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**Two new species of the subgenus *Polypedilum* (s. str.) Kieffer, 1912
(Diptera: Chironomidae: *Polypedilum*) from China**

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Abstract. Two new species of *Polypedilum* (s. str.) Kieffer, 1912, from China with the anal point constricted apically, *P.* (s. str.) *adustatum* Zhang & Wang, **sp. n.**, and *P.* (s. str.) *constrictum* Zhang & Wang, **sp. n.**, are described and illustrated as male imagines. A checklist of *Polypedilum* subgenera and species from China is also presented.

Key Words. Chironomidae, *Polypedilum*, new species, China.

INTRODUCTION

Polypedilum Kieffer, 1912, has a cosmopolitan distribution and includes about 500 species (Cranston et al. 2016). It is a heterogeneous group, and the larvae occur in almost all lentic and lotic waters, except at high altitude and latitude. The male imagines of the genus can be recognized by the combination of deeply bifid pulvilli and abdominal segment VIII constricted basally giving it a triangular appearance. The delimitation of subordinate groups within *Polypedilum* is difficult and problematic since the diagnoses of different stages are not always consistent. Sæther et al. (2010) divided *Polypedilum* into eight subgenera: *Polypedilum* (s. str.); *P.* (*Pentapedilum*) Kieffer, 1913; *P.* (*Tripedilum*) Kieffer, 1921; *P.* (*Kribionympha*) Kieffer, 1921; *P.* (*Tripodura*) Townes, 1945; *P.* (*Uresipedilum*) Oyewo & Sæther, 1998; *P.* (*Cerobregma*) Sæther & Sundal, 1999; and *P.* (*Probolum*) Andersen & Sæther, 2010. Cranston et al. (2016) treated *Tripedilum* to as a junior synonym of *Polypedilum* (s. str.).

In the last decade, 40 new species of the genus *Polypedilum* have been described in China. To date, 82 species of *Polypedilum* assigned to six subgenera have been recorded in China, including six in *P.* (*Cerobregma*), eight in *P.* (*Pentapedilum*), 24 in *Polypedilum* (s. str.), one in *P.* (*Probolum*), 27 in *P.* (*Tripodura*), and 16 in *P.* (*Uresipedilum*) (Wang 2000; Wang et al. 2005; Lin et al. 2013; Qi et al. 2014; Zhang & Wang 2004, 2005a, 2005b, 2006, 2007a, 2007b, 2008; Zhang et al. 2015; Qi et al. 2016). In this contribution, two new species of *Polypedilum* (s. str.) with the anal point characteristically constricted distally are described based on male imagines.

METHODS

The morphological nomenclature follows Sæther (1980). The material examined was mounted on slides following the procedure outlined by Sæther (1969). Measurements are given as ranges followed by a mean when there are three measurements, followed by the number measured (n) in parentheses. Specimens are deposited in the Department of Biology, Nankai University, China (BDN).

CHECKLIST OF *POLYPEDILUM* SUBGENERA AND SPECIES FROM CHINA*Polypedilum* (*Cerobregma*) Sæther & Sundal, 1998

cyclus Zhang & Wang, 2005; *exilicaudatum* Sæther & Sundal, 1998; *jii* Zhang & Wang, 2005; *kamotertium* Sasa, 1989; *okigrandis* Sasa, 1993; *paucisetum* Zhang, Wang & Sæther, 2006.

Polypedilum (*Pentapedilum*) Kieffer, 1913

convexum (Johannsen, 1932); *fanjingensis* Zhang & Wang, 2005; *kamosecundum* (Sasa, 1989); *nodosum* (Johannsen, 1932); *paraconvexum* Zhang & Wang, 2005; *pseudosordens* Zhang & Wang, 2005; *sordens* (van der Wulp, 1874); *tenuis* Zhang & Wang, 2005.

Polypedilum (s. str.) Kieffer, 1912

acutum Kieffer, 1915; *aequabe* Zhang & Wang, 2007; *albicorne* (Meigen, 1838); *asakawaense* Sasa, 1980; *bisetosum* Wang, 1995; *benokiense* Sasa & Hasegawa, 1988; *coalitum* Zhang & Wang, 2008; *depile* Zhang & Wang, 2008; *edensis* Ree & Kim, 1981; *medivittatum* (Tokunaga, 1964); *nubifer* (Skuse, 1889); *genpeiense* Niitsuma, 1996; *hainanense* Zhang & Wang, 2008; *henicurum* Wang, 1995; *laetum* (Meigen, 1818); *lichuanensis* Wang, 1994; *nubeculosum* (Meigen, 1804); *pedestre* (Meigen, 1830); *shanguiensis* Wang, *tamanigrum* Sasa, 1983; *tsukubaense* (Sasa, 1979); *xianjuensis* Qing, Zhang, Zhu & Wang, 2016.

Polypedilum (*Probolum*) Andersen & Sæther, 2010

bullum Zhang & Wang, 2004

Polypedilum (*Tripodura*) Townes, 1945

absensilobum Zhang & Wang, 2016; *apiclusetosum* Zhang & Wang, 2016; *arcuatum* Zhang & Wang, 2016; *bilamella* Zhang & Wang, 2016; *bicrenatum* (Kieffer, 1921); *bispinum* Zhang & Wang, 2007; *cochlearum* Zhang & Wang, 2005; *conghuaense* Zhang & Wang, 2016; *cypellum* Qi, Shi, Zhang & Wang, 2014; *decematoguttatum* (Tokunaga, 1938); *dengae* Zhang & Wang, 2016; *falcutum* Zhang, Song, Wang & Wang, 2015; *harteni* Andersen & Mendes, 2010; *japonicum* (Tokunaga, 1938); *masudai* (Tokunaga, 1938); *mengmanense* Zhang & Wang, 2016; *napahaiense* Zhang & Wang, 2016; *nudiprostatum* Zhang, Wang & Sæther, 2006; *parallelum* Zhang & Wang, 2016; *pollicium* Zhang & Wang, 2016; *procerum* Zhang, Song, Wang & Wang, 2015; *quadriguttatum* Kieffer, 1921; *scalaneum* (Schrank, 1803); *spathum* Zhang & Wang, 2007; *trapezium* Zhang & Wang, 2016; *udominutum* Niitsuma, 1992; *unifascia* (Tokunaga, 1938).

Polypedilum (*Uresipedilum*) Oyewo & Sæther, 1998

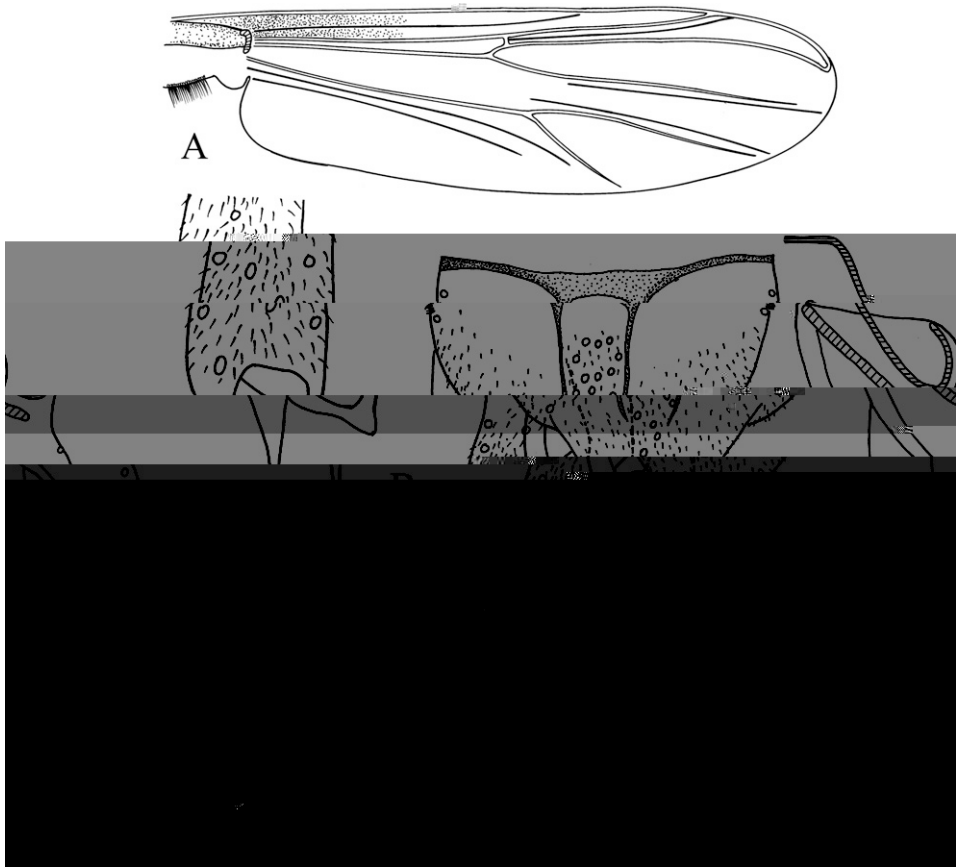
basilarum Zhang & Wang, 2004; *bingopardoxum* Kawai, Inoue & Imabayashi, 1998; *breviplumosum* Zhang & Wang, 2004; *convictum* (Walker, 1856); *crassiglobum* Zhang & Wang, 2004; *cultellatum* (Goetghebuer, 1931); *dilatatum* Zhang & Wang, 2004; *infundibulum* Zhang & Wang, 2004; *lateralum* Zhang & Wang, 2004; *medium* Zhang & Wang, 2004; *minimum* Lin, Qi, Zhang & Wang, 2005; *paraviceps* Niitsuma, 1992; *prominens* Zhang & Wang, 2004; *surugense* Niitsuma, 1992; *xuei* Zhang & Wang, 2004.

DESCRIPTIONS

Polypedilum (*Polypedilum*) *adustalum* Zhang & Wang, sp. n.

(Figure 1)

Type Specimens. Holotype: male (BDN. 1581), CHINA, Guangxi Zhuang Autonomous Region, Longsheng County, 23.V.1990, light trap, X. Wang.



Figures. 1. *Polypedilum* (s. str.) *adustalum* Zhang & Wang, sp. n. A. Wing. B. Fore tibial scale. C. Superior volsella. D. Hypopygium, dorsal and ventral view.

Diagnostic Characters: The species can be separated from other members of the subgenus by the wing having brown coloration in the proximal 2/5 of the area between vein C and R to R_{4+5} and having the anal point constricted from distal 1/4 to apex.

Etymology: From the Latin, *adustus*, brown, and *ala*, wing, referring to the brown coloration in the proximal 2/5 of the area between vein C and R to R_{4+5} .

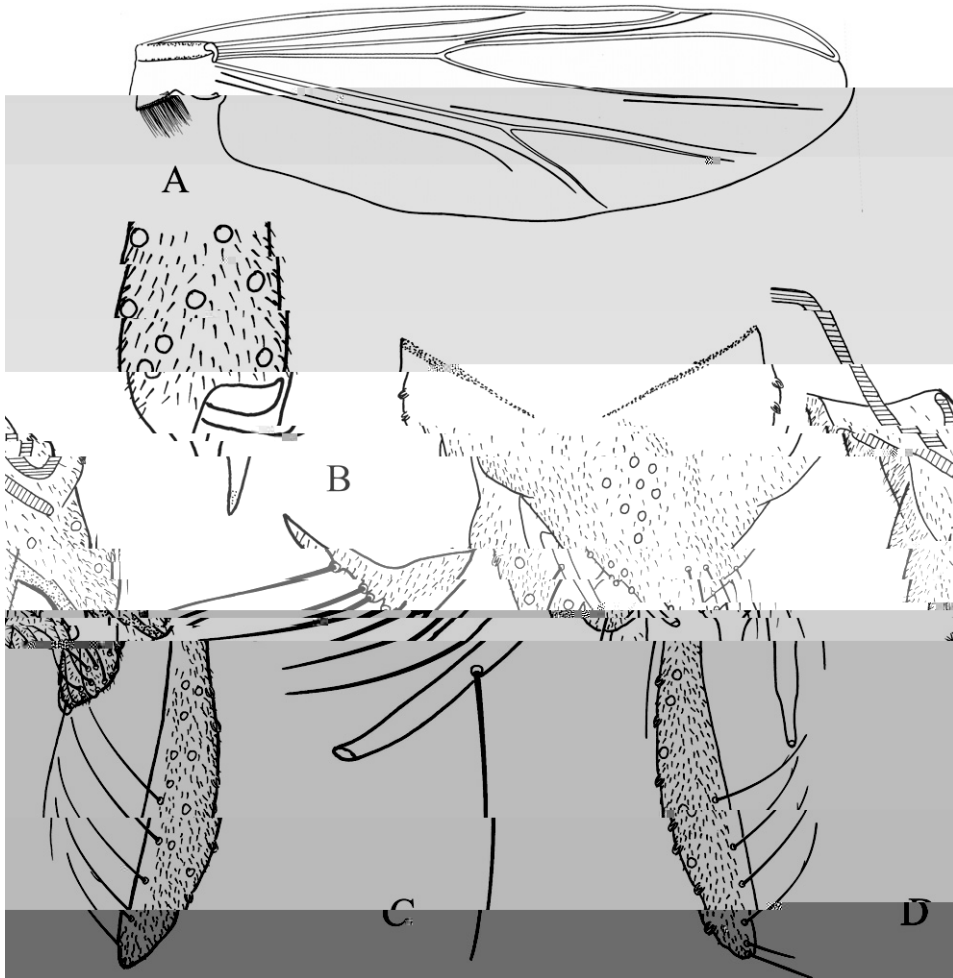
Male imago (n =1)

Total length 5.15 mm. Wing length 2.55 mm. Total length/wing length 2.01. Wing length/length of profemur 1.82.

Table 1. Lengths (in μm) and proportions of legs of *Polypedilum* (s. str.) *adustalum* Zhang & Wang, sp. n.

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR
p ₁	1400	960	1375	-	310	270	110	1.74
p ₂	1525	1225	640	420	320	220	130	0.52
p ₃	1650	1400	950	570	470	400	140	0.68

Coloration. Head dark brown. Thorax dark brown. Fore leg dark brown except for femur proximal 1/4 yellowish brown; mid and hind legs with femur distal 3/4 and tibia dark brown, femur with proximal 1/4 yellowish brown, tarsi stramineous. Abdominal



Figures 2. *Polypedilum* (s. str.) *constrictum* Zhang & Wang, sp. n. A. Wing. B. Fore tibial scale. C. Superior volsella. D. Hypopygium, dorsal and ventral view.

Paratypes: 2 males: Fujian Province, Shanghang County, Buyun Town, Shiyankeng, 7.V.1993, light trap, X. Wang.

Diagnostic Characters: The species differs from other members of the subgenus by the anal point being constricted from distal 1/3 to apex, and having the distal extension of the superior volsella nearly straight.

Etymology: From the Latin, *constrictus*, contracted, referring to the anal point constricted from distal 1/3 to apex.

Male imago (n =3)

Total length 2.83–3.65, 3.26 mm. Wing length 1.70–2.27, 1.95 mm. Total length/wing length 1.61–1.76, 1.68. Wing length/length of profemur 2.43–2.54, 2.48.

Coloration. Head brown. Thorax brown with darker vittae, postnotum and preepisternum; halteres brown. Legs entirely stramineous. Abdominal segments brown.

Head. Frontal tubercles absent. AR 0.83–0.94, 0.88. Ultimate flagellomere 450–580, 510 μ m long. Temporal setae 10–13, 12; including 3–4, 3 inner verticals, 4–6, 5 outer

verticals and 3–3, 3 postorbitals. Clypeus with 20–23, 22 setae. Tentorium 116–135, 124 μm long; 20–30, 25 μm wide. Palpomere lengths (in μm): 33–38, 35; 40–47, 44; 88–112, 98; 93–125, 108; 195–218, 210.

Wing (Figure 2A). VR 1.28–1.32, 1.30. R with 20–21, 20 setae, R_1 with 20–23, 22, R_{4+5} with 38–42, 40. Squama with 27–32, 30 setae. Anal lobe developed.

Thorax. Dorsocentrals 18–28, 23, including 4–6, 5 humerals, acrostichals 15–18, 16; prealars 5–6, 6. Scutellum with 13–23, 17 setae.

Legs. Terminal scale (Figure 2B) of front tibia 43–52, 47 μm long, triangular and apically pointed. Spur on median tibia 50–60, 55 μm long including 25–31, 29 μm long comb, un-spurred comb 25–29, 26 μm long, spur on hind tibia 58–70, 65 μm long including 28–35, 31 μm long comb, un-spurred comb 28–30, 29 μm long. Width at apex of front tibia 48–55, 51 μm , of median tibia 50–62, 57 μm ., of hind tibia 55–73, 63. Lengths (in μm) and proportions of legs as in Table 3.

Hypopygium (Figures 2C, D). Anal tergite band not fused basally. Tergite IX with 7–11, 9 median setae. Laterosternite with 2–3, 3 setae. Anal point 80–83, 81 μm long, slender, tapered basally and constricted from distal 1/3 to apex. Phallapodeme 78–88, 83 μm long, transverse sternapodeme 28–47, 37 μm long. Gonocoxite 178–212, 193 μm long. Superior volsella (Figure 2C) 78–95, 87 μm long, base wide with 3–4 inner setae and covered with microtrichia; distal extension nearly straight, and 1 lateral seta placed in the middle. Inferior volsella 110–115, 112 μm long, with 13–17 split oral setae and an apical seta. Gonostylus 178–212, 193 μm long, with 4–5 long setae branched along inner margin and an apical seta. HR 0.79–0.83, 0.82. HV 1.59–1.74, 1.68.

Distribution: The species is known from Oriental China.

Remarks: It is characteristic of the species that the anal point is constricted from distal 1/3 to apex. This species resembles the Holarctic species *P. albicorne* but differs by the combination of following characters: anal point constricted from the distal 1/3 to apex (tapered from base to apex in *P. albicorne*) (Figure 43 in Maschwitz & Cook 2000); fore leg ratio (1.89–1.97) higher (1.47–1.58 in *P. albicorne*) (Maschwitz & Cook, 2000); anal tergite band not fused (fused in *P. albicorne*).

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Table 3. Lengths in μm (means and ranges) and proportions of legs of *Polypedilum* (s. str.) *constrictum* Zhang & Wang, sp. n.

	fe	ti	ta ₁	ta ₂
p ₁	784 (700–8930)	570 (510–630)	1096 (970–1242)	722 (640–837)
p ₂	1034 (920–1161)	890 (800–999)	451 (400–504)	282 (250–315)
p ₃	1053 (920–1215)	940 (830–108)	645 (590–746)	370 (330–420)
	ta ₃	ta ₄	ta ₅	LR
p ₁	417 (380–462)	397 (350–431)	166 (150–189)	1.92 (1.89–1.97)
p ₂	224 (192–252)	141 (130–158)	87 (80–95)	0.5 (0.50–0.52)
p ₃	327 (275–360)	192 (175–210)	92 (85–105)	0.69 (0.66–0.71)

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