Notes on the Stenus cirrus group of Zhejiang, East China, with descriptions of two new species (Coleoptera, Staphylinidae)

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Abstract

Two new Stenus species of the cirrus group collected from Zhejiang Province, East China, are described, S. wuyanlingus Liu, Tang & Luo, sp. n., S. yuyimingi Liu, Tang & Luo, sp. n. and a new distributional locality for S. ovalis Tang, Li & Zhao, 2005 was discovered. The diagnostic characters of the new species are illustrated, and a key to species of the group from Zhejiang Province is provided.

Keywords

China, Coleoptera, new species, Staphylinidae, Stenus cirrus group, Zhejiang

Introduction

The Stenus cirrus group is a large group with 73 species worldwide. Among them, 56 species are known from China (Tang et al. 2008; Puthz 2009; Yu et al. 2014; Liu and Tang 2017) and seven species are known from Zhejiang: S. cirrus Benick, L., 1940, S. guangxiensis Rougemont, 1984, S. ovalis Tang, Li & Zhao, 2005, S. zhulilongi Tang & Puthz, 2008, S. lijinwendi Tang & Puthz, 2008, S. jinlongshanus Tang & Puthz, 2008
and *S. shenshanjiai* Tang & Puthz, 2008. The members of the group are characterized by the oval paraglossae and the presence of long and suberect setae on abdomen. Recently, two new species of the *Stenus cirrus* group from Zhejiang Province were found in our collections and they will be described in this paper.

**Material and methods**

The specimens examined in this paper were mainly collected at various locations in Zhejiang, East China by sifting leaf litter in broad leaf forests. Specimens were killed with ethyl acetate and dried. For examination of the male and female genitalia, the apical three abdominal segments were detached from the body after softening in hot water. The aedeagi, together with other dissected parts, were mounted in Euparal (Chroma Gesellschaft Schmidt, Koengen, Germany) on plastic slides. Photos of sexual characters were taken with a Canon G9 camera attached to an Olympus CX31 microscope; habitus photos were taken with a Canon macro photo lens MP-E 65 mm attached to a Canon EOS7D camera and stacked with Zerene Stacker.

The type specimens treated in this study are deposited in the following public and private collections:

- **SHNU** Department of Biology, Shanghai Normal University, P. R. China
- **cPut** Private collection V. Puthz, Schlitz, Germany

The measurements of proportions are abbreviated as follows:

- **BL** body length, measured from the anterior margin of the clypeus to the posterior margin of abdominal tergite X
- **FL** forebody length, measured from the anterior margin of the clypeus to the apicolateral angle of elytra
- **HW** width of head including eyes
- **PW** width of pronotum
- **EW** width of elytra
- **PL** length of pronotum
- **EL** length of elytra, measured from humeral angle
- **SL** length of elytral suture

**Taxonomy**

*Stenus wuyanlingus* Liu, Tang & Luo, sp. n.

http://zoobank.org/0F0F88C6-8EA2-4316-B391-B24D295BCF1A

Figs 1, 2, 7–13

**Type material. CHINA: Zhejiang: Holotype:** ♂, glued on a card with labels as follows: “China: Zhejiang Prov. Taishun County, Wuyanling, 27°42’N, 119°41’E, alt.
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Figures 1–6. Habitus. 1, 2 Stenus wuyanlingus sp. n. 3, 4 Stenus yuyimingi sp. n. 5, 6 Stenus ovalis. Scale bars: 1 mm.

1550 m. 6.V.2012, ZHU Jian-Qing leg”. “Holotype / Stenus wuyanlingus / Liu & Tang” [red handwritten label] (SHNU). Paratypes: 6♂5♀, same data as for the holotype. (1♂1♀ in cPut, remainder in SHNU).

Description. Brachypterous. Head black, pronotum and abdomen blackish brown, elytra light brown with median portion more or less lighter. Antennae, maxillary palpi and legs yellowish brown except antennal club infuscate. Labrum reddish brown.

BL: 2.7–3.1 mm, FL: 1.4–1.6 mm. HW: 0.63–0.71 mm, PL: 0.45–0.49 mm, PW: 0.43–0.51 mm, EL: 0.44–0.52 mm, EW: 0.48–0.61 mm, SL: 0.32–0.40 mm.

Head 1.21–1.30 times as wide as elytra; interocular area with two deep longitudinal furrows, median portion convex, slightly extending a little beneath the level of inner eye margins, with a impunctate line along midline; punctures round, larger and sparser in median portion than those near inner margins of eyes, diameter of large punctures about as wide as apical cross section of antennal segment II; interstices between punctures distinctly reticulated, varied from narrower than half the diameter of punctures to a little narrower than diameter of punctures except those along
the midline of convex median portion, which may be slightly wider than diameter of punctures. Paraglossae oval.

**Pronotum** 0.94–1.04 times as long as wide; disk uneven, with distinct median longitudinal furrow almost throughout; punctures confluent, varied in size, mostly smaller than large punctures of head; interstices reticulated, narrower than diameter of punctures except those in median area, which may be much wider than diameter of punctures.

**Elytra** 0.81–0.95 times as long as wide; disk with shallow sutural impression and humeral impression; punctures confluent, slightly larger than those on pronotum in average; interstices rarely reticulated, narrower than half the diameter of punctures.

**Legs** with tarsomeres IV strongly bilobed.

**Abdomen** cylindrical; paratergites very narrow with few punctures, present only in segment III, tergites and sternites totally fused in segment IV–VI, posterior margin of tergite VII with indistinct palisade fringe; punctuation round to elliptic, gradually becoming smaller and sparser posteriad; interstices smooth, mostly wider than diameter of punctures except those on basal impressions of tergites III–V, which may be distinctly narrower than half the diameter of punctures.

**Male.** Sternite VII (Fig. 7) with inconspicuous emargination at middle of posterior margin; sternite VIII (Fig. 8) with shallow emargination at middle of posterior margin;

**Figures 7–13.** *Stenus wuyanlingus.* 7 male sternite VII 8 male sternite VIII 9 male sternite IX 10, 11 aedeagus 12 female sternite VIII 13 valvifers and spermatheca. Scale bars: 0.25 mm.
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Sternite IX (Fig. 9) with long apicolateral projections, posterior margin serrate. Aedeagus (Figs. 10–11) widest at basal third and tapering towards the apex; median longitudinal bands each with ventral band very long, straight, narrowed apically; lateral longitudinal bands short; expulsion clasps each with anterior plate distinctly separated from the posterior plate, rounded apically, posterior plate pointed posteriorly; copulatory tube moderately long, rather stout, with basal chamber submembranous, main tube distinctly divided into basal tube and apical tube, the basal tube gently constricted near the middle, apical tube very thin; parameres longer than median lobe, each with 8–11 setae on apico-internal margins.

Female. Sternite VIII (Fig. 12) with posterior margin weakly pointed at middle; spermatheca (Fig. 13) strongly sclerotized, spermathecal duct with multiple bends.

Distribution. China (Zhejiang).

Remarks. The new species can be easily recognized among Chinese members of the group by the smaller size and reticulations of head and pronotum. It can be distinguished from other species by its sparser punctuation along in median area of head and pronotum, and the lighter color of elytra.

Etymology. The specific name is derived from the type locality of this species.

Stenus yuyimingi Liu, Tang & Luo, sp. n.

http://zoobank.org/40B0916F-3286-4CBA-A7C8-3909E9C019C2

Figs 3, 4, 14–20

Type material. CHINA: Zhejiang: Holotype: ♂, glued on a card with labels as follows: “China: S. Zhejiang, Lishui City, Longquan Fengyangshan N.R., forest nr. Xiaobian Vil., 27°55’58”N, 119°10’57”E, mixed leaf litter, sifted, 690–780 m, 9.X.2013, Z. Peng, Y.-M. Yu, Z.-W. Yin leg”. “Holotype / Stenus yuyimingi / Liu & Tang” [red handwritten label] (SHNU). Paratypes: 1 ♂, same data as for the holotype, but Mihowu, 27°55’0.18”N, 119°11’52.91”E, near stream, 1116 m, 03.V.2016, Jiang, Liu & Zhou leg (SHNU); 1 ♂, same data as for the holotype, but Datianping, 27°54’33”-55’18”N, 119°10’20”-17”E, mixed litter, moss, sifted, 1170–1300 m. 7.X.2013, Feng, Peng, Yu, Yin leg. (cPut); 1 ♂, same data as for the holotype, but Jitou Vil., 27°55’58”N, 119°12’44”E, fern, silvergrass, fir, sifted, ca, 1050 m, 9.X.2013, Z Peng, Y.-M. Yu, Z.-W. Yin leg. (SHNU); 1 ♂1 ♀, same data as for the holotype, but Jitou Vil., 27°55’00”N, 119°11’53”E, moss, fern, bamboo, bush, sifted, 1130 m, 4.X.2013, Z Peng, Y.-M. Yu, Z.-W. Yin leg. (SHNU).

Description. Brachypterous. Head black, pronotum and elytra brown, each elytron with median portion inconspicuously lighter, abdomen dark brown. Antennae, maxillary palpi and legs yellowish brown except antennal club infuscate. Labrum reddish brown.
BL: 3.6–4.4 mm, FL: 1.8–2.1 mm, HW: 0.77–0.86 mm, PL: 0.61–0.69 mm, PW: 0.56–0.66 mm, EL: 0.70–0.78 mm, EW: 0.70–0.85 mm, SL: 0.52–0.59 mm.

**Head** 1.02–1.09 times as wide as elytra; interocular area with two deep longitudinal furrows, median portion convex, extending to the level of inner eye margins; punctures round, distinctly larger and sparser in median portion than those near inner margins of eyes, diameter of large punctures slightly wider than apical cross section of antennal segment II; interstices smooth, narrower than half the diameter of punctures except those along the midline of the median portion, which may be as wide as the diameter of punctures. Paraglossae oval.

**Pronotum** 0.98–1.10 times as long as wide; disk relatively even with median longitudinal furrow very short and indistinct; punctures mostly round and slightly confluent, similar size to those of head; interstices smooth, mostly narrower than diameter of punctures except in median area, which may be triple as wide as diameter of punctures.

**Elytra** 0.93–1.00 times as long as wide; disk relatively even; punctures slightly and longitudinally confluent, of similar size to those of pronotum; interstices smooth, distinctly narrower than diameter of punctures.

**Legs** with tarsomeres IV strongly bilobed.

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**Figures 14–20. Stenus yuyimingi.** 14 male sternite VII 15 male sternite VIII 16 male sternite IX 17, 18 aedeagus 19 female sternite VIII 20 valvifers and spermatheca. Scale bars: 0.25 mm.
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Abdomen cylindrical; paratergites very narrow and almost impunctate, present only in segment III, tergites and sternites totally fused in segments IV–VI, posterior margin of tergite VII with indistinct palisade fringe; punctures round, gradually becoming smaller and sparser posteriad; interstices smooth, mostly wider than diameter of punctures except those on basal impressions of tergites III–V, which may be distinctly narrower than half the diameter of punctures.

Male. Sternite VII (Fig. 14) with inconspicuous emargination at middle of posterior margin; sternite VIII (Fig. 15) with shallow emargination at middle of posterior margin; sternite IX (Fig. 16) with short apicolateral projections, posterior margin serrate. Aedeagus (Figs. 17–18) apical sclerotized area triangular with a sharp projection at apex; median longitudinal bands each with ventral band very long, straight, narrowed apically; lateral longitudinal bands short; expulsion clasps each with anterior plate distinctly separated from the posterior plate, rounded apically; copulatory tube very long, rather slender, with basal chamber submembranous and main tube, the main tube gradually shrinke, pointed apically; parameres as long as median lobe, each with about 19–22 setae on apico-internal margins.

Female. Sternite VIII (Fig. 19) entire; spermatheca (Fig. 20) strongly sclerotized, swollen in the middle of spermathecal duct.

Distribution. China (Zhejiang).

Remarks. The new species can be easily distinguished from the Chinese members of the group by the coloration and sexual characters.

Etymology. This species is named in honor of Mr. Yi-Ming Yu who collected some specimens of the new species.

Stenus ovalis Tang, Li & Zhao, 2005
Figs 5, 6, 21–24

Stenus ovalis Tang, Li & Zhao, 2005: 613.

Material examined. CHINA: Zhejiang: 1♂, Longquan City, Fengyangshan N.R., Mihougu, 27°55’0.18”N, 119°11’52.91”E, near stream, 1116 m. 03.V.2016, Jiang, Liu & Zhou leg. (SHNU).

Measurements. BL: 4.2 mm, FL: 1.9 mm. HW: 0.77 mm, PL: 0.62 mm, PW: 0.56 mm, EL: 0.69 mm, EW: 0.67 mm, SL: 0.52 mm. Head 1.14 times as wide as elytra, pronotum 1.10 times as long as wide, elytra 1.03 times as long as wide.

Male. Sternite VIII (Fig. 21) with a shallow emargination at middle of posterior margin; sternite IX (Fig. 22) with short apicolateral projections, posterior margin serrate. Aedeagus (Figs. 23–24) apical sclerotized portion roundly projected at apex; median longitudinal bands each with ventral band long, narrowed apically; lateral longitudinal bands short; expulsion clasps each with anterior plate distinctly separated from the posterior plate, rounded apically; copulatory tube moderately long, rather stout, with basal chamber submembranous, main tube distinctly divided into basal tube and api-
Figures 21–24. *Stenus ovalis*. 21 male sternite VIII 22 male sternite IX 23, 24 aedeagus. Scale bars: 0.25 mm.

cal tube, the basal tube gently constricted near the middle, apical tube relatively thin; parameres longer median lobe, each with about 19 setae on apico-internal margins.

**Distribution.** China (Zhejiang).

**Remarks.** This is a new distributional locality of the species which is originally described from Wuyanling Nature Reserve of Zhejiang.

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**Key to species of the *Stenus cirrus* group of Zhejiang**

1. Abdominal tergites III–VI with narrow to very narrow linear margination...

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3 Interstices in median portions of head and pronotum much wider than diameter of punctures. Habitus: Figs. 1, 2; sexual characters: Figs. 7–13. .......................................................... S. wuyanlingus sp. n.

– Interstices in median portions of head and pronotum much narrower than diameter of punctures. Habitus: Fig. 4 (in Tang et al. 2008); sexual characters: Figs. 20–24 (in Tang et al. 2008). .............. S. shenshanjiai Tang, Zhao & Puthz, 2008

4 Elytra without orange spots. Habitus: Figs. 3, 4; sexual characters: Figs. 14–20. .......................................................... S. yuyimingi sp. n.

– Elytra with orange spots. .................................................. 5

5 Head distinctly wider than elytra. ........................................ 6

– Head distinctly narrower than elytra. Aedeagus: Fig. 3 (in Puthz, 1998). BL = 3.5–4.7 mm. ........................................... S. guangxiensis Rougemont, 1984

6 Punctation of pronotum and elytra dense but not crowded. Habitus: Fig. 3 (in Tang et al. 2005); sexual characters: Figs. 12–15 (in Tang et al. 2005). BL = 4.1–4.7 mm. ........................................... S. ovalis Tang, Li & Zhao, 2005

– Punctation of pronotum and elytra very dense, crowded. Species best identified by their sexual characters. .......................................................... 7

7 Punctation of elytra very densely crowded. Male: apical emargination 8th abdominal sternite very broad and shallow. Habitus: Fig. 1 (in Tang et al. 2008); sexual characters: Figs. 7–11 (in Tang et al. 2008). BL = 3.7–5.0 mm. .......................................................... S. zhulilongi Tang & Puthz, 2008

– Punctation of elytra less dense, less crowded. Male: apical emargination of 8th abdominal sternite narrower, rounded. .......................................................... 8

8 Elytral spot longer, extending towards shoulder. Habitus: Fig. 2 (in Tang et al. 2008); sexual characters: Figs. 12–15 (in Tang et al. 2008). BL = 3.8–5.0 mm. .......................................................... S. lijinweni Tang & Puthz, 2008

– Elytral spot shorter than half elytron length. Habitus: Fig. 3 (in Tang et al. 2008); sexual characters: Figs. 16–19 (in Tang et al. 2008). BL = 3.7–5.0 mm. .......................................................... S. jiulongshanus Tang & Puthz, 2008

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