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A NEW SPECIES OF *MICROTENDIPES* (DIPTERA: CHIRONOMIDAE) WITH A MEDIAN VOLSELLA FROM XISHAN ISLAND, CHINA

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ABSTRACT

Microtendipes globosus **sp. nov.** (Diptera: Chironomidae) from Xishan Island, China is described and illustrated from a male imago. The new species is characterized by a spherical median volsella with 9-10 long setae, the basal lobe of the superior volsella with 10-12 setae, tergite IX without median seta, and the absence of pigment marks on the wings. An identification key to the males belonging to the genus *Microtendipes* in China is provided.

Key Words: *Microtendipes*, key, taxonomy, Xishan Island, Zhejiang

RESUMEN

Se describe e ilustra el imago macho de *Microtendipes globosus* **sp. nov.** (Diptera: Chironomidae) de la isla de Xishan, China. La nueva especie se caracteriza por una mediana volsella esférica con 9-10 setas largas, el lóbulo basal de la volsella superior con 10-12 setas, tergito IX sin setas medianas y la ausencia de manchas pigmentadas en las alas. Se provee una clave de identificación de los machos del género *Microtendipes* en China.

Palabras Clave: *Microtendipes*, clave, Isla Xishan, taxonomía, Zhejiang

The genus *Microtendipes* Kieffer, 1915 includes 62 species distributed all over the world (Qi et al. 2012). Among them, 10 species have been reported from China (Wang 2000; Qi & Wang 2006; Qi & Wang 2010; Qi et al. 2012). The males of *Microtendipes* can be distinguished from all other Chironomini by one or two rows of stout, proximally directed setae on the fore femur. Additionally, the hypopygium of some species generally has a tubercle-like or wart-shaped median volsella often bearing a tuft of setae.

Six species of *Microtendipes* have been recorded from Zhejiang Province: *M. britteni* (Edwards, 1929), *M. chloris* (Meigen, 1818), *M. pedellus* (De Geer, 1776), *M. truncatus* Kawai & Sasa, 1985, *M. yaanensis* Qi & Wang, 2006, and *M. zhejiangensis* Qi, Lin & Wang, 2012 (Qi & Wang 2010; Qi et al. 2012). Xishan Island, located in the southeast to Zhoushan City, Zhejiang Province, China has a subtropical climate. The island covers an area of 0.37 km^2 and is surrounded by the East China Sea. In this paper, a new species of the genus is described from the island based on male imagines caught by sweep-net. A key to the males of *Microtendipes* in China is also provided.

MATERIALS AND METHODS

All specimens were preserved in 75% ethanol until laboratory processing. For detailed examination, all specimens were dissected, cleared of musculature in 8% KOH, mounted on microscope slides following the procedure outlined by Sæther (1969), and then studied using a Nikon 80i microscope. The morphological nomenclature follows Sæther (1980).

Abbreviations of anatomical parts measured are as follows:

TL: Total length - length of abdomen + length of thorax; Abdomen was measured from the concave anteriomedian margin of segment I to the apex of the gonostylus; the thorax was measured from the posterior margin of the postnotum to the anterior apex of the scutum in lateral view.

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WL: Wing length was measured from arculus to apex of wing.

Pfe: Length of profemur.

AR: Antennal ratio, length of 13th flagomere/ length of flagellomeres 1-12.

L: 5th/3rd: Length of 5th Palpomere/length of 3rd Palpomere.

VR: Venarum ratio, length of Cubitus (Cu)/length of Media (M).

BV: Length of (femur + tibia + ta_1)/length of (ta_2 + ta_3 + ta_4 + ta_5)

LR: Leg ratio, length of ta1/length of tibia.

SV: Length of (femur + tibia)/length of ta_1.

HR: Hypopygium ration, length of gonocoxite / length of gonostylus.

HV: Hypopygium value, total length/length of gonostylus times ten.

P_1: Fore leg; P_2: Mid leg; P_3: Hind leg.

fe: femur; ti: tibia; ta_1…ta_n: $tarsus_1$…$tarsus_n$.

R: Radius; R_1: Radius 1 vein; R_{4+5}: Radius 4+5 vein.

MICROTENDIPES GLOBOSUS **SP. NOV.**
(Figs. 1–8, Tables 1 and 2)

Male (n = 2)

TL 3.0-3.3 mm. WL 1.6-1.7 mm. Ratio TL/WL 1.80-1.95. Ratio WL/Pfe 1.86-1.89.

Coloration. Head yellow. Thorax greenish yellow with scutum, postnotum, median anepisternum II and preepisternum brown. Abdomen pale green, joints of tergites III-IX and hypopygium brown. Legs: femora, tibiae and fore ta_{1-2} with apical brown ring, remaining parts of fore, mid, and hind legs greenish yellow.

Head (Fig. 1). AR 1.23-1.29. Temporal setae 12-13 including 4-5 inner verticals, 4-5 outer verticals, and 3-4 postorbitals. Clypeus with 17-19 setae. Tentorium 138-140 µm long, 45-50 µm wide. Stipes 65-70 µm long, 30-32 µm wide. Palpomere lengths (in µm): 50-55, 30-32, 120-130, 215-220, 290-300. Ratio L: 5th/3rd 2.30-2.41.

Thorax (Fig. 2). Dorsocentrals 13-14, acrostichals lacking, prealars 3-4. Scutellum with 11-13 setae.

Wings (Fig. 3). Wing transparent, without markings. VR 1.20-1.23. Brachiolum with 2-3 setae and 6-9 sensilla campaniformia; R with 17-20, R_1 with 14-16, R_{4+5} with 26-29 setae. Squama with 12-14 setae.

Legs (Fig. 4). Distal half of fore femur with 11-15 proximally directed setae in 2 rows, 200-230 µm long (Fig. 5). Spur on mid tibiae 35-45 µm long including 20-25 µm long comb, unspurred comb 20-23 µm long (Fig. 6); spur on hind tibia 33-40 µm long including 20-25 µm long comb, unspurred comb 20-25 µm long. Width at apex of fore tibia 44-50 µm, of mid tibia 40-50 µm, of hind tibia 42-50 µm. Lengths (in µm) and proportions of legs in Table 1.

Hypopygium (Fig. 7). Anal point 47-55 µm long, slender, tapering from base, and apically pointed. Tergite IX with 14-18 setae along posterior margin. Phallapodeme 38-45 µm long; transverse sternapodeme 35-50 µm long. Gonocoxite 135-150 µm long. Superior volsella 68-75 µm long, with 1 long lateral seta and basal lobe bearing 10-12 setae. Median volsella 13-15 µm long, spherical, with 9-10 long setae (Fig. 8). Inferior volsella digitiform, 85-100 µm long, with 19-24 setae. Gonostylus 103-110 µm long, with 9-11 setae along inner margin in distal ½. HR 1.31-1.36, HV 2.87-3.02.

Female, pupa and larva are unknown.

Material Examined

HOLOTYPE male, CHINA: Zhejiang Province, Zhoushan City, Xishan Island, N 29° 89.38' E 122° 30.78', 30-V-2013, coll. Y. F. Li. Paratype, 1 male, same as holotype. Specimens are deposited in the College of Life Science, Taizhou University, China.

Distribution

Xishan Island, Zhejiang Province, China

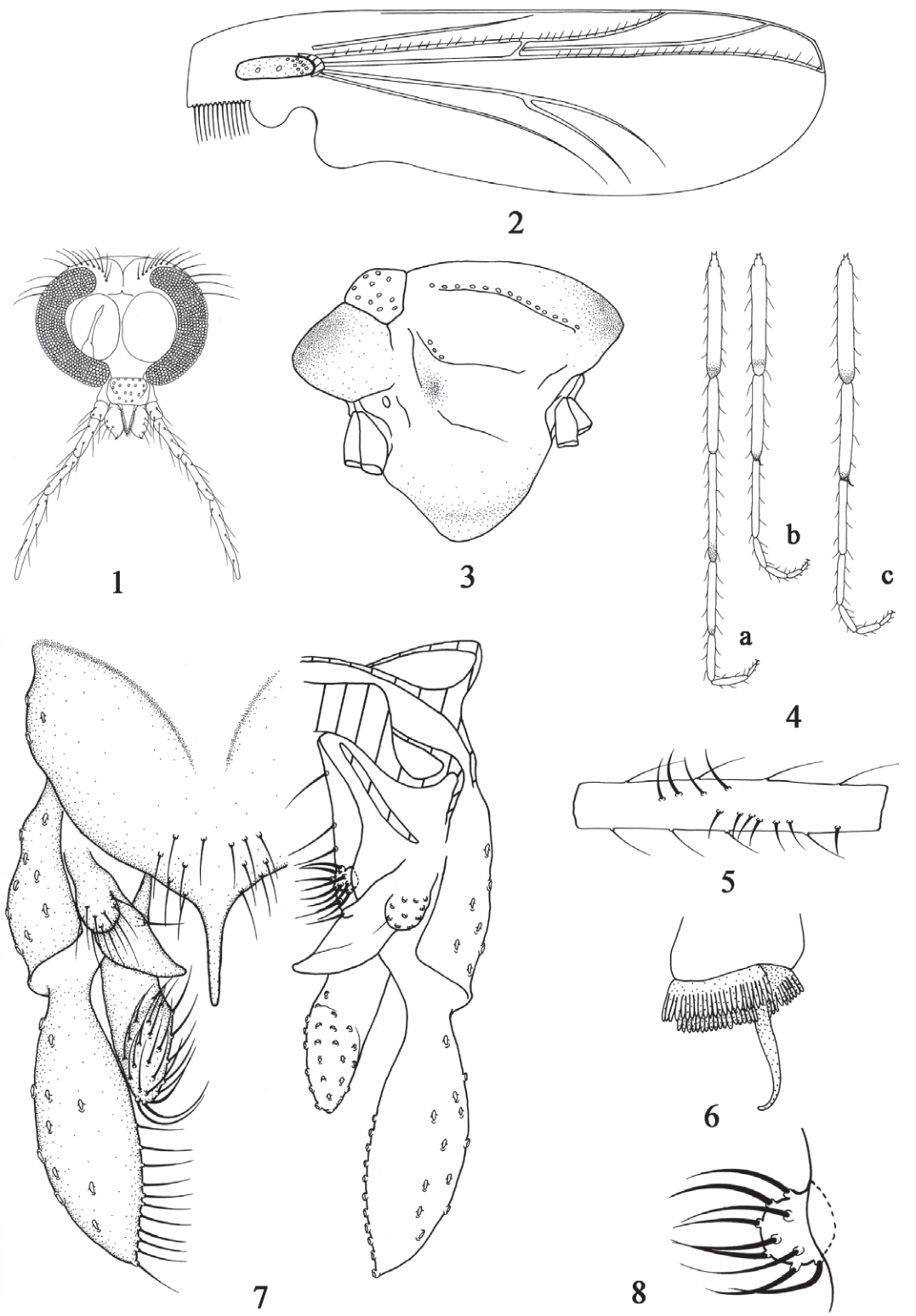
Diagnosis

The adult male of *M. globosus* **sp. nov.** can be distinguished from known species of the genus by the following combination of characters: a spherical median volsella with 9-10 long setae, the basal lobe of the superior volsella with 10-12 setae, tergite IX without median seta, and the absence of pigment marks on the wings.

TABLE 1. LENGTHS (M) AND PROPORTIONS OF LEGS OF *MICROTENDIPES GLOBOSUS* **SP. NOV.**

	P_1	P_2	P_3
fe	875–900	825–850	1000–1050
ti	750–800	725–750	825–850
ta_1	1000–1050	525–550	820–850
ta_2	550–600	225–250	450–500
ta_3	475–500	175–200	325–375
ta_4	460–500	75–100	150–200
ta_5	150–175	75–100	100–120
LR	1.31–1.33	0.72–0.73	0.99–1.00
BV	1.55–1.61	3.30–3.77	2.30–2.58
SV	1.61–1.63	2.91–2.95	2.23–2.24

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Figs. 1-8. *M. globosus* **sp. nov.**, male. (1) Head; (2) Thorax; (3) Wing; (4) Legs (a. fore leg; b. mid leg; c. hind leg); (5) Two rows of backward-directed setae on fore femur; (6) Mid tibial apex, lateral view; (7) Hypopygium; (8) Median volsella.

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TABLE 2. MAIN DIFFERENCES BETWEEN *MICROTENDIPES GLOBOSUS* **SP. NOV.**, *M. NUMEROSUS*, *M. SCHUECKI*, *M. TUBEROSUS* AND *M. YAANENSIS*.

	M. globosus **sp. nov.**	*M. numerosus*	*M. schuecki*	*M. tuberosus*	*M. yaanensis*
Antennal ratio	1.23–1.29	1.70–1.90	1.03–1.12	1.74–1.75	1.31–1.42
Dorsocentrals	13–14	30	10–13	17–19	15–17
Scutellars	11–13	26	21–25	15–16	19
fore femur	without small tubercle	without small tubercle	without small tubercle	with small tubercle	without small tubercle
Wing	transparent	with markings	with markings	transparent	transparent
Median setae of tergite IX	lacking	3	2–3	3	3
Anal point	tapering from base, and apically pointed, without lateral setae medially	parallel-sided, apex truncated, with 2 small setae medially	tapering from middle to truncated apex, with 3 long lateral setae medially	parallel-sided, with 3 small lateral setae medially	tapering from middle to truncated apex, with 2 small lateral setae medially
Superior volsella	with 1 long lateral seta and basal lobe bearing 10–12 setae	with 1 long lateral seta and basal lobe bearing 6 long setae	with 1 long lateral seta and basal lobe bearing 4 setae	with 1 long lateral seta and basal lobe bearing 5 setae	weakly sinuous, without lateral seta, basal lobe bearing 4 long setae
Median volsella	big, spherical, with 9-10 long setae	small,wart-shaped, with a group of weak setae	small, with 4–7 long setae	small, with 3 long setae	small, wart-shaped, with 6-13 weak setae
Distribution	China (Zhejiang)	Zaire	Thailand	China (Guangdong, Guizhou, Hainan)	China (Zhejiang, Sichuan)

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Etymology

Derived from the Latin "*globosus*", meaning spherical, referring to the round shape of the median volsella.

Remarks

The shape of the median volsella of *M. globosus* **sp. nov.** is characteristic within the genus. *M. globosus* **sp. nov**. is similar to *M. numerosus* Lehmann, 1979, *M. schuecki* Reiss, 1997, *M. tuberosus* Qi & Wang, 2006 and *M. yaanensis* Qi & Wang, 2006 in the presence of a basal lobe on the superior volsella. The main differences between these 5 species are given in Table 2.

KEY TO THE MALES OF *MICROTENDIPES* IN CHINA

1. Hypopygium with median volsella. 2
—. Hypopygium without median volsella 7
2. Superior volsella with basal lobe 3
—. Superior volsella without basal lobe 5
3. Tergite IX without median seta . . . . . *M. globosus* **sp. nov.**
—. Tergite IX with median setae 4
4. Fore femur with small tubercle; anal point parallel-sided, with 3 small lateral setae medially . . . . . *M. tuberosus* Qi & Wang, 2006
—. Fore femur without small tubercle; anal point tapering from middle to truncated apex, with 2 small lateral setae medially . . . . . *M. yaanensis* Qi & Wang, 2006
5. Superior volsella broad, rounded apically . . . . . *M. truncatus* Kawai & Sasa, 1985
—. Superior volsella hook-like 6
6. Abdominal tergites I-V pale green, remainder black; fore tibiae pale medially, darkened at base and tip; anal point subtriangular. . . . . *M. pedellus* (De Geer, 1776)
—. Abdominal tergites I-V dark green or blackish; fore tibiae blackish; anal point parallel sided. . . . . *M. chloris* (Meigen, 1818)
7. Inferior volsella abruptly narrowed in apical half 8
—. Inferior volsella digitiform 9
8. Anal point apically slightly swollen and rounded; superior volsella with 4 dorsal setae and 2 basal setae. . . . . *M. angustus* Qi & Wang, 2006
—. Anal point parallel-sided, slender, apex rounded; superior volsella with 7–10 dorsal setae and 4 long basal setae. . . . . *M. zhejiangensis* Qi, Lin & Wang, 2012
9. Wing with dark markings. . . . . *M. quasicauducas* Qi & Wang, 2006
—. Wing transparent, without markings 10
10. Superior volsella with 1 long basal seta and 3-7 dorsal setae; tergite IX with 13 setae along posterior margin . . . . . *M. britteni* (Edwards, 1929)
—. Superior volsella with 3-4 dorsal setae; tergite IX with 4 setae along posterior margin . . . . . *M. confinis* (Meigen, 1830)

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References Cited

EDWARDS, F. W. 1929. British non-biting midges (Diptera, Chironomidae). Trans. R. Entomol. Soc. London 77: 279-429.

KAWAI, K., AND SASA, M. 1985. Seven new species of chironomid midge (Diptera, Chironomidae) from the Ohra River, Japan. Japanese J. Limnol. Contents 46: 15-24.

LEHMANN, J. 1979. Chironomidae (Diptera) aus Fließgewässern Zentralafrikas (Systematik, Ökologie, Verbreitung und Produktionsbiologie). I. Teil: Kivu-Gebiet, Ostzaire. Spixiana Suppl. 3: 1-144.

MEIGEN, J. W. 1818. Systematische Beschreibung der europäischen zweiflügeligen Insekten. Erster Theil mit elf Kupfertafeln, Aachen, Germany.

QI, X., LIN, X. L. AND WANG, X. H. 2012. A new species of the genus *Microtendipes* Kieffer, 1915 (Diptera: Chironomidae) from Oriental China. ZooKeys 212: 81-89.

QI, X., AND WANG, X. H. 2006. A review of *Microtendipes* Kieffer from China (Diptera: Chironomidae). Zootaxa 1108: 37-51.

QI, X., AND WANG, X. H. 2010. List of Chironomidae from Wuyanling Nature Reserve, Zhejiang Province. Sichuan J. Zool. 29: 496-498.

REISS, F. 1997. *Microtendipes schuecki*, eine neue Art der numerosus-Gruppe aus Thailand (Insect, Diptera, Chironomidae). Spixiana 20: 271-276.

SÆTHER, O. A. 1969. Some Nearctic Podonominae, Diamesinae and Orthocladiinae (Diptera: Chironomidae). Bull. Fisheries Res. Board Canada 170: 1-154.

SÆTHER, O. A. 1980. Glossary of chironomid morphology terminology (Diptera: Chironomidae). Entomol. Scandinavica Suppl. 14: 1-51.

WANG, X. H. 2000. A revised checklist of Chironomidae from China (Diptera), pp. 629-652 *In* O. Hoffrichter [ed.], Late 20th Century Research on Chironomidae, Shaker Verlag, Achen, Germany.

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