. Squama bare. Anal lobe moderately developed. LEGS: All segments uniformly dark. LR: 0.55. Front tibia with a long terminal spur; mid tibia with two short terminal spurs; hind tibia with a long spur, a short spur and 13 free comb spurs. Pulvillus absent. ABDOMEN: Uniformly dark. HYPOPYGIUM (Fig. 5B): Anal point moderately long (50 μm), bare, with rounded apex. Gonocoxite with small conical inner lobe. Superior volsella absent. Gonostylus with well developed megaseta (terminal spur) and crista dorsalis.

Remarks. This species was recorded in Europe, Taiwan and Japan. Genus *Smittia* and its related genera are composed of *Smittia* complex, of which *Hahayusurika*, *Togasmittia*, *Toya-*

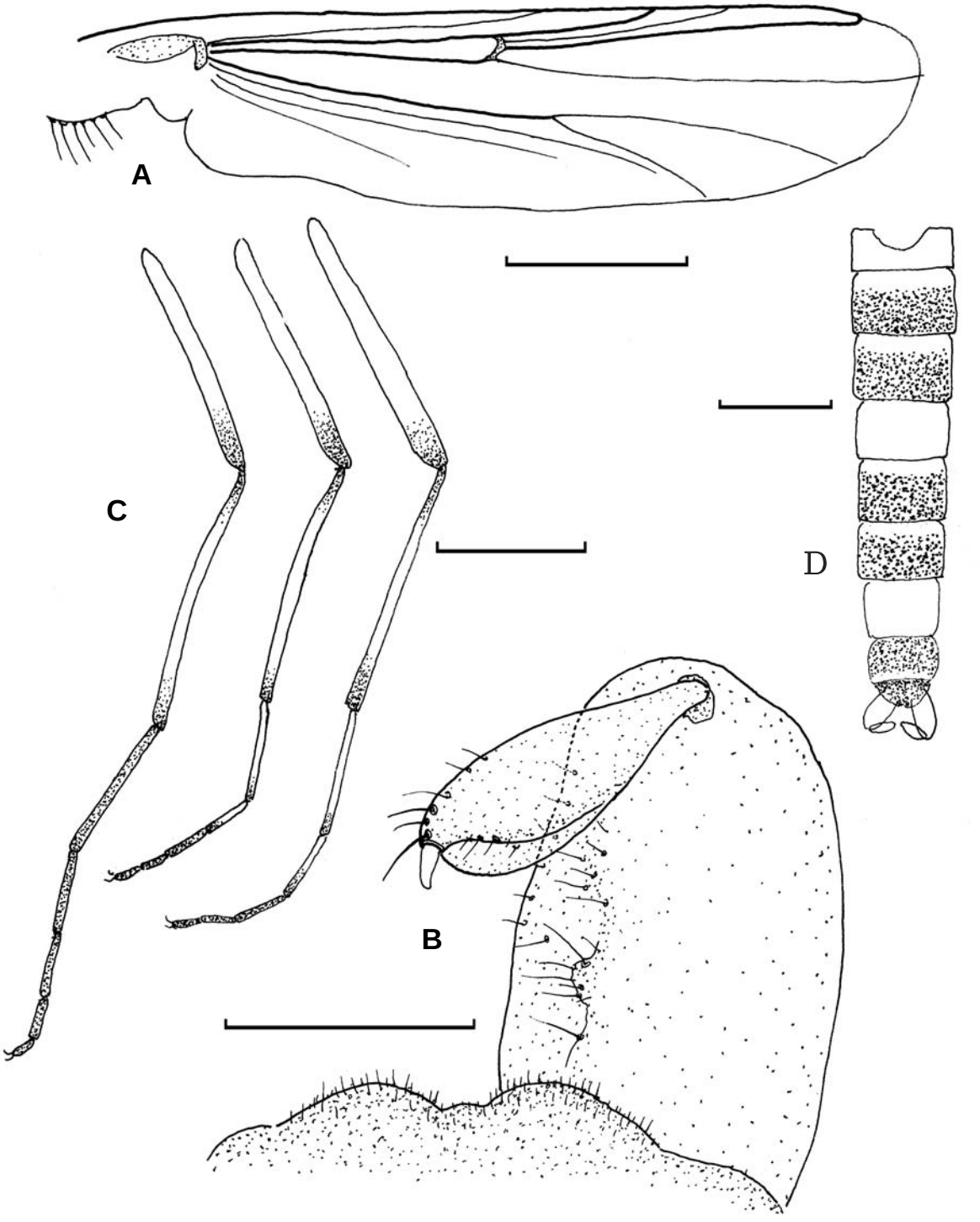

Fig. 6. Male of *Cricotopus parametatibialis* n. sp. A, wing; B, hypopygium; C, legs (front, mid and hind from left); D, abdomen. Scale bars=0.5 mm (A, C, D), 0.1 mm (B).

masmittia, Okayamayusurika, Heleniella, Smittia, Krenosmittia, Epoicoladius, Parakiefferiella and *Rheosmittia* are found in Japan (Sasa, 1998). Twenty species of the genus *Smittia* were reported in Japan, of which 17 species are native. Surprisingly, among *Smittia* complex, only one species, *Smittia nudipennis* was reported for the first time in Korea.

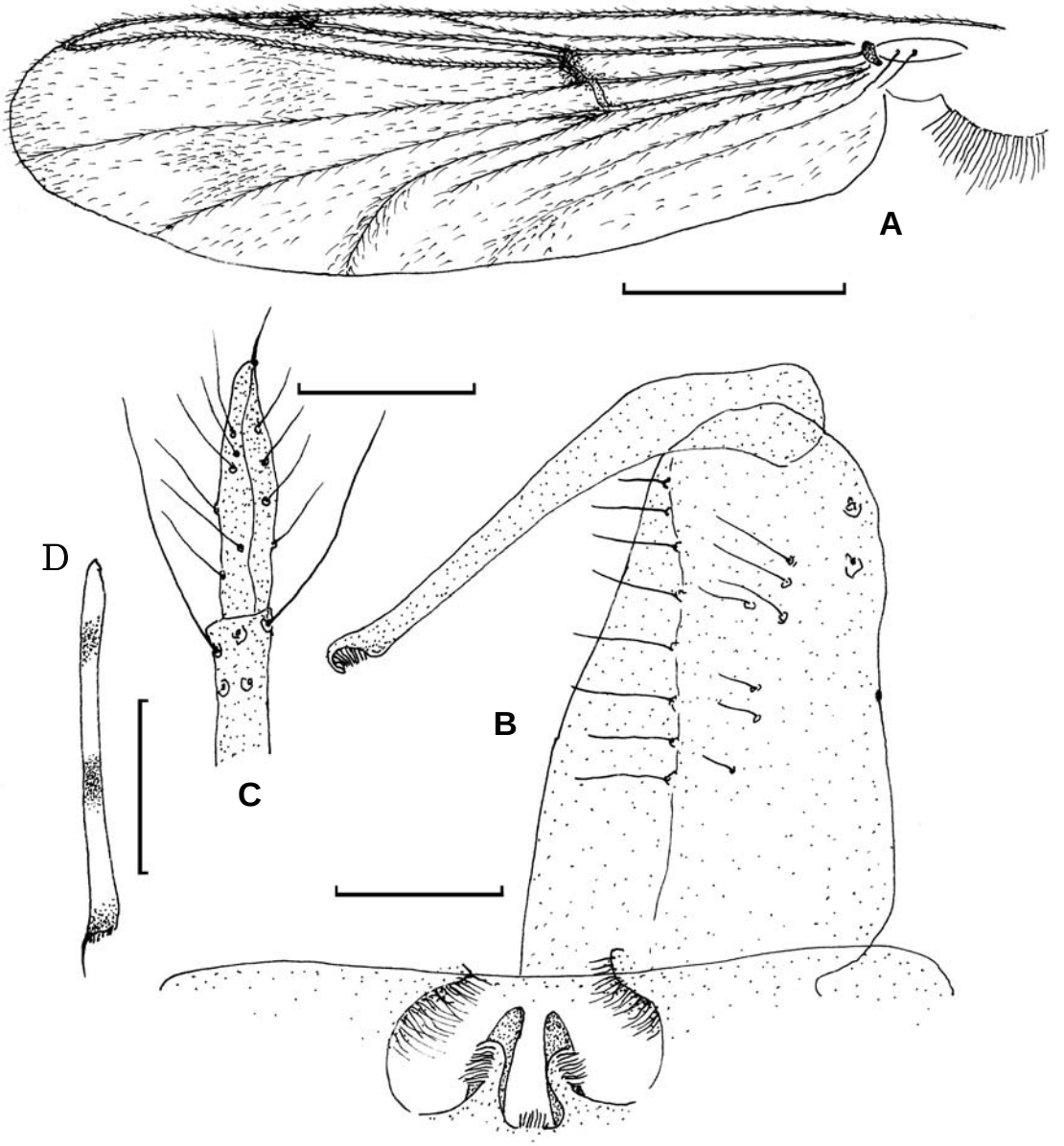

Fig. 7. Male of *Ablabesmyia longistyla*. A, wing; B, hypopygium; C, tip of antenna; D, tibia of hind leg, Scale bars=0.5 mm (A, D), 0.05 mm (B, C).

Subfamily Orthocladiinae Edwards

Genus *Cricotopus* v.d. Wulp

[1]***6. *Cricotopus parametatibialis* sp. nov. (Fig. 6)**

Type material. Holotype: 1♂ (R-CH 3197), Byeonsan Beach, Buan-gun, Jeollabuk-do; 21 May 1993 (H.I. Ree). Paratypes: 6♂♂ (R-CH 3183, 3187, 3195, 3198, 3199, 3200), same data as holotype. The type specimens are deposited in the collection of Department of Environmental Medical Biology, College of Medicine, Yonsei University.

Diagnosis. Rather small, dark brown species. Wing length 1.4 mm. All tibiae pale with basal 1/5 and distal 1/5 dark. Inner lobe of gonocoxite very small (inconspicuous). Abdominal tergite I, IV and VII pale, and the otehr segments dark brown, with basal pale band.

Description (Male). HEAD: Yellowish brown in ground color. Eye pubescent, reniform, slightly produced dorsomedially. 4 postoculars each side. Clypeus with 15 setae. Anten-

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na brown, 13 segmented, AR 1.78. Palp dark brown, 4 segmented: 32, 80, 107, 143 μm (1 : 2.5 : 3.3 : 4.4). THORAX: ground color yellowish brown. Antepronotum well developed, deep yellow. Scutum with distinct, dark brown vittae; 13 tiny acrosticals. Hater pale; scutellum yellowish brown with 20 setae. Postnotum dark brown. WING (Fig. 6A): Wing length 1.4 mm. Membrane bare. Costa not produced. R_{2+3} ending about midway between tips of R_1 and R_{4+5}. FCu distal to RM. Cu_1 almost straight. Anal lobe moderately produced. Squama fringed. LEGS (Fig. 6C). Basal 3/4 of femora pale and distal 1/4 dark brown. All tibiae pale with basal 1/5 and distal 1/5 dark brown. Front tarsi all dark brown; mid and hind tarsi I and II pale and III-IV dark brown (mid tarsi III paler basally). Front tibia with a single slendar spur, mid tibia with two rather short spurs, and hind tibia with two spurs (one very slender and the other long and stout) and 11-12 free comb spurs. Pulvillus vestigial. LR 0.55. ABDOMEN (Fig. 6D). Tergite I, IV and VII deep yellow; Tergite II, III, V and VI dark brown with basal pale band; tergite VIII and IX yellowish brown. HYPOPYGIUM (Fig. 6B): Anal point absent. Ninth tergite with a pair of conical lobes in middle of posterior margin. Gonocoxite with a very small (unconcernible) inner lobe basally, with 4-5 setae. Gnostylus simple, pale, with a strong apical spur and a apical seta.

Remarks. This species is very similar to *Cricotopus metatibialis* Tokunaga, 1936 found in Japan. However, they could be distinguished by the following characters: (1) the middle of hind tibia is dark brown in *metatibiatus* which is very unusual in *Cricotopus*, whereas present species is pale as usual; (2) AR is much longer in this species (1.8 vs 1-1.2); (3) gonocoxite with a small inner lobe (inferior volsella) basally in the new species, while completely absent in *metatibialis*; (4) vein Cu1 is almost straight in the new species, whereas distinctly sinuous in Tokunaga's description; and (5) 9th tergite light brown in the former vs white in the latter (Tokunaga, 1936; Sasa, 1981, 1983).

Subfamily Tanypodinae Thienemann and Zavrel

Genus *Ablabesmyia* Johannsen

[1]***7. Ablabesmyia longistyla* Fittkau 1962**

Ablabesmyia longistyla: Fittkau, 1962, p. 436; Pinder, 1978, p. 30.

Material examined. 1♂ (R-CH 2287): Dogo river, Dogomyon, Asan-gun, Chungcheongnam-do; 30 Sep. 1984 (M.S. Kim).

Diagnosis. Reddish brown, small midge. Wing length 1.9 mm. Hypopygium bears 2 pairs of appendages, dorsal one brush-like and ventral one finger-like.

Description (Male). HEAD: Light brown. Eye dark, bare, with narrow dorsomedial extension. Palp yellowish brown, 5 segmented: 46, 102, 154, 118, 225 μm (1 : 2.2 : 3.3 : 2.6 : 4.9). Antenna yellowish brown, 13 segmented, last segment with apical seta (Fig. 7C), shorter than the second to the last (12th segmeent). AR 2.0. Clypeus with 26 setae. THORAX: Ground color light brown. Pronotum well developed, reaching to the middle of scutum. Scutum yellowish brown with inconspicuous brown vittae. Numerous (>30) acrosticals and dorsocentrals. Scutellum pale brown, with 28 setae. Postnotum brown. WING (Fig. 7A): Membrane transparent, covered with macrotrichiae. All veins covered with hairs, more densely on R_2 and tip of Cu_1. RM with pigments. Arculus dark brown. Brachiolum pale, with 2 setae. Anal lobe moderately developed. Squama densely fringed. Wing length 1.9 mm. LEGS: All segments pale, with dark rings at tip of femur, and base, mid and tip of tibia (Fig. 7D). ABDOMEN: All segments pale, last 3 segments slightly darker. HYPOPYGIUM (Fig. 7B): Gonocoxite large, sylindrical. Gonostylus slender, long, slightly incurved, with blackened, spine-like well at tip. Basally hypopygium bears two pairs of appendages: dorsal appendage brush-like and ventral one finger-like, ventral appendage one third longer than dorsal appendage.

Remarks. This species is very similar to *Ablabesmyia monilis* in general; the wing membrane and veins of this species is covered with hairs more densely, and ventral appendage of the hypopygium is only 1/3 longer than dorsal appendage, whereas twice as long as in *monilis*. *Ablabesmyia longistyla* seems to be extremely rare species, as it was first described in German (Fittkaw, 1962) and reported in England thereafter (Pinder, 1978). Only one specimen of this species was collected in Korea, which is the first report in Asia.

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