

Two new species of subgenus *Sivatipula* from China (Diptera: Tipulidae: *Tipula*)

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Abstract. Species of *Tipula* (*Sivatipula*) *similis* Men, sp. nov. from Guangxi Zhuang Autonomous Region and *T. (S.) tongbiguanensis* Men, sp. nov. from Yunnan Province are described and illustrated and placed in the subgenus *Sivatipula* Alexander, 1964. *Tipula (S.) tongbiguanensis* Men, sp. nov. represents the first record of *Sivatipula* from Yunnan Province, China.

Key words. Diptera, Tipulidae, *Tipula*, *Sivatipula*, crane flies, new species, taxonomy, China

Introduction

Sivatipula Alexander, 1964 is a small subgenus of *Tipula* Linnaeus, 1758, proposed by ALEXANDER (1964) based on *Tipula mitocera* Alexander, 1927 (type species by original designation), recorded from the eastern Himalayas. This subgenus covers *T. (S.) pullimargo* Alexander, 1951 from Myanmar, *T. (S.) alhena* Alexander, 1953 from Thailand, *T. (S.) filicornis* Brunetti, 1918 and *T. (S.) bhishma* Alexander, 1964 from India, *T. (S.) lackschewitziana* Alexander, 1928, *T. (S.) suensoniana* Alexander, 1940, *T. (S.) parvaauricula* Alexander, 1941 and *T. (S.) biprocessa* Xue & Men, 2016 from China (OOSTERBROEK 2016). All these species are restricted to the Oriental Region. The Chinese fauna of *Sivatipula* is poorly represented with only four known species, all distributed in Southern China. Recently, a key for separating known species in *Sivatipula* was constructed by XUE & MEN (2016). They also discussed the special structure of semen pump accidentally discovered in *Sivatipula* species.

Two previously unknown taxa of *Sivatipula* were noticed while sorting and identifying crane fly specimens collected from Dayaoshan National Nature Reserve, Guangxi Zhuang

Autonomous Region, and Tongbiguan National Nature Reserve, Yunnan Province, China. In the present paper, the two new species are described and illustrated.

Material and methods

The specimens used in this study were collected using insect nets, from Guangxi Zhuang Autonomous Region and Yunnan Provinces in 2016. Photographs of the body parts of male were taken using SOIF XTZ-E stereomicroscope (SOIF, Shanghai, China). The hypopygium of each male was dissected and macerated in 10% NaOH for one hour at 50°C metal bath, observed in glycerin and illustrated under a SOIF XTZ-E stereomicroscope (SOIF, Shanghai, China). Body length was measured from the vertex of head to the tip of hypopygium. All measurements were made in millimeters (mm) with the aid of a digital caliper. The terminology and methods of description and illustration followed that of ALEXANDER & BYERS (1981) and FROMMER (1963). The type specimens are deposited in the animal specimen room, School of Life Sciences, Anqing Normal University, Anhui Province, P. R. China.

Taxonomy

Tipula (*Sivatipula*) *tongbiguanensis* Men, sp. nov.

(Figs 1–16)

Type locality. China, Yunnan Province, Tongbiguan National Nature Reserve, 24°36'N, 97°36'E.

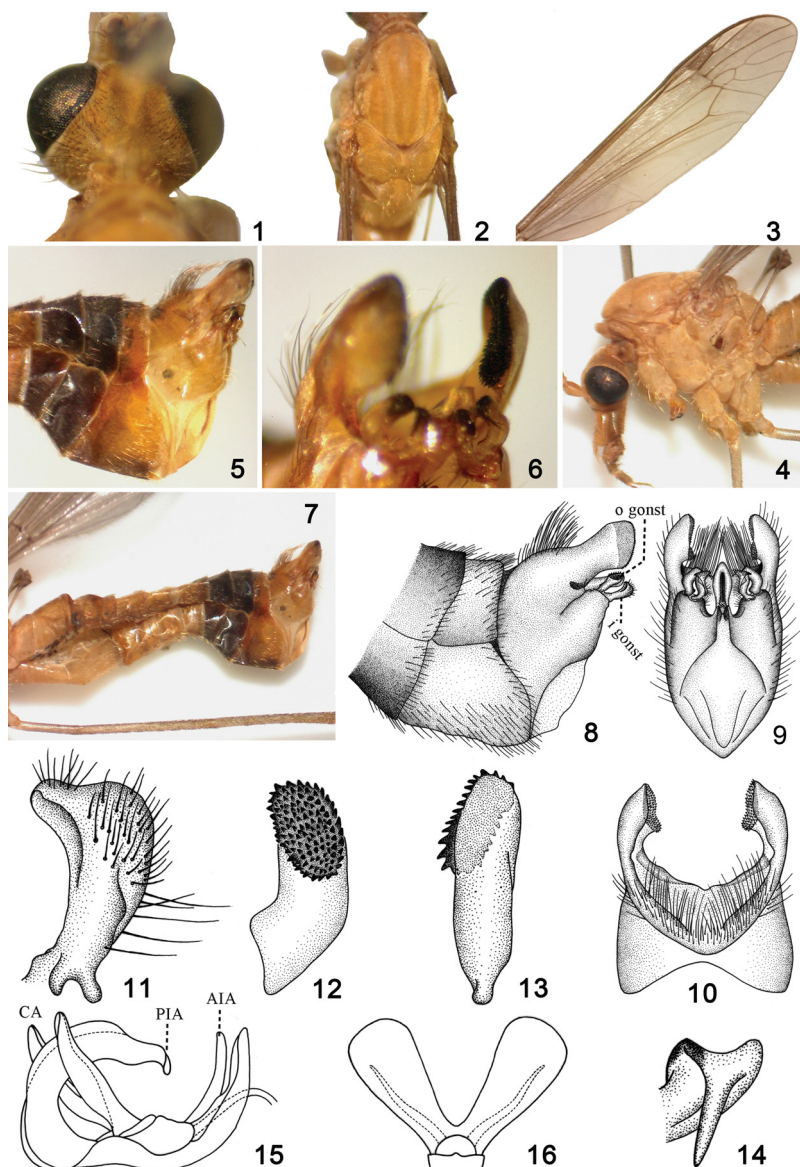
Type material. HOLOTYPE: ♂, 'China: Yunnan Province, Yingjiang County, Tongbiguan National Nature Reserve, 10. V. 2016, Guoxi Xue coll. / HOLOTYPE [red] male, *Tipula* (*Sivatipula*) *tongbiguanensis* sp. nov. Men det., 2016'. PARATYPE: 1 ♂, same data as the holotype. The paratype bears the following label: 'PARATYPE [yellow] male, *Tipula* (*Sivatipula*) *tongbiguanensis* sp. nov. Men det., 2016'.

Diagnosis. General colouration yellow; antenna slightly longer than body; prescutum orange-yellow with three light brown stripes; wing pale brown with a dark brown stigma, cell sc darker than the remaining part of wing; abdomen orange with segments six and seven black; hypopygium orange, tergite nine terminating into two broad lobes in lateral angles, densely covered with black setae at apex, inner and outer gonostylus relatively small.

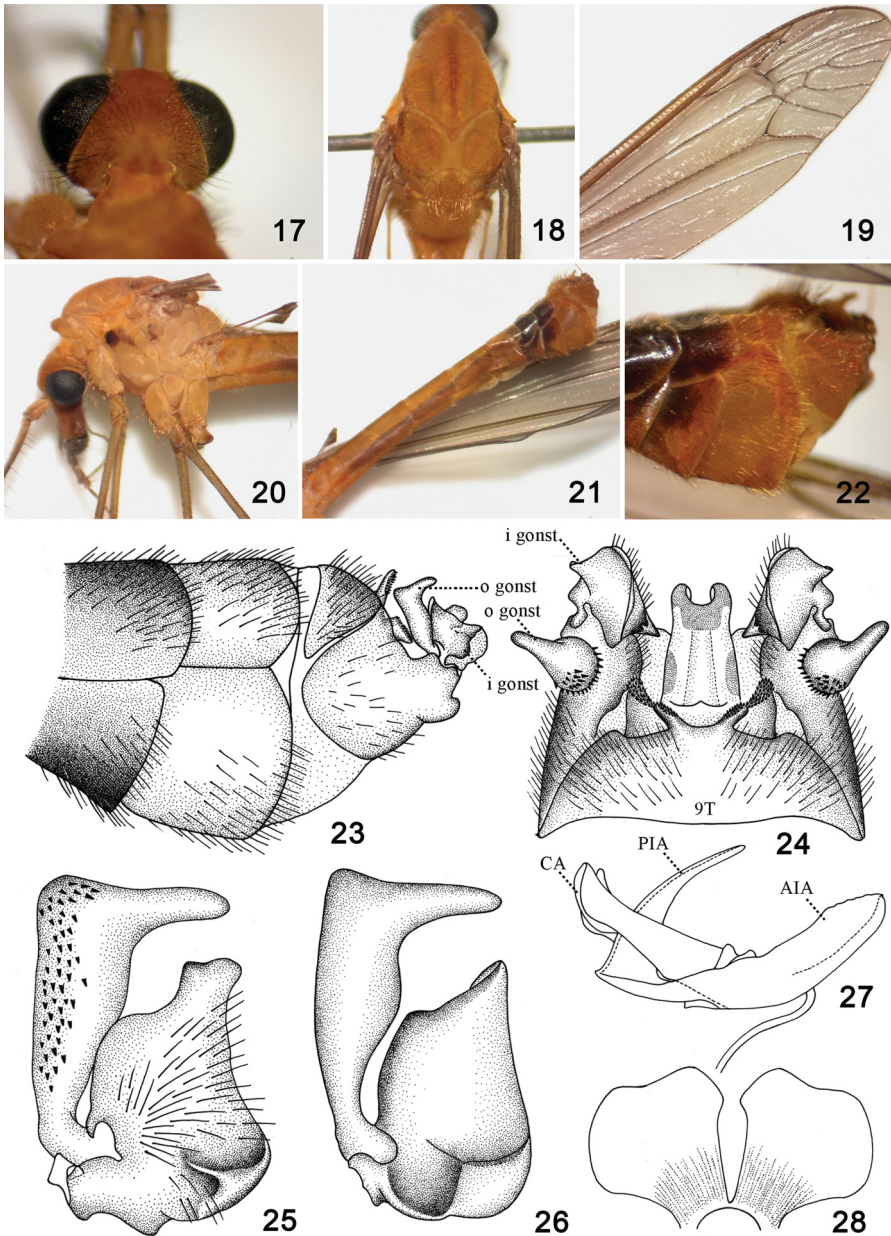
Description. Male. Length: body 13.2–13.4 mm (not including antenna, $n = 2$), wing 16.0–16.2 mm ($n = 2$), antenna: 14.0–14.2 mm ($n = 2$).

Head orange-yellow. Rostrum light brown, with a light brown nasus. Vertex unmarked (Fig. 1). Eye black. Antenna: 12-segmented, slightly longer than body; scape light yellow, expanded apically; pedicel light yellow, short; flagellomeres black, each flagellomere cylindrical, subequal in length, with abundant black verticils. Palpus light brown.

Thorax with pronotum entirely orange-yellow (Fig. 2). Prescutum orange-yellow, with three light brown stripes. Scutum, scutellum and postnotum orange-yellow (Fig. 2). Pleuron entirely bright yellow (Fig. 4). Legs slender, coxae and trochanters stramineous, femora stramineous with light brown tip, tibiae and tarsi light brown. Haltere with stem yellow, knob darker in coloration. Wing transparent, pale brown, cell sc darker than ground color, stigma dark brown. Rs relatively short, slightly shorter than R_3 , petiole of cell m_1 subequal to $m-m$ in length, distinctly shorter than the length of discal cell (Fig. 3).



Figs 1–16. *Tipula (Sivatipula) tongbiguanensis* Men, sp. nov. 1 – head, dorsal view; 2 – thorax, dorsal view; 3 – wing; 4 – thorax, lateral view; 5 – hypopygium, lateral view; 6 – lobes on hypopygium; 7 – abdomen and hypopygium, lateral view; 8 – hypopygium, lateral view; 9 – hypopygium, ventral view; 10 – tergite nine, dorsal view; 11 – inner gonostylus, outer view; 12 – outer gonostylus, inner view; 13 – outer gonostylus, outer view; 14 – inner gonostylus, inner view; 15 – semen pump, dorsal view; 16 – compressor apodeme, dorsal view. Abbreviations: AIA – anterior immovable apodeme, CA – compressor apodeme, i gonst – inner gonostylus, o gonst – outer gonostylus, T – tergite.



Figs 17–28. *Tipula (Sivatipula) similis* Men, sp. nov. 17 – head, dorsal view; 18 – thorax, dorsal view; 19 – wing; 20 – thorax, lateral view; 21 – abdomen and hypopygium, lateral view; 22–23 – hypopygium, lateral view; 24 – hypopygium, dorsal view; 25 – inner gonostylus and outer gonostylus, inner view; 26 – inner gonostylus and outer gonostylus, outer view; 27 – semen pump, lateral view; 28 – compressor apodeme, dorsal view.

Abdomen bright yellow, segments six and seven black (Fig. 7). Hypopygium orange, broad and compressed in lateral view (Figs 5, 7–8). Tergite nine shallowly emarginated at posterior margin, terminating into two broad lobes in lateral angles, densely covered with black setae at apex (Figs 6, 10). Sternite nine broader than tergite nine, median region of sternite nine protruded to a membranous extension (Figs 5, 8–9). Outer gonostylus flattened, curved, with many black setae at apex (Figs 9, 12–13). Inner gonostylus flattened, curved, apically produced into a beak in inner side, with many long hairy setae generated from outer side, the longest one longer than the length of inner gonostylus (Figs 11, 14).

Semen pump with compressor apodeme V-shaped, the arms apically expanded, basally dark in coloration (Figs 15–16). Posterior immovable apodeme with one arm, distinctly longer than compressor apodeme, gradually narrowing towards apex and curved cephalad in lateral view (Fig. 15). Anterior immovable apodeme flattened (Fig. 15). Aedeagus elongate, tubular, apically acute.

Differential diagnosis. We compared the new species with all known congeneric species based on published descriptions and illustrations, and found that it is most similar to the Indian species *T. (S.) bhishma*, by the presence of long lobes on tergite nine. It can be easily distinguished from the latter by the shape of outer gonostylus which lacks a finger-like rod and is equipped apically with black setae, as illustrated in Figures 12–13 (produced into a slender finger-like rod in inner margin and without black setae on apex in *T. (S.) bhishma* as described by ALEXANDER (1964: 105)).

Etymology. The specific epithet is an adjective derived from the Chinese spelling ‘*Tongbiguan*’ with Latin suffix ‘-ensis’, referring to the type locality of the new species.

Distribution. China (Yunnan).

Tipula (Sivatipula) similis Men, sp. nov.

(Figs 17–28)

Type locality. China, Guangxi Zhuang Autonomous Region, Dayaoshan National Nature Reserve, Lianhuashan Mountain, 24°09'N, 110°07'E.

Type material. HOLOTYPE: ♂, ‘China: Guangxi Zhuang Autonomous Region, Jinxiu County, Dayaoshan National Nature Reserve, Lianhuashan Mountain, 14. V. 2016, Guoxi Xue coll. / HOLOTYPE [red] male, *Tipula (Sivatipula) similis* sp. nov. Men det., 2016’. PARATYPE: 1 ♂, same data as the holotype except from the collector being Qiulei Men. Paratype bears the following label: ‘PARATYPE [yellow] male, *Tipula (Sivatipula) similis* sp. nov. Men det., 2016’.

Diagnosis. General colouration orange-yellow; antenna distinctly longer than body; prescutum orange-yellow with three light brown stripes; wing pale brown with a dark brown stigma; abdomen orange with segments six and seven black; hypopygium orange, tergite nine with two finger-like processes medially, ventrolateral portions of tergite nine projected into two lobes, densely covered with black setae, outer gonostylus curved squarely.

Description. Male. Length: body 17.4–17.6 mm (not including antenna, $n = 2$), wing 21.2–21.4 mm ($n = 2$), antenna 22.0–22.1 mm ($n = 2$).

Head stramineous. Rostrum light brown with a light brown nasus. Vertex without marking (Fig. 17). Eye black. Antenna: 12-segmented, distinctly longer than body; scape light yellow, expanded apically; pedicel light yellow; flagellomeres light brown, subequal in length, with abundant black verticils. Palpus light brown.

Thorax with pronotum entirely orange-yellow (Fig. 18). Prescutum stramineous with three light brown stripes (Fig. 18). Scutum, scutellum and postnotum orange-yellow. Pleuron entirely bright yellow with a black spot (Fig. 20). Legs slender, coxae and trochanters stramineous, femora stramineous with light brown tip, tibiae and tarsi light brown. Haltere with stem yellow, knob brown. Wing pale brown, cell *sc* darker than ground color, stigma dark brown. *Rs* relatively short, subequal to *R*₃ in length, petiole of cell *m*₁ slightly longer than *m-m*, slightly shorter than the length of discal cell (Fig. 19).

Abdomen bright yellow on basal two segments, gradually changing to light brown on following segments, segments six and seven almost entirely black (Fig. 21). Hypopygium broad, compressed in lateral view (Fig. 22). Tergite nine shallowly emarginated at posterior margin, two finger-like processes arising from the median region, apically provided with many black setae on dorsal side (Figs 23–24); lateral sides of tergite nine with numerous long hairy setae (Figs 23–24); ventrolateral portions of tergite nine projecting into two lobes, densely covered with black setae (Figs 23–24). Sternite nine broader than tergite nine, median region of sternite nine protruding into a membranous extension (Figs 22–23). Outer gonostylus narrow, flattened, apical one-third curved squarely and gradually narrowed to end, many black setae densely covered on inner side in lateral view (Figs 25–26). Inner gonostylus flattened, narrowed basally, terminating into a small, horn-shaped process (Figs 25–26).

Semen pump with compressor apodeme V-shaped, the arm expanding apically (Figs 27–28). Posterior immovable apodeme with one arm, gradually narrowing towards apex and curved cephalad in lateral view, the arm deeply grooved in dorsal view (Fig. 27). Anterior immovable apodeme flattened. Aedeagus elongated, tubular, acute apically (Fig. 27).

Differential diagnosis. We compared the new species with all known congeneric species, based on published descriptions and illustrations, and found that it is most similar to *T. (S.) biprocessa*, another species recorded from Guangxi Zhuang Autonomous Region, China, by the color of body and the structures of hypopygium. It can be easily distinguished from the latter by the shallowly emarginated posterior margin of tergite nine, which bears two finger-like processes covered with many black setae as illustrated in Figures 23–24 (posterior margin of tergite nine rounded, with two finger-like processes lacking black setae in *T. (S.) biprocessa* as figured in XUE & MEN (2016: Fig. 18)). There is also a noticeable difference in the shape of outer gonostylus, which is curved squarely on apical one-third in new species, but bent obtusely on apical two-fifths in *T. (S.) biprocessa*.

Etymology. The specific epithet is the Latin adjective *similis* (-is, -e), meaning similar, emphasizing the morphological similarity of the new species and its relatives.

Distribution. China (Guangxi Zhuang Autonomous Region).

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