Polypedilum (*Tripodura*) *harteni* Andersen & Mendes (Diptera: Chironomidae) newly recorded from China

Author(s): Xin Qi , Xiao–Long Lin , Yi Bai , and Xin–Hua Wang
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Polypedilum (*Tripodura*) *harteni* Andersen & Mendes (Diptera: Chironomidae) newly recorded from China

Xin Qi[1], Xiao–Long Lin[2], Yi Bai[1,3], and Xin–Hua Wang[2]*
[1]College of Life Science, Taizhou University, Zhejiang 318000, China
[2]College of Life Science, Nankai University, Tianjin 300071, China
[3]Institute of Zoology, Shaanxi Normal University, Shaanxi 710062, China
*Corresponding author, Email: xhwang@nankai.edu.cn; Tel: +8622–23508389

Abstract. *Polypedilum* (*Tripodura*) *harteni* Andersen & Mendes 2010 is recorded for the first time in China, and the adult male from Zhejiang Province is illustrated. A key to the males of species in the subgenus *P.* (*Tripodura*) found in China is given.

Key Words. *Polypedilum* (*Tripodura*) *harteni*, newly recorded species, key, China.

Introduction

Polypedilum Kieffer 1913 is a cosmopolitan genus occurring in all zoogeographical regions except Antarctica. It is a heterogeneous group, and the larvae occur in sediments with a few species mining wood or aquatic plants or grazing epilithic surfaces (Cranston et al. 1989). More than 440 species have been described (Oyewo & Sæther 2008, Sæther et al. 2010). The males of the genus can be recognized by the combination of deeply bifid pulvilli and abdominal segment VIII constricted basally, giving it a triangular appearance. According to Sæther et al. (2010), the genus contains eight subgenera: *Polypedilum sensu stricto* Kieffer 1913; *Pentapedilum* Kieffer 1913; *Tripedilum* Kieffer 1921; *Kribionympha* Kieffer 1921; *Tripodura* Townes 1945; *Uresipedilum* Oyewo & Sæther 1998; *Cerobregma* Sæther & Sundal 1999 and *Probolum* Andersen & Sæther 2010.

The subgenus *Tripodura* was established by Townes (1945), with *Polypedilum* (*Tripodura*) *simulans* Townes 1945 as the type species. The subgenus is characterized by having a trifid anal point (or at least shoulders to each side of the anal point) and/or superior volsella without apical extension. To date, more than 140 species have been described worldwide, with eight species known from China (Zhang & Wang 2007).

Polypedilum (*T.*) *harteni* Andersen & Mendes 2010 was first described from specimens collected in the United Arab Emirates (UAE; al-Ajban and Sharjah Desert Park). In this paper, *P.* (*T.*) *harteni* is reported for the first time from China, the distribution map of the species is given (Fig. 1), and a key to the Chinese species of *Polypedilum* (*Tripodura*) is provided.

Methods and Materials

We examined 12 adults of *P.* (*T.*) *harteni* collected by light trap in Zhejiang Province of China: Lin X. L. collected 10 males on 10 August 2010 at Wenzhou City, Qingjiang Town, Fuyantou Village (28°17′ N, 121°06′ E) and 2 males on 29 July 2010 at Taizhou City, Sanmen Country, Xiaoyuxi Village (28°56′ N, 121°41′ E). All specimens were stored in 75% ethanol until laboratory processing. For detailed examination, all specimens were dissected, cleared of musculature, mounted on microscope slides following the procedure outlined by Sæther (1969), and studied using a Nikon 80i microscope. The morphological nomenclature follows Sæther

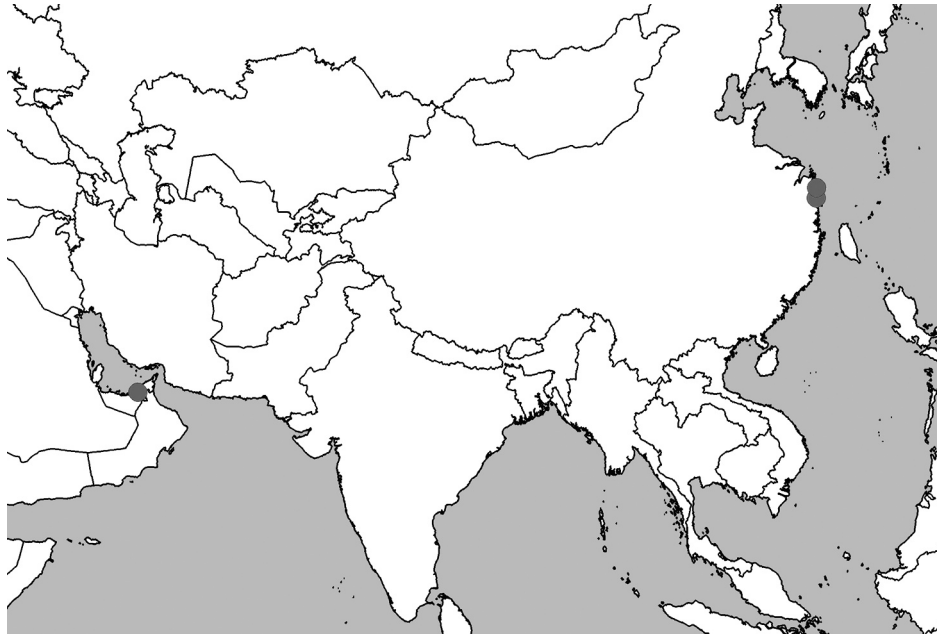


Figure 1. Distribution of *Polypedilum* (*Tripodura*) *harteni* Andersen & Mendes 2010.

(1980). Measurements are given as ranges followed by the mean. Measurements were taken as follows:

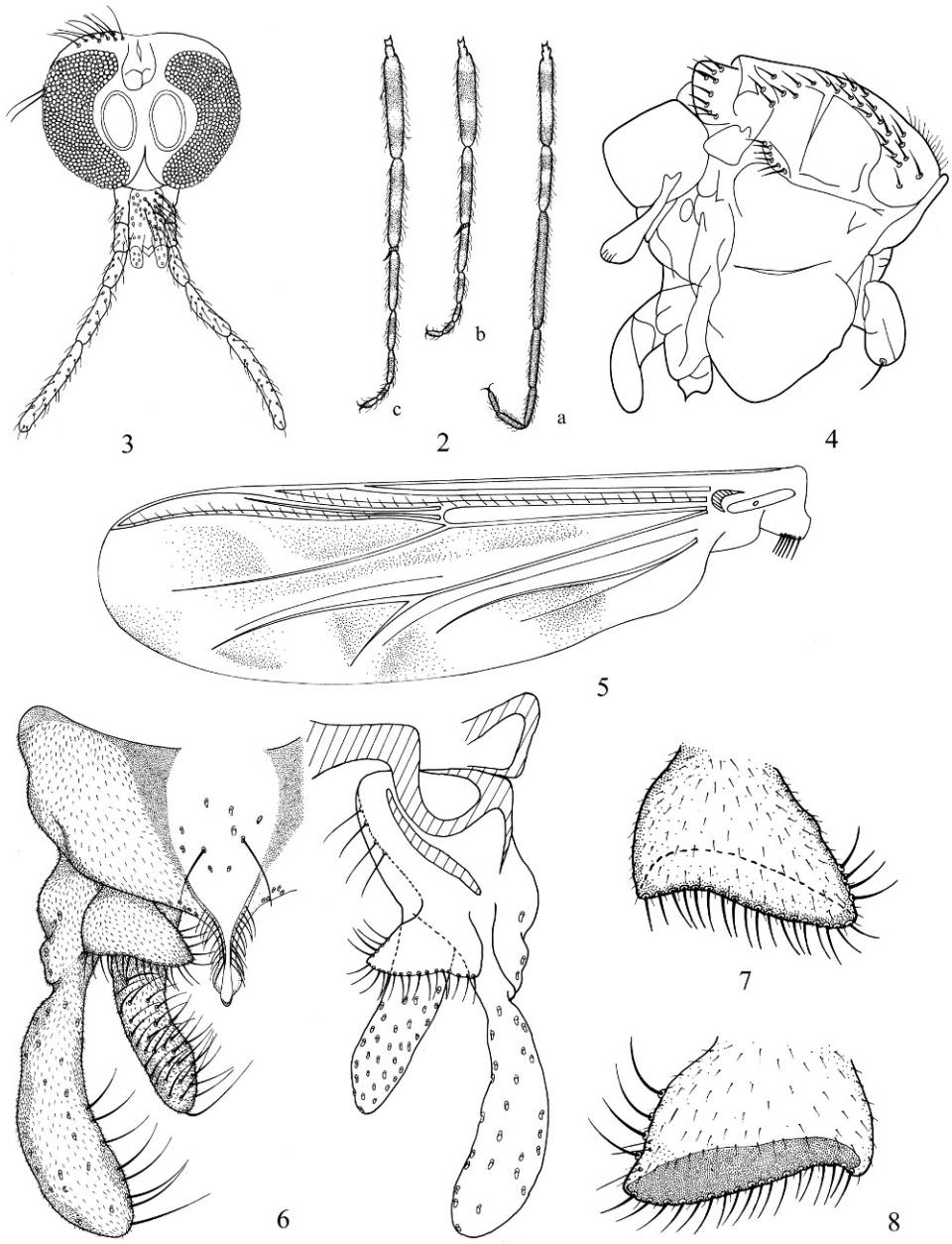
Total length: length of abdomen + length of thorax; abdomen measured from concave anteromedial margin of segment I to apex of gonostylus; thorax measured from posterior margin of postnotum to anterior apex of scutum in lateral view.
Wing length: measured from arculus to apex of wing.
Antennal ratio: length of 13th flagellomere/length of flagellomeres 1–12.
Hypopygium ratio: length of gonocoxite/length of gonostylus.
Hypopygium value: total length/length of gonostylus multiplied by 10.

Specimens are deposited in the College of Life Science, Nankai University, China and College of Life Science, Taizhou University, China. Distribution maps were made using Simplemappr (Shorthouse 2010).

Polypedilum (*Tripodura*) *harteni* Andersen & Mendes 2010
(Figs. 2–8)

The adult male can be distinguished from other species in the subgenus by the following combination of characters: superior volsella pediform, covered with microtrichia and with 20–25 setae on the distal parts of the outer margin; anal point spatulate, without lateral projections; terminal scale of fore tibia 30–35 μm long, rounded, without spur; legs with dark rings. The illustrations of *P.* (*T.*) *harteni* are shown in Figs. 2–8.

Before now, *P.* (*T.*) *harteni* had only been recorded in the UAE: al-Ajban (24°36′ N, 55°01′ E) and Sharjah Desert Park. The Chinese specimens were collected near the coast in Zhejiang Province, an area with a subtropical monsoon climate. The climate of Zhejiang Province is rainy and humid in July and August. The discovery



Figures 2–8. *Polypedilum* (*Tripodura*) *harteni* Andersen & Mendes 2010, male. Figure 2. Legs (a. front leg; b. mid leg; c. hind leg); Figure 3. Head; Figure 4. Thorax; Figure 5. Wing; Figure 6. Hypopygium; Figure 7. Superior volsella, dorsal view; Figure 8. Superior volsella, ventral view.

of *P.* (*T.*) *harteni* in China, approximately 6600 km from the original collection sites in the UAE, provides a remarkable range extension for the species. The Chinese specimens generally agree with the original description by Andersen & Mendes (2010), although some measured differences between the Chinese specimens and those of Andersen & Mendes (2010) are shown in Table 1.

Table 1. Differences between *Polypedilum* (*Tripodura*) *harteni* specimens from China and the UAE (values in parentheses represent means).

	Chinese specimens	UAE specimens
Total length	2.50–2.88 (2.76) mm	1.82–2.93 (2.56) mm
Wing length	1.23–1.42 (1.35) mm	1.96–2.04 (2.04) mm
Antennal ratio	0.67–0.84 (0.78)	0.92–0.99 (0.95)
Setae on clypeus	22–28 (24)	17–27 (21)
Dorsocentrals	22–28 (25)	16–20 (18)
Acrostichals	12–15 (13)	16–22 (20)
Setae on vein R	15–22 (19)	19–25 (22)
Median setae of tergite IX	7–11 (10)	2–7 (4)
Hypopygium ratio	1.00–1.12 (1.05)	1.10–1.40 (1.22)
Hypopygium value	1.61–1.77 (1.69)	2.09–2.12 (2.11)
Geographic coordinates of collection sites	28°17′ N, 121°06′ E; 28°56′ N, 121°41′ E	24°36′ N, 55°01′ E
Environment of collection sites	Coastal	Inland; Desert Park

The shape of the superior volsella of *P.* (*T.*) *harteni* is characteristic within the subgenus. In China, there are three species of the subgenus without lateral projections on the tergite IX [*P.* (*T.*) *harteni*, *P.* (*T.*) *japonicum* (Tokunaga 1938) and *P.* (*T.*) *spathum* Zhang & Wang 2007]. The main differences between the three species are given in Table 2.

Key to adult males of *Polypedilum* (*Tripodura*) known from China

1 Tergite IX without lateral projections 2
- Tergite IX with lateral projections or conspicuous shoulders. 4
2 Wing with one spot in cell r_{4+5}. . . . . *P.* (*T.*) *japonicum* (Tokunaga 1938)
- Wing with two spots in cell r_{4+5} 3
3 Superior volsella spatula-shaped, with 2 setae on apical margin . . . . . *P.* (*T.*) *spathum* Zhang & Wang 2007
- Superior volsella pediform, with 20–25 setae on distal parts of the outer margin . . . . . *P.* (*T.*) *harteni* Andersen & Mendes 2010 **New record**
4 Anal point slender and parallel-sided . . . . *P.* (*T.*) *unifascium* (Tokunaga 1938)
- Anal point broad or apically expanded 5
5 Wing without markings . . . . . *P.* (*T.*) *pseudacifer* Zorina & Makarchenko 2000
- Wing with markings, usually boldly marked with several dark spots and clouds . . . 6
6 Fore tibial scale rounded apically . . . . . *P.* (*T.*) *scalaenum* (Schrank 1803)
- Fore tibial scale pointed apically 7
7 Tergite IX with 2 lateral projections to each side of anal point . . . . . *P.* (*T.*) *decematoguttatum* (Tokunaga, 1938)
- Tergite IX with 1 lateral projection to each side of anal point 8
8 Lateral projections with microtrichia . . . *P.* (*T.*) *bispinum* Zhang & Wang 2007
- Lateral projections without microtrichia . . . . . *P.* (*T.*) *nudiprostatum* Zhang, Wang & Sæther 2006

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Table 2. Main differences between *Polypedilum* (*Tripodura*) *harteni*, *P.* (*T.*) *japonicum* and *P.* (*T.*) *spathum* based on Chinese specimens.

	P. (*T.*) *harteni*	*P.* (*T.*) *japonicum*	*P.* (*T.*) *spathum*
Antennal ratio	0.67–0.84	1.18–1.38	1.32–1.58
Setae on clypeus	22–28	11–18	14–22
Acrostichals	12–15	8–16	17–24
Dorsocentrals	22–28	9–13	11–17
Coloration of legs	femora and tibiae with two rings; each of fore ta_{1-5} pale brown; each of mid and hind ta_{1-5} with one ring	all femora brown with subapical yellow ring; fore tibiae entirely brown, mid tibiae with pale basal and darker apices, hind tibiae yellow; all tarsi brown	Fore femora yellow with apical brown ring; mid and hind femora brown at base and apex, yellow in the middle; all tibiae and tarsi brown
Wing	with one spot in cell r_{4+5}	with two spots in cell r_{4+5}	with two spots in cell r_{4+5}
Setae on vein R_{4+5}	16–20	12–20	35–43
Squamal setae	6–9	5–11	4–6
Terminal scale of fore tibia	Rounded	triangular and apically pointed	triangular and apically pointed
Median setae of tergite IX	7–11	13–18	20–28
Superior volsella	pediform, covered with microtrichia, with 20–25 setae on distal parts of the outer margin	pad-like, with a beak-like inner process and 2–3 apical setae	spatula-shaped, with 2 setae on apical margin
Inferior volsella	with 24–32 long setae	with 9–12 oral setae and an apical seta	with one apical seta and 2–3 oral directed setae
Hypopygium ratio	1.00–1.12	0.83–1.09	0.90–1.06
Hypopygium value	1.61–1.77	1.95–2.30	1.80–2.04
Distribution in China	Zhejiang	Anhui, Beijing, Fujian, Guangdong, Guizhou, Hainan	Yunnan

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