

TWO NEW SPECIES OF THE GENUS STENOHYA BEIER FROM YUNNAN, CHINA (PSEUDOSCORPIONES: NEOBISIIDAE)

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Two new species of the pseudoscorpion genus *Stenohya* Beier from Yunnan Province, China are reported: *Stenohya tengchongensis* sp. n. and *S. meiacantha* sp. n. Detailed diagnoses, descriptions and illustrations are given, and a key to the Chinese *Stenohya* species is also provided.

Key words: pseudoscorpion, taxonomy, biodiversity, Asia

INTRODUCTION

The *Stenohya* Beier, 1967 is a small pseudoscorpion genus, and includes 14 known species which are all distributed in Asia (HARVEY 2011, ZHAO & ZHANG 2011, HU & ZHANG 2012). The taxonomic history of the genus has been outlined by ZHAO and ZHANG (2011).

The first *Stenohya* species recorded in China was *S. chinacavernicola* Schawaller, 1995. However, no more species were reported from China until four species were described in the past two years: *S. curvata* Zhao et Zhang, 2011, *S. xiningensis* Zhao et Zhang, 2011, *S. huangi* Hu et Zhang, 2012 and *S. pengae* Hu et Zhang, 2012. Most *Stenohya* species are large in size, and with long and slender pedipalps and legs. This genus is also characterised by the trichobothrial pattern of fixed chelal finger with trichobothrium *ist* situated midway between *ib* and *it*, and far removed from *et*, *est* and *it* (which are grouped together distally), and *eb*, *esb*, *isb* and *ib* (which are grouped together basally).

During examination of new pseudoscorpion specimens collected from Yunnan Province which were donated by Dr. Zhi-sheng Zhang, two *Stenohya* species were found to be new to science, which are described and illustrated in the present paper.

MATERIAL AND METHODS

The specimens are preserved in 75% alcohol and deposited in the Museum of Hebei University (MHB). Photographs were taken with a Leica M205A stereomicroscope, which was also used for measurements. Detailed examination was carried out with an Olympus BX53 general optical microscope. All measurements are given in mm. Terminology of trichobothria follows CHAMBERLIN (1931), HARVEY (1992) and JUDSON (2007). The following abbreviations are used in the text for the trichobothria: *b* = basal; *sb* = sub-basal;

st = sub-terminal; *t* = terminal; *ib* = interior basal; *isb* = interior sub-basal; *ist* = interior sub-terminal; *it* = interior terminal; *eb* = exterior basal; *esb* = exterior sub-basal; *est* = exterior sub-terminal; *et* = exterior terminal.

TAXONOMY

Family Neobisiidae Chamberlin, 1930

Neobisiidae Chamberlin, 1930: 9; CHAMBERLIN 1931: 215–217; HARVEY 1992: 1410–1411.

Genus *Stenohya* Beier, 1967

Stenohya Beier, 1967: 343–344; HARVEY 1991: 290–291.

Levigatocreagris Čurčić, 1983: 34–35 (synonymised by HARVEY 1991: 290).

***Stenohya tengchongensis* sp. n.** (Figs 1–15)

Type material. Holotype male (Ps.-MHBG-YN11022701), China, Yunnan Province, Tengchong County, Wuhe Village [36°47'N, 104°58'E], alt. 1800 m, 27 February 2011, Zong-xu Li leg.; paratypes: one male (Ps.-MHBG-YN11022702) and eight females (Ps.-MHBG-YN11022703–11022710), collected with the holotype.

Etymology. The specific name refers to the type locality.

Diagnosis. Carapace smooth with a butterfly-shaped patch; pedipalpal femur of male claviform, which is cylindric in female; male pedipalpal patella granulated, whereas it is smooth in female; males without a seta between the anterior and posterior eyes, females with one seta between the left eyes.

Description of male. Colour mostly brown, pedipalps and legs yellow (Fig. 1). Setae of body straight and acicular.

Carapace. Smooth, with a butterfly-shaped patch, slightly convex spot, 1.50 times longer than broad, with a total of 22 setae, including 6 on anterior margin and 6 on posterior margin; epistome small, triangular; 4 eyes, anterior pair with lens, posterior pair represented by eyespots; lateral margins slightly convex, curved (Fig. 2).

Abdomen. Pleural membrane strongly granulate. Tergal chaetotaxy: 8: 10: 11: 10: 11: 12: 12: 10: 15, including at least 2 tactile setae on tergites VI–XI; sternal chaetotaxy (IV–XI): 14: 18: 15: 13: 16: 14: 10: 9, sternites VI–VIII with 9–12 medial scattered glandular setae, almost equal in length to the marginal ones (Fig. 14); anal cone with 2 dorsal and 2 ventral setae. Anterior genital operculum with 30 short setae and 2 lyrifissures; posterior genital sternite with 16 setae medially, 22 setae on the posterior margin, and 2 lyrifissures (Fig. 12).

Pedipalps. Apex of coxa rounded and with 5 setae. Trochanter 1.33–1.50, femur 4.14–4.43, patella 2.40–2.75, chela (with pedicel) 3.31–3.64, chela (without pedicel) 3.06–3.29, hand (without pedicel) 1.38–1.50 times longer than broad, movable finger 1.14–1.33 times longer than hand (without pedicel). Venom apparatus present only in the fixed chelal fin-

ger, venom duct very short. Femur claviform and prolateral face with few tubercles; prolateral face of patella with more tubercles, claviform; chelal fingers long and slender (Fig. 3). Fixed chelal finger with 8 trichobothria, movable finger with 4 (Figs 4–5); *eb* and *esb* situated on base of hand, grouped very closely with *ib* and *isb*; *est*, *et* and *it* grouped together distally; *ist* situated midway between *isb* and *it*; *b* and *sb* situated closer to each other in basal half, *st* and *t* close to each other in distal half of movable finger. Fixed chelal finger with 95 almost equal-sized teeth, and all these teeth with two pointed tips; movable finger with about 92 rounded and almost the equal-sized teeth (Fig. 4).

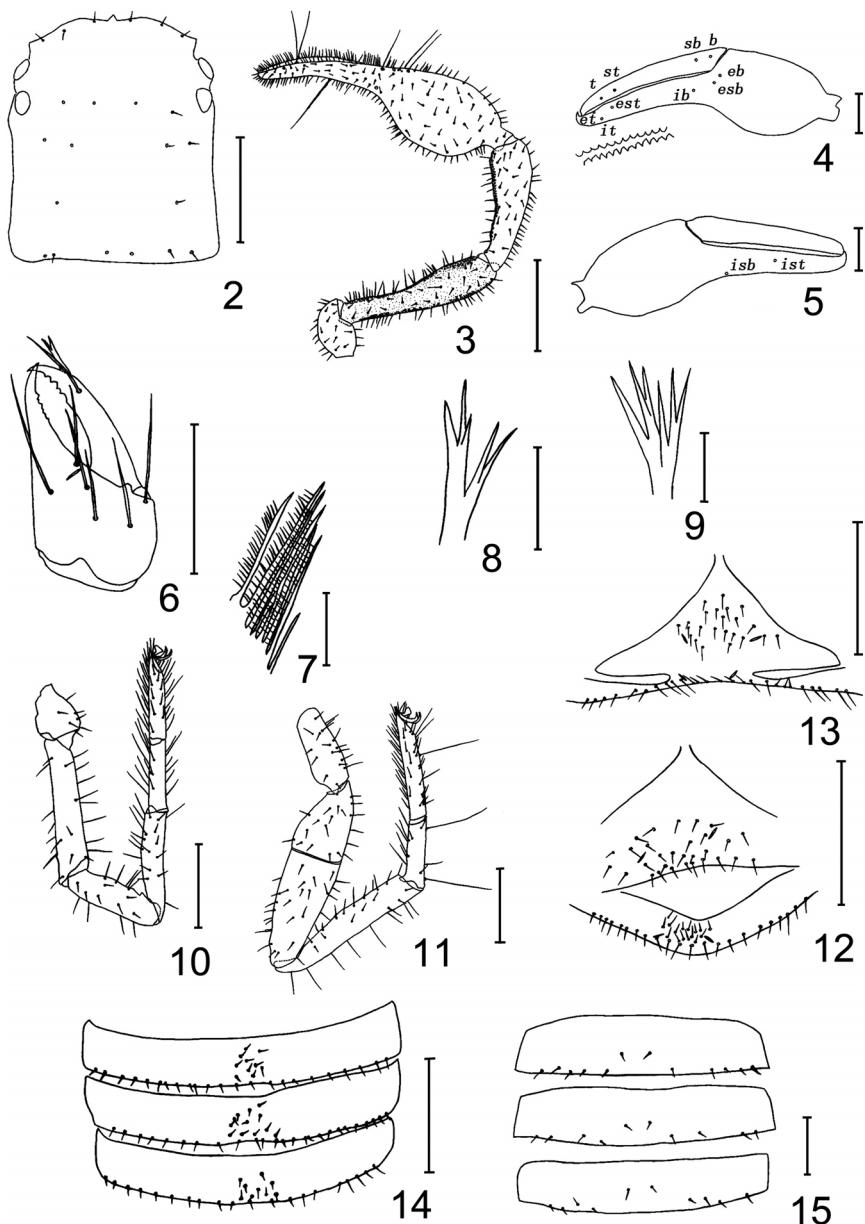
Chelicera. Palm with 6 setae, movable finger with 1 submedial seta (Fig. 6); fixed finger with 10 teeth; movable finger with 7 teeth; serrula exterior with 38 lamellae; serrula interior with 32 lamellae; galea elongated and divided into two main branches, one branch secondarily divided into 2 terminal branchlets, the other divided into 3 (Fig. 8); rallum of 8 blades, 7 blades with anteriorly-directed spinules, the basalmost blade without spinules, and about half of the length of the others, distalmost blade distinctly shorter than the second one (Fig. 7).

Legs. Leg I (Fig. 10): trochanter 1.22–1.30, femur 4.50–5.17, patella 2.43–2.57, tibia 4.20–4.40, basitarsus 2.75–3.25, telotarsus 4.00–4.50 times as long as deep. Leg IV (Fig. 11): trochanter 2.13–2.30, femur + patella 3.07–3.50, tibia 5.43–5.86, basitarsus 3.40–3.60, telotarsus 5.00–6.40 times as long as deep. Basitarsus IV with 2 tactile setae (TS 0.87, 0.17), telotarsus IV with 1 tactile setae (TS 0.61). Subterminal tarsal seta bifurcate; arolium not divided, shorter than the slender and simple claws.

Dimensions (length/breadth or depth, in mm). Body length ca. 2.85–3.30. Carapace 1.00–1.20/0.75–0.80; diameter of anterior eye 0.10; diameter of posterior eye 0.09. Pedipalps: trochanter 0.40–0.60/0.30–0.40, femur 1.45–1.55/0.35, patella 1.10–1.20/0.40–0.50, chela (with



Fig. 1. *Stenohya tengchongensis* sp. n. Holotype male (left) and paratype female (right). Habitus, dorsal view.



Figs 2–15. *Stenohya tengchongensis* sp. n. male (Figs 2–8, 10–12, 14), female (Figs 9, 13, 15). 2, carapace, dorsal view; 3, right pedipalp; 4, chela, retrolateral view; 5, chela, prolateral view; 6, right chelicera, dorsal view; 7, rallum; 8, galea, male; 9, galea, female; 10, right leg I; 11, right leg IV; 12, genital area, male, ventral view; 13, genital area, female, ventral view; 14, sternites VI–VIII with medial discal setae, male; 15, sternites VI–VIII with 2 medial setae, female. Scale bars: 1.0 mm (Fig. 3), 0.5 mm (Figs 2, 6, 10–14), 0.4 mm (Figs 4, 5, 15), 0.05 mm (Figs 7–9).

pedicel) 2.55–2.65/0.70–0.80, chela (without pedicel) 2.30–2.45/0.70–0.80, hand length (without pedicel) 1.10, movable finger length 1.25–1.40. Chelicera 0.65–0.68/0.38–0.40, movable finger length 0.48–0.50. Leg I: trochanter 0.23–0.28/0.20–0.26, femur 0.68–0.78/0.15, patella 0.43–0.45/0.18, tibia 0.53–0.55/0.13, basitarsus 0.28–0.33/0.10, telotarsus 0.40–0.45/0.10. Leg IV: trochanter 0.43–0.58/0.20–0.25, femur + patella 1.15–1.23/0.35–0.38, tibia 0.95–1.03/0.18, basitarsus 0.43–0.45/0.13, telotarsus 0.63–0.80/0.13.

Description of female. Mostly the same as holotype, except as follows. Carapace 1.18–1.24 times longer than broad, with a total of 23 setae, including 6 setae on anterior margin and 6 setae on posterior margin, 1 seta situated between the left two eyes, but none in the other side. Tergal chaetotaxy: 8–10: 7–9: 10–13: 11–15: 12–14: 13–16: 11–14: 10–14: 11–14: 12–15: 10–14, including at least 2 tactile setae on tergites VI–XI. Anterior genital sternite with 23 setae and 2 lyrifissures; posterior genital sternite with 26 scattered setae and 2 lyrifissures (Fig. 13). Chaetotaxy of sternites IV–XI: 26: 20: 19: 20: 18: 15: 14, sternites VI–VIII with a pair of medial discal glandular setae, clearly longer than marginal ones (Fig. 15).

Pedipalps. Trochanter 1.63–1.83, femur 4.00–4.13, patella 2.63–2.67, chela (with pedicel) 3.44–4.50, chela (without pedicel) 3.25–4.25, hand (without pedicel) 1.63–1.92 times longer than broad, movable finger 1.08–1.17 times longer than hand (without pedicel). Femur cylindric and prolateral face with small tubercles; patella and chelal hand smooth. Fixed chelal finger with 81–89 almost equal teeth, and all these teeth with two pointed tips; movable finger with about 83–91 rounded and almost equal-sized teeth.

Chelicera. Serrula exterior with 32–35 lamellae; serrula interior with 36–41 lamellae; galea elongated and divided into two main branches, each branch secondarily divided into 3 terminal branchlets (Fig. 9); rallum of 8 blades.

Legs. Leg I: trochanter 1.40–1.50, femur 4.43–4.50, patella 3.00–3.14, tibia 3.80–4.83, basitarsus 3.00–3.40, telotarsus 3.75–4.00 times as long as deep. Leg IV: trochanter 2.09–2.23, femur + patella 3.79–3.58, tibia 4.80–5.29, basitarsus 4.25–5.20, telotarsus 7.67–7.75 times as long as deep.

Dimensions (length/breadth or depth, in mm). Body length ca. 3.10–4.90. Carapace 1.15–1.30/0.98–1.05; diameter of anterior eye 0.10; diameter of posterior eye 0.09. Pedipalps: trochanter 0.55–0.65/0.30–0.40, femur 0.80–1.65/0.30–0.40, patella 1.05–1.20/0.40–0.45, chela (with pedicel) 2.70–2.75/0.60–0.80, chela (without pedicel) 2.55–2.60, hand length (without pedicel) 1.15–1.30, movable finger length 1.35–1.40. Chelicera 0.65–0.68/0.45–0.48, movable finger length 0.45–0.48. Leg I: trochanter 0.30–0.35/0.20–0.25, femur 0.68–0.78/0.15–0.18, patella 0.45–0.55/0.15–0.18, tibia 0.48–0.73/0.13–0.15, basitarsus 0.30–0.43/0.10–0.13, telotarsus 0.38–0.50/0.10–0.13. Leg IV: trochanter 0.58–0.73/0.28–0.33, femur + patella 1.08–1.33/0.30–0.35, tibia 0.93–1.20/0.18–0.25, basitarsus 0.43–0.65/0.10–0.13, telotarsus 0.58–0.78/0.08–0.10.

Remarks. *S. tengchongensis* sp. n. can be easily separated from the five known *Stenohya* species in China as follows, it differs from *S. chinacavernicola* by having 4 distinct eyes (while having 2 or none eyes in *S. chinacavernicola*); from *S. curvata* by no spine at the base of male chela hand (while having a spine at the base of male chela hand in *S. curvata*); from *S. xiningensis* by the contiguous teeth of the movable chela finger (while the dentition of the movable chela finger is space apart in *S. xiningensis*); from *S. huangi* by movable chela finger having more teeth (more than 90) (while movable chela finger having about 30 teeth in *S. huangi*); from *S. pengae* by the less slender pedipalp.

The new species is special for the claviform femur in male, which is cylindric in other *Stenohya* species. The other character is the absence of seta between the anterior and posterior eyes in male. Though we have no idea of its function, almost all pseudoscorpions have this seta.

***Stenohya meiacantha* sp. n.**
(Figs 16–28)

Type material. Holotype male (Ps.-MHBG-YN11022801), China, Yunnan Province, Longyang District, Nankang Yakou [24°50'N, 98°46'E], alt. 2100 m, 28 February 2011, Luyu Wang leg.; paratypes: two females (Ps.-MHBG-YN11022802-11022803), same data as for holotype.

Etymology. The specific name is derived from the Latin adjective “*meiacantha*”, refers to the smaller spine on the base of movable finger.

Diagnosis. Pedipalpal movable finger slender, 1.91 times longer than hand (without pedicel); male chelal hand with a ventral spine near the base of the finger, which is absent in the female.

Description of male. Colour mostly brown, legs and abdomen yellow (Fig. 16).

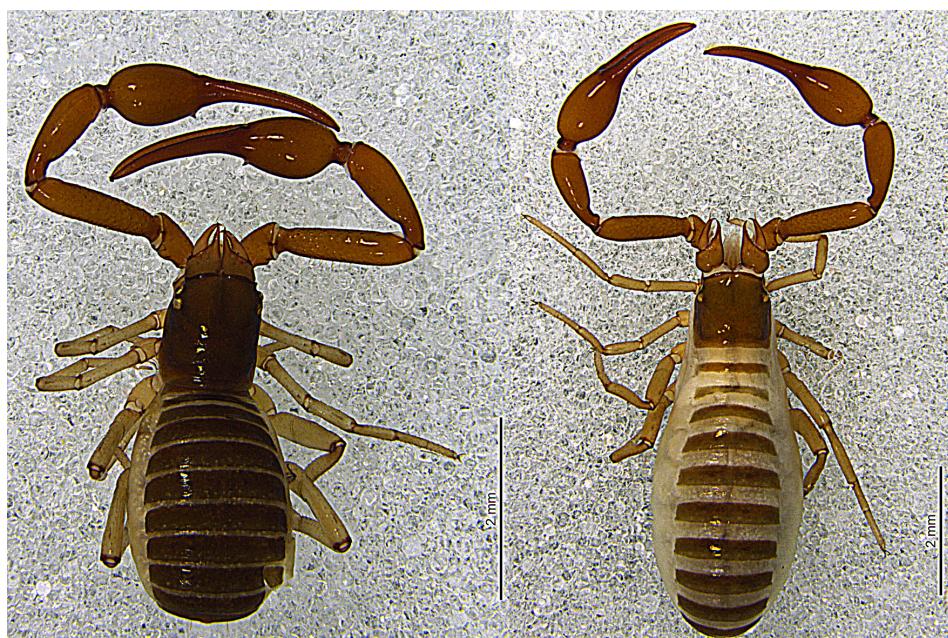


Fig. 16. *Stenohya meiacantha* sp. n. Holotype male (left) and paratype female (right). Habitus, dorsal view.

Carapace. Smooth, with a total of 23 setae, including 6 on anterior margin and 4 on posterior margin (Fig. 17); epistome small and triangular; 4 eyes, anterior pair with lens, posterior pair represented by eyespots; lateral margins slightly convex; 1.42 times longer than broad.

Abdomen. Pleural membrane strongly granulated. Tergal chaetotaxy: 6: 8: 10: 10: 6: 8: 12: 8: 8: 6, including at least 2 tactile setae on tergites VI–XI; sternal chaetotaxy (IV–XI): 18: 26: 27: 26: 22: 18: 17: 12, sternites VI–VIII with a cluster of medial scattered glandular setae, almost equal in length to the marginal ones; anal cone with 2 dorsal and 2 ventral setae. Anterior genital operculum with 17 small setae and 2 lyrifissures; posterior genital sternite with 11 setae medially, 23 setae on the posterior margin, and 2 lyrifissures (Fig. 27).

Pedipalps. Apex of coxa rounded and with 5 setae. Trochanter 1.40, femur 3.75, patella 4.58, chela (with pedicel) 2.35, chela (without pedicel) 2.22 times longer than broad, movable finger 1.91 times longer than hand (without pedicel). Venom apparatus present only in fixed chelal finger, venom duct very short. Prolateral face of femur with few tubercles and not straight, depressed at the base; prolateral face of patella smooth (Fig. 18); chelal fingers long and slender, palm with more tubercles (Fig. 19); hand on ventral side near base of movable finger with a small thorn-like projection pointing distally downwards (Fig. 21). Fixed chelal finger with 8 trichobothria, movable finger with 4 (Fig. 20): *eb* and *esb* situated on base of hand, grouped very closely with *ib* and *isb*; *est*, *et* and *it* grouped together distally; *ist* situated midway between *isb* and *it*; *b* and *sb* situated closer to each other in basal half, *st* and *t* close to each other in distal half of movable finger. Fixed chelal finger with 92 almost equal-sized rounded teeth; movable finger with about 78 teeth, of which the 5 distal teeth are pointed and the remaining teeth are rounded.

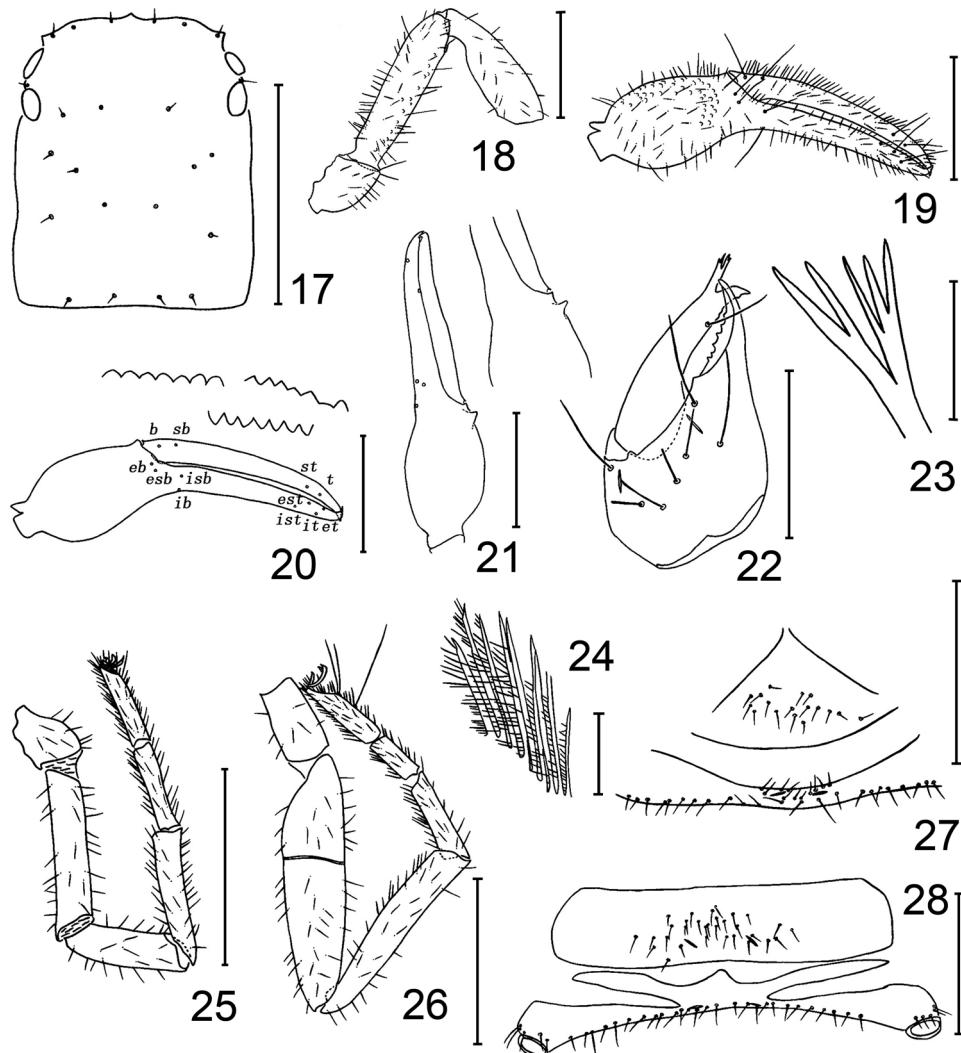
Chelicera. Palm with 7 setae, movable finger with 1 submedial seta (Fig. 22); fixed finger with 14 teeth; movable finger with 5 teeth; serrula exterior with 42 lamellae; serrula interior with 36 lamellae; galea elongated and divided into two main branches, one branch secondarily divided into 2 terminal branchlets, the other divided into 3 (Fig. 23); rallum of 9 blades, all blades with anteriorly-directed spinules, the basalmost blade short and small, and about two thirds of the length of the others, distalmost blade slightly shorter and thicker than the second one (Fig. 24).

Legs. Leg I (Fig. 25): trochanter 1.09, femur 4.71, patella 2.75, tibia 4.33, basitarsus 4.75, telotarsus 4.75 times as long as deep. Leg IV (Fig. 26): trochanter 2.00, femur + patella 3.93, tibia 5.11, basitarsus 3.50, telotarsus 6.40 times as long as deep. Telotarsus IV with 1 tactile setae (TS 0.67). Subterminal tarsal seta bifurcate; arolium not divided, shorter than the slender and simple claws.

Dimensions (length/breadth or depth, in mm). Body length ca. 4.35. Carapace 1.35/0.95. Pedipalps: trochanter 0.53/0.38, femur 1.50/0.40, patella 1.38/0.30, chela (with pedicel) 2.70/0.58, chela (without pedicel) 2.55/0.58, hand length (without pedicel) 0.88, movable finger length 1.68. Chelicera 0.82/0.40, movable finger length 0.50. Leg I: trochanter 0.30/0.28, femur 0.83/0.18, patella 0.55/0.20, tibia 0.65/0.15, basitarsus 0.48/0.10, telotarsus 0.48/0.10. Leg IV: trochanter 0.55/0.28, femur + patella 1.48/0.38, tibia 1.15/0.23, basitarsus 0.53/0.23, telotarsus 0.80/0.13.

Description of female. Like holotype, except as follows. Carapace 1.09 times longer than broad. Tergal chaetotaxy: 6: 9: 10: 11: 12: 11: 10: 8: 6: 4. Anterior genital sternite with 31 setae and 2 lyrifissures and posterior genital sternite with 27 setae and 2 lyrifissures (Fig. 28); Chaetotaxy of sternites IV–XI: 19: 22: 22: 19: 16: 16: 10: 5, sternites VI–VIII with a pair of medial discal glandular setae, clearly longer than marginal ones.

Pedipalps. Trochanter 2.45, femur 5.13, patella 2.68, chela (with pedicel) 3.56, chela (without pedicel) 3.38 times longer than broad, movable finger 1.35 times longer than hand (without pedicel). Prolateral face of femur with small tubercles; patella and chelal hand smooth, without spine. Fixed chelal finger with 84 almost equal-sized pointed teeth, movable finger with 76 almost equal-sized rounded teeth.



Figs 17–28. *Stenohya meiacantha* sp. n.: 17–27 = male, 17, carapace, dorsal view; 18–19, left pedipalp; 20, chela, retrolateral view; 21, chela, lateral view, showing the spine; 22, left chelicera, dorsal view; 23, galea; 24, rallum; 25, right leg I; 26, left leg IV; 27, genital area, male, ventral view. 28 = female, genital area, ventral view. Scale bars: 1.0 mm (Figs 17–21, 25–26), 0.5 mm (Figs 27–28), 0.4 mm (Fig. 22), 0.05 mm (Figs 23–24).

Chelicera. Serrula exterior with 45 lamellae; serrula interior with 32 lamellae; galea elongated and divided into two main branches, each branch secondarily divided into 3 terminal branchlets; rallum of 9 blades.

Legs. Leg I: trochanter 1.36, femur 4.57, patella 3.29, tibia 4.17, basitarsus 3.20, telotarsus 5.00 times as long as deep. Leg IV: trochanter 1.91, femur + patella 5.79, tibia 5.22, basitarsus 3.83, telotarsus 6.00 times as long as deep.

Dimensions (length/breadth or depth, in mm). Body length ca. 6.60. Carapace 1.78/1.08. Pedipalps: trochanter 0.68/0.28, femur 2.05/0.40, patella 1.28/0.48, chela (with pedicel) 2.85/0.80, chela (without pedicel) 2.70/0.80, hand length (without pedicel) 1.15, movable finger length 1.55. Chelicera 0.84/0.45, movable finger length 0.52. Leg I: trochanter 0.38/0.28, femur 0.80/0.18, patella 0.58/0.18, tibia 0.63/0.15, basitarsus 0.40/0.13, telotarsus 0.50/0.10. Leg IV: trochanter 0.53/0.28, femur + patella 2.03/0.35, tibia 1.18/0.23, basitarsus 0.58/0.15, telotarsus 0.75/0.13.

Remarks. Males of three species of *Stenohya*, *S. hamata* (Leclerc et Mahnert, 1988), *S. curvata* Zhao et Zhang and *S. meiacantha* sp. n. have a spine on the ventral margin of the chelal hand. However, *S. meiacantha* can be separated from the other two species by the following unique characteristics: the movable chelal finger is straight in *S. meiacantha*, whereas it is bent in the basal third in *S. curvata*; the spine is small and blunt in *S. meiacantha*, while it is bigger and pointed in *S. hamata*; and the movable finger of *S. hamata* has a ventral hump-like projection, which is absent in *S. meiacantha*.

KEY TO THE CHINESE SPECIES OF STENOHYA

- 1 Cave-living species, without eyes or with indistinct eyespots
S. chinacavernicola
- Free-living species, with four eyes, anterior pair with lens and posterior pair represented by eyespots 2
- 2 Movable finger of chela with a low number of teeth (about 30 teeth)
S. huangi
- Movable finger of chela with a higher number of teeth (more than 40 teeth) 3
- 3 Male with slender pedipalps (femur 6.79–7.20×, patella 6.17–6.25× longer than broad)
S. pengae
- Male with less slender pedipalps (femur 3.75–6.42, patella 2.63–4.68 times longer than broad) 4
- 4 Seta absent between anterior and posterior eyes in males, while one seta occurred between left eyes in females
S. tengchongensis sp. n.

- Both males and females with one seta between the anterior and posterior eyes respectively 5
- 5 Dentition of the base of the movable chelal finger discontinuous; chelal hand without a spine *S. xiningensis*
- Dentition of the movable chelal finger normal (continuous); chelal hand with a spine 6
- 6 Movable chelal finger of male shorter (1.00–1.59× longer than hand), curving in basal third *S. curvata*
- Movable chelal finger of male slender (1.91× longer than hand), straight *S. meiacantha* sp. n.

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Acknowledgements – We are grateful to Dr. Zhi-sheng Zhang (School of Life Science, Southwest University) for the donation of the valuable specimens that formed the basis for this study. Many thanks are given to the two anonymous reviewers for helpful comments on the manuscript. Thanks are also due to Zong-xu Li and Lu-yu Wang for collecting the valuable specimens. This work was supported by the National Natural Science Foundation of China (No. 31093430, 31071885, 30970325), and in part by a Program of Ministry of Science and Technology of Republic of China (2012FY110803) to Dr. Feng Zhang.

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Revised version received January 7, 2013, accepted May 16, 2013, published May 31, 2013