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 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 anteromedian 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 + ta1)/length of (ta2 + ta3 + ta4 + ta5)
LR: Leg ratio, length of ta1/length of tibia.
SV: Length of (femur + tibia)/length of ta1.
HR: Hypopygium ration, length of gonocoxite/length of gonostylus.
HV: Hypopygium value, total length/length of gonostylus times ten.
fe: femur; ti: tibia; ta1…ta5: tarsus 1…tarsus 5.
R: Radius; R1: Radius 1 vein; R4+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 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 20-25 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 9-10 long setae, the absence of pigment marks on the wings.

**Table 1. Lengths (μm) and Proportions of Legs of Microtendipes Globosus SP. NOV.**

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>fe</td>
<td>875-900</td>
<td>825-850</td>
<td>1000-1050</td>
</tr>
<tr>
<td>ti</td>
<td>750-800</td>
<td>725-750</td>
<td>825-850</td>
</tr>
<tr>
<td>ta1</td>
<td>1000-1050</td>
<td>525-555</td>
<td>820-850</td>
</tr>
<tr>
<td>ta2</td>
<td>550-600</td>
<td>225-250</td>
<td>450-500</td>
</tr>
<tr>
<td>ta3</td>
<td>475-500</td>
<td>175-200</td>
<td>325-375</td>
</tr>
<tr>
<td>ta4</td>
<td>460-500</td>
<td>75-100</td>
<td>150-200</td>
</tr>
<tr>
<td>ta5</td>
<td>150-175</td>
<td>75-100</td>
<td>100-120</td>
</tr>
</tbody>
</table>

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*.

<table>
<thead>
<tr>
<th></th>
<th><em>M. globosus</em> sp. nov.</th>
<th><em>M. numerosus</em></th>
<th><em>M. schuecki</em></th>
<th><em>M. tuberosus</em></th>
<th><em>M. yaanensis</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Antennal ratio</td>
<td>1.23−1.29</td>
<td>1.70−1.90</td>
<td>1.03−1.12</td>
<td>1.74−1.75</td>
<td>1.31−1.42</td>
</tr>
<tr>
<td>Dorsocentrals</td>
<td>13−14</td>
<td>30</td>
<td>10−13</td>
<td>17−19</td>
<td>15−17</td>
</tr>
<tr>
<td>Scutellars</td>
<td>11−13</td>
<td>26</td>
<td>21−25</td>
<td>15−16</td>
<td>19</td>
</tr>
<tr>
<td>Fore femur</td>
<td>without small tubercle</td>
<td>without small tubercle</td>
<td>without small tubercle</td>
<td>with small tubercle</td>
<td>without small tubercle</td>
</tr>
<tr>
<td>Wing</td>
<td>transparent</td>
<td>with markings</td>
<td>with markings</td>
<td>transparent</td>
<td>transparent</td>
</tr>
<tr>
<td>Median setae of tergite IX</td>
<td>lacking</td>
<td>3</td>
<td>2−3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Anal point</td>
<td>tapering from base, and apically pointed, without lateral setae mediaaly</td>
<td>parallel-sided, apex truncated, with 2 small setae mediaaly</td>
<td>tapering from middle to truncated apex, with 3 long lateral setae mediaaly</td>
<td>parallel-sided, with 3 small lateral setae mediaaly</td>
<td>tapering from middle to truncated apex, with 2 small lateral setae mediaaly</td>
</tr>
<tr>
<td>Superior volsella</td>
<td>with 1 long lateral seta and basal lobe bearing 10−12 setae</td>
<td>with 1 long lateral seta and basal lobe bearing 6 long setae</td>
<td>with 1 long lateral seta and basal lobe bearing 4 setae</td>
<td>with 1 long lateral seta and basal lobe bearing 5 setae</td>
<td>weakly sinuous, without lateral seta, basal lobe bearing 4 long setae</td>
</tr>
<tr>
<td>Median volsella</td>
<td>big, spherical, with 9−10 long setae</td>
<td>small, wart-shaped, with a group of weak setae</td>
<td>small, with 4−7 long setae</td>
<td>small, with 3 long setae</td>
<td>small, wart-shaped, with 6−13 weak setae</td>
</tr>
<tr>
<td>Distribution</td>
<td>China (Zhejiang)</td>
<td>Zaire</td>
<td>Thailand</td>
<td>China (Guangdong, Guizhou, Hainan)</td>
<td>China (Zhejiang, Sichuan)</td>
</tr>
</tbody>
</table>
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 ....................................................... 4
—. Tergite IX with median setae ....................................................... 4
4. Fore femur with small tubercle; anal point parallel-sided, with 3 small lateral setae medially ................................................... 6
—. Fore femur without small tubercle; anal point tapering from middle to truncated apex, with 2 small lateral setae medially ................................................. 5
5. Superior volsella broad, rounded apically .......................................... 6
—. 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 ................................................... 6
—. Abdominal tergites I-V dark green or blackish; fore tibiae blackish; anal point parallel sided ........................................................... 6
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 ................................................... 8
—. Anal point parallel-sided, slender, apex rounded; superior volsella with 7–10 dorsal setae and 4 long basal setae ................................................... 8
9. Wing with dark markings ................................................................. 9
—. 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 ................................................. 10
—. Superior volsella with 3-4 dorsal setae; tergite IX with 4 setae along posterior margin ........................................................... 10

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