

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. lijinweni* 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

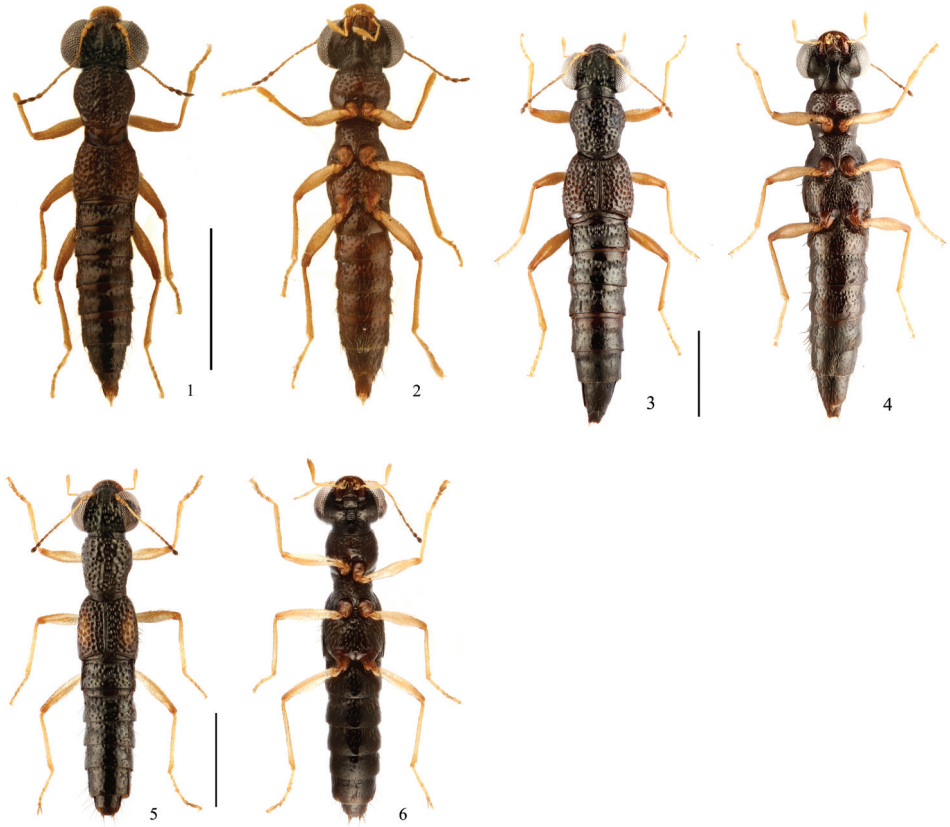
Taxonomy

***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.



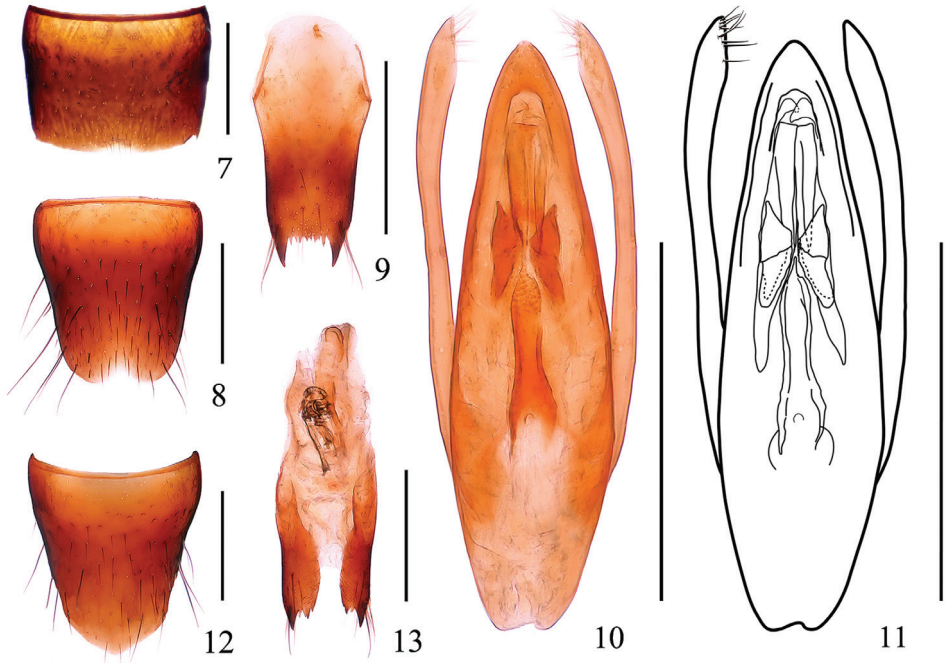
Figures 1–6. Habitus. **1, 2** *Stenus wuyanlingus* sp. n. **3, 4** *Stenus yuyimingi* sp. n. **5, 6** *Stenus ovalis*. Scale bars: 1 mm.

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



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.

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; punctation 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;

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 punctation 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.

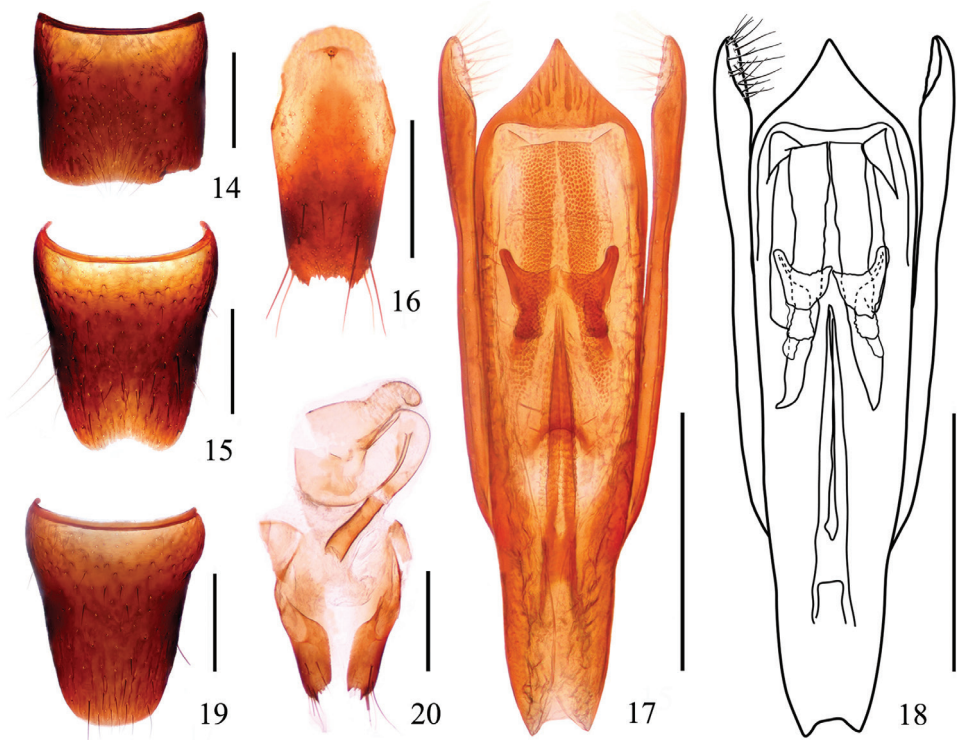
***Stenus yuyimingi* Liu, Tang & Luo, sp. n.**

<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 Mihougu, 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 Datian-Ping 27°54’36”N, 119°10’20”E, bush leaf, moss, ferns, sifted & beating, 1320 m. 27.IV.2014, Peng, Song, Yan, Yin & Yu leg. (SHNU); 1♀, same data as for the holotype (SHNU); 1♀, same data as for the holotype, but Luao 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 infusate. Labrum reddish brown.



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.

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.

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 posteriorly; 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 shrink, 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**

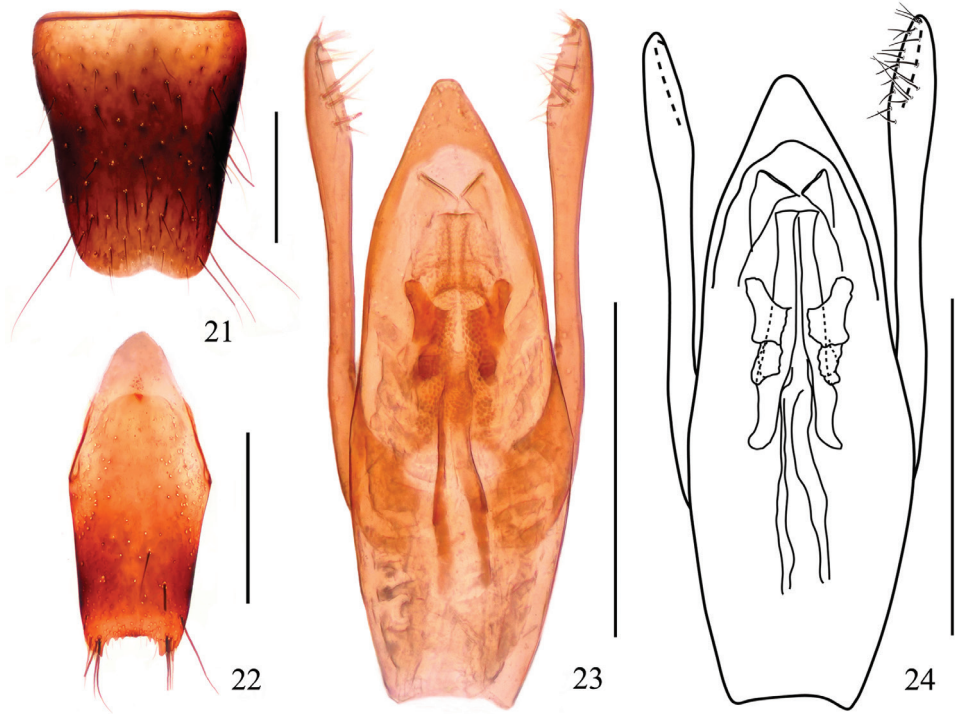
Figs 5, 6, 21–24

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.

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

- 1 Abdominal tergites III–VI with narrow to very narrow linear margination.... *S. cirrus* L. Benick, 1940
- Only abdominal tergite III with complete paratergites, tergites, and sternites totally fused in segments IV–VI..... 2
- 2 Small species, BL = 2.3–3.1 mm, head and pronotum with distinct reticulation..... 3
- Large species, BL = 3.5–5.0 mm, interstices of head and pronotum smooth... 4

- 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. wuyanlingi* 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 Punctuation 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
- Punctuation of pronotum and elytra very dense, crowded. Species best identified by their sexual characters..... 7
- 7 Punctuation 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
- Punctuation 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. lijnweni* 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

Acknowledgments

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