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A New Species of *Tanytarsus* and an Unrecorded Species of *Chironomus* in Korea (Diptera: Chironomidae)

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ABSTRACT

In the study of population dynamics of non-biting midges (Diptera: Chironomidae) emerging from reclaimed rice fields in Seosan, Chungchongnam-do, Korea, a new species, *Tanytarsus seosanensis* sp. nov. and an unrecorded species from Korea, *Chironomus javanus* (Kieffer) were found. *T. seosanensis* was the third dominant species among the non-biting midges found in the reclaimed rice fields, whereas *C. javanus* was a rare species. They are fully described with illustrations.

Key words: *Tanytarsus seosanensis*, *Chironomus javanus*, Taxonomy, non-biting midges, Chironomidae, Korea

INTRODUCTION

The study of population dynamics of chironomid midges (Diptera: Chironomidae) emerging from reclaimed rice fields in Seosan, Chungchongnam-do, Korea was carried out in 1997-1999. Fifteen cone-shaped emergence traps were set up at 15 randomly selected plots, and sampled continuously from April to September (Kim *et al.*, 2001). The collected midges were preserved in 70% ethanol, and later were slide-mounted with the head, antennae, wings, legs, abdomen and genitalia apart. In this study more than 25 species of Chironomidae were collected, and among them *Tanytarsus* sosanensis sp. nov. and *Chironomus javanus* (Kieffer) were identified.

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Terminology for the morphology followed Seather (1980) and Oliver and Dillon (1989). The length of the wing which represents the size of the body was measured from the apex of the wing to the acrista. Antennal ratio (AR) is the value obtained by dividing the length of the 13th segment by the length of the remaining segments of the antenna. Leg ratio (LR) is the value obtained by dividing the length of the first tarsal segment by the length of tibia of the front leg. The type specimens are deposited in Department of Parasitology, College of Medicine, Yonsei University, Seoul, Korea.

DESCRIPTIONS

***Tanytarsus seosanensis* sp. nov.** (서산장부깔따구, 신칭) **(Fig. 1; Table 1)**

Material examined. Holotype: 1♂ (R-S-40, slide-mounted), Chang-ri, Buseok-myon, Seosan-si, Chungchognam-do, 4 July 1999 (J. Y. Kim). Paratypes: 10♂♂, same data as holotype.

Diagnosis. Body color yellowish brown. Wing length 1.59±0.09 mm. AR 1.3±0.07. LR 2.31±0.14. Superior volsella oval with 7-8 setae, digitus absent. Median volsella with numerous simple setae.

Description (male, n = 10). HEAD (Fig. 1B): Yellowish brown in ground color. Eye black, bare, slightly produced dorsally, widely separated each other. Frontal tubercle present. Antenna with 13 flagellomeres; AR 1.3±0.07; antennal length 0.9±0.05 mm; pedicel and flagellum dark brown. Vertex with 10-11 setae in a row at each side. Clypeus oval, with 16 long setae. Palp dark brown, 4 segmented: 38.9±2.9, 89.6±5.8, 109.8±7.6, 161.6±13.0 μm (1 : 2.3 : 2.8 : 4.2). THORAX: Ground color light brown. Pronotum brown, reduced, not reaching up to frontal margin of scutum. Scutal stripes dark brown. Halter pale. WING (Fig. 1A): Length 1.59±0.09 mm. Membrane with macrotrichiae on distal portion only. Acrista pale brown. Costa not extended. R_{2+3} ending in slightly proximal between apices of R_1 and R_{4+5}. R_{4+5} ending distal to apex of M_{3+4}. RM proximal to fCu. R, R_1, R_{4+5}, M_{1+2}, M_{3+4}, Cu_1 and An with setae. Anal lobe not developed. Squama bare. LEGS: All segments uniformly yellowish brown. Mid and hind tibiae with separated combs, both bearing a spur. Pulvilli absent. Relative length (in μm) of leg segments as in Table 1. ABDOMEN (Fig. 1C): Ground color yellowish brown, dark brown markings on middle and distal portion of each

Table 1. Measurement* (in μm) of the leg segments of *Tanytarsus seosanensis* sp. nov. males

	Fore leg	Mid leg	Hind leg
Femur	743±44 (673-805)	726±30 (690-779)	797±34 (761-864)
Tibia	396±27 (372-443)	620±28 (591-690)	809±42 (766-899)
Tarsus I	917±50 (862-1009)	405±19 (384-448)	559±23 (540-614)
Tarsus II	490±21 (455-522)	234±16 (218-269)	349±21 (327-395)
Tarsus III	395±16 (379-425)	186±12 (177-218)	308±19 (283-354)
Tarsus IV	313±11 (304-336)	131±12 (106-150)	200±11 (186-219)
Tarsus V	135± 7 (126-142)	85±5 (80-94)	110± 5 (99-115)
Leg ratio (LR)	2.31±0.14	0.65±0.02	0.71±0.04

* Average±S.D. (min.-max.); n = 10

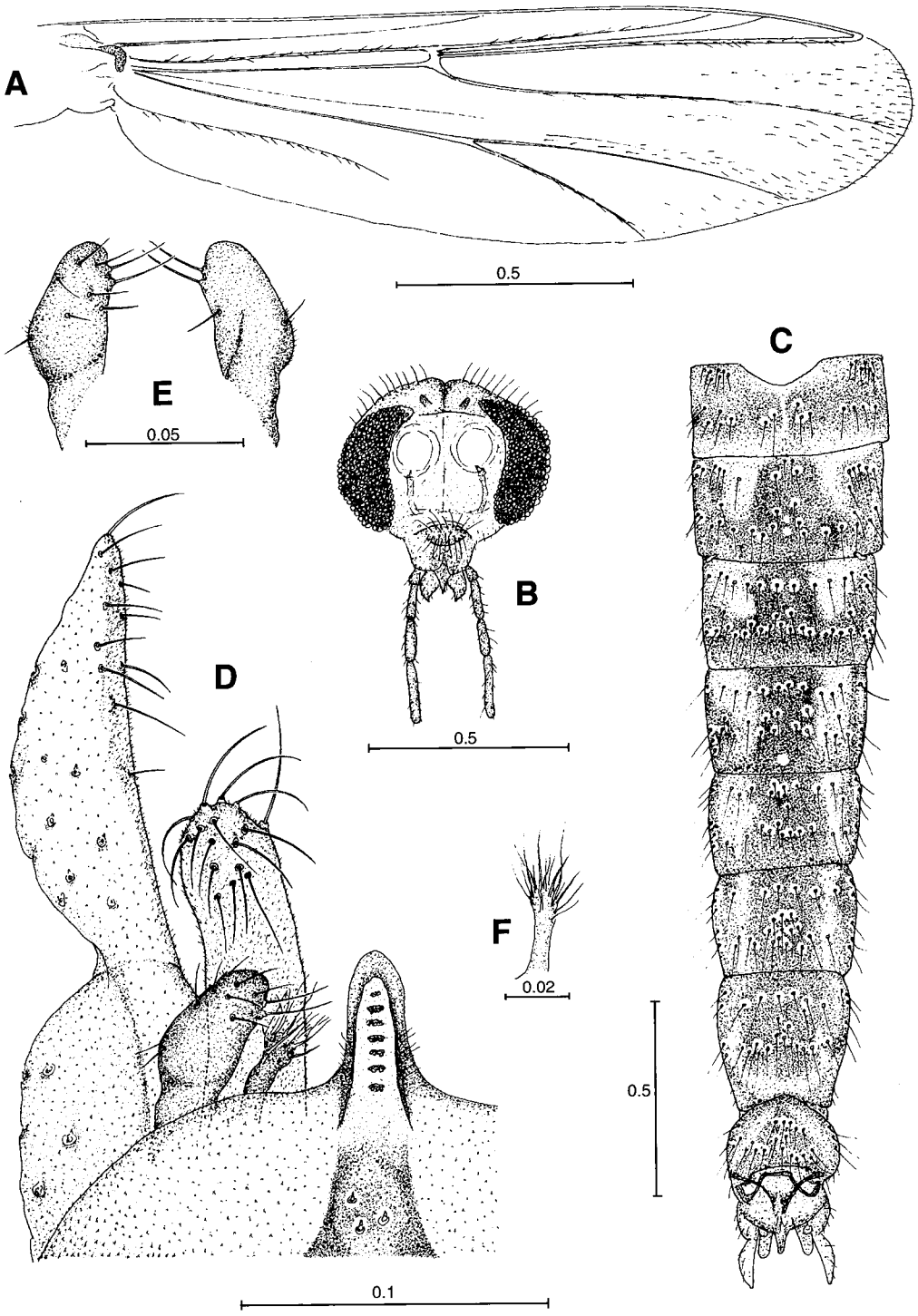

Fig. 1. Male of *Tanytarsus seosanensis* sp. nov. A, wing; B, head; C, abdomen (dorsal); D, hypopygium (dorsal); E, superior volsella (left: dorsal; right: ventral); F, median volsella. Scale in mm.

tergum. HYPOPYGIUM (Fig. 1D): Anal point rather short, broad, and tip smoothly rounded, with 7 flatish disc-like clusters. Gonostylus straight, narrowed distally, with one apical seta and irregularly arranged setae along distal half of inner margin. Superior volsella oval, with 7-8 setae on distal half (Fig. 1E). Median volsella moderately long with numerous simple setae (Fig. 1F). Inferior volsella almost straight, cyclindrical, with 16-18 long apical setae.

Bionomics. This species was the 3rd dominant species among all chironomid midges breeding in the reclaimed rice fields where organic materials are richer and content of the salt is slightly higher than ordinal rice fields. The population of *T. seosanensis* sp. nov. occurrs from late April to the end of September, with the peak at the 3rd week of June. The absolute density was 1,990 adults/m^2 in average throughout the season (May-September) of 1997-1999 with the peak density of 71.8 adults/m^2/day during the peak period (Kim *et al.*, 2001).

Remarks. This new species is similar to *T. gregarius* found in Europe (Kieffer, 1909) and to *T. nippogregarius* from Japan (Sasa and Kamimura, 1987). These three species have no digitus of the superior volsella which is present in most of *Tanytarsus* species. In *T. gregarius*, long axis of superior volsella is more or less paralle with the body axis (Pinder, 1979), superior volsela is narrowed at tip, and inferior volsella has some simple hairs and flattened blades arranged in a fan-like manner as seen in side view (Edwards, 1929), whereas in *T. seosanensis* sp. nov., axis of superior volsella oriented more or less transversely, and inferior volsella has simple hairs only (no flattened blades). In *T. nippogregarius* axis of superior volsella is paralle to body axis, inferior volsella has several simple setae and a flat lamellar seta bearing one to three marginal spurs, and large numbers (18-30) of spinules is present in multiple rows on anal point (Sasa and Kamimura, 1987), while the present new species and *T. gregarius* have about 8 spinules in a single row.

***Chironomus javanus* (Kieffer)** (자바깔따구, 신칭) **(Fig. 2)**

Tendipes javanus Kieffer, 1924 (Ann. Soc. Sci. Brux., 43: 263)

Chironomus javanus: Johansen, 1932 (p. 536, Fig. 25); Tokunaga, 1964 (p. 566-567, Fig. 11e); Sasa and Hasegawa, 1983 (p. 317, Fig. 2E); Hashimoto, 1984 (p. 24); Sasa and Kikuchi, 1986 (p. 18, Fig. 1A); Hasegawa and Sasa, 1987 (p. 281); Sasa and Suzuki, 1993 (p. 111).

Materials examined. 2♂♂, Chang-ri, Buseok-myon, Seosan-si, Chungchongnam-do; 4 September 1997 (J. Y. Kim).

Diagnosis. Body color greenish yellow. Wing length 2.1-2.3 mm (n = 2). AR 2.78. LR 1.76. Foreleg with longer tarsus IV than tarsus III. AR 2.78 and LR 1.76.

Description. HEAD: Eye black, bare, with well developed dorsal projection. Frontal tubercle present (Fig. 2D). Antenna 12 segmented; pedicel light brown; AR 2.78. Palp pale brown, 4 segmented. THORAX: Ground color uniformly greenish yellow. Anterior pronotal lobe well developed, without setae. Acrostichals absent, 5 dorsocentrals on scutum, with unconspicuous stripes. Halter pale white. WING (Fig. 2A): Membrane transparent and colorless, without macrotrichae. Veins pale. Costa not produced, well beyond M_{3+4}. RM short, oblique and slightly pigmented. fCu under RM. Cu_1 straight. Anal lobe poorly developed. Squama fringed. LEGS (Fig. 2C): Coxa, femur and tibia completely pale white. Tarsus I pale with a yellowish brown ring at tip; tarsus II-IV pale with yellowish brown rings at both proximal and apical ends; tarsus V yellowish brown. Pulvilli present. Tarsus IV of foreleg longer than tarsus III. LR 1.76. ABDOMEN: Uniformly

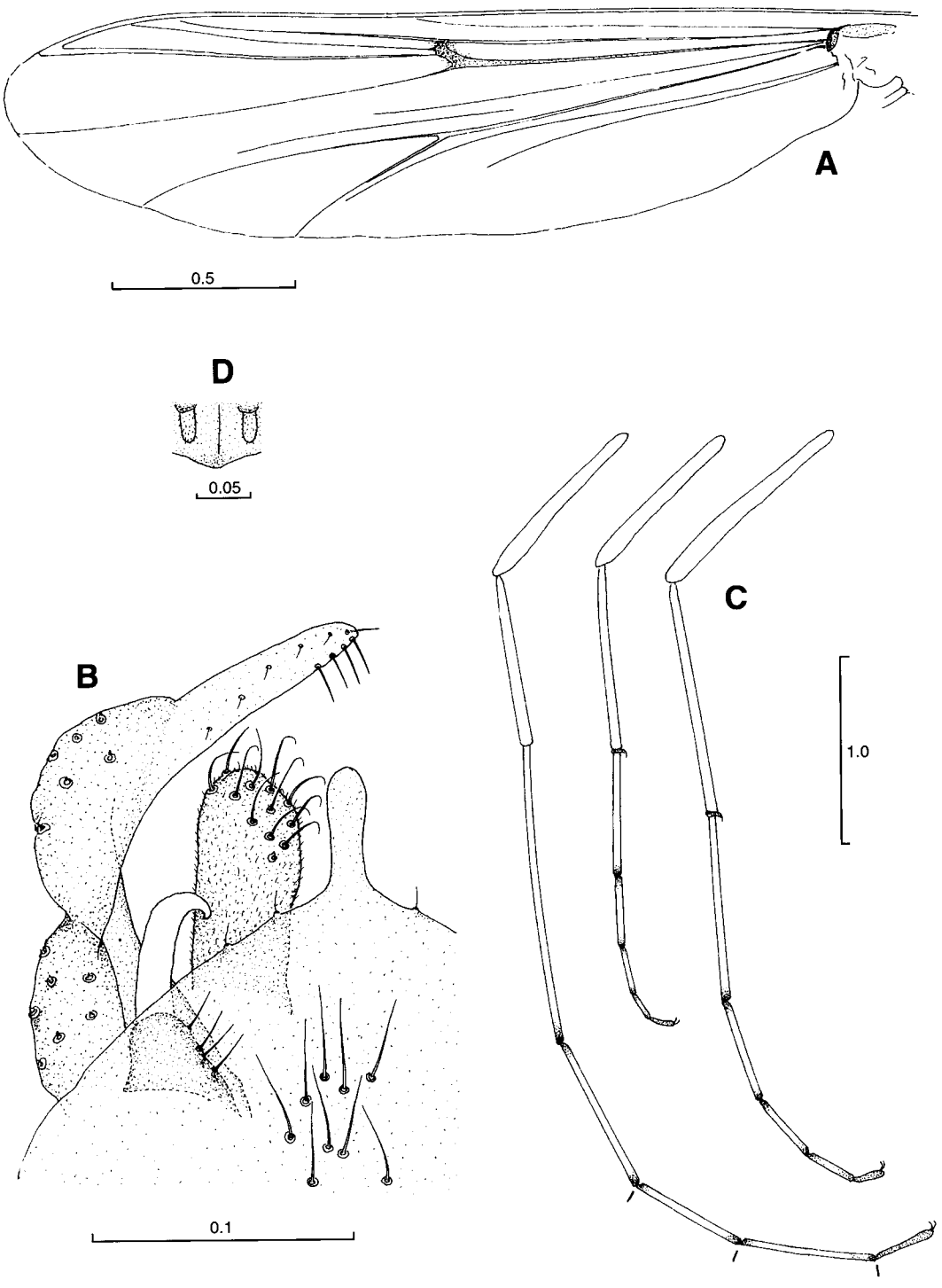

Fig. 2. Male of *Chironomus javanus* (Kieffer). A, wing; B, hypopygium (dorsal); C, fore, mid and hind legs from left (lateral); D, frontal tubercles. Scale in mm.

yellowish green. HYPOPYGIUM (Fig. 2B): Anal point moderately narrow, bent ventrally. Apical half of gonostylus conspicuously narrowed, with 4 sub-apical setae internally. Superior volsella pale, bare, slender and abruptly curved inward at tip. Inferior volsella relatively long, broad, with 12-14 long recurved bristles.

Remarks. This species was first found from Southeast Asia and Micronesian regions (Kieffer, 1924; Tokunaga, 1964), and later collected more at Shizuoka, Tokushima, Okinawa and Amami Island in Japan by various workers (Sasa and Hasegawa, 1983; Hashimoto, 1984; Sasa and Kikuchi, 1986). Morphological characteristics of our specimens coincide in general with those of the specimens collected in Java, Southeast Asia described by Tokunaga (1964) and in Japan described by Sasa and Hasegawa (1984), except smaller AR (2.78 vs 3.00-3.46) and smaller body size (wing length: 2.15 mm vs 2.86-3.08 mm). These differences are considered to be geographical variations, rather than different species.

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장부깔따구속의 1신종과 깔따구속의 국내 1미기록종

이 한 일·김 진 영[1]
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요 약

1997-1999년에 걸쳐 충청남도 서산 간척 수답에서 발생하는 깔따구를 채집하여 25종의 깔따구를 동정하였다. 그 중 1신종 *Tanytarsus seosanensis* (서산장부깔따구, 신칭)과 국내 1미기록종 *Chironomus javanus* (자바깔따구, 신칭)을 확인하였기에 형태적 특징을 그림과 함께 기술하였다.