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## On *Stenus scopulus* and allied species, with descriptions of seven new taxa (Coleoptera: Staphylinidae: Steninae)

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**A b s t r a c t :** *Stenus scopulus* ZHENG (China) is redescribed and illustrated. The *S. scopulus* group is defined. 7 new species are described: *Stenus acutiunguis* nov.sp. (China: Yunnan), *S. variunguis* nov.sp. (China: Qinghai, Shaanxi, Sichuan, Yunnan), *S. vorticipennis* nov.sp. (China: Sichuan), *S. vorticipennoides* nov.sp. (China: Yunnan), *S. vorticipennatus* nov.sp. (Bhutan), *S. rimulosus* nov.sp. (China: Sichuan, Yunnan), and *S. rimulosoides* nov.sp. (China: Sichuan). Additional records of *S. scopulus* are reported. A key to the species of the *S. scopulus* group is presented and the distributions of all treated species are mapped.

**Key words :** Coleoptera, Staphylinidae, Steninae, *Stenus*, *Hemistenus*, Palearctic region, China, Bhutan, taxonomy, new species.

### 1. Introduction

Owing to increased collecting activity, the knowledge of the diversity and zoogeography of the genus *Stenus* LATREILLE in China and adjacent regions has improved considerably in the recent past. Nevertheless, research on *Stenus* in this region is still at the beginning (PUTHZ 2003).

At present, the genus *Stenus* is represented by 168 (sub-)species in China (PUTHZ 2003a, 2003b, in prep.; SMETANA 2004; TANG et al. 2005; ZHAO & ZHOU 2005, 2006a, 2006b, 2006c, 2007). The vast majority of the species belong to the subgenera *Hemistenus* MOTSCHULSKY, *Hypostenus* REY, and *Stenus* (in total 148 species). The subgenus *Hemistenus* was recently treated by several authors, a historical outline of publications on Chinese *Hemistenus* is presented by ZHAO & ZHOU (2005). 58 (sub-)species of *Hemistenus* are currently recorded from China (PUTHZ 2003a, 2003b, in prep.; SMETANA 2004; ZHAO & ZHOU 2005, 2006b).

In the past years, extensive material of *Stenus scopulus* ZHENG and allied species from private and public collections has been compiled by V. Puthz, who kindly made it available to me for study.

## 2. Material and methods

The material referred to in this study is deposited in the following public institutions and private collections:

NHMB ..... Naturhistorisches Museum Basel (E. Sprecher)  
 NHMW ..... Naturhistorisches Museum Wien (H. Schillhammer)  
 SHNU ..... Shanghai Normal University, Department of Biology (L. Tang)  
 SMNS..... Staatliches Museum für Naturkunde, Stuttgart (W. Schawaller)  
 cFel..... private collection B. Feldmann, Münster  
 cKis..... private collection T. Kishimoto, Tokyo  
 cPue..... private collection A. Pütz, Eisenhüttenstadt  
 cPut ..... private collection V. Puthz, Schlitz  
 cSme..... private collection A. Smetana, Ottawa  
 cSch..... private collection M. Schülke, Berlin  
 cWat..... private collection Y. Watanabe, Tokyo

Ratios of measurements are given as arithmetic means. The terminology of spermathecal structures is based on NAOMI (2006). The term "infundibulum" for a part of the spermatheca was introduced by PUTHZ (2005). The maps were generated using the online generic mapping tool (GMT) of the Geomar website at [www.aquarius.ifm-geomar.de/omc](http://www.aquarius.ifm-geomar.de/omc).

## 3. The *Stenus scopulus* species group

ZHAO & ZHOU (2005) erected the *Stenus viridanus* species group based on only few characters (irregular puncturation with interstices forming vorticose rugae, no spots on elytra, sternite IX apicolaterally not serrate, pronotum with longitudinal furrow). In 2006b, the same authors added more characteristics (aedeagus with strongly sclerotized median hook and intricate spermatheca) and attributed further species to this species group. Puthz (in prep.) gives a more accurate definition of the *S. viridanus* group and additional definitions of closely related, partly new species groups of the Oriental region, e. g. the *S. rugosipennis* group, which seems to be closely allied to the *S. scopulus* group as defined here. Therefore, the assignment of the species, which are attributed to the *S. viridanus* group by ZHAO & ZHOU (2005, 2006b), will change completely. In their key to the males of the *S. viridanus* group from China, ZHAO & ZHOU (2006b) separate *S. scopulus* and *S. viridanus* CHAMPION from other species of the *S. viridanus* group based on the relatively broad paratergites. *Stenus scopulus* and its allies can be easily separated from *S. viridanus* by shorter appendages (last antennomeres distinctly shorter), more uneven surface, coarser and less dense puncturation of the abdomen, the blackish coloration without metallic greenish to bluish hue, and the conspicuously different sexual characters (for figures of the male and female genitalia of *S. viridanus* see ZHENG 1992a).

The eight species treated in the present paper are hereafter referred to as *S. scopulus* group, which may or may not form a monophyletic group. The phylogenetic affiliations of the *Stenus* fauna of China have not been examined sufficiently.

The group of *S. scopulus* can be distinguished from other species groups of *Hemistenus* by the following character combination:

Body length 3.8-5.8 mm, length from anterior margin of clypeus to posterior apex of suture 2.1-2.7 mm. Coloration of body black, more or less shiny, sometimes with an indistinct bronze hue; legs and antennae yellowish, more or less infusate. Head with distinct dorsal furrows, median elevation at least level with inner margin of eye; puncturation coarse and dense; antennae relatively short, not reaching posterior margin of pronotum; paraglossae of oval shape. Pronotum about as wide as long, with median impression and 2 impressions on either side of median impression; surface with more or less strongly elevated vorticosae rugae. Elytra wider than long, slightly widened caudad, humeral angles pronounced; surface uneven, with more or less strongly elevated vorticosae rugae; hind wings fully developed (only in *S. vorticipennis* brachypterous). Meso- and metatibiae of males with more or less distinct spur at inner margin of apex. Abdomen slightly tapering caudad, with coarse, more or less dense puncturation; paratergites moderately broad.

Aedeagus with distinct median hooks connected by a somewhat V-shaped structure. Spermatheca distinct, capsule/collum clearly separated from apical chamber of spermathecal duct, which is more or less bulging; spermathecal duct of variable shape; infundibulum present, simple or shaped like an umbrella.

#### 4. Species redescription, new species and new records

##### *Stenus (Hemistenus) scopulus* ZHENG (Figs 1-12, Map 1)

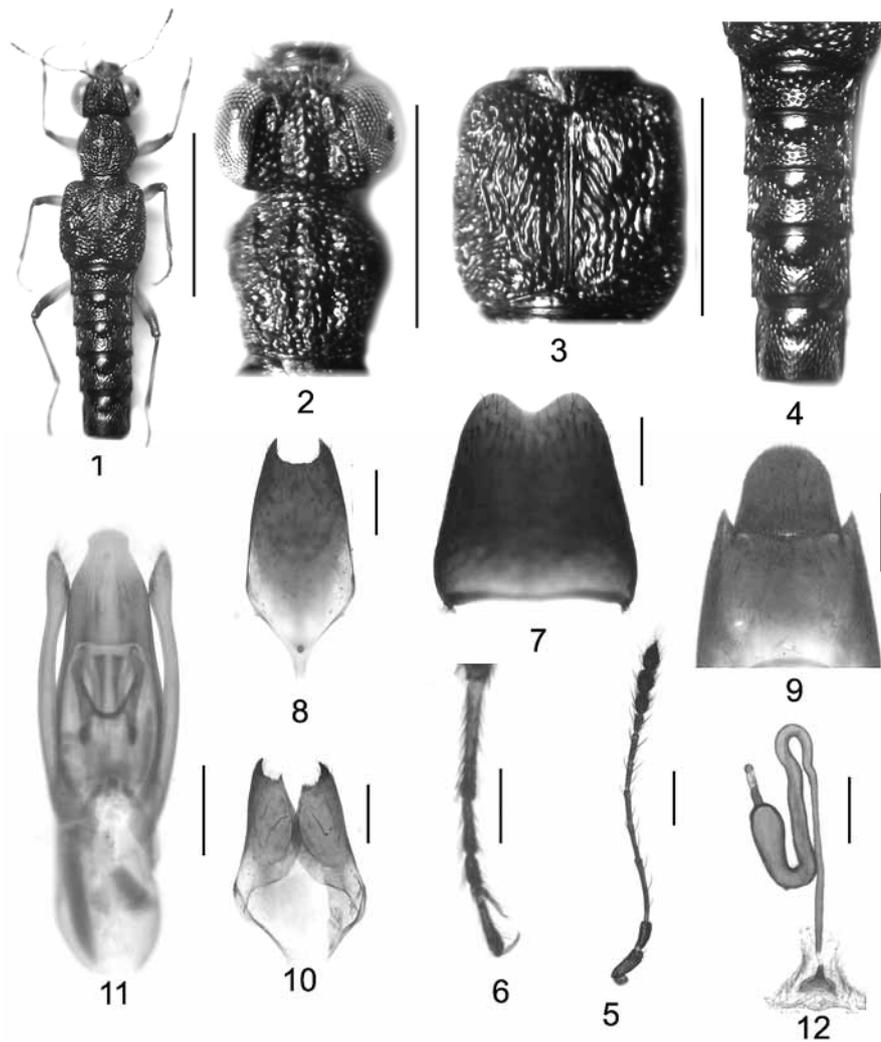
*Stenus (Hemistenus) scopulus* ZHENG 1992b: 294 f.

**Material examined:** China: 6♂♂, 12♀♀: W-Sichuan (13), Daxue Shan, Hailuoguo Glacier Park, Camp 1, 2100 m, 29.36.00N, 102.03.35E, 27.-31.V.1997, M. Schülke (cSch, cPut); 1♂, 3♀♀: same data, but...river valley, ca. 5 km above Camp 1, 2100 m, 28.-31.V.1997, leg. Pütz (cPue, cPut); 1♂, 2♀♀: Sichuan, Emei Shan, Leidongping, 2500 m, 18.VII.1996, 29°32'N 103°21'E, C 65, leg. A. Smetana, J. Farkač, P. Kabátek (cSme, cFel); 1♂: Emei Shan, Leidongping, 2365 m, 2.XI.1995, leg. S. Uéno (cWat); 1♀: same data, but ..., 2390 m, 4.X.1996, S. Nomura (cWat); 1♂: Sichuan, Baoxing Xian, Yaogi, Guohaye, Nt. Baiyu-shan (alt. 2290 m) [Tul.], 1.X.1997, T. Kishimoto leg. (cKis); 7 exs.: Sichuan, Hailuoguo, Luding county, 2200-2300 m, 26.-28.VII.2006, Hu, J.-Y. & Tang, L. leg. (SHNU); 2 exs.: Shaanxi, Foping Nature Reserve, Foping county, 2065 m, 19.-21.VII.2004, Hu, J.-Y., Tang, L. & Zhu, L.-L. leg. (SHNU); 1 ex.: Shaanxi, Foping Nature Reserve, Foping county, 1450-1750 m, 15.VII.2004, Hu, J.-Y., Tang, L. & Zhu, L.-L. leg. (SHNU); 1 ex.: Shaanxi, Foping Nature Reserve, Foping county, 2350-2750 m, 14.VII.2004, Hu, J.-Y., Tang, L. & Zhu, L.-L. leg. (SHNU); 1♂: Yunnan, Weibaoshan Mts., 25°12'N 100°24'E, 2800-3000 m, 29.-30.VI.1992, leg. V. Kuban (NHMB).

**Description:** Total length: 4.7-5.7 mm; length from anterior margin of clypeus to posterior apex of suture: 2.25-2.7 mm. Facies as in Fig. 1. Body black, sometimes with indistinct bronze hue and especially abdomen more or less shiny. Antennae yellowish with slightly infusate club, maxillary palpi yellowish with slightly infusate last segment. Legs yellowish with about apical third (hind femora) or fourth (front-, middle femora) of femora darkened, the basal and apical apices of tibiae and the tarsi slightly darkened.

Head (Fig. 2) wider than pronotum (1.21 ×) and narrower than elytra (0.84 ×). Lateral dorsal furrows parallel in posterior half, converging anteriorly, deeply impressed and

with median part strongly elevated, median elevation level with inner margin of eye; area between inner margin of eye and furrow almost as wide as area between furrows. Punctuation moderately coarse, dense, in the middle indistinctly sparser; diameter of punctures similar to that of antennomere III in cross-section; interstices on average narrower than punctures, with indistinct microsculpturation; antennomeres IX-XI slightly longer than wide (Fig. 5).



**Figs 1-12:** *Stenus scopulus* ZHENG: (1) habitus; (2) forebody; (3) elytra; (4) Abdomen; (5) antenna; (6) hind tarsus; (7) male sternite VIII; (8) male sternite IX; (9) male tergite X; (10) valvifer; (11) aedeagus in ventral view; (12) spermatheca. Scales: 1: 2.0 mm; 2-4: 1 mm; 5-12: 0.2 mm.

Pronotum (Fig. 2) approximately as wide as long (0.98 ×), maximal width between anterior angle and middle, lateral margins in posterior half indistinctly concave in dorsal view. Surface uneven, with a more or less deep median longitudinal impression, not reaching anterior and posterior margins of pronotum, and two impressions on either side of median impression; puncturation of pronotum approximately as coarse and dense as that of head, interstices forming relatively short and irregular rugae. Median impression with distinctly sparser puncturation or impunctate; distinct microsculpture visible only in the middle of median depression, otherwise barely visible.

Elytra (Fig. 3) at suture slightly longer than pronotum (1.07 ×) and clearly wider than long (1.3 ×); slightly widened caudad, lateral margins weakly bent mediad near posterior angles, posterior margin of elytra slightly emarginate; humeral angles prominent. Puncturation more pronounced in anterior and humeral area, slightly to barely visible on posterior 2/3, because of interstices forming vermiculate rugae (Fig. 3). Microsculpture more or less noticeable. Hind wings fully developed. Legs with bilobed tarsomere IV (lobes about half the length of tarsomere V; Fig. 6); hind tarsi about 0.85 times the length of hind tibiae; tarsomere I of hind leg approximately as long as combined length of II-IV, V approximately half the length of I. Meso- and metatibiae of males with indistinct spur at inner margin of apex, often not visible.

Abdomen (Fig. 4) slightly tapering caudad; paratergites of tergite III-V about as wide as base of metatibia, with 1 row of punctures, VI about the width of first metatarsomere with fewer and more scattered punctures, paratergite VII very narrow, VIII shaped like a carina. Basal impressions of anterior tergites relatively shallow. Puncturation of tergites III-V relatively deep, coarse and dense (particularly in basal impressions), in the middle indistinctly sparser; tergites VI-VIII with distinctly shallower puncturation. Abdomen weakly microsculptured on tergites III-VI, on apical tergites more distinctly microsculptured; tergite VII with palisade fringe.

♂: sternites III-VI without distinct modifications, posterior median area of sternite VII indistinctly depressed, with denser and longer pubescence than in anterior and lateral areas, posterior margin of sternite VIII with relatively broad V-shaped incision (Fig. 7), sternite IX as in Fig. 8 (see also ZHENG 1992b, Fig. B). Tergite X as in Fig. 9; aedeagus as in Fig. 11 (see also ZHENG 1992b, Fig. A), apex of median lobe broadly rounded, parameres slightly shorter than median lobe.

♀: posterior margin of sternite VIII rounded. Apex of valvifer (Fig. 10) laterally with long tooth, in the middle with short, but distinct teeth. Spermatheca (Fig. 12) of simple shape, inflected only twice; infundibulum shaped like an umbrella (Fig. 12).

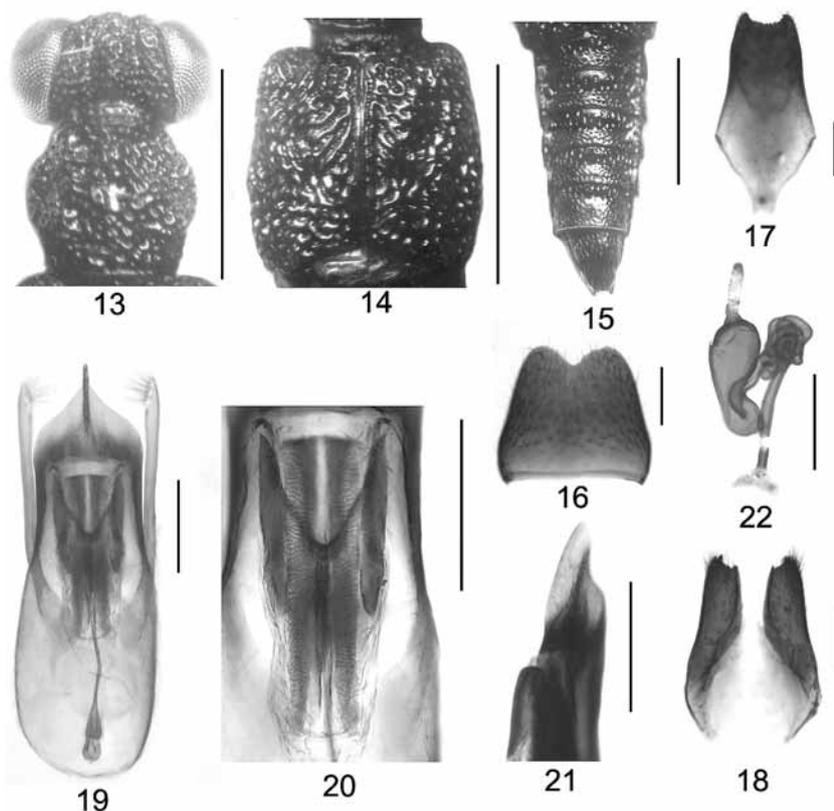
**C o m m e n t s :** ZHENG (1992b) described *S. scopulus* based on a single male from Sichuan. His figures of the male sexual characters are in agreement with the characters of the males studied here. Also, the illustration of the spermatheca of *S. scopulus* (first figured by ZHAO & ZHOU (2006b), Fig. 2) match the spermathecae of the female specimens listed above.

**D i s t r i b u t i o n a n d b i o n o m i c s :** The species is known from Shaanxi, Sichuan and Yunnan (Map 1). The specimens were collected in May-July and October-November at altitudes of 1450-3000 m. Ecological data are unknown.

***Stenus (Hemistenus) acutiunguis* nov.sp. (Figs 13-22, Map 1)**

**H o l o t y p e** ♂ : C h i n a: N-Yunnan, Diqing Tibet Aut. Pr., Zhongdian Co., Xue Shan 23 km S Zhongdian, 27°38.3'N 99°41.5'E, 3675-3725 m, 2.VI.2005, A. Smetana (C 149) / Holotypus ♂ *Stenus (Hemistenus) acutiunguis* sp.n. det. B. Feldmann 2007 (cSme). **P a r a t y p e s** : 10♂♂, 10♀♀: same data as holotype (cSme, cFel, cPut); 3♂♂, 1♀: N-Yunnan, Diqing Tibet Aut. Pr., Bitai Hai Lake area, 29 km ESE Zhongdian, 27°43.65'N 99°58.97'E, 3540m, 1.VI.2005, A. Smetana (C 147) (cSme, cPut); 4♂♂, 3♀♀: N-Yunnan, Diqing Tibet Aut. Pr., Zhongdian Co., Xue Shan, near lake, 23 km S Zhongdian, 27°37.1'N 99°38.5'E, 3895m, 5.VI.2005, A. Smetana (C 152) (cSme, cFel); 1♂, 1♀: N-Yunnan, Zhongdian Co., 10 km SW Zhongdian, Xue Shan, 27°46.5'N 99°36.5'E, 3800m, 20.VIII.2003, A. Smetana (C 129) (cSme); 2♂♂: N-Yunnan [C2005-05], Diqing Tibet Aut. Pref., Zhongdian Co., Xue Shan near lake 23 km Zhongdian, 3895m / 27°37.1'N, 99°38.5E, devast mixed forest, meadows, lake border, leaf litter, dead wood, sifted, 5.VI.2005, leg M. Schülke [C2005-05] (cSch, cPut); 1♂: Yunnan 1995, 25 km E of Zhongdian, 3300-4000m, Bolm lgt., 12.-14.VII. (NHMB).

**Material examined, but not designated as paratypes, because of uncertain identification:** 2♀♀: China, N Yunnan, Xue Shan near Zhongdian, 3900 m, 27°49'N, 99°34'E, 25.VI.1996, leg. A. Smetana, J. Farkač, P. Kabátek (cSme).



**Figs 13-22:** *Stenus acutiunguis* nov.sp.: (13) forebody; (14) elytra; (15) abdomen; (16) male sternite VIII; (17) male sternite IX; (18) valvifer; (19) aedeagus in ventral view; (20) internal structures of aedeagus; (21) apex of median lobe in lateral view; (22) spermatheca. Scales: 13-15: 1.0 mm; 16-22: 0.2 mm.

**Description:** Total length: 4.3-5.1 mm; length from anterior margin of clypeus to posterior apex of suture: 2.3-2.7 mm. In general appearance similar to *S. scopulus*, but slightly more shiny and – especially antennomere and palpi – of darker coloration.

Head (Fig. 13) 1.2 times as wide as pronotum and 0.83 times as wide as elytra.

Pronotum (Fig. 13) indistinctly wider than long (1.08 ×), maximal width between anterior angle and middle, lateral margins in posterior half indistinctly concave in dorsal view. Surface uneven, with a more or less deep, round to longitudinal median impression not reaching anterior and posterior margins of pronotum, and two impressions on either side of median impression; puncturation of pronotum distinct, on average slightly coarser and as dense as that of head, interstices forming relatively long and distinctly elevated irregular rugae. Median impression with distinctly sparser puncturation or impunctate; shallow microsculpture visible only in the middle of median depression, otherwise barely visible.

Elytra (Fig. 14) at suture distinctly longer than pronotum (1.28 ×) and wider than long (1.22 ×); outline as in *S. scopulus*. Puncturation on average coarser than that of pronotum; more pronounced on anterior 1/3 of elytra, on posterior 2/3 interstices forming relatively broad and distinctly elevated vermiculate rugae (on average shorter than in *S. scopulus*), but puncturation also visible here. Microsculpture more or less noticeable. Hind wings fully developed. Legs with bilobed tarsomere IV (lobes less than half the length of tarsomere V); hind tarsi about 0.81 times the length of hind tibiae; tarsomere I of hind leg slightly shorter than combined length of II-IV, V approximately 2/3 the length of I. Meso- and metatibiae of males with spur at inner margin of apex.

Abdomen (Fig. 15) as in *S. scopulus*. Puncturation of tergites III-V relatively deep, coarse and dense, in basal half distinctly coarser than in apical half; tergites VI-VIII with distinctly shallower puncturation. Microsculpture on tergites III-VI barely visible, on apical tergites more distinct; tergite VII with palisade fringe.

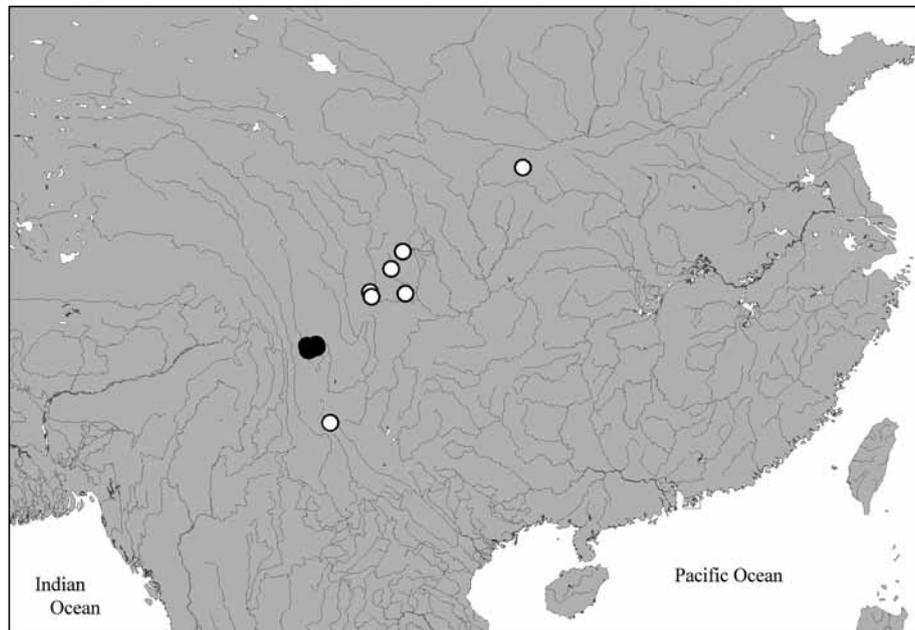
♂: median area of sternites III-VI slightly depressed; VII with more distinct median depression, this depression with denser puncturation and denser and longer pubescence than in anterior and lateral areas, posterior margin of sternites IV-VII weakly incised; posterior margin of sternite VIII with more V-shaped incision (Fig. 16), sternite IX as in Fig. 17. Tergite X as in *S. scopulus*; aedeagus as in Figs 19-20, apex of distinctive shape (Fig. 21).

♀: posterior margin of sternite VIII rounded. Valvifer as in Fig. 18. Spermatheca with infundibulum as in Fig. 22 (the shape of the spermathecal duct is subject of considerable intraspecific variation).

**Etymology:** The name (Lat., noun) refers to the claw-like shape of the apex of the aedeagus.

**Comparative notes:** The similar morphology of the male and female primary characters suggests that *S. acutiunguis* is closely related to – possibly the sister species of – *S. variunguis* nov.sp. A reliable separation of these two species is possibly only based on an examination of the male genitalia (see descriptions). For characters separating the species from other species of the *S. scopulus* group see key.

**Distribution and bionomics:** The species is known only from Yunnan (see Map 1). The specimens were collected in June, July and August at altitudes of 3540-3895 m. Some of the paratypes were sifted from leaf litter and dead wood; additional ecological data are not available.



**Map 1:** Distributions of *Stenus scopulus* (open circles) and *S. acutiunguis* (filled circles) in China, based on revised records.

***Stenus (Hemistenus) variunguis* nov.sp. (Figs 23-40, Map 2)**

**H o l o t y p e** ♂ : **C h i n a**: W-Sichuan 1999, Ganzi Tibet. Aut. Pref., Kangding Co., Daxue Shan, Mu Ge Cuo, ob. See, 15 km NW Kangding, 3700m, Moos, Rhododendron., Pilze, 30°09'N101°52'E, 27.VI., leg. M. Schülke /Sammlung M. Schülke Berlin / Holotypus ♂ *Stenus (Hemistenus) variunguis* sp.n. det. B. Feldmann 2007 (cSch). **P a r a t y p e s** : 2♂♂: same data as holotype (cSch, cFel); 1♂: same date as holotype, but leg. Pütz (cPut); 1♂, 2♀♀, **C h i n a**: W-Sichuan (Ganzi Tibet. Aut. Pref., Kangding Co.), Daxue Shan, Mu Ge Cuo, upp. lake, 15 km NW Kangding, 3700 m, 30°09'N101°52'E, 27.VI.-5.VII.1999, D. W. Wrase (cSch, cFel); 1♂: same data, but..., 30°09.18'N, 101°51.18'E, 5.VII.1999, leg. Pütz (cPut); 1♂, China, Sichuan, Jitang [ca. 30°28'N, 101°36'E], 3.VII.-14.VII.2001, leg. E. Kučera (cFel); 1♀, China, W-Sichuan, Jintiang (Tcho-nin), 15.-20.VIII.2002, leg. E. Kučera (cFel); 1♂, 2♀♀, China, Sichuan, Gongga Shan, Hailuogou, above Camp 3, 3000 m, 6.VII.96, 29°35'N 102°00'E, C53 / collected by A. Smetana, J. Farkač, P. Kabátek (cSme, cFel, cPut); 1♂: China, Sichuan, Li Xian, Shegushankou, 3820m, 5.IX.1998, leg. Y. Nishikawa (cKis); 1 ex.: China, Sichuan, Songpan Xian, Mounigou, 3230 m, 2.IX.1998, leg. T. Kishimoto (cKis); 1♂, 1♀: China, Sichuan, Songpan Xian, Mouni Xiang, Zhaga, 3000 m, 3.IX.1998, leg. T. Kishimoto (cKis, cPut); 1♀: China, Sichuan, Songpan Xian, Mouni Xiang, Zhaga, 3000 m, 3.IX.1998, leg. S. Nasataka (cKis); 1♂, 1♀: China, Sichuan, Songpan Xian, Huanglonggou, 3150 m, 1.IX.1998, leg. T. Kishimoto (cKis, cFel); 3♂♂: China, Sichuan, Jiuzhaigou Xian, Gonggaling, 3400 m, 31.VII.1998, leg. T. Kishimoto (cKis, cFel); 1♂, 1♀: same data, but ..., 3450 m, 29.VII.1998,... (cKis, cFel); 1♂: China, N Sichuan, pass btw. Pingwu and Nanping, 3100 m, 22.VIII.1999, Cavazutti (cSme); 8♂♂, 12♀♀: China, Shaanxi, Qin Lin Shan, 108.47 E, 33.51 N, Mountain W pass at Autoroute km 70, 47 km S Xian, 2300-2500 m, sifted, 26.-30.08.1995, leg. M. Schülke / Sammlung M. Schülke Berlin (cSch, cFel, cPut); 4♂♂, 10♀♀: same data, but ..., leg. A. Pütz (cSch, cFel, cPut); 1♂, 1♀: China, Qinghai Prov., Bei Shan-N.P. 120 km NE Xi-ning, 23.V.-8.VI.1996, 2300-2700 m, leg. J. Martens (SMNS); 1♂: Beishan, Huzu county, Qinghai Autonomous Region, 2750 m, 29.VII.2004, Hu J.-Y., Tang L. & Zhu L.-L. leg. (SHNU); 1♂: China, N-Yunnan, Xue Shan nr. Zhongdian, 3800 m, 26.VI.1996,

27°49'N, 99°34'E, C43 / collected by A. Smetana, J. Farkač, P. Kabátek (cSme); 1 ♂: China, N-Yunnan, Diqing Tibet Aut. Pr., Zhongdian Co., Xue Shan nr. lake 23 km S Zhongdian, 27°37.1'N 99°36.5'E, 3850 m, 6.VI.2005, A. Smetana (C 153a) (cSme).

Material examined, but not designated as paratype, because of uncertain identification: 1 ♀: China, S Shaanxi, Qin Lin Shan mt. range W pass on rd. Xi'an-Shagoujie, 45 km SSW Xi'an, 33°52'N, 108°46'E, 2600 m, 25.VII.2001, leg A. Smetana (cSme).

**Description:** Total length: 4.4-5.4 mm; length from anterior margin of clypeus to posterior apex of suture: 2.25-2.7 mm. Habitus very similar to *S. scopulus*, but distinguished as follows:

Habitus and coloration as in *S. scopulus*, but with on average slightly more shine.

Head (Fig. 23) 1.17 times as wide as pronotum and 0.85 times as wide as elytra; puncturation of head slightly coarser and slightly less dense than in *S. scopulus*.

Pronotum (Fig. 23) as in *S. scopulus*, but surface more uneven with median impression on average deeper and shorter; puncturation on average slightly coarser; approximately as wide as long (1.06×).

Elytra (Fig. 24) at suture indistinctly longer than pronotum (1.12×) and clearly wider than long (1.30×); surface as in *S. scopulus*; puncturation coarser, distinctly visible also in posterior half of elytra; vorticose rugae on average shorter than in *S. scopulus*, especially in lateral areas of elytra. Hind wings fully developed. Legs with bilobed tarsomere IV (lobes less than half the length of tarsomere V); hind tarsi about 0.82 times the length of hind tibiae; tarsomere I of hind leg approximately as long as the combined length of II-IV, V distinctly more than half the length of I. Meso- and metatibiae of male with spur at inner margin of apex.

Abdomen (Fig. 25) as in *S. scopulus*, but with slightly denser puncturation.

♂: median area of sternites IV-VI slightly depressed; VII with more distinct median depression, this depression with denser puncturation and denser and longer pubescence than anterior and lateral areas, posterior margin of sternite IV-VII weakly incised; posterior margin of sternite VIII with more V-shaped incision (Fig. 26); sternite IX as in Fig. 27. Tergite X as in *S. scopulus*; aedeagus as in Figs 29-33, aedeagal apex with claw-like modification (Figs 34-38).

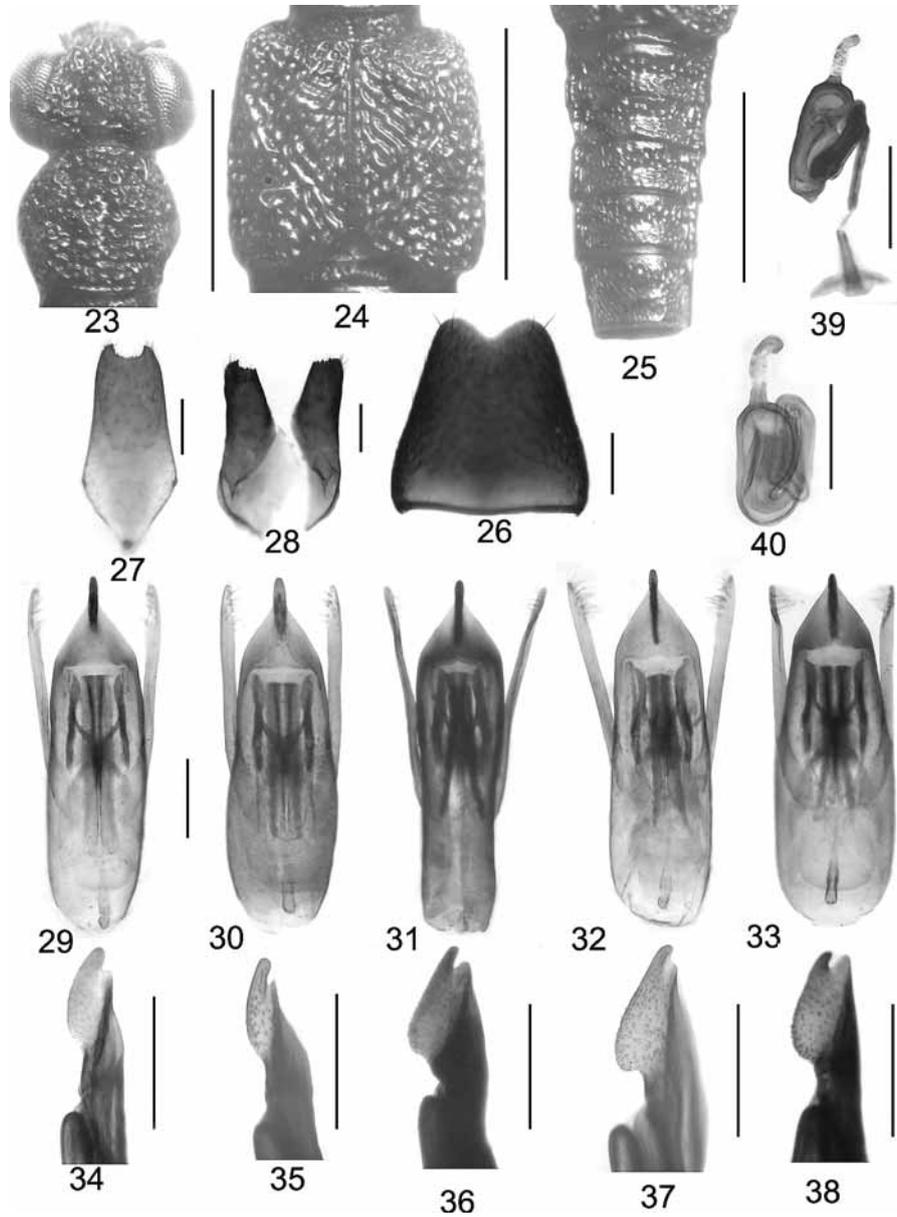
♀: posterior margin of sternite VIII rounded. Valvifer as in Fig. 28. Spermatheca as in Figs 39-40 (Fig. 40 without infundibulum) (the shape of the spermathecal duct is subject of considerable intraspecific variation).

**Etymology:** The name (Lat., noun) refers to the variable claw-like shape of the apex of the aedeagus.

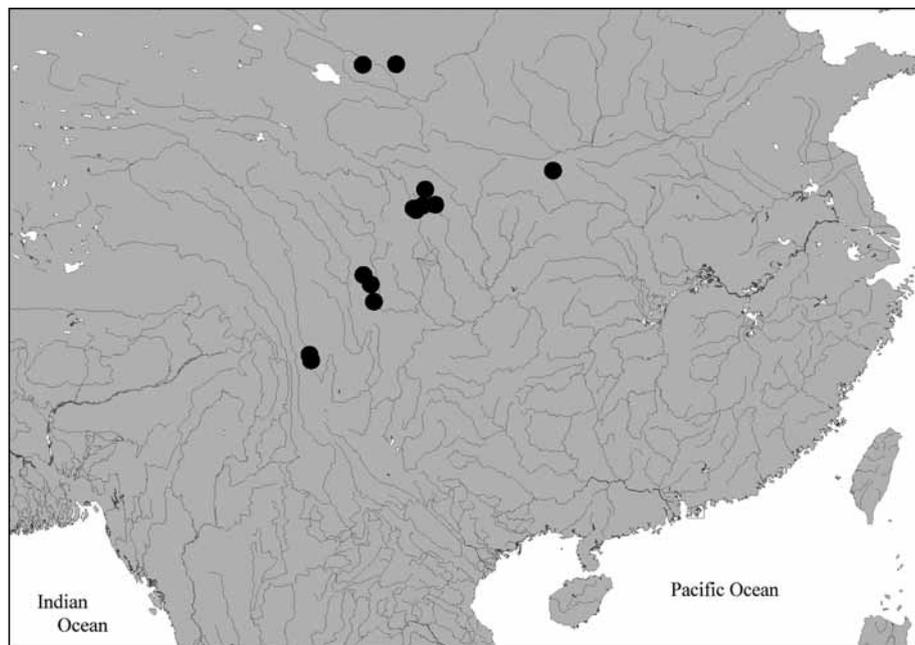
**Comparative notes and comments:** For separating *S. variunguis* from other species of the *S. scopulus* group, see comparative notes in the section on *S. acutiunguis* and the key.

*Stenus variunguis* is characterized by a remarkable variability of the shape of the aedeagal apex (Figs 29-38). Since the different shapes are connected by transitional states, this variation is here interpreted as an expression of intraspecific variability.

**Distribution and bionomics:** The species is known from Qinghai, Sichuan, Shaanxi and Yunnan (see Map 2). The specimens were collected from June through September at altitudes of 2500-3850 m. Some of the paratypes were sifted from moss, fungi and *Rhododendron* litter.



**Figs 23-40:** *Stenus variunguis* nov.sp.: (23) forebody; (24) elytra; (25) abdomen; (26) male sternite VIII; (27) male sternite IX; (28) valvifer; (29-33) aedeagus in ventral view (29-31 from Sichuan, 32 from Yunnan, 33 from Shaanxi); (34-38) apex of median lobe in lateral view (34-36 from Sichuan, 37 from Yunnan, 38 from Shaanxi); (39-40) spermatheca. Scales: 23-25: 1.0 mm; 26-40: 0.2 mm.



**Map 2:** Distribution of *Stenus variunguis* in China, based on revised records.

***Stenus (Hemistenus) vorticipennis* nov.sp. (Figs 41-52, Map 3)**

**H o l o t y p e** ♂ : Erlong Shan (2.960 m), (Jiajin Shan Mts.), Luding Xian, Sichuan, SE China. 2-X-1996. Coll. S. Nomura / Holotypus ♂ *Stenus (Hemistenus) vorticipennis* sp.n. det. B. Feldmann 2006 (cWat). Paratypes: 2 ♂♂ : China: W-Sichuan, Ya'an Prefecture, Tianquan Co., E Erlang Shan Pass, 2900 m, 22.VI.1999, 29.52.36N, 102.17.82E, leg. A. Pütz (cPue); 1 ♂, 1 ♀ : China, W-Sichuan 1999, Ya'an Prefecture, Tianquan Co., E Erlang Shan Pass, 2900 m, 9 km SE Luding, 29°52'N, 102°18'E, Gesiebe, 22.VI., leg M. Schülke (cSch, cPut); 1 ♂, 1 ♀ : China, W-Sichuan (5), Daxue Shan, Mu Ge Cuo, NW Kangding, 30.10.57N, 101.52.09E, 3200-3400 m, 21.V.1997, leg. M. Schülke (cSch, cFel); 1 ♂, 1 ♀ : China, W-Sichuan (14), Daxue Shan, Hailuogou Glacier Park, Camp 3, 3000-3100 m, 29.34.22N, 101.59.39E, 29.V.1997, leg. M. Schülke (cSch); 1 ♀ : China, Sichuan, Baoxing Xian, Yaogi, Guobaye, Mt. Baiyu - shan (alt. 2900-3000 m), 1.X.1997, T. Kishimoto leg. (cKis); 1 ♀ : China, Sichuan, Gongga Shan, above Camp 3, 3050 m, 22.VII.1994, A. Smetana (C18) (cPut); 1 ♀ : China, Sichuan, Gongga Shan, Hailuogou, above Camp 3, 3059 m, 6.VII.96, 29°35'N 102°00'E, C52, / collected by A. Smetana, J. Farkač, P. Kabátek (cSme); 1 ♂ : same data, but "..., 3000 m, ... C53 ..." (cFel); 1 ♂ : same data, but "..., 3200 m, 7.VII.96, ... C54 ..." (cSme); 1 ♀ : same data, but "... in front of glacier 1, 2800 m, 9.VII.96, ... C58 ..." (cSme); 1 ♂ : China, Sichuan, Gongga Shan, Hailuogou, in front of glacier 1, 2850 m, 29°35'N 102°00'E, 7.VII.1998, A. Smetana (C76) (cSme).

**D e s c r i p t i o n** : Total length: 4.9-5.7 mm; length from anterior margin of clypeus to posterior apex of suture: 2.3-2.65 mm. Facies as in Fig. 41. Body black, shiny. Coloration of antennae, maxillary palpi and legs as in *S. scopulus*, legs slightly more distinctly bicoloured.

Head (Fig. 42) wider than pronotum (1.21×) and narrower than elytra (0.88×). Lateral dorsal furrows parallel in posterior half and converging anteriorly, deeply impressed and with median part very strongly elevated, area between bases of antennae flattened; me-

dian elevation above level of inner margins of eyes. Puncturation coarse, less dense, in the middle on average indistinctly sparser; diameter of punctures similar to that of antennomere II in cross-section; interstices on average narrower than punctures, with more or less distinct microsculpturation. Antennomeres IX-XI slightly longer than wide.

Pronotum (Fig. 42) approximately as wide as long (1.01 ×), shaped as in *S. scopulus*. Surface very uneven, with a deep longitudinal median impression not reaching anterior and posterior margins of pronotum, and two distinct impressions on either side of median impression; edges of depressions sometimes strongly elevated. Puncturation of pronotum approximately as coarse and dense as that of head, interstices forming relatively short and irregular rugae. Median impression with distinctly sparser puncturation or impunctate; shallow microsculpture visible only in the middle of median impression, otherwise barely visible.

Elytra (Fig. 43) at suture indistinctly longer than pronotum (1.06 ×) and clearly wider than long (1.3 ×); outline of elytra as in *S. scopulus*, but slightly more widened caudad and less prominent humeral angles. Depression behind humeral angle noticeable; puncturation more visible in anterior and humeral area of elytra (here slightly coarser and with slightly larger diameter than punctures on pronotum), barely visible on posterior 2/3, because of interstices forming strongly elevated, vermiculate rugae. Microsculpture barely noticeable. Hind wings reduced. Legs as in *S. scopulus*, but hind tarsi about 0.79 times the length of hind tibiae; tarsomere I of hind leg indistinctly shorter than the combined length of II-IV, V scarcely half the length of I. Meso- and metatibiae of males with pronounced spur at inner margin of apex.

Abdomen (Fig. 44) inconspicuously tapering caudad; paratergites as in *S. scopulus*. Basal impressions of anterior tergites relatively shallow. Puncturation of tergites in basal half coarse and deep, in apical half with much finer and denser puncturation. Abdomen very weakly microsculptured on tergites III-VI, on apical tergites with slightly more noticeable microsculpture; palisade fringe at posterior margin of tergite VII fully developed or rudimentary.

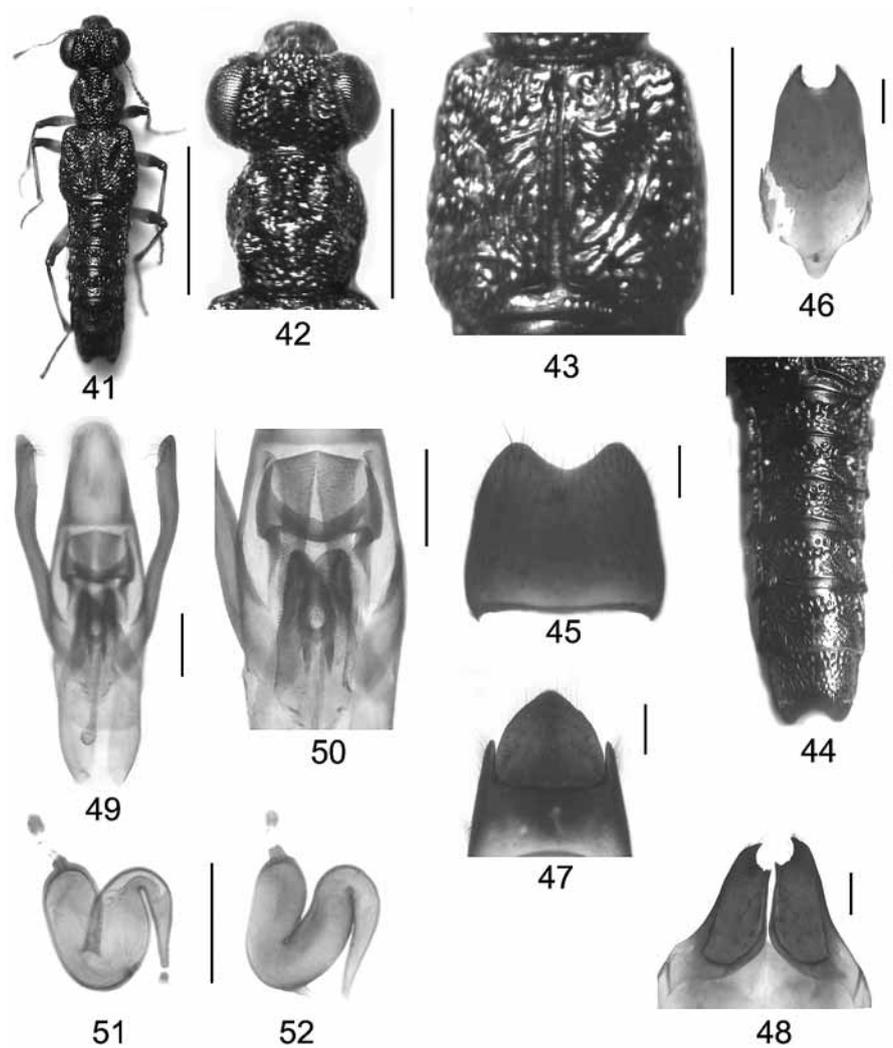
♂: sternites III-VI as in *S. scopulus*, posterior margin of sternite VIII with broad U-shaped incision (Fig. 45), sternite IX as in Fig. 46. Tergite X more angularly rounded (Fig. 47); aedeagus as in Figs 49-50, parameres conspicuously massive.

♀: posterior margin of sternite VIII rounded. Valvifer as in Fig. 48. Spermatheca (Fig. 51-52; Fig. 52 without infundibulum) inflected only twice; infundibulum small, inconspicuous.

**E t y m o l o g y :** The name (Lat., noun) refers to the striking vorticose structure, especially of the elytrae.

**C o m p a r a t i v e n o t e s :** *S. vorticipennis* can be separated from all other species of the *S. scopulus* group, except *S. vorticipennoides* and *S. vorticipennatus*, by the characteristic vorticose structure of the pronotum and the elytra. From *S. vorticipennoides* and *S. vorticipennatus*, this species can be reliably separated onely by the primary and secondary sexual characters (see key).

**D i s t r i b u t i o n a n d b i o n o m i c s :** The species is known only from Sichuan (see Map 3). The specimens were collected in May, June, July, and October at an altitude of 2800-3400 m. Ecological data are unknown.



**Figs 41-52:** *Stenus vorticipennis* nov.sp.: (41) habitus; (42) forebody; (43) elytra; (44) abdomen; (45) male sternite VIII; (46) male sternite IX; (47) male tergite X; (48) valvifer; (49) aedeagus in ventral view; (50) internal structures of aedeagus; (51-52) spermatheca. Scales: 41 : 2.0 mm; 42-44: 1.0 mm; 45-52: 0.2 mm.

***Stenus (Hemistenus) vorticipennoides* nov.sp. (Figs 53-61, Map 3)**

**H o l o t y p e** ♂: China, N-Yunnan [C2005-16], Nujiang Lisu Aut. Pref. Gongshan Co., Gaoligong Shan, sidevalley, 3000-3050 m, 27°47.90'N, 98°30.19'E / Conif. Forest with *Rhododendron*, broad leaved bushes, litter, moss, sifted along creek and snowfield, 21.VI.2005, M. Schülke [C2005-16] / Holotypus ♂ *Stenus (Hemistenus) vorticipennoides* sp. n. det. B. Feldmann 2006 (cSch).  
**P a r a t y p e** ♀: China, N-Yunnan, Nujiang Lisu Aut. Pr. Gongshan Co., Gaoligong Shan, valley at 3000-3050 m, 27°47.90'N 98°30.19'E, 21.VI.2005, A. Smetana (C169) (cSme).

**D e s c r i p t i o n**: Total length: 5.0 mm (holotype) and 5.4 mm (paratype); length from anterior margin of clypeus to posterior apex of suture: 2.55 mm and 2.7 mm. Similar to *S. vorticipennis*, but distinguished as follows:

Coloration as in *S. vorticipennis*. Head (Fig. 53) 1.19 times as wide as pronotum and 0.86 times as wide as elytra; puncturation of head slightly coarser and less dense.

Pronotum (Fig. 53) as in *S. vorticipennis*; as wide as long (1.0×).

Elytra (Fig. 54) at suture indistinctly longer than pronotum (1.05×) and clearly wider than long (1.3×), slightly widened caudad (as in *S. scopulus*); surface more uneven, vorticose rugae more pronounced than in *S. vorticipennis*. Hind wings fully developed, extending to posterior margin of tergite VI, when unfolded (holotype). Hind tarsi about 0.85 times the length of hind tibiae; tarsomere I of hind leg approximately as long as combined length of II-IV, V slightly more than half the length of I. Meso- and metatibiae of male with pronounced spur at inner margin of apex.

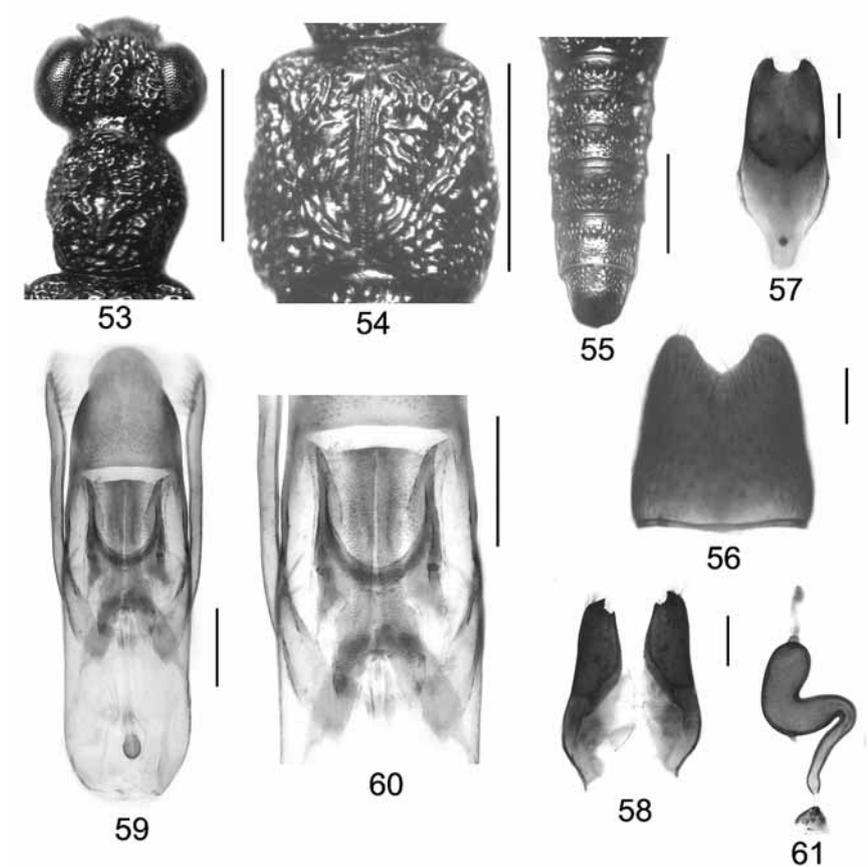
♂: median area of sternites IV-VI slightly depressed and more densely punctured; VII with more distinct median depression, this depression with denser puncturation and denser and longer pubescence than anterior and lateral areas, posterior margin of sternite VII weakly incised; posterior margin of sternite VIII with broad U-shaped incision (Fig. 56), sternite IX as in Fig. 57; tergite X as in *S. vorticipennis*; aedeagus as in Figs 59-60.

♀: posterior margin of sternite VIII rounded. Valvifer as in Fig. 58. Spermatheca as in Fig. 61.

**E t y m o l o g y**: The name (Lat., adj.) refers to the resemblance of the new species with *S. vorticipennis*, especially regarding the conspicuous vorticose sculpturation.

**C o m p a r a t i v e n o t e s**: See comparative notes in section on *S. vorticipennis*.

**D i s t r i b u t i o n a n d b i o n o m i c s**: The species is known only from one locality in Yunnan (see Map 3). The specimens were collected in June at an altitude of about 3000 m. The holotype was sifted in a coniferous forest with *Rhododendron* and broad-leaved bushes.



**Figs 53-61:** *Stenus vorticipennoides* nov.sp.: (53) forebody; (54) elytra; (55) abdomen; (56) male sternite VIII; (57) male sternite IX; (58) valvifer; (59) aedeagus in ventral view; (60) internal structures of aedeagus; (61) spermatheca. Scales: 53-55: 1.0 mm; 56-61: 0.2 mm. Abdomen (Fig. 55) with slightly coarser and deeper puncturation.

***Stenus (Hemistenus) vorticipennatus* nov.sp. (Figs 62-70, Map 3)**

**H o l o t y p e** ♂ : Bhutan: Paro District, Chiley-La, 3000-3500 m, 10.-13.7.1990, leg. Holzschuh (001) / Holotypus ♂ *Stenus (Hemistenus) vorticipennatus* sp. n. det. B. Feldmann 2006 (NHMW).  
**P a r a t y p e s** : 2 ♀ ♀ : same data as holotype (NHMW, cPut).

**D e s c r i p t i o n** : Total length: 4.7-5.3 mm; length from anterior margin of clypeus to posterior apex of suture: 2.3-2.65 mm. Very similar to *S. vorticipennis*, but distinguished as follows:

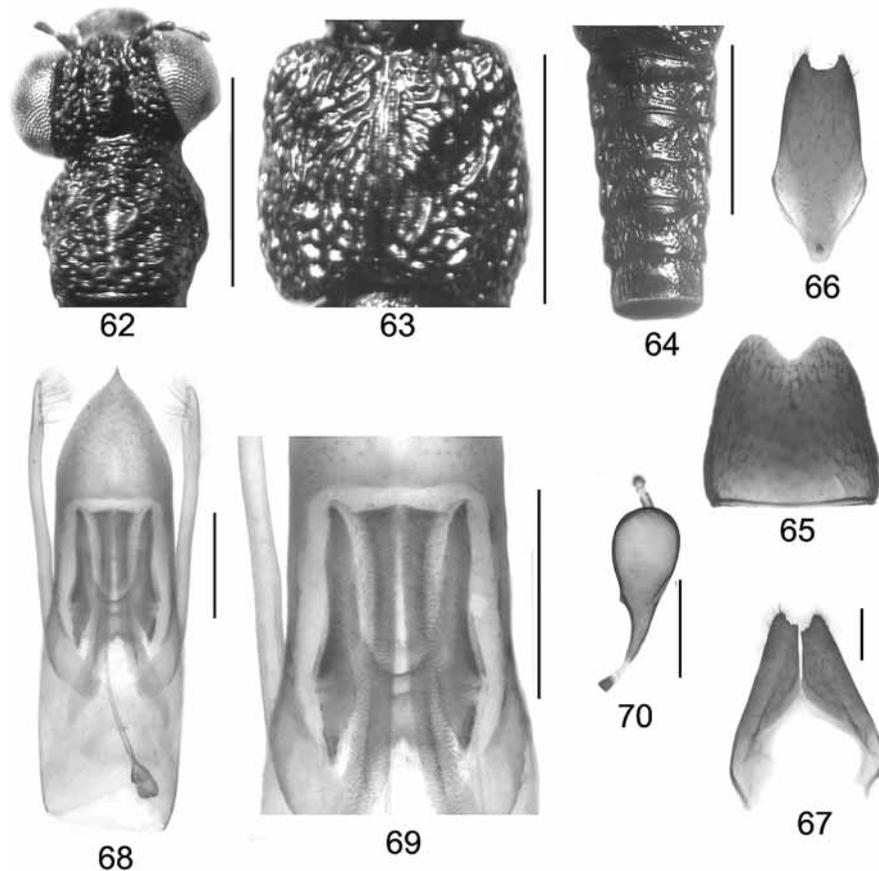
Coloration as in *S. vorticipennis*, but antennomere, palpi, and tarsi slightly darker. Head (Fig. 62) 1.26 times as wide as pronotum and 0.88 times as wide as elytra; puncturation of head slightly coarser and less dense. Pronotum (Fig. 62) as in *S. vorticipennis*, but impressions less pronounced; approximately as wide as long (1.04×).

Elytra (Fig. 63) at suture slightly longer than pronotum (1.18×) and clearly wider than

long (1.26×), slightly widened caudad (as in *S. scopulus*); surface as in *S. vorticipennis*. Hind wings fully developed. Hind tarsi about 0.84 times the length of hind tibiae; tarsomere I of hind leg approximately as long as the combined length of II-IV, V distinctly more than half the length of I. Meso- and metatibiae of male with pronounced spur at inner margin of apex.

Abdomen (Fig. 64) with coarser and deeper puncturation than in *S. vorticipennis*.

♂: sternites III-VI without distinct modifications, posterior median area of sternite VII indistinctly depressed, this depressions with slightly denser and longer pubescence than anterior and lateral areas; posterior margin of sternite VIII as in Fig. 65, sternite IX as in Fig. 66. Tergite X as in *S. scopulus*; aedeagus as in Figs 68-69.



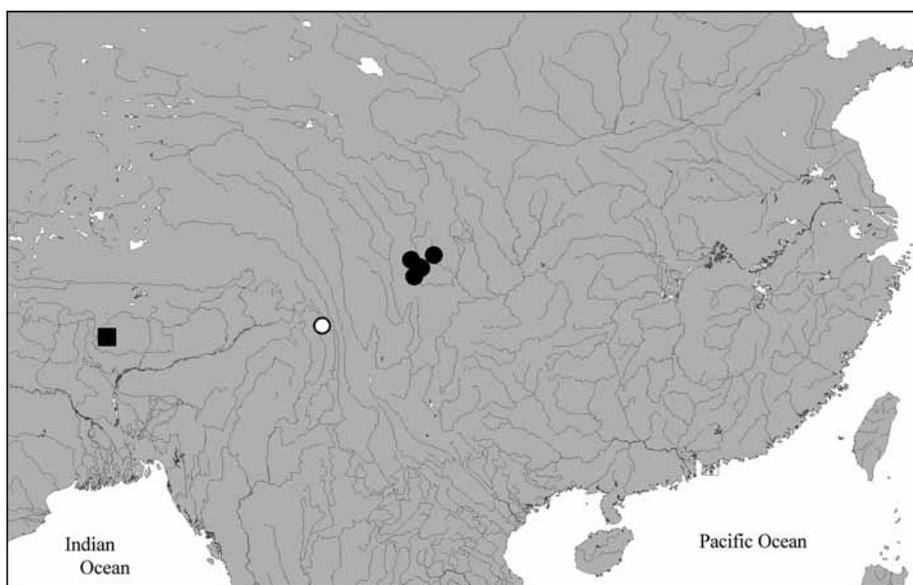
**Figs 62-70:** *Stenus vorticipennatus* nov.sp.: (62) forebody; (63) elytra; (64) abdomen; (65) male sternite VIII; (66) male sternite IX; (67) valvifer; (68) aedeagus in ventral view; (69) internal structures of aedeagus; (70) spermatheca. Scales: 62-64: 1.0 mm; 65-70: 0.2 mm.

♀: posterior margin of sternite VIII indistinctly angularly rounded. Valvifer as in Fig. 67. Spermatheca as in Fig. 70, infundibulum small, similar to that of *S. vorticipennis*.

**E t y m o l o g y :** The name (Lat., adj.) refers to the similarity – especially the vorticosc sculpture of the elytra – of this species to *S. vorticipennis*.

**C o m p a r a t i v e n o t e s :** See comparative notes in section on *S. vorticipennis*.

**D i s t r i b u t i o n a n d b i o n o m i c s :** The species is known only from one locality in Bhutan (see Map 3). At present, this species is the only representative of the *S. scopulus* species group outside China. The specimens were collected in July at an altitude of about 3000-3500 m. Ecological data are unknown.



**Map 3:** Distributions of *Stenus vorticipennis* (filled circles) and *S. vorticipennoides* (open circle) in China and of *S. vorticipennatus* (filled square) in Bhutan, based on revised records.

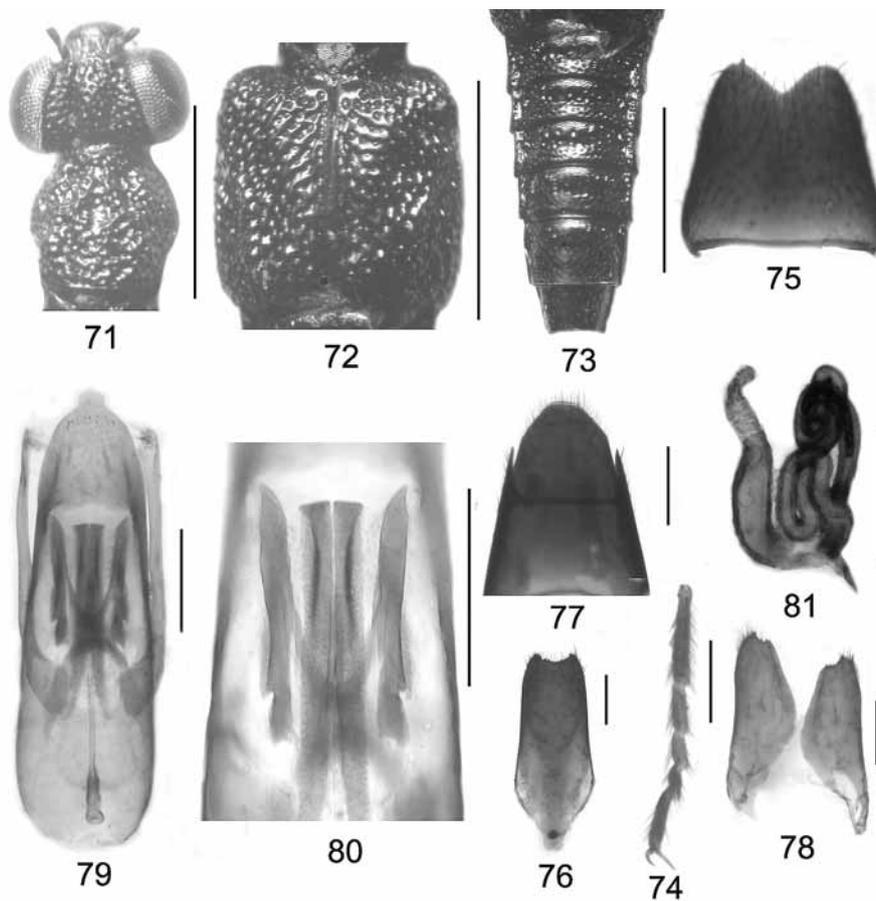
#### ***Stenus (Hemistenus) rimulosus* nov.sp. (Figs 71-81, Map 4)**

**H o l o t y p e ♂ :** C h i n a: Sichuan, Gongga Shan, Hailuogou, above camp 3, 3200 m, 7.VII.1996, 29°35'N 102°00'E, C54 / collected by A. Smetana, J. Farkač and P. Kabátek / Holotypus ♂ *Stenus (Hemistenus) rimulosus* sp. n. det. B. Feldmann 2007 (cSme). **P a r a t y p e s :** 1 ♀: same data as holotype (cSme); 2 ♂♂: Sichuan, Langmusi [Dagcanghلامو, 34°06'N, 102°34'E], 3500-3600 m, 13.VII.94, leg. A. Smetana (c14) (cSme, cPut); 2 ♂♂, 1 ♀: N-Yunnan, Diqing Tibet Aut. Pr., Bitai Hai Lake area, 29 km ESE Zhongdian, 27°43.65'N 99°58.97'E, 3540 m, 1.VI.2005, A. Smetana (C147) (cSme, cFel, cPut); 1 ♂, 3 ♀♀: N-Yunnan, Diqing Tibet Aut. Pr., Zhongdian Co., Xue Shan 23 km S Zhongdian, 27°38.3'N 99°41.5'E, 3675-3725 m, 2.VI.2005, A. Smetana (C149) (cSme, cFel); 2 ♂♂, 3 ♀♀: N-Yunnan, Diqing Tibet Aut. Pr., Zhongdian Co., Xue Shan, near lake, 23 km S Zhongdian, 27°37.1'N 99°38.5'E, 3895 m, 15.VI.2005, A. Smetana (C161) (cSme, cFel).

**M a t e r i a l e x a m i n e d , b u t n o t d e s i g n a t e d a s p a r a t y p e , b e c a u s e o f u n c e r t a i n i d e n t i f i c a t i o n :** 1 ♀: China, Gansu, mts. 25 km E Xiahe, 2805-2925 m, 3.VIII.1994, leg. A. Smetana (cSme).

**D e s c r i p t i o n :** Total length: 3.9-4.3 mm; length from anterior margin of clypeus

to posterior apex of suture: 2.10-2.25 mm. Body black, rather matt, elytra with more distinct shine than remainder of the body. Antennae slightly to clearly infusate with basal 1-2 antennomeres indistinctly lighter; maxillary palpi with infusate basal and apical palpomeres. Legs more or less infusate with basal half of femora yellowish. Head (Fig. 71) 1.21 times as wide as pronotum and 0.82 times as wide as elytra. Head as in *S. scopulus*, lateral dorsal furrows sometimes more deeply impressed and with median part more strongly elevated, median elevation at least level with inner margins of eyes. Punctuation as in *S. scopulus*. Antennomeres IX-XI indistinctly longer than wide.



**Figs 71-81:** *Stenus rimulosus* nov.sp.: (71) forebody; (72) elytra; (73) abdomen; (74) hind tarsus; (75) male sternite VIII; (76) male sternite IX; (77) male tergite X; (78) valvifer; (79) aedeagus in ventral view; (80) internal structures of aedeagus; (81) spermatheca. Scales: 71-73: 1.0 mm; 74-81: 0.2 mm.

Pronotum (Fig. 71) slightly wider than long (1.09×), similar to that of *S. scopulus*, but surface on average less uneven, with median impression on average shallower and shorter, and two impressions on either side of median impression; puncturation of pronotum approximately as coarse and dense as that of head, interstices forming relatively short and irregular rugae. Median impression with distinctly sparser puncturation or impunctate; shallow microsculpture visible only in the middle of median impression, otherwise absent or barely visible.

Elytra (Fig. 72) at suture distinctly longer than pronotum (1.3×) and clearly wider than long (1.23×); outline as in *S. scopulus*. Puncturation on average coarser than on pronotum, clearly visible in triangular area from humeral angle to middle of suture of elytra, interstices shallowly elevated in this area; in humeral area and in posterior half interstices forming short and irregular rugae, but puncturation also clearly visible; microsculpture shallow. Hind wings fully developed. Legs relatively shorter than in *S. scopulus*, with shallowly bilobed tarsomere IV (Fig. 74); hind tarsi about 0.80 times the length of hind tibiae; tarsomere I of hind leg approximately as long as the combined length of II-IV, V approximately 2/3 the length of I. Meso- and metatibiae of males with spur at inner margin of apex.

Abdomen (Fig. 73) as in *S. scopulus*. Puncturation of tergites III-V slightly finer and less dense than in *S. scopulus*; from tergite VI to apex with shallower puncturation, interstices partly wider than diameter of punctures. Abdomen weakly microsculptured on tergites III-VI, on apical tergites more distinctly microsculptured; tergite VII with palisade fringe.

♂: sternites III-VI without distinct modifications, posterior median area of sternite VII indistinctly depressed, with denser and longer pubescence than in anterior and lateral areas, posterior margin of sternite VIII with relatively deep V-shaped incision (Fig. 75), sternite IX as in Fig. 76. Tergite X as in Fig. 77; aedeagus as in Figs 79-80.

♀: posterior margin of sternite VIII rounded (sometimes very indistinctly angular). Valvifer as in Fig. 78. Spermatheca as in Fig. 81.

**E t y m o l o g y :** The name (Lat., adj.) refers to the weakly vorticose sculpture especially of the elytra.

**C o m p a r a t i v e n o t e s :** The morphology of the male and female primary characters suggests that *S. rimulosus* is closely related to – possibly the sister species of – *S. rimulosoides*. A reliable separation of these species is possible only based on an examination of the genitalia (see descriptions). For separating the species from other species of the *S. scopulus* group see key.

**D i s t r i b u t i o n a n d b i o n o m i c s :** The species is known from Sichuan and Yunnan (see Map 4). The specimens were collected in June and July at an altitude of 3200-3895 m. Additional ecological data are unknown.

***Stenus (Hemistenus) rimulosoides* nov.sp. (Figs 82-90, Map 4)**

**H o l o t y p e** ♂ : C h i n a: Sichuan, Gongga Shan, Hailuogou, above camp 3, 3200 m, 7.VII.1996, 29°35'N 102°00'E, C54 / collected by A. Smetana, J. Farkač and P. Kabátek / Holotypus ♂ *Stenus (Hemistenus) rimulosoides* sp.n. det. B. Feldmann 2007 (cSme); **P a r a t y p e s** : 2 ♀ ♀ : same data as holotype (cSme, cPut).

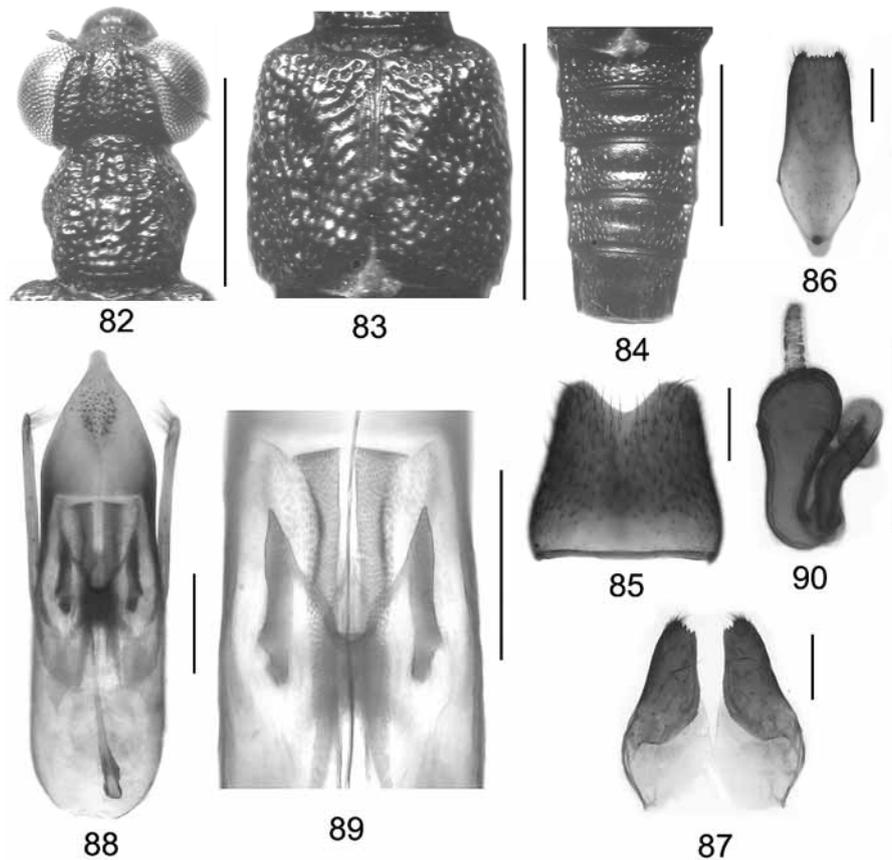
**D e s c r i p t i o n** : Total length: 3.8-4.1 mm; length from anterior margin of clypeus

to posterior apex of suture: 2.1-2.15 mm. Very similar to *S. rimulosus*, but distinguished as follows:

Body black, relatively bright. Antennae yellowish with slightly infusate club; maxillary palpi yellowish with slightly infusate last palpomere. Legs yellowish with apex of femora slightly infusate.

Head (Fig. 82) 1.21 times as wide as pronotum and 0.82 times as wide as elytra. Head as in *S. rimulosus*, but median elevation less strong. Punctuation less denser than in *S. rimulosus*.

Pronotum (Fig. 82) slightly wider than long (1.14), similar to that of *S. rimulosus*, surface on average less uneven, impressions on average shallower; punctuation of pronotum less dense, interstices more flattened. Shallow microsculpture visible especially in the middle of median impression.



**Figs 82-90:** *Stenus rimulosoides* nov.sp.: (82) forebody; (83) elytra; (84) abdomen; (85) male sternite VIII; (86) male sternite IX; (87) valvifer; (88) aedeagus in ventral view; (89) internal structures of aedeagus; (90) spermatheca. Scales: 82-84: 1.0 mm; 85-90: 0.2 mm.

Elytra (Fig. 83) at suture distinctly longer than pronotum ( $1.38\times$ ) and clearly wider than long ( $1.22\times$ ); in outline as in *S. rimulosus*. Puncturation less dense than in *S. rimulosus*; interstices more flattened. Microsculpture weakly pronounced. Hind wings fully developed. Legs as in *S. rimulosus*, with shallowly bilobed tarsomere IV; hind tarsi about 0.84 times the length of hind tibiae; tarsomere I of hind leg approximately as long as the combined length of II-IV, V approximately  $2/3$  the length of I. Meso- and metatibiae of holotype male with little spur at inner margin of apex.

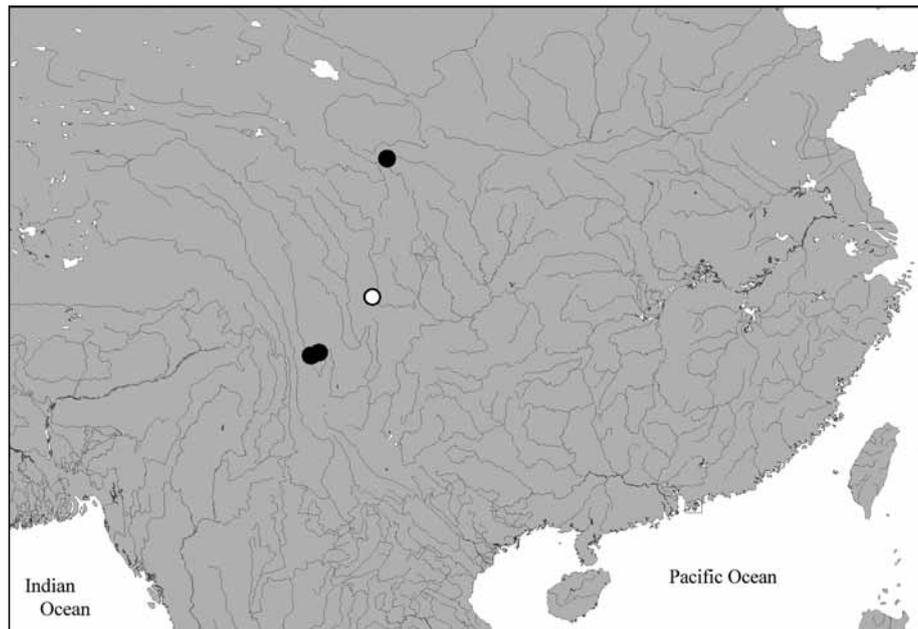
Abdomen (Fig. 84) as in *S. rimulosus*. Puncturation slightly less dense than in *S. rimulosus*; tergite VII with palisade fringe.

♂: sternites III-VI without distinct modifications, posterior median area of sternite VII indistinctly depressed, with denser and longer pubescence than in anterior and lateral areas, posterior margin of sternite VIII with relatively deep V-shaped incision, but less acutely incised as in *S. rimulosus* (Fig. 85), sternite IX as in Fig 86. Tergite X as in *S. rimulosus*; aedeagus as in Figs 88-89.

♀: posterior margin of sternite VIII rounded. Valvifer as in Fig. 87. Spermatheca as in Fig. 90; infundibulum not figured, but as in *S. rimulosus*, umbrella-shaped.

**E t y m o l o g y :** The name (Lat., adj.) refers to the doubtlessly close relationship of the new species to *S. rimulosus*.

**C o m p a r a t i v e n o t e s :** See the comparative notes of *S. rimulosus*.



**Map 4:** Distributions of *Stenus rimulosus* (filled circles) and *S. rimulosus* / *rimulosoides* (open circle: locality where both species were recorded) in China, based on revised records.

**D i s t r i b u t i o n a n d b i o n o m i c s :** The species was found together with *S. rimulosus* and is known only from Sichuan (see Map 4). The specimens were collected in July at an altitude of 3200 m. Additional ecological data are unknown.

***Stenus (Hemistenus) sp.***

**M a t e r i a l e x a m i n e d :** 7♂♂: China, Sichuan, Gongga Shan, Hailuogou, above camp 3, 3200 m, 7.VII.1996, 29°35'N 102°00'E, C54 / collected by A. Smetana, J. Farkač and P. Kabátek (cSme).

A reliable identification of the females is not possible. The specimens are similar to *S. acutiunguis* and *S. variunguis*, especially in the shape of the spermatheca (see figs 22, 39-40), but the sculpturation of the elytra is constantly more pronounced with longer vortico-se rugae.

**Key to the species of the *Stenus scopulus* group**

Because of some variability in puncturation and sculpture, an identification should always verify by an examination of the genitalia. A reliable identification of females is not always possible. This especially applies to species similar to *S. acutiunguis* and *S. variunguis*. In these species, the shape of the spermatheca is subject of considerable intraspecific variation.

- 1 Smaller species (3.8-4.3 mm; length from anterior margin of clypeus to posterior apex of suture: 2.10-2.25 mm); elytral length/pronotal length > 1.3; tarsomere IV of hind tarsi less distinctly bilobed (Fig. 74). Rugose sculpture of pronotum and especially elytra shallower (e. g. Figs 82, 83).....2
- Larger species (4.3-5.7 mm; length from anterior margin of clypeus to posterior apex of suture: 2.25-2.7 mm); elytral length/pronotal length < 1.28; tarsomere IV of hind tarsi distinctly bilobed (Fig. 6). Rugose sculpture of pronotum and especially elytra clearly elevated, vortico-se (e. g. Figs 13, 14, 42, 43).....3
- 2 Less shiny species. Elytra with more pronounced rugose sculpture and denser puncturation. Apical process (median cuspid in NAOMI 2006) of aedeagus broader in ventral view, parameres longer in relation to median lobe (Fig. 79), median hook distinctly longer (Fig. 80); spermatheca with less bulging apical chamber of spermathecal duct (Fig. 81). China: Sichuan and Yunnan .....*S. rimulosus* nov.sp.
- More shiny species. Elytra with less pronounced rugose sculpture and less dense puncturation. Apical process of aedeagus distinctly acute in ventral view, parameres shorter in relation to median lobe (Fig. 88), median hook distinctly shorter (Fig. 89); spermatheca with distinct bulging apical chamber of spermathecal duct (Fig. 90). China: Sichuan .....*S. rimulosoides* nov.sp.
- 3 Pronotum and especially elytra with pronounced rugose sculpture; vortico-se rugae highly elevated and longer, therefore puncturation less distinctly visible especially on posterior half of elytra. Aedeagal apex without claw-like modification; spermathecal duct simple or inflected only twice. ....4
- Pronotum and elytra with less pronounced rugose sculpture; vortico-se rugae more shallowly elevated and shorter, therefore puncturation distinctly visible also on posterior half of elytra. Aedeagal apex with claw-like modification; spermathecal duct closely inflected, with more numerous bends .....7
- 4 Apical process of aedeagus acute in ventral view (Fig. 68) ; spermatheca shaped like a pear, spermathecal duct not inflected (Fig. 70). Bhutan.....*S. vorticipennatus* nov.sp.
- Apical process of aedeagus more or less broadly rounded; spermathecal duct inflected twice.....5
- 5 Less shiny species with appendages on average less distinctly bicoloured; vortico-se rugae, especially of elytra less pronounced. Posterior incision of male sternite VIII less deep and more V-shaped (Fig. 7), tergite X (Fig. 9) apically rounded. Aedeagus as in Fig. 11 (see also Fig. A in ZHENG (1992b)); apical chamber of spermathecal duct slender, spermathecal duct long and slender (Fig. 12). China: Sichuan, Shaanxi and Yunnan..... *S. scopulus* ZHENG

- More shiny species; appendages more distinctly bicoloured; vorticose rugae, especially of elytra on average more pronounced. Posterior incision of male sternite VIII deeply and broadly U-shaped (Figs 45, 56), tergite X (Fig. 47) apically angularly rounded; apical chamber of spermathecal duct more bulging, spermathecal duct short and with broader diameter .....6
- 6 On average less shiny species; vorticose rugae more slender and closer. Apical process of aedeagus narrower in ventral view, parameres more massive (Fig. 49); spermathecal duct proximally shorter and less slender, infundibulum simple (Figs 51-52). China: Sichuan.....*S. vorticipennis* nov.sp.
- On average more shiny species; vorticose rugae broader and less dense. Apical process of aedeagus broad in ventral view, parameres less massive (Fig. 59); spermathecal duct proximally longer and more slender, infundibulum umbrella-shaped (Fig. 61). China: Yunnan.....*S. vorticipennoides* nov.sp
- 7 Vorticose rugae of elytra on average narrower, shorter and closer; abdominal puncturation on average denser. Apico-lateral angle of aedeagus less pronounced and more rounded in ventral view (Figs 29-33), claw-like modification of aedeagal apex very variable, each in ventral (Figs 29-33) and in lateral view (Figs 34-38); median hook slightly bent. Spermatheca as in Figs 39-40. China: Qinghai, Sichuan, Shaanxi and Yunnan ..... *S. variunguis* nov.sp.
- Vorticose rugae of elytra on average broader, longer, and less close; abdominal puncturation on average less dense. Apico-lateral angle of aedeagus more pronounced (Fig. 19), claw-like modification of aedeagal apex not very variable, each in ventral (Fig. 19) and in lateral view (Fig. 21); median hook almost straight (Fig. 20). Spermatheca as in Fig. 22. China: Yunnan .....*S. acutiunguis* nov.sp.

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### Zusammenfassung

*Stenus scopulus* ZHENG (China) wird redeskribiert und abgebildet. Eine Definition der *S. scopulus*-Gruppe wird gegeben. 7 neue Arten werden beschrieben: *Stenus acutiunguis* nov.sp. (China: Yunnan), *S. variunguis* nov.sp. (China: Qinghai, Shaanxi, Sichuan, Yunnan), *S. vorticipennis* nov.sp. (China: Sichuan), *S. vorticipennoides* nov.sp. (China: Yunnan), *S. vorticipennatus* nov.sp. (Buthan), *S. rimulosus* nov.sp. (China: Sichuan, Yunnan) und *S. rimulosoides* nov.sp. (China: Sichuan). Weitere Fundorte von *S. scopulus* werden gemeldet. Ein Bestimmungsschlüssel der Arten der *S. scopulus*-Gruppe wird erstellt und die Verbreitung aller hier behandelten Arten wird anhand von Karten dargestellt.

### References

- NAOMI S.-I. (2006): Taxonomic revision of the genus *Stenus* LATREILLE, 1797 (Coleoptera, Staphylinidae, Steninae) of Japan: Species group of *S. indubius* SHARP. — The Japanese Journal of Systematic Entomology **12**: 39-120.



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