



A New Species of *Microtendipes* (Diptera: Chironomidae) with a Median Volsella from Xishan Island, China

Authors: Qi, Xin, Li, Ying-Feng, Wang, Xin-Hua, and Shao, Qing-Jun

Source: Florida Entomologist, 97(3) : 871-876

Published By: Florida Entomological Society

URL: <https://doi.org/10.1653/024.097.0344>

BioOne Complete (complete.bioone.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

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

XIN QI^{1,2}, YING-FENG LI¹, XIN-HUA WANG³ AND QING-JUN SHAO^{1*}

¹College of Animal Sciences, Zhejiang University, Hangzhou, Zhejiang 310058, China

²College of Life Science, Taizhou University, Taizhou, Zhejiang 318000, China

³College of Life Science, Nankai University, Tianjin 300071, China

*Corresponding author; E-mail: qjshao@zju.edu.cn

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 km² 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.

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 ta_1 /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...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 μ m long, 45-50 μ m wide. Stipes 65-70 μ m long, 30-32 μ m wide. Palpomere lengths (in μ m): 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 μ m long (Fig. 5). Spur on mid tibiae 35-45 μ m long including 20-25 μ m long comb, unspurred comb 20-23 μ m long (Fig. 6); spur on hind tibia

33-40 μ m long including 20-25 μ m long comb, unspurred comb 20-25 μ m long. Width at apex of fore tibia 44-50 μ m, of mid tibia 40-50 μ m, of hind tibia 42-50 μ m. Lengths (in μ m) and proportions of legs in Table 1.

Hypopygium (Fig. 7). Anal point 47-55 μ m long, slender, tapering from base, and apically pointed. Tergite IX with 14-18 setae along posterior margin. Phallapodeme 38-45 μ m long; transverse sternapodeme 35-50 μ m long. Gonocoxite 135-150 μ m long. Superior volsella 68-75 μ m long, with 1 long lateral seta and basal lobe bearing 10-12 setae. Median volsella 13-15 μ m long, spherical, with 9-10 long setae (Fig. 8). Inferior volsella digitiform, 85-100 μ m long, with 19-24 setae. Gonostylus 103-110 μ m long, with 9-11 setae along inner margin in distal $\frac{1}{2}$. 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

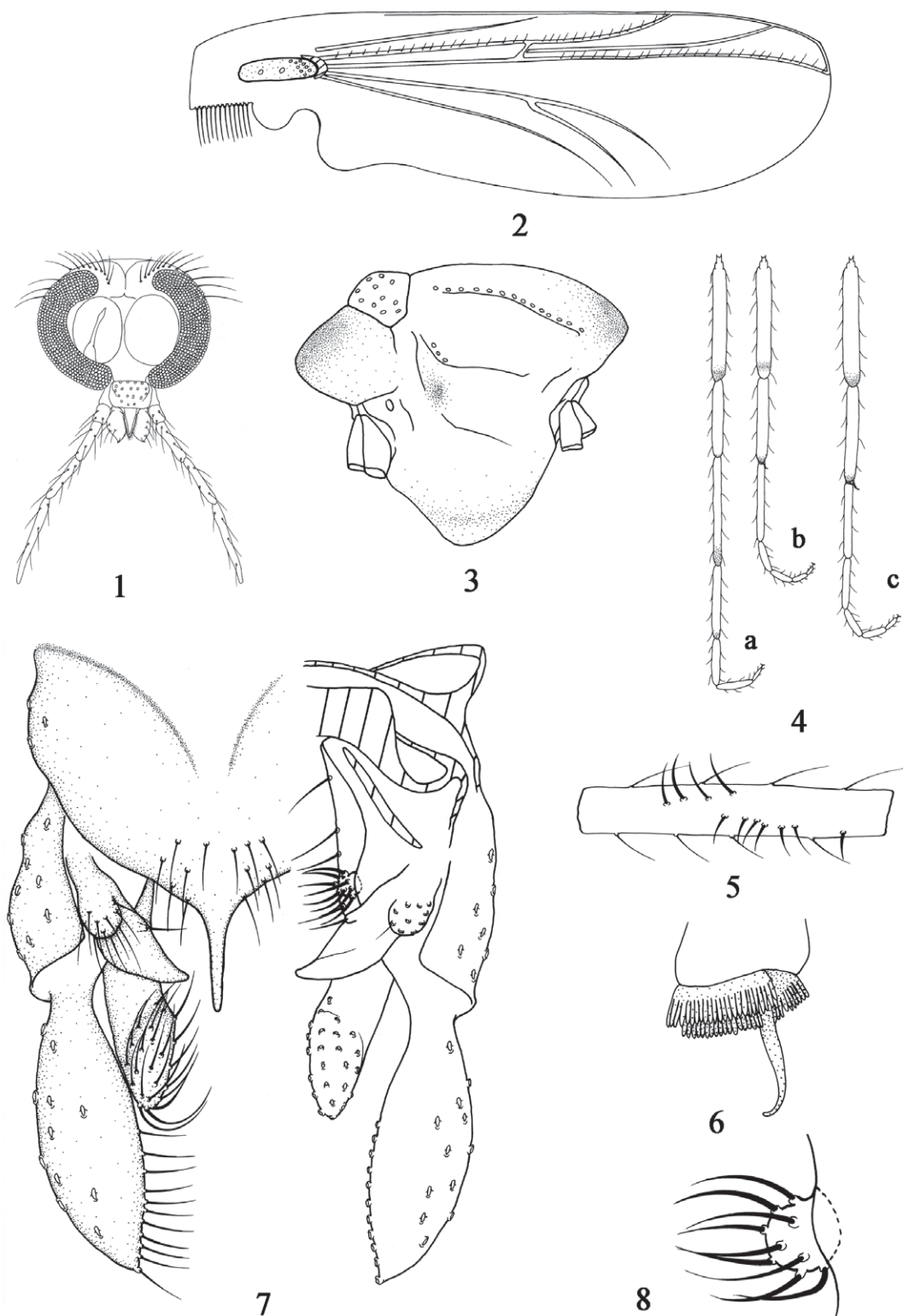
Xishan Island, Zhejiang Province, China

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 |



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.

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

| | <i>M. globosus</i> sp. nov. | <i>M. numerosus</i> | <i>M. schuecki</i> | <i>M. tuberosus</i> | <i>M. yaanensis</i> |
|----------------------------|--|--|--|---|---|
| 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) |

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)

ACKNOWLEDGMENTS

Financial support from the National Natural Science Foundation of China (NSFC, grant No. 31301908, 31272284), the Zhejiang Provincial Natural Science

Foundation of China (grant No. Y3100486), and Fauna of China (FY120100) is acknowledged with thanks. We also thank four anonymous reviewers for providing valuable comments on a previous version of the manuscript.

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 Orthoclaadiinae (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, Aachen, Germany.