

***Bumba*, a replacement name for *Maraca* Pérez-Miles, 2005 and *Bumba lennoni*, a new tarantula species from western Amazonia (Araneae, Theraphosidae, Theraphosinae)**

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Academic editor: *I. Agnarsson* | Received 16 May 2014 | Accepted 2 October 2014 | Published 20 October 2014

<http://zoobank.org/313FBA31-A116-40CD-94B9-8C125CC96DA4>

Citation: Pérez-Miles F, Bonaldo AB, Miglio LT (2014) *Bumba*, a replacement name for *Maraca* Pérez-Miles, 2005 and *Bumba lennoni*, a new tarantula species from western Amazonia (Araneae, Theraphosidae, Theraphosinae). ZooKeys 448: 1–8. doi: 10.3897/zookeys.448.7920

Abstract

We propose the name *Bumba* as a new name for *Maraca*, preoccupied by *Maraca* Hebard, 1926 (Orthoptera). We describe and illustrate *Bumba lennoni*, a new theraphosid species from Caxiuanã, Pará, Brazil. This species differs from the other species of the genus in the extremely reduced keel on male palpal organ and in the higher number of labial and maxillary cuspules. Females additionally differ in the spermathecal morphology. As a consequence of the name replacement, three new combinations are established.

Keywords

Tarantula, taxonomy, *Bumba*, *Maraca*, Amazônia, Caxiuanã

Introduction

The genus *Maraca* Pérez-Miles, 2005 was originally described as a replacement name for *Iracema* Pérez-Miles, 2000 which was preoccupied by *Iracema* Triques, 1996 in Pisces. Pérez-Miles (2005) was again unaware that the name *Maraca* was previously used for a Neotropical cockroach (Hebard 1926). To remove this generic homonymy the name *Bumba* is here proposed for *Maraca* Pérez-Miles (2005). The type species *Bumba cabocla* (Pérez-Miles 2000), comb. n. is so far recorded solely for the type locality, Maracá Island, State of Roraima northern Brazilian Amazonia. *Bumba horrida* (Schmidt 1994), comb. n.

was transferred from the genus *Paraphysa* Simon, 1892 by Bertani and Carla-da-Silva (2003) to *Iracema* and, by the homonymy, fall into *Maraca* and now into *Bumba*. These authors extended the records of *Bumba horrida* from its type locality in Amazonas Federal Territory, Venezuela to the states of Amazonas and Roraima, Brazil. Recently, Perafán and Pérez-Miles (2014) transferred *Euathlus pulcherrimaklaasi* (Schmidt, 1991) to *Maraca* including Ecuador in the distribution of the genus.

Bumba (formerly *Maraca*) is characterized by the presence of type IV urticating hairs, a retrolateral process on male palpal tibiae, palpal bulb resting in a ventral distal excavation of palpal tibia, male metatatarsus I passing between tibial spurs when flexed, and spiniform setae on prolateral and retrolateral maxillae and coxae I–IV (Pérez-Miles 2000, Bertani and Carla-da-Silva 2003). Besides these characters, the reduced number of cuspules on labium was also indicated as diagnostic for *Bumba*; the new species fits in all other generic characters but has about 50 cuspules on labium. Consequently, the diagnosis of *Bumba* is presently modified in this point. We here diagnose, describe and illustrate *B. lennoni* sp. n., based on male and female specimens from Caxiuanã, Pará, Brazil. Some brief additional natural history comments on *B. lennoni* sp. n. are given. Three new combinations are established: *Bumba cabocla* (Pérez-Miles, 2000), *Bumba horrida* (Schmidt 1994) and *Bumba pulcherrimaklaasi* (Schmidt, 1991).

Methods

Abbreviations: AME = anterior median eyes, ALE = anterior lateral eyes, PME = posterior median eyes, PLE = posterior lateral eyes, OQ = ocular quadrangle (including lateral eyes), d = dorsal, p = prolateral, r = retrolateral, v = ventral; MPEG = Museu Paraense Emílio Goeldi (Belém, Pará, Brazil). Male palpal organ keel terminology (following Bertani 2000): PSK = prolateral superior keel; PIK = prolateral inferior keel; SAK = subapical keel. All measurements are in millimeters (mm) and were taken using an ocular micrometer. The total length excludes chelicerae and spinnerets. Drawings were made with a camera lucida, with a stereomicroscope Zeiss Discovery V8. Urticating setae terminology follows Cooke et al. (1972). The number of cuticular extensions in paired appendages are expressed as right/left.

Taxonomy

Genus *Bumba* Pérez-Miles, Bonaldo & Miglio, 2014

Iracema Pérez-Miles, 2000: 141 (pre-occupied, nec *Iracema* Trique, 1996).

Maraca Pérez-Miles, 2005: 247 (pre-occupied, nec *Maraca* Hebard, 1926).

Diagnosis. *Bumba* differs from other genera of Theraphosinae in the combined presence of type IV urticating hairs, retrolateral process in male palpal tibiae, palpal bulb

resting in a ventral distal excavation of palpal tibia, male metatatarsus I passing between tibial spurs when flexed, and spiniform setae on prolateral and retrolateral maxillae and coxae I–IV.

Type species. *Bumba cabocla* (Pérez-Miles, 2000), comb. n.

Etymology. Bumba (feminine) is taken from Brazilian theatrical folk tradition of the popular festival called Boi-bumbá (hit my bull), which takes place annually in North and Northeastern Brazil.

New combinations. *Bumba cabocla* (Pérez-Miles, 2000), comb. n.; *Bumba horrida* (Schmidt, 1994), comb. n.; and *Bumba pulcherrimaklaasi* (Schmidt, 1991), comb. n.

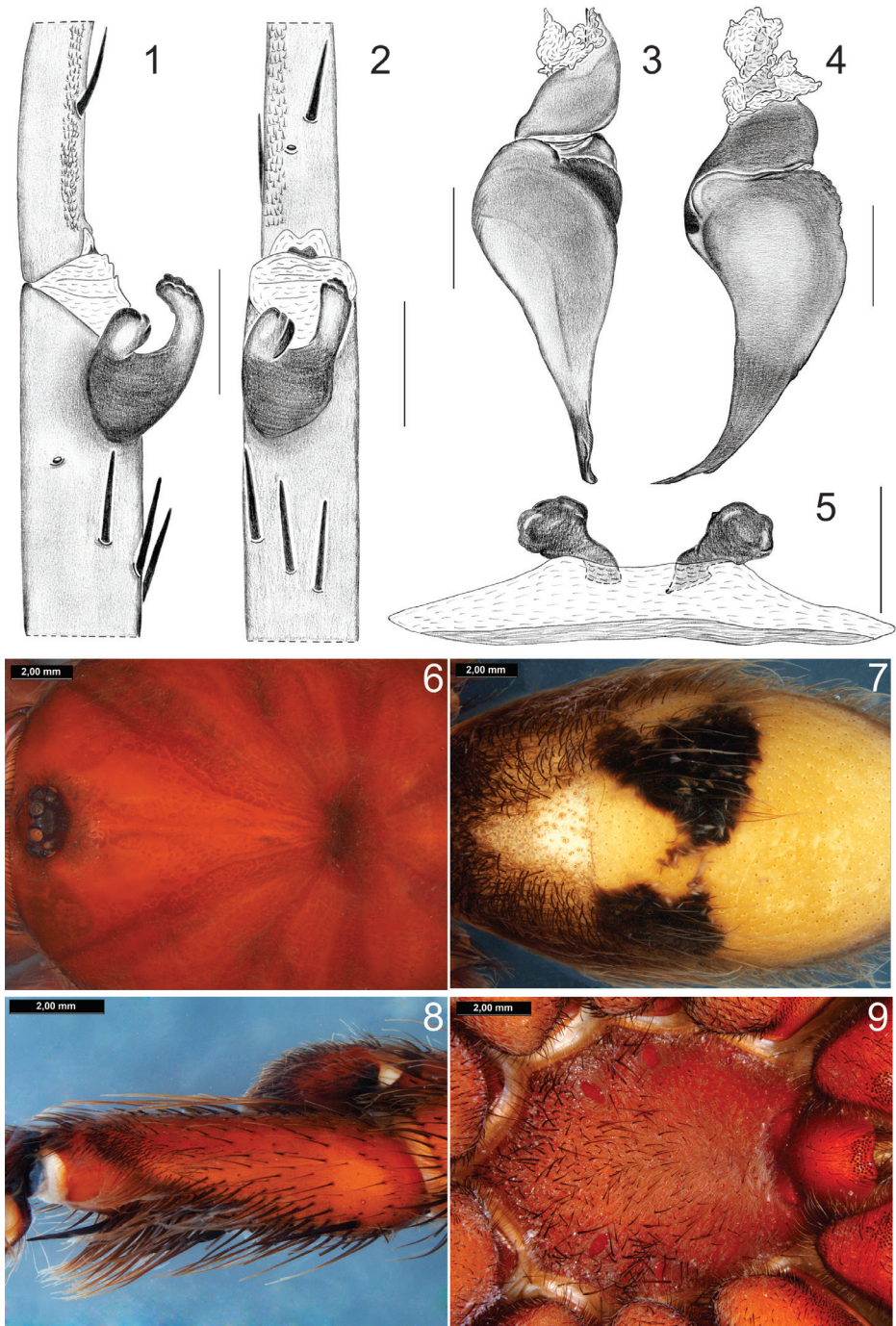
***Bumba lennoni* sp. n.**

<http://zoobank.org/382133FC-96E8-44CC-A4C3-7B0395671910>

Type material. Holotype ♂, 01°44'18.02"S, 51°27'48.01"W (DMS), Estação Científica Ferreira Penna, FLONA Caxiuanã, Melgaço, Pará, Brazil, 02.VI.2003, J. A. P. Barreiros & C. O. Araújo leg. (MPEG 983). **Paratypes:** BRAZIL. Pará: Melgaço, FLONA Caxiuanã, Estação Científica Ferreira Penna, 01°43'43.2"S, 51°29'00.7"W (DMS), Plot TEAM 2, 2♀♀, 03.X.2005, B. C. Araújo leg. (MPEG 19040); 05.X.2005, N. Abrahim leg. (MPEG 19041); 01°44'18.02"S, 51°27'48.01"W (DMS), 4♂♂, 10.VII.2002, D. E. Guimarães leg. (MPEG 1001); 19.VIII.2003, J. A. P. Barreiros leg. (MPEG 976); 24.VIII.2003, J. A. P. Barreiros leg. (MPEG 985); 19.X.2003, J. A. P. Barreiros & L. T. Miglio leg. (MPEG 975); 1♀, 21–30.XI.2000, A. B. Bonaldo leg. (MPEG 1924); 01°57'38.9"S, 51°36'45.3"W (DMS), Acampamento PPBio, Plot PPBio, 1♀, 10.V.2005, C. A. Lopes leg. (MPEG 19039). All deposited at MPEG.

Diagnosis. Differ from the other species of *Bumba* in the very reduced keel on male palpal bulb and the higher number of labial cuspules (nearly 50).

Description. Male (holotype, MPEG 983): Total length 34.00, carapace length 17.50, width 14.75. Anterior eye row procurved, posterior recurved. Eyes sizes and interdistances: AME 0.42, ALE 0.66, PME 0.38, PLE 0.42, AME-AME 0.42, AME-ALE 0.36, PME-PME 1.32, PME-PLE 0.24, ALE-PLE 0.18, OQ length 0.98, width 2.94, clypeus 0.56. Fovea transverse, straight, width 2.06. Labium length 1.90, width 2.80, with 58 cuspules, maxillae with 218 cuspules in a triangular group with base on the proximal edge. Sternum length 7.75, width 6.63, posterior sigillae submarginal. Chelicerae with 12/11 promarginal teeth (5 to 8/9 from distal tip, smaller); a group 29/30 very small proximal teeth, behind promarginal ones. Tarsi I–IV densely scopulate, scopula I–III entire, IV divided by a narrow line of longer conical setae. Metatarsi I scopulate on distal half, II scopulate on distal third, III scopulate on distal fourth and IV apically scopulate. Tibia I with two prolatero-ventral, distal, unequal apophysis (Figs 1–2). Flexion of metatarsus I between both branches of the tibial apophysis. Palpal organ piriform (Figs 10–11), in Fig. 11 TA detailed; with distal ring-shaped keel (Fig. 12), perpendicular to major axis (Figs 3–4). Palpal tibia with a setose retrolateral process (Fig. 8); setae thick. Length of leg and palpal segments, in Table 1. Spination:



Figures 1–9. *Bumba lennoni* sp. n.: 1–4 and 6–8 male holotype (MPEG 983) 5, 9 female paratype (MPEG 19039). 1–2 Tibiae and metatarsi of left leg I: 1 Prolateral 2 Ventral 3–4 Copulatory bulb: 3 Prolateral 4 Retrolateral 5 Spermathecae, dorsal 6 carapace, dorsal 7 abdomen, dorsal 8 retrolateral process in male palpal tibiae 9 sternum, ventral Scales: 1–2: 3 mm; and 3–5: 1 mm.

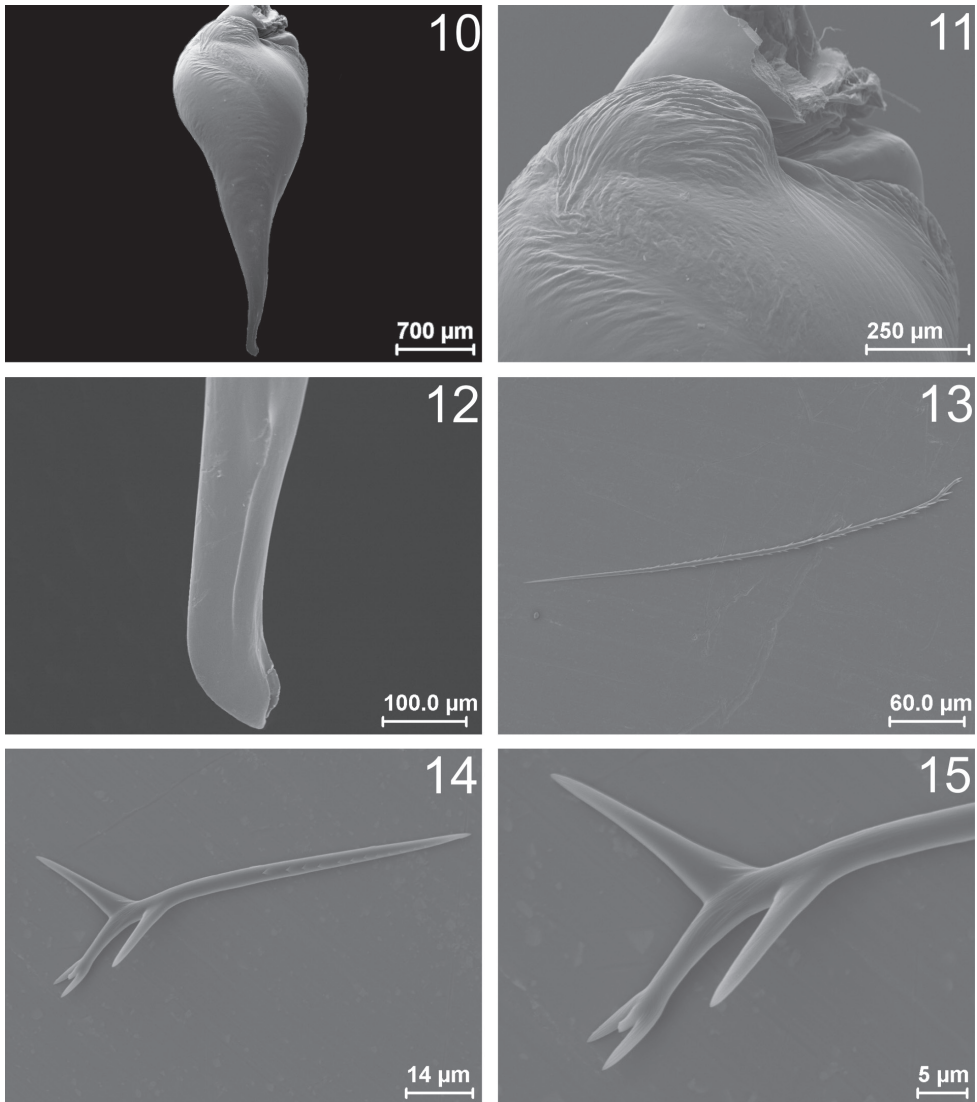
Table 1. Length of legs and palpal segments of holotype male *Bumba lennoni*.

	I	II	III	IV	Palp
Fe	16.13	15.00	13.25	16.50	7.88
Pa	8.75	8.63	6.88	7.25	5.25
Ti	13.63	12.50	10.25	13.63	6.88
Mt	13.50	13.38	15.88	21.13	-----
Ta	7.75	6.63	7.75	7.88	2.75
Total	59.76	56.14	54.01	66.39	22.76

Femora I, 3P; II, 3P, 1R; III, 4P, 3R; IV, 2P, 2R; palp, 1P. Patellae I, 1P, II, 0; III, 0; IV, 0; palp, 0. Tibiae I, 3P, 5R, 4V; II, 2P, 1R, 9V; III, 2P, 3R, 10V, 1D; IV, 5P, 9R, 12V, 2D; palp, 3P, 3V. Metatarsi I, 1P, 2R, 2V; II, 2P, 2R, 6V; III, 5P, 9R, 6V; IV, 6P, 8R, 14V; Tarsi I–IV and palp, 0. Color: Cephalothorax (Fig. 6) and legs reddish brown, abdomen light brown with central patch of urticating setae darker (Fig. 7). Type III (Fig. 13) and type IV urticating hairs present. PMS well developed, PLS normal, apical segment digitiform.

Variation (range (mean \pm standard deviation)): Total length 34.00–36.13 (35.20 \pm 0.93), carapace length 16.37–17.50 (17.02 \pm 0.51), width 14–15.25 (14.60 \pm 0.46). AME 0.40–0.64 (0.49 \pm 0.095), ALE 0.60–0.68 (0.64 \pm 0.04), PME 0.38–0.44 (0.40 \pm 0.02), PLE 0.40–0.44 (0.43 \pm 0.02), AME-AME 0.28–0.42 (0.33 \pm 0.06), AME-ALE 0.24–0.36 (0.30 \pm 0.06), PME-PME 1.08–1.32 (1.21 \pm 0.09), PME-PLE 0.04–0.24 (0.10 \pm 0.08), ALE-PLE 0.12–0.24 (0.19 \pm 0.04), OQ length 0.96–1.08 (1.00 \pm 0.046), width 2.20–2.94 (2.44 \pm 0.29), clypeus 0.56 (0.56 \pm 0.03). Fovea width 1.60–2.06 (1.93 \pm 0.31). Labium length 1.63–2.25 (1.91 \pm 0.22), width 1.75–2.80 (2.44 \pm 0.42). Sternum length 6.88–7.75 (7.25 \pm 0.34), width 5.5–6.63 (6.10 \pm 0.43). Legs: I 51.62–59.76 (56.22 \pm 2.47), II 49.63–56.14 (52.73 \pm 2.37), III 46.88–54.01 (49.80 \pm 2.62), IV 59.13–66.39 (62.53 \pm 2.69), palp 19.63–22.76 (21.58 \pm 1.22).

Female (Paratype, MPEG 19039): Total length 43.00, carapace length 20.38, width 16.63. Anterior eye row procurve, posterior row straight. Eye sizes and interdistances: AME 0.53, ALE 0.65, PME 0.44, PLE 0.56, AME-AME 0.44, AME-ALE 0.34, PME-PME 1.50, PME-PLE 0.19, ALE-PLE 0.25, OQ length 1.13, width 2.81, clypeus 0.84. Fovea width 2.28. Labium length 2.31, width 3.34, with 60 cuspules, maxillae with 264 cuspules. Sternum length 8.13, width 7.5, posterior sigillae submarginal (Fig. 9). Chelicerae with 14/13 promarginal teeth (from distal to proximal, 6/10 small, 7/6 to 13/10 medium sized); A basal group of 61/63 very small teeth, behind large ones. Tarsi densely scopulate, scopulae I–III entire, IV divided by a band of longer conical setae. Metatarsi I scopulate on distal half, II on distal third, III on apical fourth and IV without scopula. Length of leg and palpal segments in Table 2. Spination: Femora I, 2P; II, 1P; III, 1P, 1D; IV, 1D; palp, 1P. Patellae I–II, 0, III, 1P; IV and palp, 0. Tibiae I, 1P, 5V; II, 1P, 5V; III, 2P, 2R, 7V; IV, 2R, 5V; palp, 4P, 3V. Metatarsi: I, 3V; II, 1P, 5V; III, 2P, 6R, 7V; IV, 2P, 4R, 11V. Tarsi I–IV and palp, 0. Color: Carapace and legs as in male, abdomen dark brown. Type III, IV (Figs 14–15) urticating hairs present, type IV modified, short with few (3–4) barbs. PMS slightly



Figures 10–15. *Bumba lennoni* sp. n.: **10–13** male paratype (MPEG 975) **14–15** female paratype (MPEG 19039). **10–12** Copulatory bulb: **10** Prolateral **11** Prolateral, tegular apophysis (TA), detail **12** Prolateral, ring-shaped keel, detail **13** Type III urticating hair, silhouette **14–15** Type IV urticating hair: **14** Silhouette; **15** Tip, detail.

smaller than in male; PLS as in male. Spermathecae with two wide sub-spheric distal receptacles, very sclerotized, with a short neck with a narrow part sclerotized and a wide membranous area (Fig. 5).

Variation (range (mean \pm standard deviation)): Total length 26.25–43.00 (31.50 \pm 7.80), carapace length 16.50–20.38 (18.00 \pm 1.68), width 13.37–16.63 (14.72 \pm 1.41). AME 0.40–0.56 (0.48 \pm 0.08), ALE 0.60–0.72 (0.66 \pm 0.05), PME 0.36–

Table 2. Length of legs and palpal segments of paratype female *Bumba lennoni*.

	I	II	III	IV	Palp
Fe	14.50	13.75	12.63	16.13	10.00
Pa	9.25	8.63	7.25	7.63	6.25
Ti	11.75	10.25	9.13	12.00	7.75
Mt	9.50	9.63	12.88	19.00	-----
Ta	6.00	5.38	5.75	6.00	6.13
Total	51	47.64	47.64	60.76	30.13

0.44 (0.40±0.03), PLE 0.56 (0.46±0.07), AME-AME 0.24–0.44 (0.34±0.10), AME-ALE 0.34 (0.29±0.10), PME-PME 1.50 (1.22±0.21), PME-PLE 0.19 (0.77±0.49), ALE-PLE 0.25 (0.22±0.03), OQ length 1.00–1.13 (1.08±0.06), width 2.16–2.81 (2.42±0.28), clypeus 0.56–0.84 (0.69±0.12). Fovea width 1.92–2.56 (2.24±0.26). Labium length 1.75–2.31 (2.05±0.27), width 2.50–3.34 (2.71±0.43). Sternum length 6.88–8.13 (7.32±0.59), width 6.38–7.5 (6.75±0.51). Legs: I 38.25–51.00 (42.50±5.95), II 35.25–47.64 (40.94±5.30), III 35.88–47.64 (40.76±5.23), IV 46.63–60.76 (52.50±6.29), palp 24.50–30.13 (26.94±2.53).

Etymology. The specific name is patronymic in honor of John Winston Lennon (1940–1980), the legendary creator of The Beatles, who contributed to make this world a gentler place.

Natural history. All specimens from Estação Científica Ferreira Penna, FLONA Caxiuanã were collected in pit-fall traps used for herpetological surveys or in nocturnal manual searching, in both flooded and dry areas.

Acknowledgments

We greatly thank to arachnological team of MPEG, specially C. A. Lopes, C. O. Araújo, B. C. Araújo, D. E. Guimarães, J. A. P. Barreiros (*in memoriam*) and N. Abraham) who collected the specimens used in this paper. We also thank CNPq for the financial support (grants DOC#143220/2009-8 to LTM, PQ#304965/2012-0 to ABB, PV# 450468/2011-9 to FPM). The fieldwork was partly sponsored by the Programa de Pesquisas em Biodiversidade da Amazônia Oriental - Núcleo Leste Paraense (PPBio/AO-LNP, CNPq grant # 558202/2009-8).

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A review of the dragon millipede genus *Desmoxytes* Chamberlin, 1923 in China, with descriptions of four new species (Diplopoda, Polydesmida, Paradoxosomatidae)

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Academic editor: D. V. Spiegel | Received 10 June 2014 | Accepted 29 September 2014 | Published 20 October 2014

<http://zoobank.org/1DD006FB-85C3-4E34-862E-98B77B9F1084>

Citation: Liu WX, Golovatch SI, Tian MY (2014) A review of the dragon millipede genus *Desmoxytes* Chamberlin, 1923 in China, with descriptions of four new species (Diplopoda, Polydesmida, Paradoxosomatidae). ZooKeys 448 9–26. doi: 10.3897/zookeys.448.8081

Abstract

Four new species of *Desmoxytes* are described from southern China: *D. lingulata* **sp. n.**, *D. parvula* **sp. n.**, and *D. nodulosa* **sp. n.**, from Guangxi Zhuang Autonomous Region, and *D. getuhensis* **sp. n.** from Guizhou Province. In addition, new records of *D. scutigeroideus* Golovatch, Geoffroy & Mauriès, 2010 and *D. scolopendroides* Golovatch, Geoffroy & Mauriès, 2010 are provided, with a modified key to *Desmoxytes* species currently known to occur in China. Two of the new species, *D. nodulosa* **sp. n.** and *D. getuhensis* **sp. n.**, seem to be troglobites.

Keywords

Diplopod, *Desmoxytes*, new species, cave, troglobite, key, China

Introduction

Desmoxytes Chamberlin, 1923 is a large, common, rather well defined, southeast Asian genus of the basically oriental millipede tribe Orthomorphini, subfamily Paradoxosomatinae, family Paradoxosomatidae (Golovatch et al. 2012). The genus is one of the very

few among paradoxosomatid millipedes which not only harbours troglobitic species, but also bears its own vernacular name, the “dragon millipedes”, labeled so to emphasize the unusually prominent, wing-, spine- or antler-shaped paraterga. At the moment, *Desmoxytes* is represented by 29 species, usually aposematic, brightly coloured and surface-active, ranging from southern China in the north, through Indochina, down to approximately the middle of Malay Peninsula within both Thailand and Malaysia in the south (Golovatch et al. 2012). Only one species, *D. planata* Pocock, 1895, has attained a vast, nearly pantropical distribution through human agency (Nguyen and Sierwald 2013).

At present, China supports 10 species of *Desmoxytes*, including 7 presumed troglobites. Unlike the epigeal congeners usually demonstrating bright live colorations, the cavernicolous *Desmoxytes* are typically poorly pigmented and appear to be confined to caves in southern China while the genus is the sole among oriental Paradoxosomatidae to contain troglobites (Golovatch et al. 2010, 2012). The following species of *Desmoxytes* have hitherto been known to occur in continental China:

- D. cornuta* Zhang & Li, 1982, from Guangxi, Guilin, Yangshuo (Zhang and Li 1982).
- D. draco* Cook & Loomis, 1924, from Jiangxi, Jiujiang, Lushan Mountains (Cook and Loomis 1924).
- D. eupterygota* Golovatch, Li, Liu & Geoffroy, 2012, from two caves in Hunan, Chenzhou, Linwu (Golovatch et al. 2012).
- D. longispina* Loksa, 1960, from a cave in Guangxi (no exact locality is known) (Loksa 1960; Golovatch et al. 2010, 2012).
- D. lui* Golovatch, Li, Liu & Geoffroy, 2012, from a cave in Guangxi, Yongfu (Golovatch et al. 2012).
- D. minutubercula* Zhang, 1986, from Guangxi, Tianlin (Zhang 1986).
- D. planata* Pocock, 1895, from a cave in Yunnan, Luxi, but basically nearly pantropical (Pocock 1895; Zhang 1986).
- D. scolopendroides* Golovatch, Geoffroy & Mauriès, 2010, from a cave in Guangxi, Huanjiang (Golovatch et al. 2010).
- D. scutigeroides* Golovatch, Geoffroy & Mauriès, 2010, from several caves in Guangxi, Huanjiang (Golovatch et al. 2010).
- D. spinissima* Golovatch, Li, Liu & Geoffroy, 2012, from a cave in Guangxi, Fuchuan. (Golovatch et al. 2012).

The present paper describes a further four new species of *Desmoxytes*, two of which seem to be troglobites, as well as provides new records of two known presumed troglobitic congeners.

Material and methods

The holotypes and a number of paratypes are deposited in the zoological collection of the South China Agricultural University, Guangzhou, China (SCAU), with some

material also to be housed in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZAS), and Zoological Museum, State University of Moscow, Russia (ZMUM). The methods and terminology used are after Golovatch et al. (2012).

Taxonomic part

Desmoxytes lingulata sp. n.

<http://zoobank.org/2C15FE60-AD85-4A8E-83A8-1577D277735E>

Figs 1–3

Holotype. ♂ (SCAU), China, Guangxi, Guilin City, Pingle County, Ertang Town, Chaotianyan, 24°37.075'N, 110°45.501'E, 257 m, 29.IV.2013, leg. Tian Mingyi, Liu Weixin, Sun Feifei & Yin Haomin.

Paratypes. 3 ♂ (SCAU), same locality and collecting data as of the holotype.

Name. To emphasize a peculiar, paramedian, linguiform, sternal process between ♂ coxae 5.

Diagnosis. Differs from congeners in the paraterga being antler-shaped, the humped ♂ femur 6, combined with small, setose tubercles between ♂ coxae 3 and a peculiar sternal process between ♂ coxae 5, as well as the stout and curved gonopod femorite and a condensed solenophore.

Description. Length ca 18.0–18.5 mm (♂), width of pro- and metaterga together with paraterga 0.8–1.0 and 1.8–2.0 mm (♂), respectively. Holotype 18.0 mm long, 0.8 and 2.0 mm wide on midbody pro- and metazonae, respectively. Head broadest, 1.2–1.4 mm (♂) (Fig. 1D). Coloration of material rather uniformly dark brownish (Fig. 1). Antennomeres 5 and 6, paraterga, posterior parts of metaterga, and sterna brownish to yellow brownish; apex of antennomere 7 pallid; a few basal podomeres yellowish (Fig. 1). Head densely setose, epicranial suture distinct (Fig. 1A). Antennae rather long and slender, reaching back until segment 7 or 8 (♂) when stretched dorsally, antennomeres 5 and 6 each with a compact apicodorsal group of bacilliform sensilla.

Prozonae very delicately microalveolate; surface below paraterga 2–4 rather shagreened and microspinulate (Fig. 2B), surface below following paraterga and metaterga finely microgranulate and moderately setose (Fig. 1D, E). Collum with three transverse rows of large, setigerous spines: 4+4 anterior, 2+2 intermediate, 1+1 posterior; paraterga stout and spiniform, directed dorsolaterad, with a setigerous spine anteriorly at base (Figs 1D, 2A). Metaterga 2–4 with 2+2 and 2+2 large setigerous spines arranged in two transverse rows (Figs 1D, 2B); metaterga 5–18 with three transverse rows of setigerous spines: 1+1 anterior; 1+1 intermediate, located at base of paraterga; 2+2 posterior, lateral spines of posterior rows much larger than the others in metaterga 2–18 (Figs 1E, 2C); metatergum 19 with 2+2(3) anterior and 2+2(3) posterior rows of setigerous spines of same size (Fig. 1F). Paraterga antler-shaped, very strongly developed, ca 0.8–1.0 times as long as body height. Paraterga 2–4 subvertical (Fig. 2B); following paraterga 5–18 rather long, evidently 2- or 3-dentate laterally, near tip of each denticle

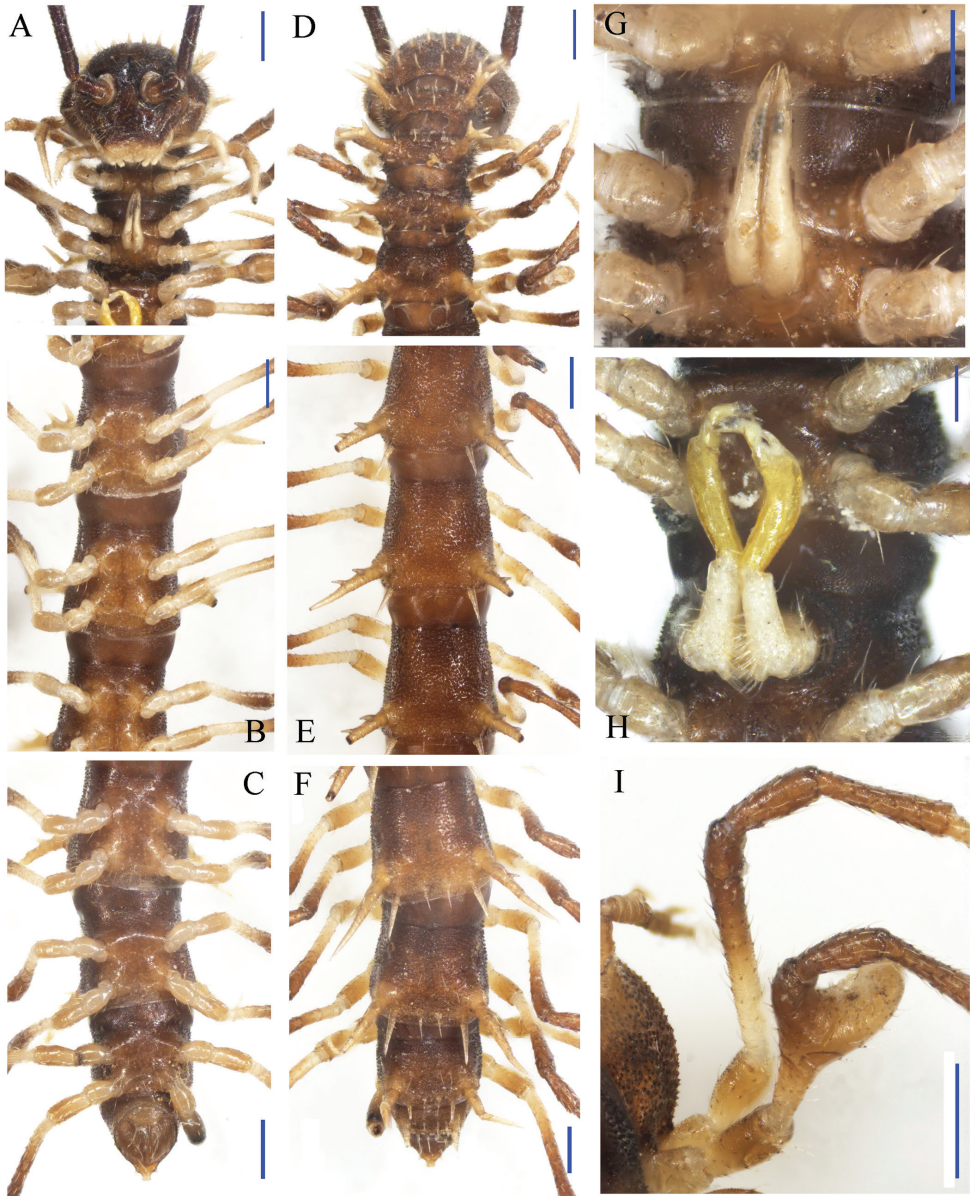


Figure 1. *Desmoxytes lingulata* sp. n., ♂ paratype from Ertang Twon, Chaotianyan. **A, D** anterior part of body, ventral and dorsal views, respectively **B, E** midbody segments, ventral and dorsal views, respectively **C, F** posterior part of body, ventral and dorsal views, respectively **G** sternal process in the middle of ♂ sternum 5 *in situ*, ventral view **H** gonopods *in situ*, ventral view **I** femur 6, lateral view. Scale bars: **A–F, I** = 0.5 mm; **G, H** = 0.2 mm.

with a seta, directed dorsolaterally and ending up clearly above dorsum (Figs 1E, 2C); paraterga 19 short spines directed caudad (Fig. 1F). Ozopores rather inconspicuous. Transverse sulcus visible on metaterga 2–18. Pleurosternal carinae very evident on ♂

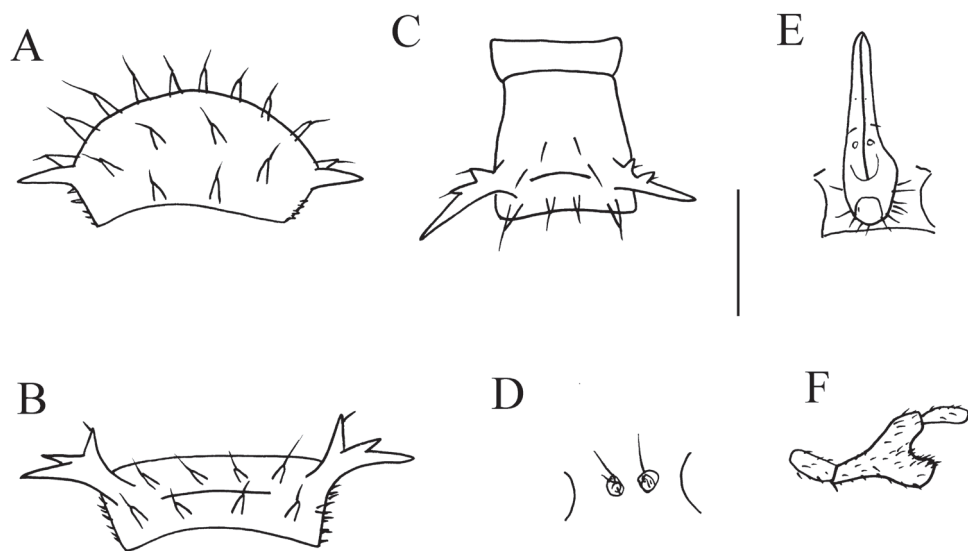


Figure 2. *Desmoxytes lingulata* sp. n., ♂ paratype from Ertang Twon, Chaotianyan. **A** Collum **B** metatergum 2, dorsal view **C** segment 10, dorsal view **D** sternal cones between coxae 3, ventral view **E** sternal processes between coxae 5, ventral view **F** femur 6, front view. Scale bar: **A–B, D–E** = 0.5 mm; **C, F** = 1.0 mm.

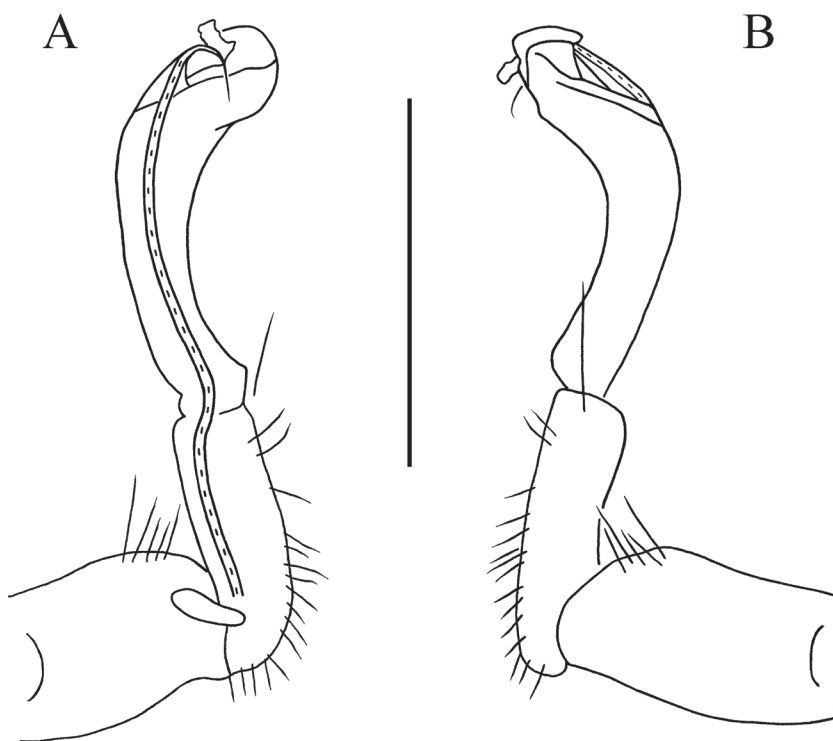


Figure 3. *Desmoxytes lingulata* sp. n., ♂ paratype from Ertang Twon, Chaotianyan. **A, B** left gonopod, mesal and lateral views, respectively. Scale bar: 0.5 mm.

segments 2 and 3, obscure on the rest. Epiproct with 2+2 setigerous tubercles on lateral sides, and 1+1 paramedian ones near midway dorsally, tip subtruncate, lateral pre-apical papillae very distinct, tuberculiform. Hypoproct subtrapeziform, caudal margin very slightly concave, setigerous cones at caudal edge very small, widely separated (Fig. 1C, F). Axial line missing.

Sterna sparsely setose, cross-impressions faint (Fig. 1B). A paramedian pair of entirely separated, very small, setose tubercles between ♂ coxae 3 (Fig. 2D). A peculiar, paramedian, linguiform sternal process between ♂ coxae 5 (Figs 1A, G, 2E). Legs 1 short, following ones increasingly longer and slenderer towards telson, ca 3.5–4.0 (♂) times longer than body height. ♂ femur 6 with a very strong, mesal, distoventrally densely pilose apophysis in distal half (Figs 1I, 2F).

Gonopods (Figs 1H, 3A, B) subfalcate. Coxite subcylindrical, poorly setose disto-dorsally, about 1/3 as long as telopodite. Prefemoral portion rather long, about as long as acropodite, densely setose. Femorite short, curved dorsad, with seminal groove running entirely on mesal side, apically with a strongly condensed solenophore. Solenomere short, flagelliform, folded apically, rather faintly separated at base from solenophore.

Remarks. This species seems to be especially similar to *D. cornuta* Zhang & Li, 1982, from Guangxi, Guilin, Yangshuo. Obvious differences lie in a peculiar linguiform sternal process between ♂ coxae 5, combined with the stout, curved gonopod femorite and a condensed solenophore in *D. lingulata* sp. n., as opposed to an elongated and suberect one in *D. cornuta* (cf. Zhang and Li 1982).

***Desmoxytes parvula* sp. n.**

<http://zoobank.org/0E3F9DD5-1FFE-45BB-B896-631C999232F4>

Figs 4–6

Holotype. ♂ (SCAU), China, Guangxi, Hechi City, Du'an County, Xia'ao Town, cave I, 24°15.144'N, 107°56.272'E, 347 m, 2.V.2013, leg. Tian Mingyi, Liu Weixin, Sun Feifei & Yin Haomin.

Paratype. 1 ♀ (SCAU), same locality and collecting data as of the holotype.

Name. To emphasize the small size of this species.

Diagnosis. Differs from congeners in the combination of spiniform paraterga, a paramedian pair of subtrapzoidal processes between ♂ coxae 4, the humped ♂ femur 6, and certain details of gonopod structure.

Description. Length ca 18 (♂) or 19 mm (♀), width of pro- and metaterga together with paraterga 0.8 and 1.2 (♂), or 1.0 and 1.4 mm (♀), respectively. Head broadest, 1.3 mm (♂) or 1.5 mm (♀) wide. Coloration of material rather uniformly brownish, antennae and lateral body parts dark brown, venter and a few basal podomeres yellowish, basal parts paraterga pink (Fig. 4). Head densely setose, epicranial suture distinct. Antennae long and slender, reaching back to segment 6 (♂) or 4 (♀) when stretched dorsally, antennomeres 5 and 6 each with a compact apicodorsal group of bacilliform sensilla.

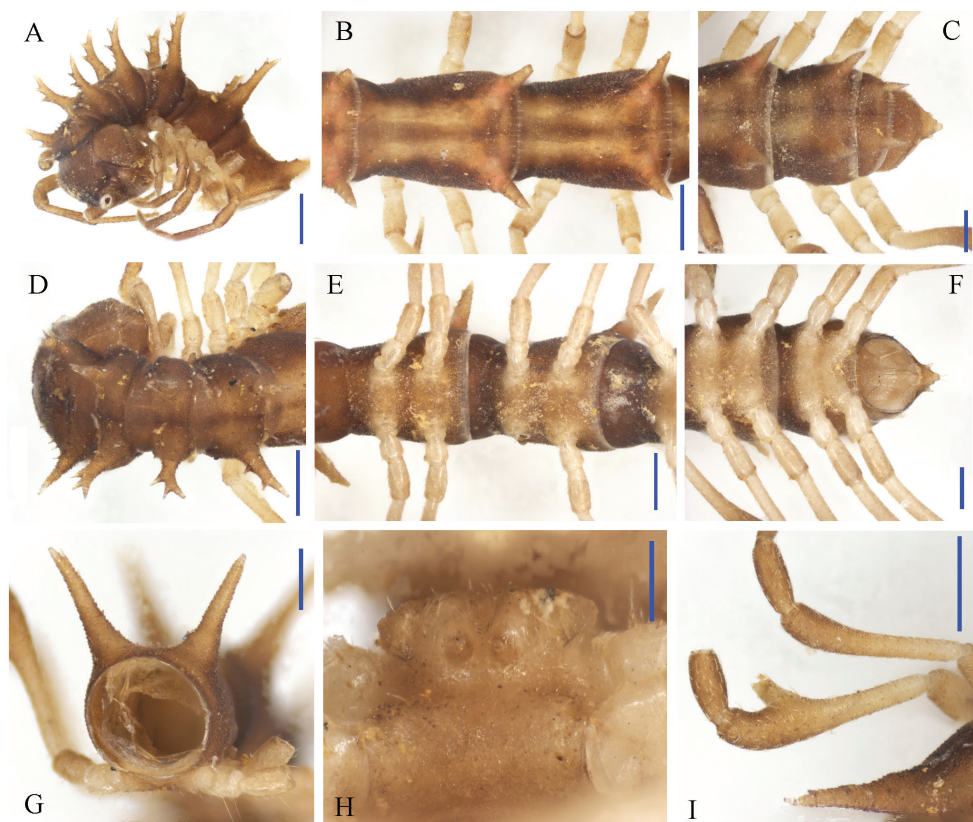


Figure 4. *Desmoxytes parvula* sp. n., ♂ holotype from Xia'ao Town, cave I. **A, D** anterior part of body, lateral and dorsal views, respectively **B, E** midbody segments, dorsal and ventral views, respectively **C, F** posterior part of body, dorsal and ventral views, respectively **G** cross-section of a midbody segment, frontal view **H** sternal process between coxae 4 *in situ*, ventral view **I** femur 6, lateral view. Scale bars: **A–G, I** = 0.5 mm; **H** = 0.2 mm.

Pro- and metazonae very delicately microalveolate, metaterga finely shagreened and transversely rugulose, surface below paraterga finely shagreened (Fig. 4A–F). Collum with three transverse rows of rather evident spines: 5(6)+5(6) anterior, 4+4 intermediate and 4(5)+4(5) posterior, setae often visible, but sometimes obliterated (Fig. 5A); paraterga spiniform, each with 2 denticles laterally, a spine anteriorly at base (Figs 4A, 5A). Metaterga 2–4 with three transverse rows of setigerous tubercles: 4+4 anterior, 4+4 intermediate, 5+5 posterior. Starting from metatergum 5, anterior row gradually showing 1–2 additional tubercles so that following metaterga with transverse rows of 4–6 irregular tuberculations varying in number, but posterior two rows usually regular, each with (3–5)+(3–5) and (5–8)+(5–8) tuberculations (Fig. 4B). Metatergum 19 with five rather regular rows of tuberculations. Paraterga spiniform, each with 2–3 denticles (Fig. 4A–D). ♂ paraterga 2–9 subvertical, following paraterga directed dorsolaterally (Fig. 4A–B, G), but ♀ paraterga mostly low and short; paraterga 19 directed

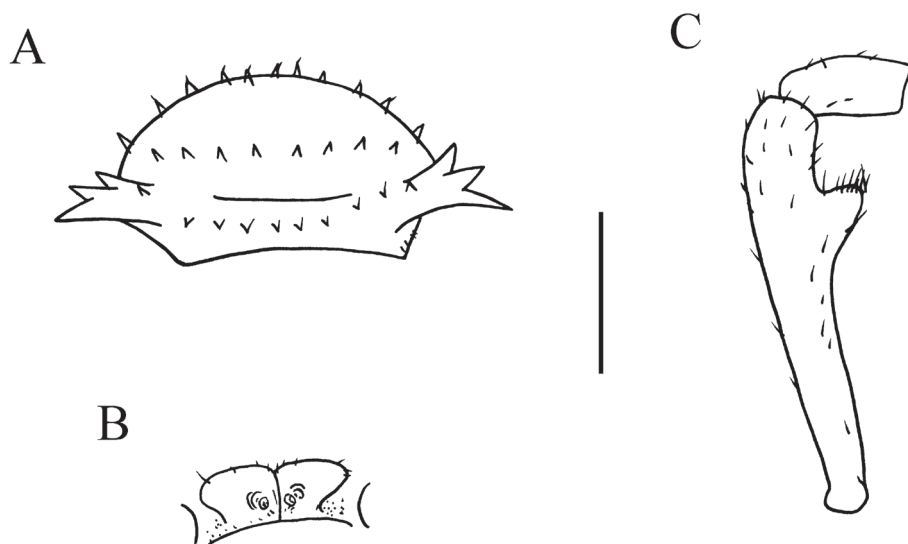


Figure 5. *Desmoxytes parvula* sp. n., ♂ holotype from Xia'ao Town, cave I. **A** Collum **B** sternal process between coxae 4, ventral view **C** femur 6, lateral view. Scale bar: 0.5 mm.

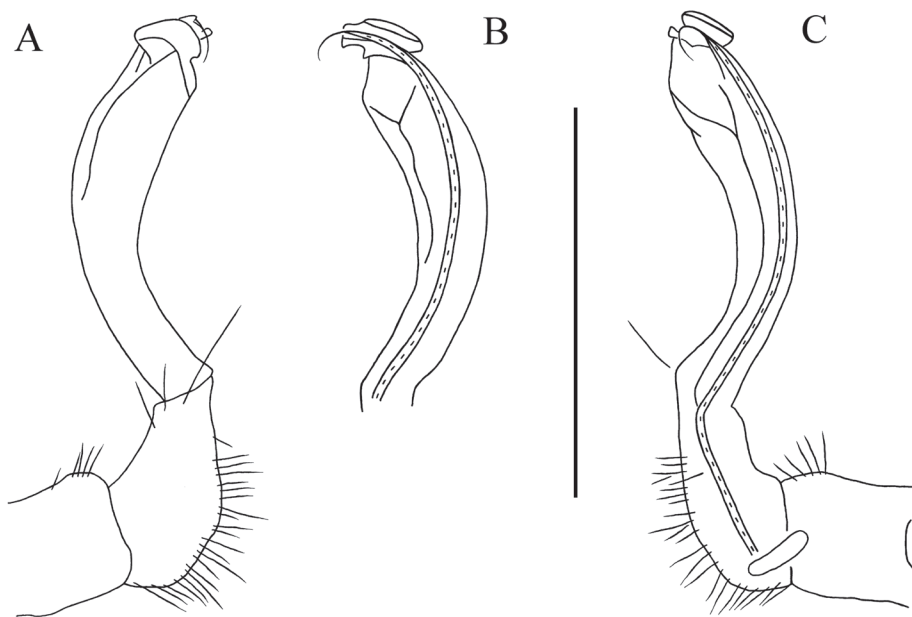


Figure 6. *Desmoxytes parvula* sp. n., ♂ holotype from Xia'ao Town, cave I. **A–C** right gonopod, lateral, dorsal and mesal views, respectively. Scale bar: 0.5 mm.

caudad (Fig. 4C). Ozopores inconspicuous. Transverse sulcus visible on coullum and metaterga 2–18 (Figs 4B–C, 5A). Pleurosternal carinae poorly developed on segments 2 and 3 both in ♂ and ♀, absent on the rest (Fig. 4D). Epiproct (Fig. 4C) simple,

dorsal subapical and, especially, lateral pre-apical papillae very distinct, tuberculiform. Hypoproct (Fig. 4F) subtrapeziform, caudal margin very slightly concave, setigerous cones at caudal edge very small, widely separated. Axial line present.

Sterna moderately setose, cross-impressions very weak (Fig. 4E). A paramedian pair of subtrapzoidal processes between ♂ coxae 4 (Figs 4H, 5B). Legs 1 short, following ones increasingly longer and slenderer towards telson, ca 2.5 (♂) or 2.0 (♀) times longer than body height. ♂ femur 6 with a very evident, digitiform, distoventral apophysis in distal 1/3 (Figs 4I, 5C).

Gonopods (Fig. 6A–C) simple, strongly elongated. Coxite rather short, subcylindrical, poorly setose distodorsally, about 1/3 as long as telopodite. Prefemoral portion about half as long as acropodite, densely setose. Femorite rather long, strongly curved dorsad, slightly enlarged distally, with seminal groove running entirely on the mesal side. Postfemoral part strongly condensed; solenomere short, flagelliform, sheathed by a similarly short solenophore.

Remarks. Even though this species has been taken from a cave, it hardly represents a true cavernicole as it is rather strongly pigmented and shows short antennae and legs.

***Desmoxytes nodulosa* sp. n.**

<http://zoobank.org/D3F59C0C-A666-459B-9B51-542DB05A2AB4>

Figs 7–9

Holotype. ♂ (SCAU), China, Guangxi, Hechi City, Du'an County, Xia'ao Town, near Xia'ao Middle School, cave II, 24°17.987'N, 107°57.146'E, 317 m, 3.V.2013, leg. Tian Mingyi, Liu Weixin, Sun Feifei & Yin Haomin.

Paratypes. 3 ♂, 4 ♀ (SCAU), 1 ♂, 1 ♀ (IZAS), 1 ♂, 1 ♀ (ZMUM), same locality, and collecting data as of the holotype. 1 ♀ (SCAU), same county, Yong'an Town, Yong'an Village, cave I, 24°14.659'N, 108°03.032'E, 287 m; 1 ♀ (SCAU), same town, Anju Village, cave Suidao Dong, 24°13.340'N, 108°05.694'E, 311 m, 3.V.2013, leg. Tian Mingyi, Liu Weixin, Sun Feifei & Yin Haomin; 1 ♂, 2 ♀ (SCAU), same county, Longwan Town, Qunle Village, cave I, 23°56.021'N, 108°10.962'E, 459 m, 27.VI.2013, leg. Tian Mingyi, Lin Wei, Liu Weixin, Yin Haomin & Huang Sunbin.

Name. To emphasize the humped ♂ femora 5–7.

Diagnosis. Differs from congeners in most of the paraterga being wing-shaped, combined with the humped ♂ femora 5–7, the sternal process present between ♂ coxae 4, occasionally also between ♂ coxae 3, as well as a short gonopod femorite and a strongly condensed solenophore.

Description. Length ca 19–22 (♂) or 20–23 mm (♀), width of midbody pro- and metaterga together with paraterga 1.0–1.5 and 2.2–2.8 (♂), or 1.8–2.0 and 2.8–3.0 mm (♀), respectively. Holotype 21.0 mm long, 1.5 and 2.5 mm wide on midbody pro- and metaterga, respectively. Coloration of material varying from pallid to rather uniformly dark brownish (Fig. 7A). Head yellowish to dark brownish; antennae and anterior body part often a little darker brownish; paraterga, posterior

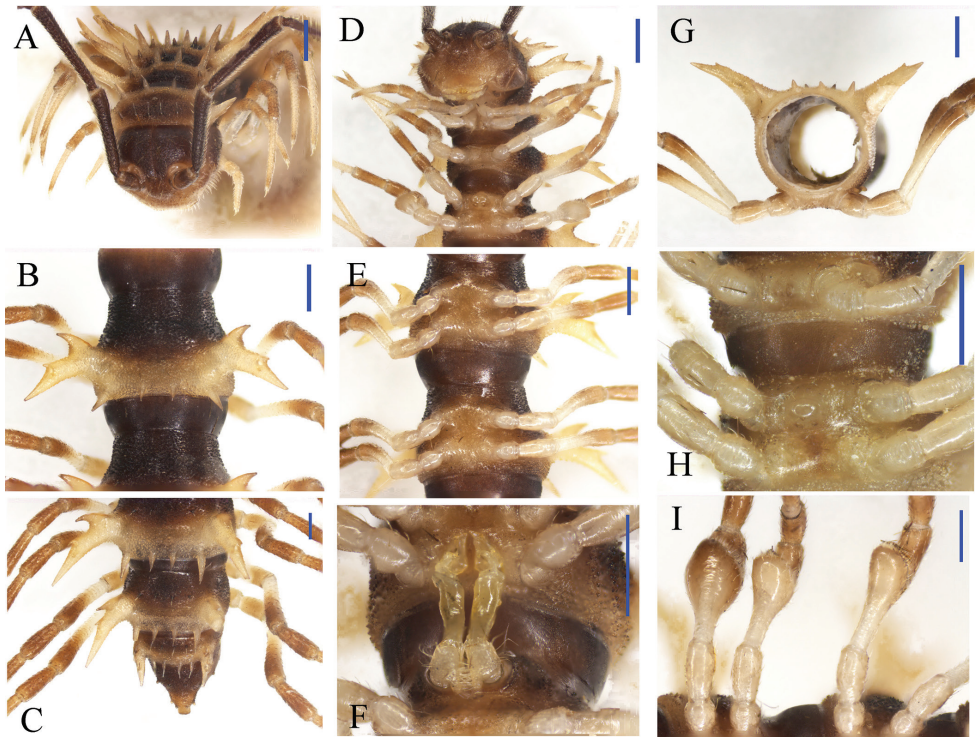


Figure 7. *Desmoxytes nodulosa* sp. n., ♂ paratype from Xia'ao Town, near Xia'ao Middle School, cave II. **A, D** anterior part of body, subdorsal and ventral views, respectively **B, E** midbody segments, dorsal and ventral views, respectively **C** posterior part of body, dorsal view **F** gonopods *in situ*, ventral view **G** cross-section of a midbody segment, caudal view **H** sternal processes between coxae 3 and 4, ventral view **I** femora 5–7, ventral view. Scale bars: 0.5 mm.

parts of metaterga, sterna and a few basal podomeres pallid to yellowish (Fig. 7A, D). In width, head > collum > segment 2–4 < 5–18, thereafter body gradually tapering towards telson. Head rather densely setose, epicranial suture distinct (Fig. 7A). Antennae rather long and slender, reaching back until segment 6 (♂) or 5 (♀) when stretched dorsally, antennomeres 5 and 6 each with a compact apicodorsal group of bacilliform sensilla.

Prozonae very delicately microalveolate, but shining; collum, metaterga, paraterga and surface below paraterga finely shagreened and microgranulate, moderately setose in posterior parts of metaterga (Fig. 7B–E). Collum with two transverse rows of coniform spines: 4+4 anterior, 2+2 posterior; paraterga stout and spiniform, directed dorsolaterad, with a spine anteriorly at base (Figs 7A, 8A). Metaterga 2–19 each with 2+2 and 2+2 (or 2+3) coniform spines arranged in two transverse rows, lateral spines of posterior rows much larger than the others in metaterga 2–18 (Figs 7A–C, G, 8B), but of same size on metatergum 19 (Fig. 7C). Paraterga very strongly developed, wing-shaped, usually 3-lobate laterally, occasionally with a setigerous denticle near ozopore, slightly thicker in pore-bearing segments; tip of each para-

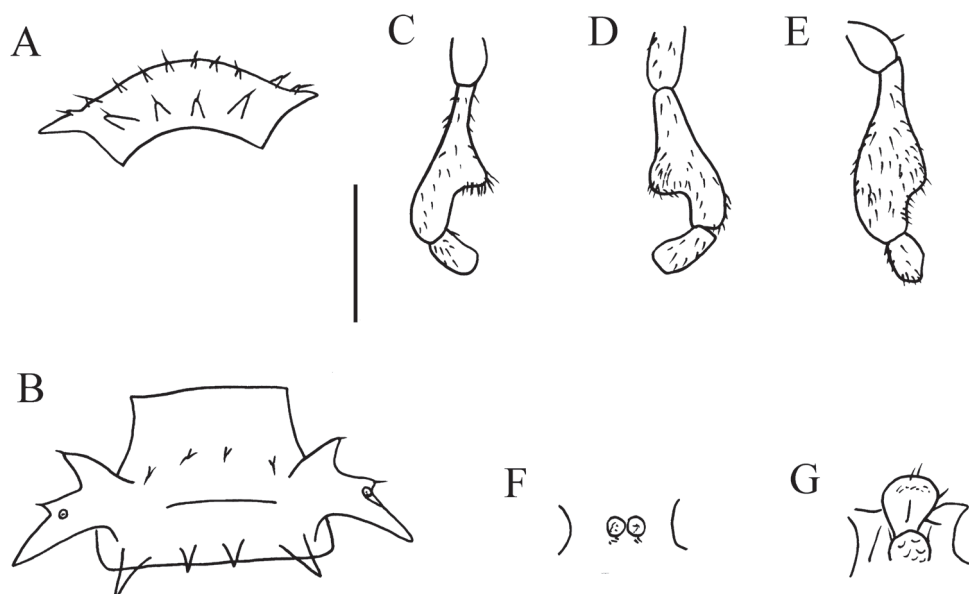


Figure 8. *Desmoxytes nodulosa* sp. n., ♂ paratype from Xia'ao Town, near Xia'ao Middle School, cave II. **A** Collum **B** matatergum 10, dorsal view **C-E** femora 5-7, lateral view **F** sternal processes between coxae 3, ventral view **G** sternal processes between coxae 4, front view. Scale bar: **A-E** = 1.0 mm; **F-G** = 0.5 mm.

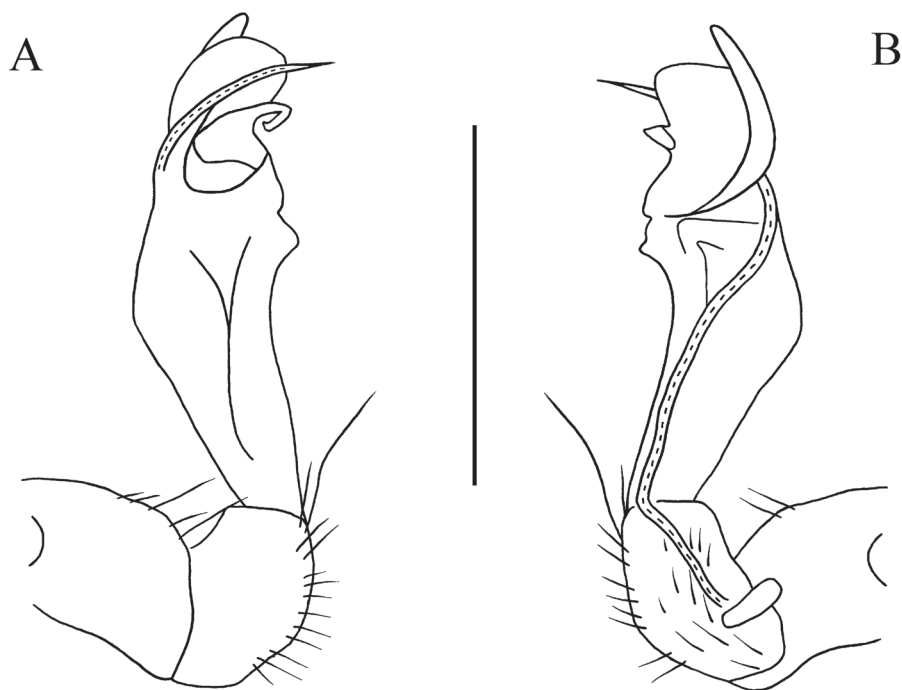


Figure 9. *Desmoxytes nodulosa* sp. n., ♂ paratype from Xia'ao Town, near Xia'ao Middle School, cave II. **A, B** right gonopod, lateral and mesal views, respectively. Scale bar: 0.5 mm.

tergal incision with an evident lateral seta (Figs 7B, G, 8B). Paraterga 2–8 directed obliquely upwards at ca 45°, following pareterga growing increasingly horizontal and ending up clearly above dorsum in ♂ (Fig. 7B–C), but slightly lower, shorter, sub-horizontal and level to dorsum in ♀. Pore formula normal; ozopores conspicuous, located inside an ovoid groove about 1/3 in front of caudal corner (Figs 7B–C, 8B). Transverse sulcus obscure on collum and metaterga 2–4; more evident, but incomplete on metaterga 5–18 (Figs 7D, 8B). Pleurosternal carinae visible on segments 2 and 3 in both sexes, absent on the rest. Epiproct with 1+1 setigerous knobs on lateral sides, and 2+2 paramedian ones dorsally near midway, tip truncate, lateral pre-apical papillae very distinct, tuberculiform (Fig. 7C). Hypoproct subtrapeziform, caudal margin very slightly concave, setigerous cones at caudal edge very small, widely separated. Axial line missing.

Sterna sparsely setose, cross-impressions visible (Fig. 7E). A rounded subcylindrical sternal process with two small pores between ♂ coxae 4 (Figs 7H, 8G); occasionally a paramedian pair of small, short, rounded tubercles between ♂ coxae 3 as well (Figs 7H, 8F). Legs 1 short, following ones growing increasingly longer and slenderer towards telson, ca 2.2–2.8 (♂) or 2.0–2.2 (♀) times longer than midbody height. ♂ femora 5–7 each with a very strong, rounded, mesal, densely pilose apophysis in distal 1/2 (Figs 7I, 8C–E).

Gonopods (Figs 7F, 9A, B) short. Coxite short, subcylindrical, poorly setose distodorsally, about 1/3 as long as telopodite. Prefemoral portion less than half as long as acropodite, densely setose. Femorite quite stout, slightly enlarged distad, with seminal groove running entirely on the mesal side, apically with a distinct sulcus demarcating a short, strongly condensed solenophore. Solenomere long, flagelliform, well separated at base from solenophore.

Remarks. Although the coloration of this species is quite variable, based on several troglomorphic traits such as some individuals being completely unpigmented, and the antennae and legs clearly elongated, this species may well be a troglobite.

***Desmoxytes getuhensis* sp. n.**

<http://zoobank.org/D8B16E5A-72FA-4054-9A35-F04EC4EB2FB1>

Figs 10–12

Holotype. ♂ (SCAU), China, Guizhou Prov., Anshun City, Ziyun County, Getuhe National Geopark, cave Suidao Dong, 25°41.32'N, 106°18.26'E, 950 m, 28.XII.2012, leg. Tian Mingyi, Liu Weixin, Sun Feifei & Yin Haomin.

Paratypes. 2 ♂, 5 ♀, 1 ♂ juv., 1 ♀ juv. (SCAU), 1 ♂, 1 ♀ (IZAS), 1 ♂, 1 ♀ (ZMUM), same locality and collection data as of the holotype. 1 ♂, 6 ♀ (SCAU), same locality, cave Taiyang Dong, 25°41.55'N, 106°14.27'E, 1056 m, 28.XII.2012, leg. Tian Mingyi, Liu Weixin, Sun Feifei & Yin haomin.

Name. To emphasize the location of the new species within the Getuhe National Geopark.

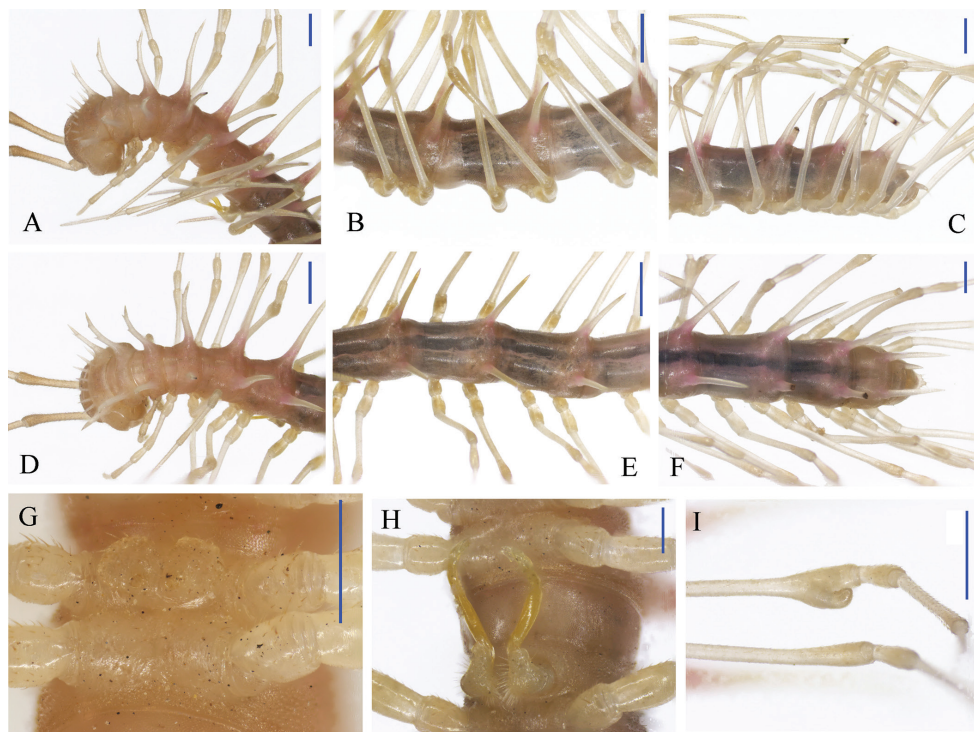


Figure 10. *Desmoxytes getuhensis* sp. n., ♂ paratype from Getuhe National Geopark, cave Taiyang Dong. **A, D** anterior part of body, sublateral and dorsal views, respectively **B, E** midbody segments, lateral and dorsal views, respectively **C, F** posterior part of body, lateral and dorsal views, respectively **G** sternal process between coxae 4 *in situ*, ventral view **H** gonopods *in situ*, ventral view **I** femur 6, lateral view. Scale bars: **A–F, I** = 1.0 mm, **G, H** = 0.5 mm.

Diagnosis. Differs from congeners in the paraterga being long and spiniform throughout, and the antennae and legs very long, combined with setose tubercles between ♂ coxae 4, the humped ♂ femur 6, and the gonopods strongly condensed.

Description. Length ca 23–27 (♂) or 25–28 mm (♀); width of pro- and metaterga together with paraterga 1.2–1.4 and 2.5–3.0 (♂) or 1.5–2.0 and 2.8–3.0 mm (♀), respectively. Holotype 26.0 mm long, 1.2 and 2.5 mm wide on midbody pro- and metaterga, respectively. Coloration of material rather uniformly light brownish to nearly pallid, anterior body part a little darker, some specimens pinkish (Fig. 10A–F). Antennomere 7 dark brown. Head broadest, densely setose, but more sparsely so on vertex, epicranial suture distinct (Fig. 10D). Antennae extremely long and slender, reaching back until segment 7 (♂) or 6 (♀) when stretched dorsally, antennomeres 5 and 6 each with a compact apicodorsal group of bacilliform sensilla.

Tegument rather shining and smooth, prozonae delicately microalveolate, metaterga and surface below paraterga finely shagreened to microgranulate (Fig. 10A–F). Collum with 5+5 evident spines arranged in a row at front margin, behind it with about 3(2)+3(2) and 2(3)+2(3) smaller spinules in an irregular transverse row; para-

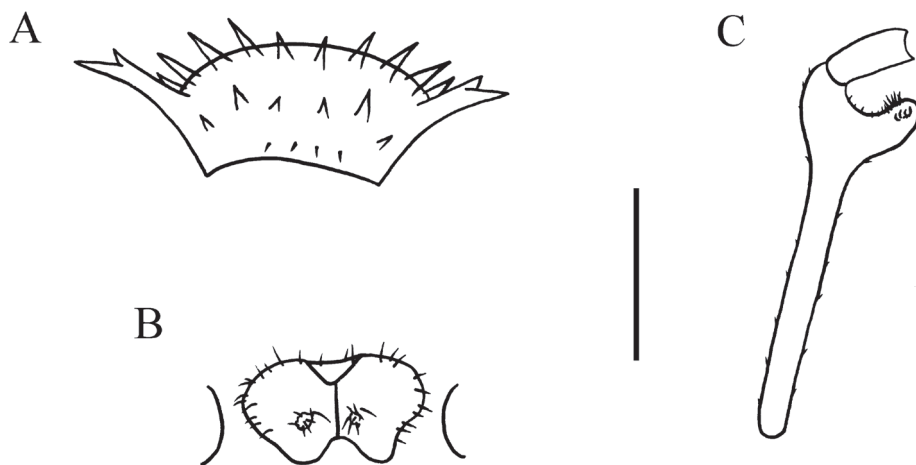


Figure 11. *Desmoxytes getuhensis* sp. n., ♂ paratype from Getuhe National Geopark, cave Taiyang Dong. **A** Collum **B** sternal process between coxae 4, ventral view **C** femur 6, lateral view. Scale bar: **A**, **C** = 1.0 mm; **B** = 0.5 mm.

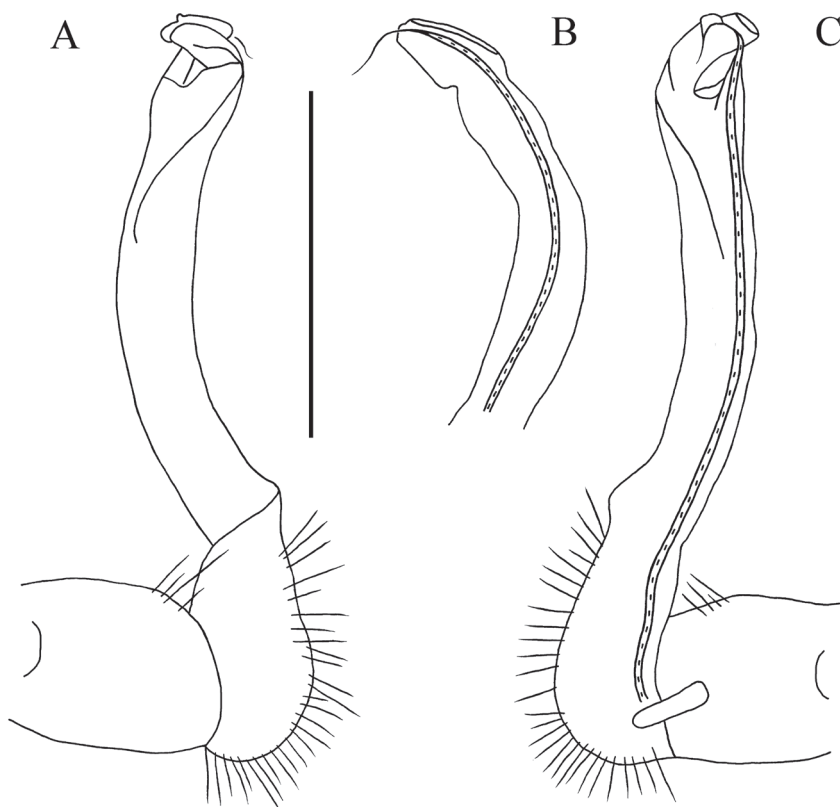


Figure 12. *Desmoxytes getuhensis* sp. n., ♂ paratype from Getuhe National Geopark, cave Taiyang Dong. **A–C** right gonopod telopodite, lateral, dorsal and mesal views, respectively. Scale bar: 0.5 mm.

terga stout and spiniform, directed dorsolaterad, with a small denticle frontally (Figs 10A, D, 11A). Metaterga 2–4 each with 3+3 and 3+3, similar, but smaller spinules arranged in two transverse rows; sculpture on following metaterga gradually disappearing. Metatergum 19 with 3+3 and 3+3 setae in two rows. Paraterga (Fig. 10A–F) extremely long, straight, spiniform, about as high as body height in ♂, a little shorter in ♀; mainly directed more dorsad than laterad and ending up clearly above dorsum on collum and in segments 2–18; only paraterga 19 subhorizontal, about level to dorsum, directed clearly caudad and reaching behind until about midlength along telson (Fig. 10F). Paraterga 2–4 each with two evident indentations frontally (Fig. 10 A, D). Pore formula normal; ozopores inconspicuous, located just at base on lateral side of poriferous paraterga. Transverse sulcus usually very vague, but traceable in segments 5–18 (Fig. 10E–F). Pleurosternal carinae evident only on segments 2 and 3 in both sexes (Fig. 10A), absent on the rest. Epiproct (Fig. 10F) rather simple, lateral pre-apical papillae very distinct, finger-shaped. Hypoproct subtrapeziform, caudal margin emarginate, setigerous cones at caudal edge very large, widely separated. Axial line present.

Sterna quite sparsely setose, cross-impressions weak (Fig. 10G–H). A paramedian pair of short, rounded, setose tubercles between ♂ coxae 4 (Figs 10G, 11B). Legs (Fig. 10C) extremely long and slender, ca 3.0–4.0 times longer than midbody height. ♂ femur 6 strongly inflated ventrally in distal 1/5 (Figs 10I, 11C).

Gonopods (Figs 10H, 12A–C) simple. Coxite rather short, subcylindrical, poorly setose distodorsally, about 1/3 as long as telopodite. Prefemoral portion about half as long as acropodite, densely setose. Femorite rather slender, elongate, slightly curved, with seminal groove running entirely on the mesal side. Postfemoral part strongly condensed; solenomere short, flagelliform, evidently separated at base from solenophore.

Remarks. Based on several troglomorphic traits such as some individuals being nearly unpigmented, and the antennae and legs very strongly elongated, this species seems to be a troglobite.

Desmoxytes scutigeroides Golovatch, Geoffroy & Mauriès, 2010

Desmoxytes scutigeroides Golovatch, Geoffroy & Mauriès, 2010: 58.

Desmoxytes scutigeroides – Nguyen and Sierwald 2013: 1242.

Material examined. 1 ♂, 1 ♀ (SCAU), China, Guangxi, Du'an County, Disu Town, Dading Village, cave II, 23°56.34'N, 108°0.32'E, 26.VI.2013, leg. Tian Mingyi, Lin Wei, Yin Haomin & Huang Sunbin; 1 ♂, 1 ♀, 1 ♀ fragment (SCAU), same county, Longwan Town, Nongqu Village, cave I, 23°56.021 N, 108°10.962 E, 459 m, 27.VI.2013, leg. Tian Mingyi, Liu Weixin, Lin Wei, Yin Haomin & Huang Sunbin.

Remarks. This species has been described from a few caves in Huanjiang County, Guangxi, China while the new samples derive from two caves in the neighbouring Du'an County, Guangxi. The above material is in good agreement with the original description by Golovatch et al. (2010).

Desmoxytes scolopendroides* Golovatch, Geoffroy & Mauriès, 2010Desmoxytes scolopendroides* Golovatch, Geoffroy & Mauriès, 2010: 60.*Desmoxytes scolopendroides* – Nguyen and Sierwald 2013: 1242.

Material examined. 1 ♀ (SCAU), China, Guangxi, Du'an County, Gaoling Town, Jinzhu Village, cave I, 24°06.547'N, 108°04.785'E, 190 m, 3.V.2013, leg. Tian Mingyi; 1 ♀ (SCAU), same locality, cave II, 24°06.514'N, 108°04.695'E, 218 m, 3.V.2013, leg. Liu Weixin; 5 ♂, 5 ♀ (SCAU), same county, Xia'ao Town, cave I, 24°15.144'N, 107°56.272'E, 347 m, 2.V.2013, leg. Tian Mingyi, Liu Weixin, Sun Feifei & Yin Haomin; 1 ♀, 4 ♂ juv., 8 ♀ juv. (SCAU), same cave, 28.VI.2013, leg. Tian Mingyi, Liu Weixin, Lin Wei, Yin Haomin & Huang Sunbin; 3 ♂, 3 ♀ (SCAU), same cave, 28.XII.2013, leg. Tian Mingyi, Liu Weixin, Yin Haomin & Luo Xiaozhu.

Remarks. This species has been described from a cave in Huanjiang County, Guangxi, China while the new samples come from a few more caves in the neighbouring Du'an County, Guangxi. The above material is in good agreement with the original description by Golovatch et al. (2010).

A key to *Desmoxytes* species in China

- 1 Paraterga spiniform, mostly very long and directed evidently more dorsad than laterad (Figs 4A–D, 10A–F) **2**
- Paraterga wing- (Fig. 7A–C) or antler-shaped (Fig. 1D–F) **8**
- 2 Adult body relatively small, length <20 mm..... ***D. parvula* sp. n.**
- Adult body much larger, length >20 mm..... **3**
- 3 Paraterga long and spiniform only on collum and following four segments, evidently shorter on segment 5, small and conical to tuberculiform thereafter...***D. lui***
- Paraterga subequally long and spiniform at least in segments 2–18 (Fig. 10A–F) **4**
- 4 Only ♂ femur 7 very evidently humped distoventrally ***D. longispina***
- Either ♂ femur 6 or both femora 6 and 7 very evidently humped distoventrally **5**
- 5 Both ♂ femora 6 and 7 very evidently humped ventrally in distal quarter..... ***D. spinissima***
- Only ♂ femur 6 very evidently humped distoventrally **6**
- 6 Metaterga not only with normally arranged setigerous tubercles, but also with a row of similar tubercles along posterior rim.....***D. minutubercula***
- Metaterga 2–4 with several transverse rows of setigerous spines, following metaterga smooth, sculpture gradually disappearing **7**
- 7 Gonopods telopodite subfalcate, femorite stouter relative to a condensed solenophore; Guangxi ***D. scutigeroides***

- Gonopods (Figs 10H, 12A–C) more simple, only slightly curved, femo-rite rather slender and elongate relative to a particularly short solenophore; Guizhou ***D. getubensis* sp. n.**
- 8 Paraterga wing-shaped **9**
- Paraterga antler-shaped **12**
- 9 ♂ femora unmodified ***D. eupterygota***
- At least a pair of ♂ femora (5–7) humped..... **10**
- 10 Metaterga 2–19 with only two transverse rows of 2+2(3) setigerous spines... **11**
- Metaterga 2–19 with more than two transverse rows of setigerous spines..... ***D. scolopendroides***
- 11 ♂ femora 5–7 very evidently humped distoventrally (Figs 7I, 8C–E); a single sternal process between ♂ coxae 4 (Figs 7H, 8G)..... ***D. nodulosa* sp. n.**
- ♂ femora 5 and 6 slightly humped distoventrally; two processes between ♂ coxae 4..... ***D. planata***
- 12 Paraterga 2–18 antler-shaped, evidently branched; Jiangxi..... ***D. draco***
- Anterior paraterga evidently antler-shaped, posterior paraterga rather long and spiniform, evidently 2- or 3-dentate laterally; Guangxi **13**
- 13 A pair of setose tubercles between ♂ coxae 3, and a peculiar linguiform sternal process between ♂ coxae 5 (Figs 1G, 2E)..... ***D. lingulata* sp. n.**
- A pair of bristle-like tubercles between ♂ coxae 3, and a very deeply divergent sternal process between ♂ coxae 5..... ***D. cornuta***

Acknowledgements

We thank Ms. Bo Jiang, Biodiversity Conservation official, Department of Environmental Protection, Guangxi Regional Government, Nanning, for her support and encouragement. Our thanks are also due to Mr. Weihua Yang, Getuhe National Geopark, and members of our team in SCAU, for their assistance. Two reviewers kindly provided their suggestions and critical remarks which were helpful to improve the manuscript. This study was sponsored by Nanjing Institute of Environmental Sciences, Ministry of Environmental Protection, through a biodiversity conservation project in 2013 which was focused on cave biodiversity, and the Specialized Research Fund for the Doctoral Program of Higher Education of China (Grant no. 20134404110026).

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A new species of *Isoperla* (Insecta, Plecoptera) from the Karawanken, with considerations on the Southern Limestone Alps as centers of endemism

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Academic editor: M. Gottardo | Received 27 August 2014 | Accepted 30 September 2014 | Published 20 October 2014

<http://zoobank.org/5B6A06E7-A1A6-4B58-B14B-6E7905DD7EF2>

Citation: Graf W, Konar M, Murányi D, Orci KM, Vitecek S (2014) A new species of *Isoperla* (Insecta, Plecoptera) from the Karawanken, with considerations on the Southern Limestone Alps as centers of endemism. ZooKeys 448: 27–36. doi: 10.3897/zookeys.448.8509

Abstract

A new species of the genus *Isoperla* (Plecoptera, Perlodidae), belonging to the *oxylepis* species-group is described, and the male mating call is characterized. Its range falls within a small region of the Southern Limestone Alps which is well known to be one endemism-centre of aquatic insects.

Keywords

Isoperla, new species, endemism, Austria, Slovenia, Southern Alps

Introduction

The genus *Isoperla* consists of about 150 species (DeWalt et al. 2011, Baumann and Lee 2009, Murányi 2011, Szczytko and Stewart 1979, Zwick and Surenkhorloo 2005) and covers the Holarctic and Oriental regions. In Europe 56 species are known so far (Graf et al. 2009, Murányi 2011), of which ten occur in Austria (Graf 2010). *Isoperla* is a morphologically difficult genus, especially the *grammatica* and *tripartita* species groups that both exhibit high variability, and requires further resolution. A synthesis of zoogeographical, morphological, molecular, and possibly behavioural data will be required to get full knowledge on the diversity of this highly interesting genus.

Recently a series of specimens were collected from the Karawanken Alps in southern Austria and the nearby Kamnik Alps in northern Slovenia deviating from all hitherto known species. In this paper we provide morphological descriptions of males, females and the larva. Additionally we illustrate drumming signals of one male.

Material and methods

Adult specimens were collected using sweep nets, larvae were collected by handpicking from cobbles (mesolithal), the dominant substrate type. Collected specimens were stored in 70% ethanol. Morphological characteristics of male terminalia were examined in KOH-treated, cleared specimens. Comparative material from the authors' collections enabled the identification of the new species.

Vibratory signal recordings were made using a small, dynamic speaker (SAL YD78) as a vibration transducer. The speaker was connected to the microphone input socket of a solid state, digital recorder (Zoom H4n). The examined specimen was placed on the diaphragm of the speaker. To prevent the specimen from escaping the speaker was covered by a sheet of hobby glass. During the recordings ambient air temperature was measured using a P 300W thermometer. Vibration recordings were analysed and oscillograms produced using the software Adobe Audition 1.5 (Adobe Systems Incorporated, San Jose, California, USA). Drumming signal terminology follows Stewart and Sandberg (2006) and Murányi et al. (2014).

Results

Isoperla claudiae Graf & Konar, sp. n.

<http://zoobank.org/50F79ECE-AD68-4DD1-BD7F-643D25205189>

Figs 1–3

Type material. Holotype: 1 male, Austria, Carinthia, Dolintschitschach brook south-east of Feistritz ob Bleiburg (46°32'6"N, 14°45'52"E), 600m a.s.l., 30.5.2014, leg.

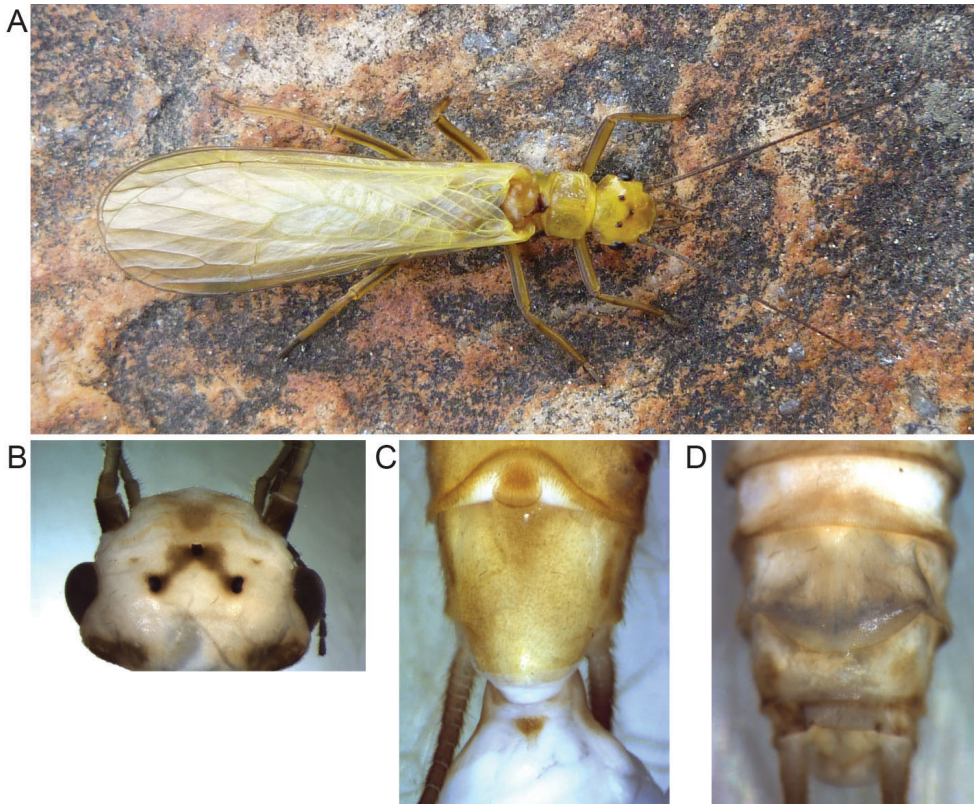


Figure 1. *Isoperla claudiae* sp. n. **A** habitus **B** colouration of the head of *I. claudiae* **C** ventral view of the male abdomen with extruded penis **D** ventral view of the female abdomen.

W. Graf; Paratypes: 3 males, 2 females, same place, date and collector. The holotype is deposited at the Linzer Landesmuseum, Linz, Austria, paratypes are stored in the first author's collection.

Other material. 1 male (drumming call examined), 1 female (HNHM: PLP4333), Slovenia, Upper Carniola, Kamnik municipality, Kamnik Alps, small forest brook S of Podvolovljek Pass (46°16.250'N 14°41.325'E), 980m a.s.l., 09.07.2013, leg. D. Murányi, I. Sivec.

Type locality. Austria, Carinthia, Feistritz ob Bleiburg, Dolintschitschach brook.

Etymology. The species is named in honour of the second author's wife Claudia.

Diagnosis. An *Isoperla* exhibiting the following combination of characters: (1) a small medial penial armature in the form of an equilateral triangle, lacking lateral penial armatures; (2) yellow head and pronotum with a small horseshoe-like brown marking connecting the ocelli.

Description. Medium-sized species, macropterous. Body length: holotype 10.5 mm, allotypes 11–12 mm; forewing length: holotype 12 mm, paratypes 12–14 mm. Primary colouration yellow, head and pronotum mostly yellow with dark brown

markings; pilosity short. Primary colouration of the head yellow, with a dark horse-shoe-like brown patch connecting the three ocelli (Fig. 1A, B). Occiput with indistinct rugosities but with brown patches laterally. Eyes normal sized. Scape brown, pedicel and the following antennomeres brown; palpi greyish to light brown. Pronotum yellow with a delicate brownish marking at the posterior margin, trapezoidal, edges angled; rugosities hardly visible and yellow. Anterior part of the mesonotum yellow, remaining portions brown; metanotum medially dark brown, laterally and anterior of the insertion of wings whitish. Wings yellowish, particularly the anterior half; venation mostly whitish to yellow, costa and apical part of radii brown. Ventral surface of thorax pale, meso- and metabasisternum inconspicuous, furcasternites and furcal pits pale. Femora brown dorsally and yellow ventrally. Tibiae brownish dorsally, pale ventrally; tarsi brown.

Male abdomen (Fig. 1C): 1st to 7th tergite dorsally brown (with some tiny pale spots) with increasing laterally whitish areas towards the apex, 8th to 10th tergite mostly yellowish with small brown medial patches and medially interrupted anterior stripes up to T9, T10 pale without markings. Laterally and ventrally all segments whitish to yellow, lacking dark markings. Pilosity on segment posterior ends short and inconspicuous. Ventral lobe of sternite VIII yellow, slightly longer than wide, its posterior margin strongly convex with long marginal pilosity. Sternite IX yellowish. Paraprocts brown, regularly curved in caudal with blunt tips; cerci light brown, apically dark brown.

Penis (Fig. 2): Divided into four lobes and a basal section in extruded position. Medial penial armature located on the medial lobe adjacent to the ventral lobe, lateral penial armatures lacking. The medial penial armature resembles an equilateral triangle of 130 µm width and 97 µm length formed by slightly brownish coloured scales that are relatively blunt and short and vary in length (4.98–6.26 µm). The median basal area is sparsely covered by shorter scales. The medial penial armatures are connected distally by a narrow band of colourless scales with an area densely covered by smaller triangular scales. Similar scales are located proximal to the medial armatures. Their length varies between 4.4 and 7.2 µm. With the exception of the medial armatures the central area of the ventral penis is bald. Lateral portions of lateral lobes covered by dense scales similar to the ones on medial and ventral lobes, being denser at the connection to the ventral lobe.

Female abdomen (Fig. 1D): 1st to 7th tergite dorsally brown with increasing laterally whitish areas towards the apex, 8th to 10th tergite mostly yellowish with small brown medial patches. Laterally and ventrally all segments entirely whitish with dark markings reduced to delicate brownish lines at the posterior end of sternites. Subgenital plate covers most of sternite VIII width and half of sternite IX length, posterior margin rounded semicircularly. Sternite X and paraprocts yellowish; cerci generally brownish, the first segment being pale.

Larva (Fig. 3): Body length of the matured larva: 13 mm. General colour brown but with pale markings. Pilosity dense, pronotal, posterior tergal and cercal fringes short and acute; swimming hairs lacking. Head dark brown with two yellow spots

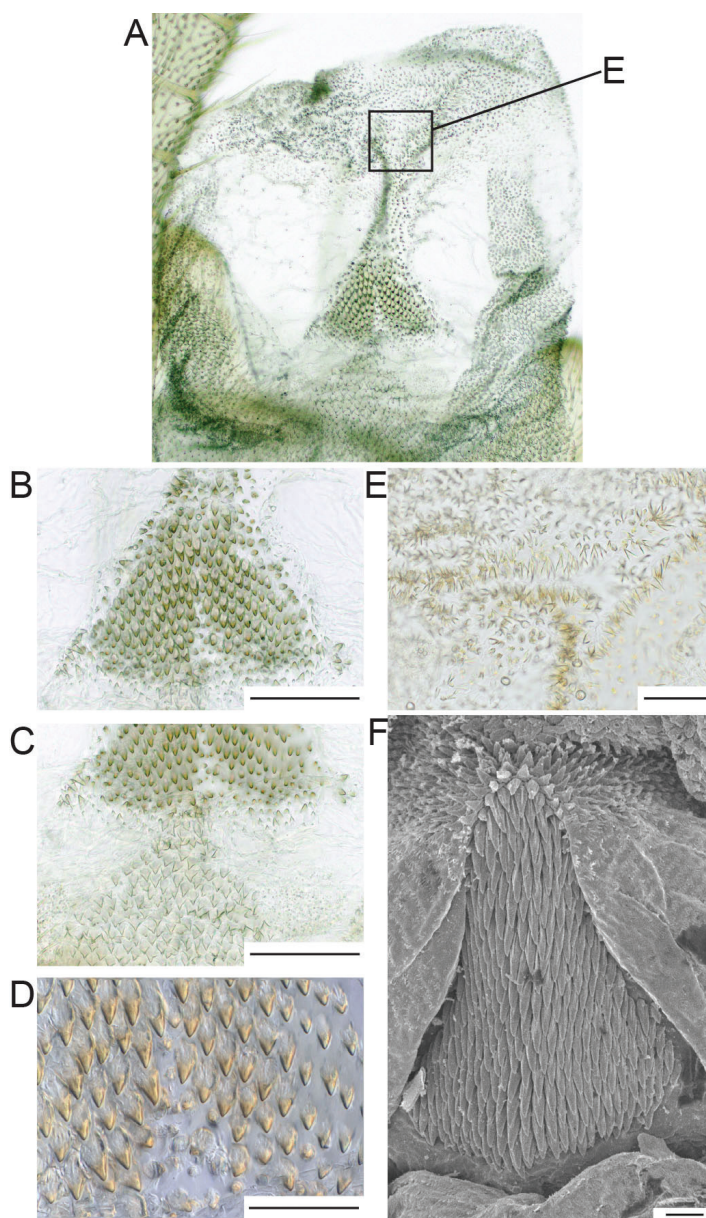


Figure 2. Penis of *Isoperla claudiae* sp. n. **A** ventral view of the extruded penis **B** medial penial armature, scale bar 50 µm **C** medial penial armature, scale bar 50 µm **D** scales of the medial penial armature, scale bar 20 µm **E** scales found caudally the medial penial armature, scale bar 20 µm **F** medial penial armature of *I. orobica*, scale bar 200 µm. Photographs **A–E** by W. Lechthaler, Vienna.

anterior to the M-line, two posterior to the M-line, one around the median ocellus and one laterally to the each posterior ocellus. Two large pale spots laterally on the occipit (Fig. 3A). M-line distinct, tentorial callosities hardly visible; eyes normal

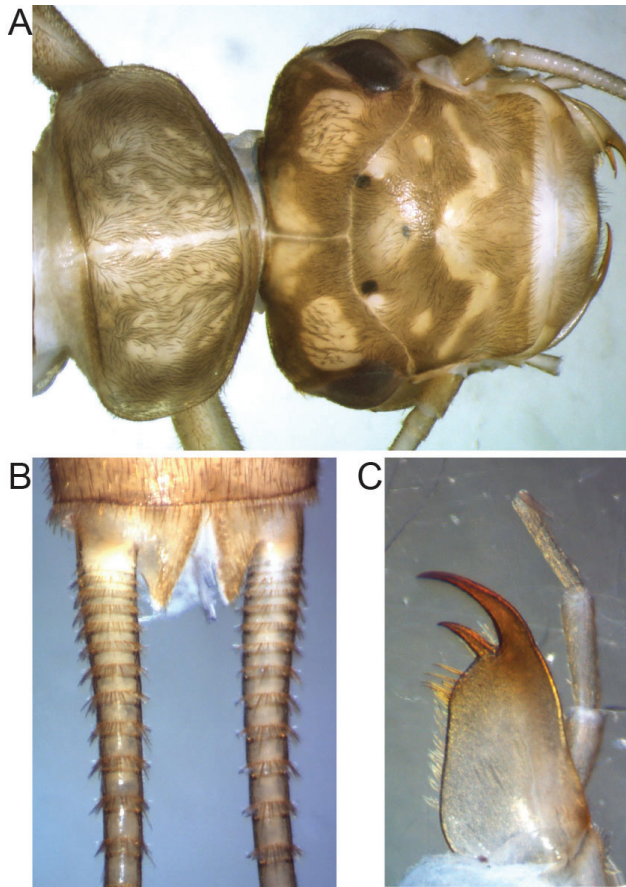


Figure 3. Larval characters of *I. claudiae* sp. n. **A** mature larva of *I. claudiae* sp. n. in dorsal view, head and pronotum **B** ventral view of the abdomen end of *I. claudiae* sp. n. **C** lacinia of *I. claudiae* sp. n.

sized. Scape and pedicel pale, the following antennomeres light brown; palpi yellowish, mouthparts light brown. Lacinia triangular, with 6 strong setae beneath the two apical teeth, thin hairs present all along the inner margin; galea with scattered setae on the whole surface (Fig. 3C). Pronotum rectangular with rounded corners, twice as wide as long, brown but with a narrow medial pale stripe along the medial suture and a marbled impression due to several medial pale areas, lateral parts uniformly brown, margins laterally pale. Mesonotum and metanotum mostly brown but with a pale, marmoreal pattern; wingpads brownish. Ventral surface of thorax pale, furcasternites and furcal pits inconspicuous. Legs uniformly pale. Abdominal tergites brown with a pair of roundish pale spots laterally to a median, darker area. The spots are increasing in size towards the entirely pale last tergite. Ventral surface of abdomen pale brown, the distal segments darker. Paraprocts brown; cerci light brown with dense circumferential rows of bristles of varying length at the end of each segment.

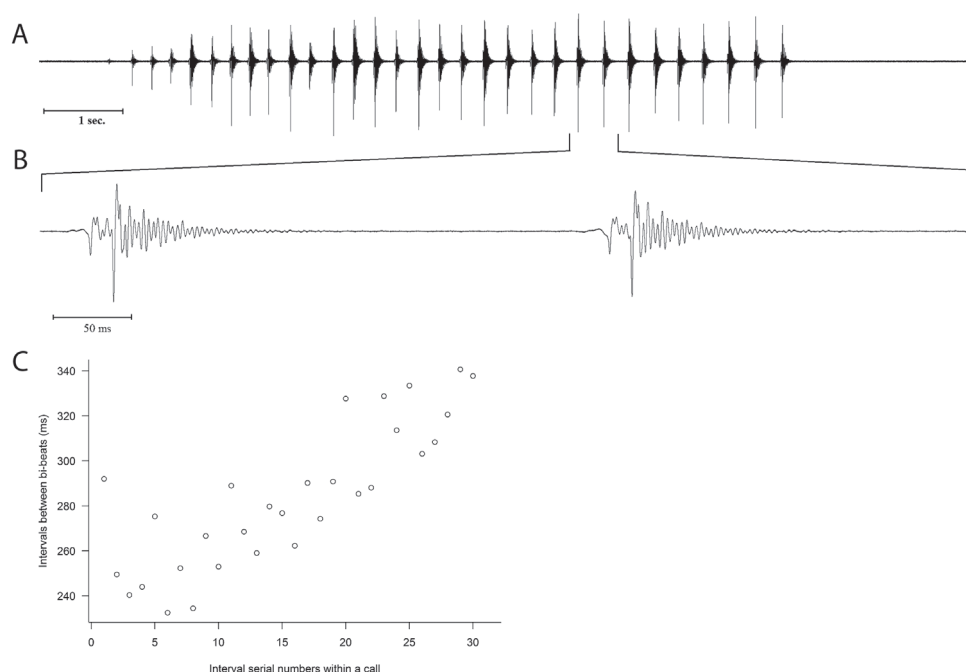


Figure 4. Oscillograms showing the drumming call of an *I. claudiae* sp. n. male (ambient air temperature 24.2 °C). **A** oscillogram showing rhythm and amplitude variation patterns of a call **B** a faster oscillogram of two bi-beats from the second half of the call **C** variation of interval duration between bi-beats during the call presented in **A**. Inter-beat intervals were measured from the amplitude peak of one bi-beat to the amplitude peak of the next bi-beat (measured on the same call presented in **A**).

Ecology and distribution. The species was collected in a small spring-brook at 535 m a.s.l. in the Karawanken, and a small forest brook at 980 m a.s.l. in the Kamnik Alps (Southern Limestone Alps).

Preliminary description of the male drumming call. Since only one signal from a single male could be recorded we cannot give any information on the variation range of the signal parameters in this species. The aim of this preliminary description is only to report the basic features of the signal, but even that should be treated with some caution since we cannot be sure whether or not the recorded signal shows some deviant features.

As it is observable in (Fig. 4A) the male call is a sequence of bi-beats. After an initial crescendo the peak amplitude of bi-beats fluctuate around a constant value. In bi-beats the first beat is of lower amplitude (missing in the low amplitude initial part of the call and sometimes hardly detectable even in the main part of the signal), the second one is of higher amplitude and followed by a long, decaying wave train (Fig. 4B). Inter beat interval within bi-beats varied between 8–20 ms during the call. The interval between bi-beats (or single beats at the initial part) gradually increased during the sequence (except for a short initial part of the sequence where inter beat interval decreases) varying between 230–350 ms (Fig. 4C).

Discussion

Relationships

The new species can be attributed to the *oxylepis* species-group sensu Murányi (2011), currently comprising *I. oxylepis oxylepis* (Despax), *I. oxylepis balcanica* Raušer, *I. bosnica* Aubert, *I. orobica* Ravizza and *I. submontana* Raušer. These species develop similarly shaped medial penial armatures and scales of penial armatures, lack real lateral armatures, and develop dense, uncoloured scales on each lobe.

Isoperla claudiae sp. n. is most similar to *I. orobica*, a species restricted to the southwestern Alps, but can be easily distinguished from the latter species as the scales of the medial penial armature are shorter in *I. claudiae* sp. n., a higher density of uncoloured scales on the penis in *I. claudiae* sp. n., as well as yellow, hardly visible rugosities of the pronotum in *I. claudiae* sp. n.

The male drumming call of *I. claudiae* sp. n. is clearly different from the drumming call of *I. oxylepis*, which is the only species of the *I. oxylepis* species-group, where published information regarding the vibratory signals is available (Rupprecht 1969, 1983). Amongst the European species of *Isoperla* the male call of *I. claudiae* sp. n. is most similar to that of *I. rivulorum* (Pictet) (Rupprecht 1969, Tierno de Figueroa and Sánchez-Ortega 1999, Tierno de Figueroa et al. 2000, 2002, 2011, Tierno de Figueroa and Luzón-Ortega 2002, Luzón-Ortega et al. 2010), but the beat group repetition period seems to be longer in this species (230–350 ms, 24.2 °C, Fig. 4C) than in *I. rivulorum* (Luzón-Ortega et al. 2010) reported 103–163 ms at 20 °C), and *I. rivulorum* frequently produces 3 beats per beat group.

The Southern Limestone Alps as centers of endemism

The southern slopes of the Alps from the Ligurian Prealps in the southwest to the Pohorje Mountains in the east are densely covered by microendemic species. Concentrations of endemic species in the south and south-eastern Alps are well known among Trichoptera species (Malicky 1983, 2000); regarding Plecoptera *Leuctra dylani* Graf, *L. juliettae* Vinçon & Graf, *L. muranyii* Vinçon & Graf and *Protonemura bipartita* Consiglio are restricted to small areas from the Bergamo prealps to the Lessinian Alps; the apterous *L. istenicae* Sivec and *Siphonoperla ottomoogi* Graf are nested as microendemics in southeastern refugia referred to as the Steirische Randgebirge.

The western alpine slopes (Biellesse, Graian and Cottian Alps) are another area of alpine endemism where a high diversity within the genus *Leuctra* is found (Ravizza Dematteis and Ravizza 1988; Vinçon and Ravizza 1998), and their distribution patterns are associated with the presence of nunataks during the Würm glaciation (Ravizza and Ravizza Dematteis 1993, 1994). The hitherto known range of *Isoperla claudiae* sp. n. fits well in this hot-spot of biodiversity and supports the Dinodal theory of Malicky (1983, 2000), which suggests glacial species-specific refugia

within the Alps based on distribution patterns of endemic caddisfly species. Most of these microendemic species are stenoecious elements of springs and small streams in medium altitudes.

Acknowledgements

The authors acknowledge support from the BioFresh EU project–Biodiversity of Freshwater Ecosystems: Status, Trends, Pressures and Conservation Priorities (contract No. 226874). The bioacoustic research in this study was supported by the Hungarian Scientific Research Fund (OTKA K 81929). This study further was morally supported by the Austrian Science Fund (FWF) (project number P23687-B17).

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A new species and first record of the genus *Cynegetis* Chevrolat (Coleoptera, Coccinellidae, Epilachnini) from China

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Academic editor: N. Vandenberg | Received 24 July 2014 | Accepted 29 September 2014 | Published 20 October 2014

<http://zoobank.org/39DABBB2-8A5D-40A6-BA4F-1C81D0CEDFD9>

Citation: Wang X, Tomaszewska W, Ren S (2014) A new species and first record of the genus *Cynegetis* Chevrolat (Coleoptera, Coccinellidae, Epilachnini) from China. ZooKeys 448: 37–45. doi: 10.3897/zookeys.448.8342

Abstract

The first species of the genus *Cynegetis* Chevrolat is recorded from China. *Cynegetis chinensis* Wang & Ren, **sp. n.** is described from the Ningxia Province in North China. A key to the known species of *Cynegetis* is given. Diagnostic similarities and differences between *Cynegetis* and *Subcoccinella* Agassiz & Erichson are discussed and illustrated.

Keywords

Entomology, taxonomy, Cucujoidea, *Cynegetis*, new species, China

Introduction

The genus *Cynegetis* was established by Chevrolat (Chevrolat in Dejean 1837) and the type species, *C. impunctata* (Linnaeus, 1767) was designed by Crotch in 1874. Formerly *Cynegetis* was classified in the tribe Cynegetini Thomson (= Madaini Gordon) in the subfamily Epilachninae.

The subfamily Epilachninae traditionally was divided into four tribes: Epilachnini Mulsant, Madaini Gordon, Epivertini Pang & Mao and Eremochilini Gordon & Vandenberg (Jadwiszczak and Węgrzynowicz 2003), but recently Seago et al. (2011) combined these into a single tribe Epilachnini within a broadly defined subfamily Coccinellinae. As currently defined, Epilachnini is a large group of herbivorous ladybird beetles that include 25 genera with a worldwide distribution (Jadwiszczak and Węgrzynowicz 2003, Szawaryn 2011, Szawaryn and Tomaszewska 2013, Tomaszewska and Szawaryn 2013). However, the research of Seago et al. (2011) includes only 7 species of the former subfamily Epilachninae, so the relationship between *Cynegetis* and other genera was not completely resolved. Ongoing research by W. Tomaszewska and K. Szawaryn on the phylogeny of Epilachninae and by A. Ślipiński et al. on the comprehensive molecular phylogeny of Coccinellidae may clarify generic relationships which will not be discussed here.

The species of *Cynegetis* are very similar to *Subcoccinella* Agassiz & Erichson in having oval and strongly convex bodies, well developed spurs on all tibiae and similar male and female genitalia. Kapur (1950) described larvae of these two genera, which also supports their close relationships based on the similar general shape and the armature of the body wall.

Cynegetis is a very small genus, containing only two species: *C. impunctata* (Linnaeus, 1958) and *C. syriaca* (Mader, 1958), which are distributed in the Palaearctic region (Jadwiszczak and Węgrzynowicz 2003). This genus was unknown from China until a new species, described in the present paper, was found during comprehensive investigations of Chinese ladybirds by the members of Shunxiang Ren's research group.

Material and methods

The external morphology was observed with a dissecting stereoscope (SteREO Discovery V20, Zeiss and Leica Mz Apo). The following measurements were made with an ocular micrometer: total length, length from apical margin of clypeus to apex of elytra (TL); total width, width across both elytra at widest part (TW = EW); height, from the highest part of the beetle to elytral outer margins (TH); head width in a frontal view, widest part including eyes (HW); pronotal length, from the middle of anterior margin to the base of pronotum (PL); pronotal width at widest part (PW); elytral length, along the suture, from the apex to the base including the scutellum (EL). Male and female genitalia were dissected, cleared in a 10% solution of NaOH by boiling for several minutes, and examined with an Olympus BX51 and Leica compound microscopes.

Morphological character photographs were made with digital cameras (AxioCam HRc and Coolsnap-Procf & CRI Micro*Color), connected to the dissecting microscope. The software AxioVision Rel. 4.8 and Image-Pro Plus 5.1 were used to capture images from both cameras, and photos were cleaned up and laid out in plates with Adobe Photoshop 8.0 CS.

Morphological terms of Coccinellidae follow Ślipiński (2007) and Ślipiński and Tomaszewska (2010). Type specimens designated in the present paper are deposited at SCAU – the Department of Entomology, South China Agriculture University, Guangzhou, China. Specimens of *C. impunctata* and *Subcoccinella vigintiquatuorpunktata* (L.) examined for comparison are deposited at: ANIC – Australian National Insect Collection, CSIRO, Canberra, Australia, BPBM – Bernice P. Bishop Museum, Honolulu, USA; IOZ – the Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

Taxonomy

Genus *Cynegetis* Chevrolat

Cynegetis Chevrolat in Dejean 1837: 461. Type species: *Coccinella impunctata* Linnaeus, 1767, subsequent designation by Crotch (1874).

Cynegetis (sic!): Crotch 1874: 90.

Diagnosis. This genus is most similar to *Subcoccinella* in general shape of the body and the genitalia of both sexes and sharing interocular distance of more than 0.75 width of head (Figs 1a, 1l–p, 2a, 2k, 2l, 3a, 3m–q). *Cynegetis*, however, can be distinguished from *Subcoccinella* by the strongly convex body, anterior margin of clypeus distinctly emarginate, subapical teeth and incisor edge of mandible without denticles (Figs 1f, 3e), the terminal maxillary papomere barrel shaped (Figs 1g, 3f), short metaventrite (Fig. 1b), elytral surface covered with double-sized punctures, elytral epipleuron with distinct foveae for apices of mid and hind femora, strongly expanded/inflated outer edges of front tibiae (Figs 1i, 3j), and tarsal claw single, possessing large basal tooth (Fig. 1k, l). In *Subcoccinella*, the body is moderately convex, anterior margin of clypeus is straight or weakly emarginate, subapical teeth and incisor edge of mandibles are multidentate (Fig. 2e), the terminal maxillary palpomere is elongate and widened apically (Fig. 2c), the metaventrite is relatively long, the elytral surface covered with single-sized punctures, the elytral epipleuron smooth without foveae, outer edges of tibiae of front legs simple (Fig. 2h), and tarsal claws are bifid, lacking basal tooth (Fig. 2j).

Description. Body shortened oval, strongly convex, dorsum densely pubescent (Figs 1a–d, 3a–c). Head with frons slightly convex. Clypeus protruded with anterior margin distinctly emarginate at middle. Labrum transverse, covered with densely distributed, long setae, anterior margin emarginate. Mandible subtriangular in shape, with two apical teeth and two subapical teeth: apical teeth long and large with 4–5 additional denticles; subapical teeth shorter than apical ones, smooth without additional denticles (Figs 1f, 3e). Antennae with 11 antennomeres (Figs 1e, 3d), antennal insertions located posterior to imaginary line joining anterior edges of eyes (Figs 1d, 3c). Maxillary palp with terminal palpomere longer than wide, barrel shaped, truncate at apex (Figs 1g, 3f); lacinia hook-like or simple. Terminal labial palpomere elongate, narrowing anteriorly (Fig. 3g).

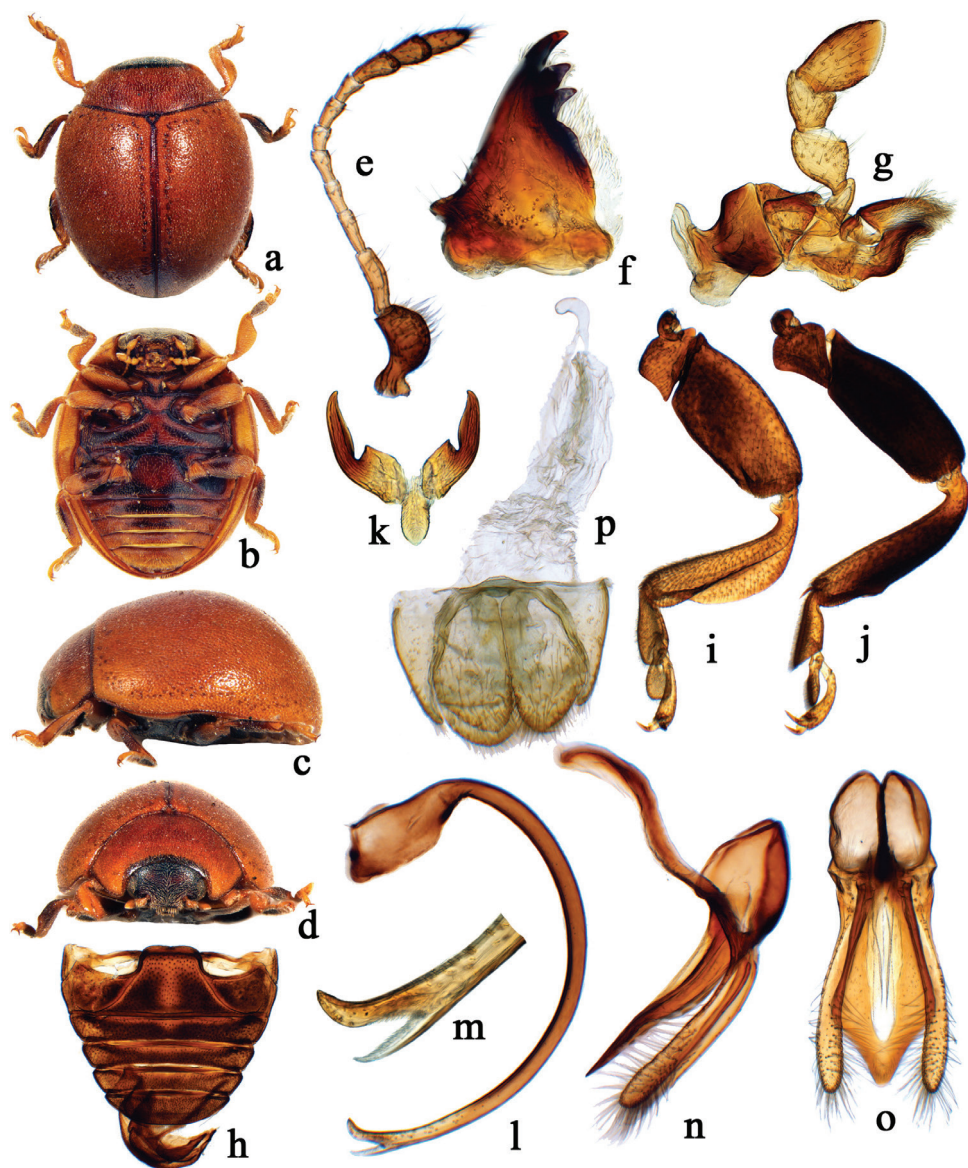


Figure 1. Morphological characters of the genus *Cynagetis*. **a–o** *Cynagetis impunctata* Linnaeus, 1767 From Poland. **a** dorsal habitus **b** ventral habitus **c** lateral habitus **d** frontal habitus **e** antenna **f** mandible **g** maxilla **h** abdomen **i** front leg **j** hind leg **k** tarsal claw **l–o** male genitalia: **l** penis **m** apex of penis **n** tegmen, lateral view **o** tegmen, ventral view **p** female genitalia: coxites and spermatheca.

Pronotum transverse, widest at base and gradually narrowing anteriorly, anterior and hind margins not bordered, anterior angles distinctly protruded. Scutellum small, triangular. Elytra at base distinctly wider than pronotum, lateral margins very narrow, invisible from above, humeral angles inconspicuous. Prothoracic hypomeron with

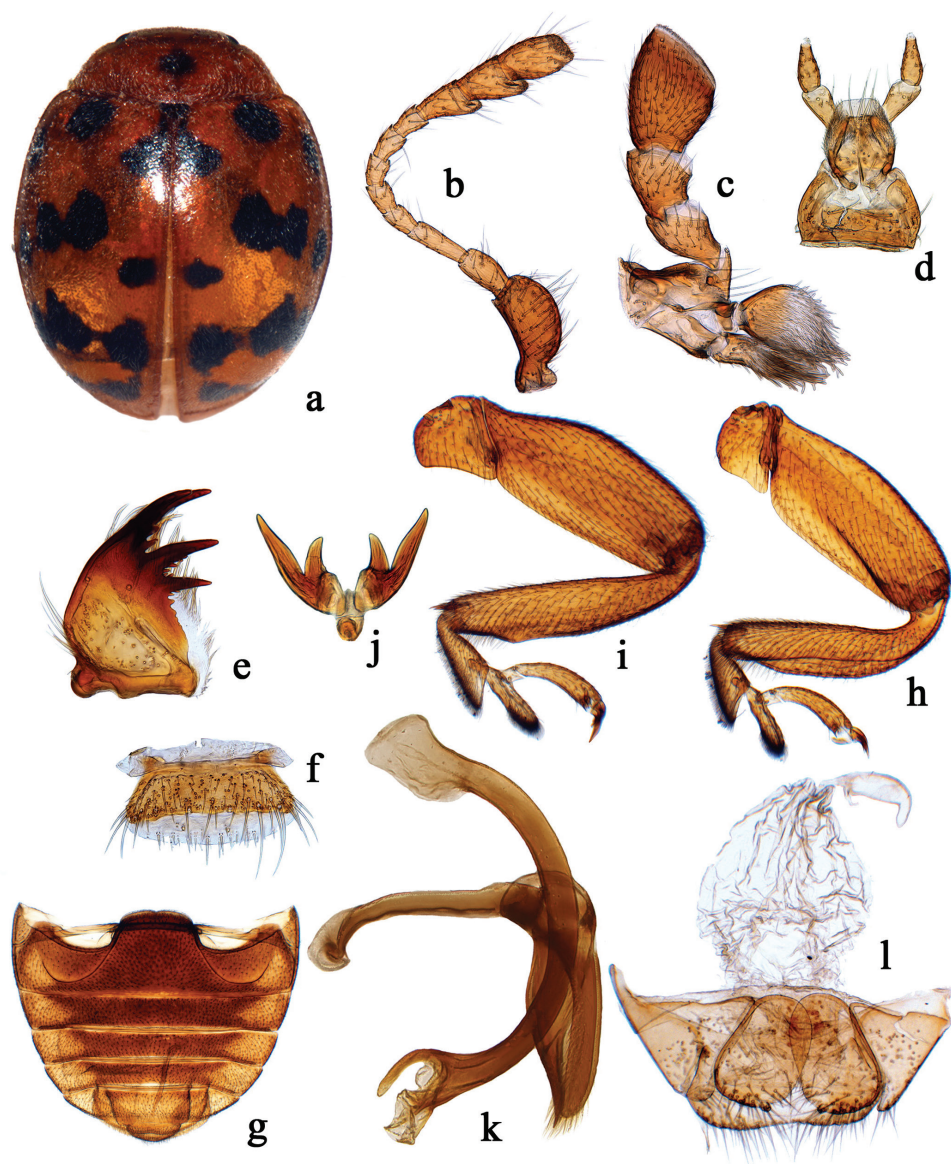


Figure 2. Morphological characters of the genus *Subcoccinella*. **a–l** *Subcoccinella vigintiquatuorpunktata* Linnaeus, 1758 From China. **a** dorsal habitus; **b** antenna **c** maxilla **d** labium **e** mandible **f** labrum **g** abdomen **h** front leg **i** hind leg **j** tarsal claw **k** male genitalia: penis and tegmen **l** female genitalia: coxites and spermatheca.

clearly delimited cavities to accommodate apices of femora of front legs. Prosternum T-shaped, without carinae (Fig. 1b).

Mesoventrite with anterior edge with complete raised border and with weak groove behind it, mesal surface with cavity for receiving prosternal process; meso-metaventral

junction broad, forming an almost straight line or slightly emarginated. Metaventrite about as long as abdominal ventrite 1 with incomplete discrimen (Fig. 1b); metaventral postcoxal lines recurved, complete laterally. Elytral surface with double-sized punctures; epipleuron incomplete apically, with distinct foveae for apices of femora of mid and hind legs (Fig. 1b).

Fore and mid trochanters angulate, produced. Fore tibia with single apical spur; mid and hind tibiae with two spurs (Figs 1i–j, 3j–k). Mid and hind tibiae on outer edge near apex with oblique carina. Tarsal claws simple with subquadrate tooth at base (Figs 1k, 3l).

Abdomen with six ventrites in males and five ventrites in females; abdominal postcoxal lines recurved roundly, almost complete (Figs 1h, 3i).

Male genitalia. Tegmen stout, penis guide wide and flat in ventral view, parameres straight with densely distributed setae apically (Figs 1n–o, 3o–p). Penis stout, curved; basal capsule expanded, but not typically T-shaped; apex bifid or not (Figs 1l–m, 3m–n).

Female genitalia. Coxites oval, setose apically; styli present or absent. (Figs 1p, 3q). Spermatheca small, curved weakly sclerotized (Fig. 1p).

Distribution. China: Ningxia; Europe (Austria, Belgium, Bosnia and Herzegovina, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Norway, Poland, Romania, Slovakia, Spain, Sweden, Switzerland, West Russia); Asia: Asian part of Russia (Maritime Prov.), Iran, N. Korea, Syria, Turkey.

Key to the species of *Cynegetis*

- 1 Antennomere 7 subquadrate; elytra covered with black, transverse, irregularly shaped bands (Fig. 3a–b) ***C. chinensis* Wang & Ren, sp. n.**
- Antennomere 7 distinctly elongate; elytra with separated black spots or without black spots **2**
- 2 Maxillary lacinia strongly sclerotized, hook-like; head always black; apex of penis bifid (Fig. 1l–m); the length of parameres almost equal to penis guide... ***C. impunctata* (Linnaeus)**
- Maxillary lacinia moderately sclerotized, simple; head often brown; elytra yellowish brown with black spots; apex of penis not bifid; the length of parameres distinctly shorter than penis guide ***C. syriaca* (Mader)**

Cynegetis chinensis Wang & Ren, sp. n.

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Figure 3

Diagnosis. This species is very similar to *C. syriaca* in general appearance and male genitalia but it can be distinguished from the latter as follow: antennomere 7 subquadrate, scutellum black, most of black spots on elytra joined, forming wavy shaped bands, coxites bearing distinct styli and the characters of penis capsule and penis guide

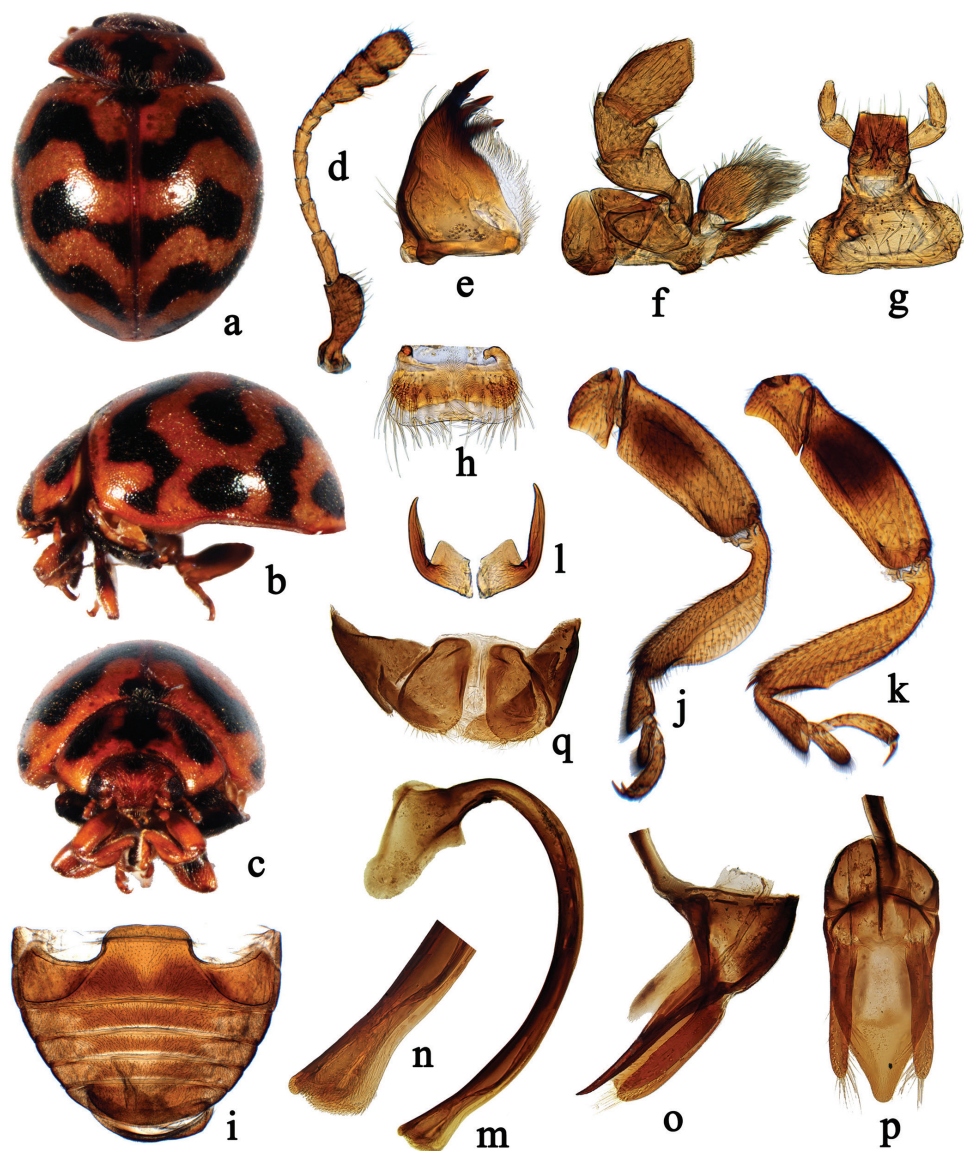


Figure 3. *Cynegetis chinensis* Wang & Ren, sp. n. **a** dorsal habitus **b** lateral habitus **c** frontal habitus **d** antenna **e** mandible **f** maxilla **g** labium **h** labrum **i** abdomen **j** front leg **k** hind leg **l** tarsal claw **m–p** male genitalia: **m** penis **n** apex of penis **o** tegmen, lateral view **p** tegmen, ventral view **q** female genitalia: coxites.

are distinctly different from the latter. In *C. syriaca*, antennomere 7 is distinctly elongate, scutellum yellow, black spots on the elytra are separated from each other and the coxites lack styli (Fürsch 1986, Duverger 1983, WT, personal observations).

Description. TL: 3.4–3.5 mm, TW: 2.7–2.9 mm, TH: 1.7–1.9 mm, TL/TW: 1.21–1.26; PL/PW: 0.44–0.45; EL/EW: 1.00–1.03; HW/TW: 0.38; PW/TW: 0.67.

Body short oval, dorsum strongly convex, densely pubescent (Fig. 3a–c). Head yellowish brown, with small black spot at base. Pronotum yellowish brown, with three large black spots, the middle one longitudinal, expanded laterally at apical 1/4, the lateral pair irregularly oval. Scutellum black. Elytra yellowish brown, with three rounded black spots and three black wavy bands, arranged as Fig. 3a–b. Underside yellowish brown, meso- and metaventrite black, epipleura and legs yellow.

Head with frontal punctures fine and inconspicuous, associated with scattered long setae; eyes of small size and moderately coarsely faceted. Maxillary lacinia moderately sclerotized, simple. Pronotal disk with fine and densely distributed punctures, slightly larger than those on head, 0.5–1.0 diameters apart. Elytral disk with punctures similar to those on pronotum. Prosternum and mesoventrite rough, with scattered short setae. Metaventrite broad with fine and inconspicuous punctures.

Male genitalia. Penis stout, strongly curved, apex slightly expanded, truncate with scattered short setae, basal capsule large (Fig. 3m–n). Tegmen stout and symmetrical (Fig. 3o–p). Penis guide in lateral view widest at base and narrowing to pointed apex, the basal 1/2 with a membrane part which accept stout penis (Fig. 3o). Parameres rather narrow and almost straight, distinctly shorter than penis guide (Fig. 3o). Penis guide in ventral view flattened, widest at basal 1/3, strongly narrowing to apex, apex blunt (Fig. 3p).

Female genitalia. Coxites oval, with distinct terminal styli (Fig. 3q). Spermatheca not studied.

Types. Holotype: 1 male, **China, Ningxia:** Baiyunsi, Liupanshan National Natural Reserve, Jingyuan County, 106°15.6'E, 35°36.6'N, ca2300m, 10.viii.2009, Wang XM leg; **Paratypes:** 1 female, same data as holotype.

Distribution. China (Ningxia).

Etymology. The specific epithet is an adjective derived from the geographical name “China”, the type locality of this ladybird.

Acknowledgements

We thank Adam Ślipiński for providing many useful suggestions and lending specimens of *C. impunctata* and *S. vigintiquatuor punctata*. The research was supported by the National Natural Science Foundation of China (No. 30970324 and 2006FY120100).

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A taxonomic revision of the *Neoserica* (sensu lato) *calva* group (Coleoptera, Scarabaeidae, Sericini)

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Academic editor: Andrey Frolov | Received 31 July 2014 | Accepted 24 September 2014 | Published 20 October 2014

<http://zoobank.org/D62011A5-C112-48E5-9847-F9C85B23DC50>

Citation: Liu W-G, Fabrizi S, Bai M, Yang X-K, Ahrens D (2014) A taxonomic revision of the *Neoserica* (sensu lato) *calva* group (Coleoptera, Scarabaeidae, Sericini). ZooKeys 448: 47–81. doi: 10.3897/zookeys.448.8368

Abstract

The species of the *Neoserica* (sensu lato) *calva* group are revised. *Neoserica calva* Frey, 1972, **comb. n.** is re-described. Thirteen new species are described from China and South Korea: *Neoserica ailaoshanica* **sp. n.**, *N. anonyma* **sp. n.**, *N. calvoides* **sp. n.**, *N. gulinqingensis* **sp. n.**, *N. koelkebecki* **sp. n.**, *N. liangi* **sp. n.**, *N. luxiensis* **sp. n.**, *N. menghaiensis* **sp. n.**, *N. mengi* **sp. n.**, *N. taipingensis* **sp. n.**, *N. zhejiangensis* **sp. n.**, *N. zhibenshanica* **sp. n.**, and *N. zongyuani* **sp. n.** A key to Sericini genera with multilamellate antenna and species groups of *Neoserica* of mainland Asia as well as a key to species of the *N. calva* group are provided. A map of species distribution is given, habitus and male genitalia are illustrated.

Keywords

Beetles, chafers, *Neoserica*, China, South Korea, new species

Introduction

In the present study we improve the taxonomy of the representatives of *Neoserica* Brenske, 1894, related to *Neoserica calva* Frey, 1972, described originally from Fujian (China). According to our present knowledge the species group is restricted to southern China and South Korea. The species of this group are characterised by the bidentate protibia, antennal club composed of four or five antennomeres in male, frons being shiny anteriorly and dull and finely setose in posterior third or half, and posterior margin of metafemur being serrated ventrally and dorsally. Here, thirteen new species are described from Southern China or South Korea.

Material and methods

The terminology and methods used for measurements, specimen dissection and genital preparation follow Ahrens (2004). Data from specimens examined are cited in the text with original label contents given in quotation marks, multiple labels are separated by a “/”. Male genitalia were glued to a small pointed card attached to the specimen. Descriptions and illustrations of new taxa are based on the holotype specimen, while the variation of other specimens is described separately. All descriptions and measurements were made under an Olympus SZX 12 microscope, and all genital and habitus illustrations were made with a digital camera (AxioCam HRC) attached to a stereo microscope (Zeiss Stereo Discovery V20) and Axio Version 4.8 software. Measurements refer to the maximum extension of the specimen or the named structure. The distribution map was generated using Q-GIS 2.0.1 and Adobe Photoshop CS4.

Type specimens and other examined material are deposited in the following institutions:

- BMH** Bishop Museum Honolulu, Hawaii, U.S.A.;
CPPB Coll. Petr Pacholatko, Brno, Czech Republic;
HBUM Museum of Hebei University, Baoding (Hebei Prov.) China;
IZAS Institute of Zoology, Chinese Academy of Sciences, Beijing, China;
LSSYU College of Life Sciences, Sun Yat-sen University, Guangzhou (Guangdong Prov.), China;
MHNG Museum d’Histoie Naturelle de Geneve, Switzerland;
NMPC National Museum Prague (Natural History), Czech Republic;
ZFMK Zoologisches Forschungsmuseum A. Koenig, Bonn, Germany.

A preliminary key to the species groups and genera of Chinese Sericini with a multilamellate antennal club

- | | | |
|----|-----------------------------|---------------------------------|
| 1 | Hypomeron not carinate..... | <i>Tetraserica</i> Ahrens, 2004 |
| 1' | Hypomeron carinate..... | 2 |

2	Antennal club in female composed of 3 antennomeres.....	3
2'	Antennal club in female composed of more than 3 antennomeres.....	15
3	Posterior margin of metafemur serrate ventrally and dorsally	4
3'	Posterior margin of metafemur smooth ventrally	7
4	Anterior angles of pronotum obsolete	5
4'	Anterior angles of pronotum acute and moderately produced	
 <i>Neoserica</i> (s.l.) <i>calva</i> group	
5	Dorsal surface nearly glabrous.....	<i>Gastroserica</i> Brenske, 1897
5'	Dorsal surface densely setose.....	6
6	Metatibia beside dorsal margin with a serrated longitudinal line or carina....	
 <i>Neoserica</i> (s.str.) Brenske, 1894	
6'	Metatibia beside dorsal margin without a serrated longitudinal line or carina...	
 <i>Calloserica</i> Brenske, 1894	
7	Metatibia beside dorsal margin with a serrated longitudinal line or carina....	
 <i>Lasioserica</i> Brenske, 1896	
7'	Metatibia beside dorsal margin without a serrated longitudinal line or carina..	8
8	Antennal club in males long and reflexed	<i>Anomalophylla</i> Reitter, 1887
8'	Antennal club in males short or moderately long and straight.....	9
9	Protibia bidentate	10
9'	Protibia tridentate.....	<i>Trioserica</i> Moser, 1922
10	Elytra bicolored, yellowish or reddish brown and black.....	11
10'	Elytra unicolored	12
11	Parameres symmetrical.....	<i>Oxyserica</i> Brenske, 1900
11'	Parameres asymmetrical	<i>Microserica</i> Brenske, 1894
12	Apex of metatibia shallowly truncate at interior apex near tarsal articulation ...	13
12'	Apex of metatibia sharply truncate at interior apex near tarsal articulation.....	14
13	Dorsal surface yellowish brown to reddish brown, strongly and simply shiny ...	
 <i>Neoserica</i> (s.l.) <i>lubrica</i> group	
13'	Dorsal surface dull or iridescent shiny.....	
 <i>Neoserica</i> (s.l.) <i>vulpes</i> group, other <i>Neoserica</i> (s.l.)	
14	Pronotum and elytra always nearly glabrous.....	
 <i>Sericania</i> Motschulsky, 1860 (see also couplet 21)	
14'	Pronotum and elytra always distinctly setose.....	
 <i>Leuroserica</i> Arrow, 1946, <i>Gynaecosserica</i> Brenske, 1896	
15	Labrum without a transverse rim of very dense, short and robust setae	16
15'	Labrum short, with a transverse rim of very dense, short and robust setae.	
	Dorsal surface densely setose..... <i>Neoserica</i> (s.l.) <i>pilosula</i> group	
16	Metatibia slender and long.....	17
16'	Metatibia short and wide	<i>Neoserica</i>
	(s.l.) <i>uniformis</i> group & <i>N.</i> (s.l.) <i>multifoliata</i> group (from Indochina)	
17	Antennal club of males with 7 antennomeres.....	18
17'	Antennal club of males with 7, 6 or less antennomeres	19

- 18 Metafemur with a continuously serrated line adjacent to the anterior margin of metafemur. Protibia more or less distinctly tridentate ***Neoserica* (s.l.) *septemlamellata* group**
- 18' Metafemur without a continuously serrated line adjacent to the anterior margin of metafemur. Protibia always distinctly bidentate.....***Nepaloserica* Frey, 1965**
- 19 Basis of labroclypeus dull. Antennal club of males with 6 antennomeres....**20**
- 19' Antennal club of males with 5 or 4 antennomeres.....**21**
- 20 Angle between basis of hypomerion and that of pronotum strongly rounded, angle between surfaces of hypomerion and pronotum basally blunt. Hypomerion basally strongly produced ventrally and transversely sulcate ***Lepidoserica* Nikolaev, 1979**
- 20' Angle between basis of hypomerion and that of pronotum sharp, angle between surfaces of hypomerion and pronotum sharp. Hypomerion basally not produced ventrally and not sulcate.....***Neoserica* (s.l.) *abnormis* group**
- 21 Apex of metatibia shallowly truncate at interior apex near tarsal articulation..... **22**
- 21' Apex of metatibia deeply truncate at interior apex near tarsal articulation..... ***Sericania* Motschulsky, 1860** (see also couplet 14)
- 22 Body surface strongly shiny. Body smaller (5.7–6.6 mm) ***Neoserica* (s.l.) *speciosa* group**
- 22' Body surface dull. Body larger (8 mm) ***Chrysoserica* Brenske, 1897**

Key to species of the *Neoserica calva* group (♂♂):

- 1 Eyes small: ratio diameter/interocular distance < 0.65.....**2**
- 1' Eyes larger: ratio diameter/interocular distance > 0.72**7**
- 2 Antennal club longer, 3 times as long as remaining antennomeres combined ***N. zhibenshanica* sp. n.**
- 2' Antennal club shorter, at maximum 1.7 times as long as remaining antennomeres combined.....**3**
- 3 Antennal club short, at maximum 1.2 times as long as remaining antennomeres combined. Phallobase without apical process**4**
- 3' Antennal club longer, 1.4 to 1.7 times as long as remaining antennomeres combined. Phallobase with apical process**5**
- 4 Metatibia moderately wide, ratio width/length: 1/3.3. Left paramere not reduced in length..... ***N. anonyma* sp. n.**
- 4' Metatibia more stout, ratio width/length: 1/2.8. Left paramere strongly reduced in length..... ***N. mengi* sp. n.**
- 5 Phallobase with narrow dorsal process. Species from South Korea ***N. koelkebecki* sp. n.**
- 5' Phallobase with wide dorsolateral process**6**
- 6 Right paramere more elongate, narrow ***N. ailaoshanica* sp. n.**

- 6' Right paramere shorter, dorsoventrally strongly widened at middle *N. luxiensis* sp. n.
- 7 Antennal club moderately long, at maximum 1.4 times as long as remaining antennomeres combined 8
- 7' Antennal club long, at least twice as long as remaining antennomeres combined 11
- 8 Eyes very large, ratio diameter/interocular distance > 0.9. Metatibia in basal half with blunt carina beside dorsal margin bearing a few short robust setae in punctures with serrated margin 9
- 8' Eyes smaller, ratio diameter/interocular distance < 0.8. Metatibia in basal half without a blunt carina beside dorsal margin 10
- 9 Left paramere reduced in length, not visible under the largely widened dorsal lobe of right paramere *N. calvoides* sp. n.
- 9' Left paramere not reduced in length, subequal in length to the less widened dorsal lobe of right paramere *N. gulinqingensis* sp. n.
- 10 Phallobase distinctly widened at apex. Left paramere straight at apex *N. liangi* sp. n.
- 10' Phallobase not widened at apex. Left paramere hooked at apex *N. napoana* sp. n.
- 11 Antennal club composed of 5 antennomeres *N. zhejiangensis* sp. n.
- 11' Antennal club composed of 4 antennomeres 12
- 12 Eyes very large, ratio diameter/interocular distance > 1.0 *N. calva* Frey
- 12' Eyes smaller, ratio diameter/interocular distance < 0.85 13
- 13 Legs moderately long, ratio metatibial width/length: 1/3.4 *N. taipingensis* sp. n.
- 13' Legs longer, ratio metatibial width/length: 1/3.9 *N. zongyuani* sp. n.

Systematics

Neoserica (s.l.) *calva* (Frey, 1972), comb. n.

Figs 1A–D, 6

Trichoserica calva Frey, 1972: 173.

Serica calva: Ahrens 2006: 245, 2007: 36.

Type material examined. Holotype: ♂ “Kuatun 2300 m 27,40 n. Br. 117,40 ö. L. J. Klapperich 18.4.1938 (Fukien)/ Ophthalmoserica Type clava G. Frey 1972/ Trichoserica calva” (ZFMK). Paratypes: 1 ♂ “Kuatun 2300 m 27,40 n. Br. 117,40 ö. L. J. Klapperich 28.4.1938 (Fukien)/ Ophthalmoserica Paratype clava G. Frey 1972” (ZFMK), 1 ♂ “Kuatun 2300 m 27,40 n. Br. 117,40 ö. L. J. Klapperich 15.4.1938 (Fukien)/ Ophthalmoserica Paratype clava G. Frey 1972” (ZFMK).

Additional material examined. 1 ex. “Chine 31.IV.46 Kuatun, Fukien leg. Tschung-Sen” (MHNG), 1 ex. “Chine 8.IV.46 Kuatun, Fukien leg. Tschung-Sen” (MHNG), 1 ex. “Chine 22.VII.46 Kuatun, Fukien leg. Tschung-Sen” (MHNG), 33 ex. “China: Hunan; Mupu Mt. 1600 m, Pingjiang VIII-2003, leg. Li et al.” (ZFMK), 924 ex. “China: Hunan: Jiucui Ling 25°32'N, 111°22'E, ~300m, iv.2006, leg. V. Siniaev” (ZFMK), 1 ex. “Kuatun 2300 m 27,40 n. Br. 117,40 ö. L. J. Klapperich 31.5.1938 (Fukien)/ ex. Coll. V. Balthasar Natinal Museum Prague, Czech Republic” (NMPC), 1 ex. “Kuatun 2300 m 27,40 n. Br. 117,40 ö. L. J. Klapperich 17.5.1938 (Fukien)/ ex. Coll. V. Balthasar National Museum Prague, Czech Republic” (NMPC), 1 ex. “Kuatun 2300 m 27,40 n. Br. 117,40 ö. L. J. Klapperich 21.4.1938 (Fukien)/ ex. Coll. V. Balthasar National Museum Prague, Czech Republic” (NMPC), 1 ♂ “Ao-tou, Huangkeng, Jianyang, Fujian, 2.V.1960, 950m, leg. Zhang Yinran” (IZAS), 1 ♂ “San'gang, Fujian, 17.IV.1981, leg. Wang Jiashe” (IZAS).

Redescription. Body length: 6.1 mm, length of elytra: 4.7 mm, width: 3.6 mm. Body oblong, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior two thirds of frons shiny.

Labroclypeus subrectangular, only little wider than long, widest at middle; lateral margins convex and moderately convergent anteriorly and posteriorly; anterior angles moderately rounded; anterior margin moderately sinuate medially; margins strongly reflexed; surface weakly elevated medially and shiny, finely and very densely punctate, with a few single setae. Frontoclypeal suture distinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately twice as wide as long. Ocular canthus moderately long and narrow, finely and sparsely punctate, with a terminal seta. Frons on posterior third dull, finely and densely punctate, mid-line impunctate and slightly elevated; with a few erect setae beside eyes. Eyes very large, ratio diameter/interocular width: 1.1. Antenna with ten antennomeres, club with four antennomeres and strongly reflexed, 2.3 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median sinuation.

Pronotum short and transverse, almost twice as wide as long, widest at base; lateral margins nearly straight and subparallel in basal half, moderately convex and strongly convergent anteriorly; anterior angles weakly produced and blunt, slightly rounded at tip; posterior angles nearly right-angled and moderately rounded at tip; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral border sparsely setose, anterior one glabrous; hypomeron distinctly carinate basally. Scutellum long, triangular, with fine, very dense punctures, glabrous, punctures less dense on basal midline.

Elytra oblong, widest in posterior third; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

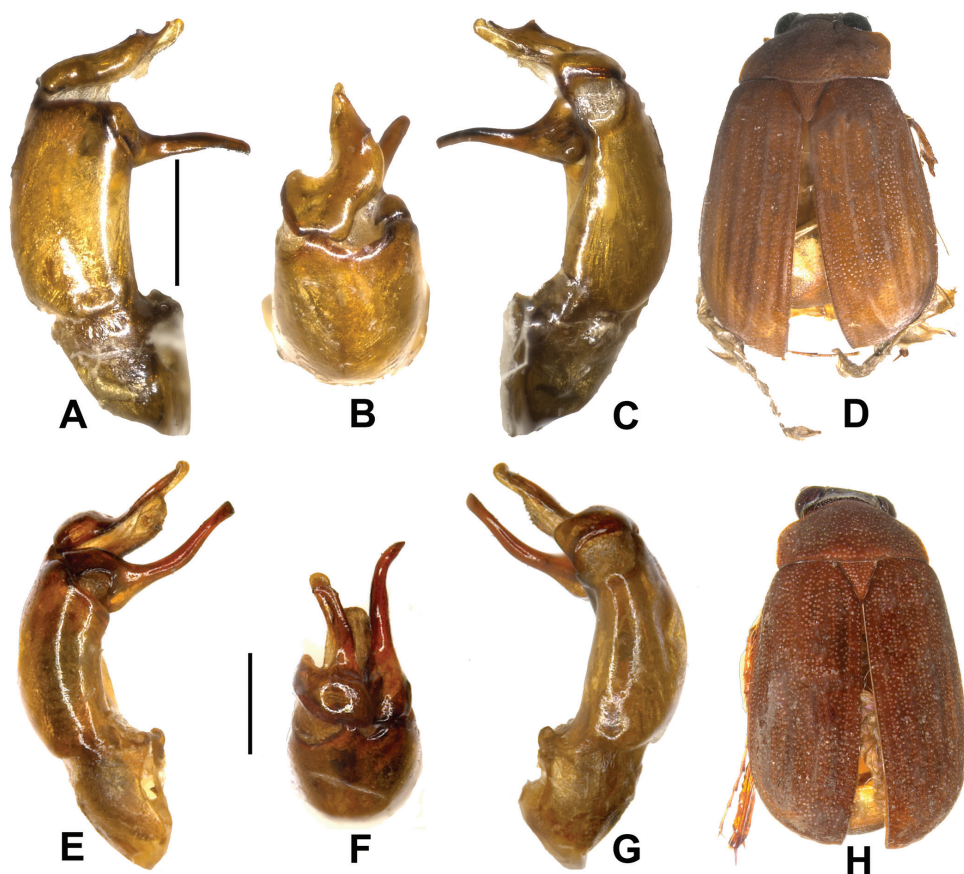


Figure 1. A–D *Neoserica calva* (Frey) (lectotype) E–H *N. zongyuani* sp. n. (holotype). A, E aedeagus, left side lateral view C, G aedeagus, right side lateral view B, F parameres, dorsal view D, H: habitus. Scale: 0.5 mm. Habitus not to scale.

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.23. Pygidium weakly convex and dull, coarsely and densely punctate, without smooth midline, with a few long setae at apex, otherwise glabrous.

Legs slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin in apical half serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length:

1/3.88; dorsal margin sharply carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; basally with a few short robust setae in single robust punctures; external face longitudinally convex, finely and sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex sharply truncate anteriorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, with fine sparse punctures dorsally; metatarsomeres with a strongly serrated ventral ridge; metatarsomere I as long as following two tarsomeres combined and half of its length longer than dorsal tibial spur. Protibia moderately long, bidentate, bluntly widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 1A–C.

***Neoserica* (s.l.) *zongyuani* sp. n.**

<http://zoobank.org/5243A034-45CB-44B7-8C93-373ED01BE211>

Figs 1E–H, 6

Type material examined. Holotype: ♂ [China] “Qingyin’ge, Mts. Emeishan, Sichuan, 20.IV.1957, 800–1000m, leg. Wang Zongyuan” (IZAS). Paratypes: 1 ♂ [China] “Guanyingge, Mts. Emeishan, Sichuan, 24.IV.1957, 800–1000m, leg. Wang Zongyuan” (IZAS), 1 ♂ [China] “Baoguo Temple, Mts. Emeishan, Sichuan, 22.IV.1957, 550–750m, leg. Lu Youcai” (IZAS), 1 ♂ [China] “Qingyin’ge, Mts. Emeishan, Sichuan, 16.V.1957, 800–1000m, leg. Zhu Fuxing” (ZFMK).

Description. Body length: 6.0 mm, length of elytra: 4.4 mm, width: 3.3 mm. Body oblong, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior two thirds of frons shiny.

Labroclypeus subrectangular, only little wider than long, widest at base; lateral margins in basal half subparallel and straight, strongly convergent and convex anteriorly; anterior angles moderately rounded; anterior margin moderately sinuate medially; margins moderately reflexed; surface weakly elevated medially and shiny, finely and very densely punctate, with a few single setae. Frontoclypeal suture distinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately twice as wide as long. Ocular canthus moderately long and narrow, finely and sparsely punctate, with a single terminal seta. Frons on posterior third dull, finely and densely punctate, anterior midline impunctate and slightly elevated; with a few erect setae beside eyes. Eyes large, ratio diameter/interocular width: 0.83. Antenna with ten antennomeres, club with four antennomeres and strongly reflexed, 2.3 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median situation.

Pronotum moderately transverse, almost twice as wide as long, widest at base; lateral margins nearly straight and weakly convergent in basal half, moderately convex

and moderately convergent anteriorly; anterior angles weakly produced and blunt; posterior angles nearly right-angled and moderately rounded at tip; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum long, with fine, very dense punctures, glabrous.

Elytra oblong, widest in posterior third; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.24. Pygidium moderately convex and dull, coarsely and densely punctate, with narrow smooth midline, with a few long setae at apex, otherwise glabrous.

Legs slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin in apical half serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.9; dorsal margin sharply carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; in basal half with a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, finely and sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex sharply truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, with fine sparse punctures dorsally; metatarsomeres missing in holotype. Protibia moderately long, bidentate, bluntly widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 1E–G.

Female unknown.

Diagnosis. *Neoserica zongyuani* sp. n. differs from *N. calva* by the slightly smaller eyes and the shape of the parameres: the left paramere is longer than that in *N. calva*, the right paramere is narrowed abruptly behind base.

Etymology. The new species is named after one of the collectors of the type series, Wang Zongyuan.

Variation. Length: 6.0 mm, length of elytra: 4.4–4.6 mm, width: 3.3–3.6 mm.

***Neoserica* (s.l.) *menghaiensis* sp. n.**

<http://zoobank.org/31693723-E6C2-4160-B0F4-B42A861C2C65>

Figs 2A–D, 6

Type material examined. Holotype: ♂ [China] “Menghai, Xishuangbanna, Yunnan, 18.VII.1958, 1200–1600m, leg. Wang Shuyong” (IZAS). Paratype: 1 ♂ “Defu, Napo, Guangxi, 19.VI.2000, 1350m, leg. Li Wenzhu” (ZFMK).

Description. Body length: 5.1 mm, length of elytra: 3.9 mm, width: 3.5 mm. Body oval, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus subtrapezoidal, distinctly wider than long, widest at base; lateral margins strongly convergent and convex anteriorly; anterior angles blunt; anterior margin distinctly sinuate medially; margins moderately reflexed; surface weakly elevated medially and shiny, finely and densely punctate, with a few single setae. Frontoclypeal suture indistinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately twice as wide as long. Ocular canthus short and narrow, finely and sparsely punctate, with a single terminal seta. Frons on posterior half dull, finely and densely punctate, anterior midline narrowly impunctate and not elevated; with a few erect setae beside eyes and dense fine setae on posterior half. Eyes large, ratio diameter/interocular width: 0.72. Antenna with ten antennomeres, club with four antennomeres and straight, 1.2 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median sinuation.

Pronotum moderately transverse, almost twice as wide as long, widest at base; lateral margins weakly evenly convex and weakly convergent, more strongly convergent in anterior third; anterior angles distinctly produced and sharp; posterior angles strongly rounded; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum long, with fine, dense punctures, at base punctures less dense, glabrous.

Elytra short-oval, widest in posterior third; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.39. Pygidium weakly

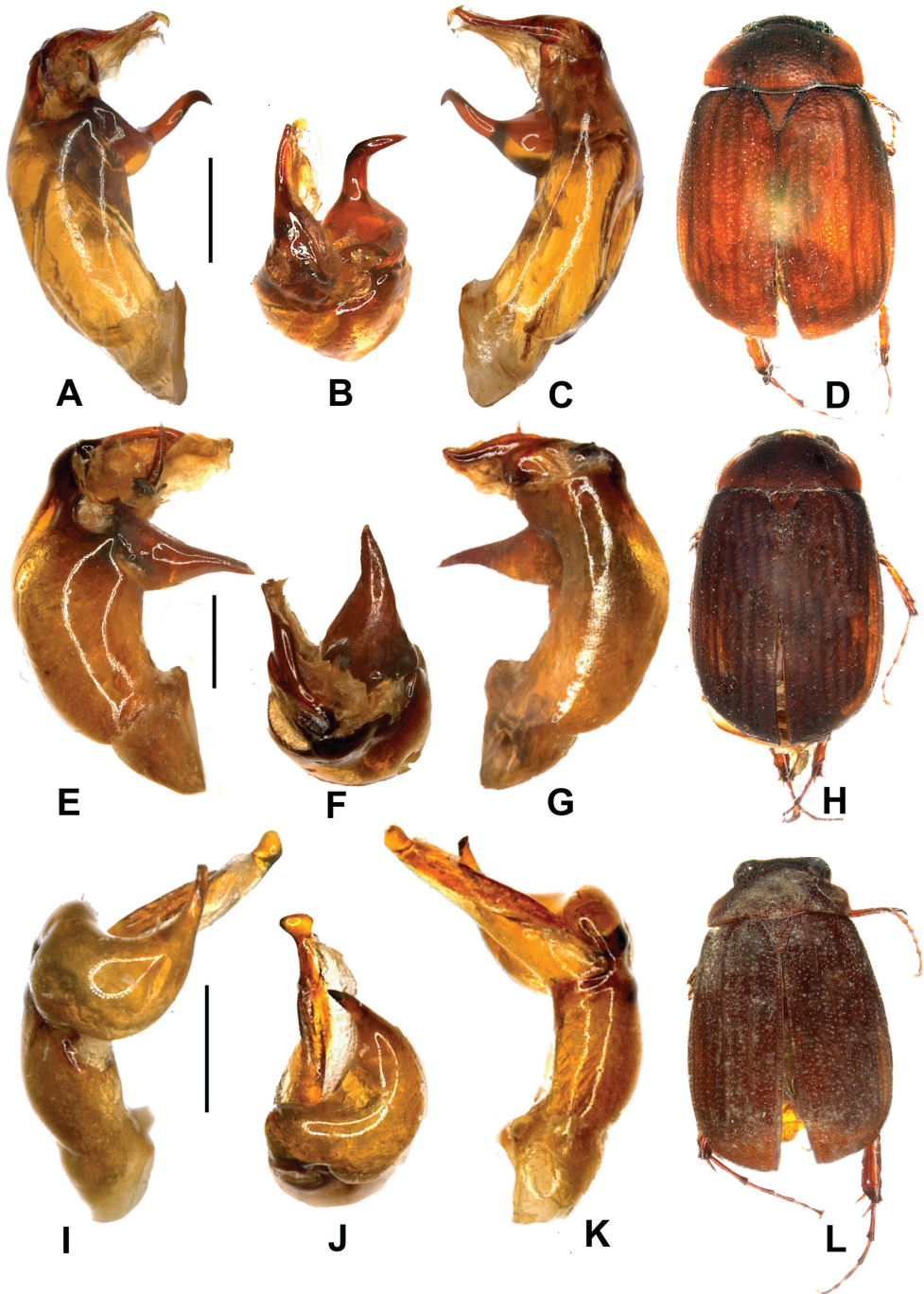


Figure 2. A–D *Neoserica menghaiensis* sp. n. (holotype) E–H *N. liangi* sp. n. (holotype) I–L *N. calvoides* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view B, F, J parameres, dorsal view D, H, L habitus. Scale: 0.5 mm. Habitus not to scale.

convex and dull, coarsely and densely punctate, with narrow smooth midline, with a few long setae at apex, otherwise glabrous.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.2; dorsal margin indistinctly carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; in basal half with a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, finely and sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex shallowly sinuate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, with fine sparse punctures dorsally; metatarsomeres with a strongly serrated ventral ridge; metatarsomere I as long as following two tarsomeres combined and half of its length longer than dorsal tibial spur. Protibia short, bidentate, not widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 2A–C.

Female unknown.

Diagnosis. *Neoserica menghaiensis* sp. n. differs from *N. calva* by the more wider body shape, shorter and straight antennal club, smaller eyes, less sharply carinate dorsal margin of metatibia, and the shape of the parameres: the left paramere is much more widened at base than in that *N. calva*, the right paramere is almost straight.

Etymology. The new species is named after its type locality, Menghai.

Variation. Body length of the paratypes: 5.1–5.7 mm, length of elytra: 3.9–4.3 mm.

***Neoserica* (s.l.) *liangi* sp. n.**

<http://zoobank.org/ED2AE588-3116-48CB-9D73-B01846F2F4D7>

Figs 2E–H, 6

Type material examined. Holotype: ♂ [China] “Caiyanghe Nature Reserve, Pu’er, Yunnan, 28–29.VII.2007, leg. Liang Geqiu” (LSSYU).

Description. Body length: 5.9 mm, length of elytra: 4.5 mm, width: 3.6 mm. Body oval, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus subtrapezoidal, distinctly wider than long, widest at base; lateral margins strongly convergent and convex anteriorly; anterior angles blunt; anterior margin distinctly sinuate medially; margins moderately reflexed; surface weakly elevated medially and shiny, finely and densely punctate, with a few single setae. Frontoclypeal suture indistinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately twice as wide as long. Ocular canthus short and narrow,

finely and sparsely punctate, with a single terminal seta. Frons on posterior half dull; finely and densely punctate; with a few erect setae beside eyes and dense fine setae on posterior half. Eyes large, ratio diameter/interocular width: 0.75. Antenna with ten antennomeres, club with four antennomeres and straight, 1.2 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median sinuation.

Pronotum moderately transverse, almost twice as wide as long, widest at base; lateral margins weakly evenly convex and weakly convergent, more strongly convergent in anterior third; anterior angles distinctly produced and sharp; posterior angles strongly rounded; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomer on distinctly carinate basally. Scutellum long, with fine, dense punctures, at base punctures less dense, glabrous.

Elytra short-oval, widest in posterior third; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.32. Pygidium weakly convex and dull, coarsely and densely punctate, with narrow smooth midline, with a few long setae at apex, otherwise glabrous.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.2; dorsal margin finely carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; in basal half with a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, finely and sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex shallowly sinuate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, with fine sparse punctures dorsally; metatarsomeres with a strongly serrated ventral ridge; metatarsomere I as long as following two tarsomeres combined and half of its length longer than dorsal tibial spur. Protibia short, bidentate, not widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 2E–G.

Female unknown.

Diagnosis. *Neoserica liangi* sp. n. differs from *N. menghaiensis* sp. n. by the shape of the aedeagus: the phallobase is strongly widened apically (in lateral view); the left paramere is much wider at base being evenly narrowed towards the apex rather than being narrowed abruptly after base.

Etymology. The new species is named after the collector of the holotype, Liang Geqiu.

***Neoserica* (s.l.) *calvoides* sp. n.**

<http://zoobank.org/71938A51-1BE2-4B1E-B6CF-46F7A08836AA>

Figs 2I–L, 6

Type material examined. Holotype: ♂ [China] “Gulingqing, Maguan, Yunnan, 20.VII.2006, leg. Mao Benyong, Lang Juntong etc.” (HBUM).

Description. Body length: 5.8 mm, length of elytra: 4.6 mm, width: 3.5 mm. Body moderately oblong, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior two thirds of frons shiny.

Labroclypeus subtrapezoidal, little wider than long, widest at base; lateral margins strongly convergent and convex anteriorly; anterior angles blunt; anterior margin distinctly sinuate medially; margins moderately reflexed; surface weakly elevated medially and shiny, finely and densely punctate, with a few single setae. Frontoclypeal suture indistinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately 3 times as wide as long. Ocular canthus short and narrow, finely and sparsely punctate, with a single terminal seta. Frons on posterior half dull; finely and densely punctate; with a few erect setae beside eyes and dense fine setae on posterior half. Eyes very large, ratio diameter/interocular width: 1.0. Antenna with ten antennomeres, club with four antennomeres and weakly reflexed, 1.4 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median situation.

Pronotum short and transverse, twice as wide as long, widest shortly before base; lateral margins nearly straight and subparallel, weakly convex and convergent in anterior third; anterior angles weakly produced and blunt; posterior angles blunt, slightly rounded at tip; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum long, with fine, dense punctures, at base punctures less dense, glabrous.

Elytra oblong, widest at middle; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures; penultimate lateral interval with a few long single setae. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.35. Pygidium weakly convex and dull, coarsely and densely punctate, without smooth midline, with a few long setae at apex, otherwise glabrous.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.2; dorsal margin moderately carinate, with one group of spines, only; former basal group reduced to a single spine at middle, apical group at three quarters of metatibial length; with a blunt carina beside dorsal margin in basal half bearing a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, coarsely but sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex moderately truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, with fine sparse punctures dorsally; metatarsomeres with a strongly serrated ventral ridge; metatarsomere I as long as following two tarsomeres combined and half of its length longer than dorsal tibial spur. Protibia short, bidentate, not widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 2 I–K.

Female unknown.

Diagnosis. *Neoserica calvoides* sp. n. differs from *N. calva* by the slightly shorter antennal club and the shape of the parameres: the right paramere bears a strongly widened basal lobe that is curved dorsally; the left paramere is reduced in length and not visible under the basal lobe of the right paramere.

Etymology. The new species is named '*calvoides*' (as combination of *calva*, and –oides (resembling) – the ancient greek suffix (eidos, “form”, “likeness”), referring to the external similarity to *N. calva* (Frey).

***Neoserica* (s.l.) *gulingensis* sp. n.**

<http://zoobank.org/E5578439-5EA0-40CF-841D-C7813281E9DD>

Figs 2A–D, 6

Type material examined. Holotype: ♂ [China] “Gulingqing, Maguan, Yunnan, 20.VII.2006, leg. Mao Benyong, Lang Juntong etc.” (HBUM).

Description. Body length: 5.9 mm, length of elytra: 4.2 mm, width: 3.2 mm. Body oblong, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior two thirds of frons shiny.

Labroclypeus subtrapezoidal, little wider than long, widest at base; lateral margins convergent and convex anteriorly; anterior angles moderately rounded; anterior margin distinctly sinuate medially; margins moderately reflexed; surface weakly elevated medially and shiny, finely and densely punctate, with a few single setae. Frontoclypeal suture indistinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately 2.5 times as wide as long. Ocular canthus moderately long and narrow, finely and sparsely punctate, with a single terminal seta. Frons on posterior half dull; finely and densely punctate; with a few erect setae beside eyes and behind frontoclypeal suture, dense fine setae on posterior half. Eyes very large, ratio diameter/interocular width: 0.94. Antenna with ten antennomeres, club with four antennomeres and weakly reflexed, 1.4 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median sinuation.

Pronotum transverse, nearly twice as wide as long, widest shortly before base; lateral margins weakly convex and convergent in anterior third, weakly narrowed posteriorly; anterior angles weakly produced and blunt; posterior angles blunt, slightly rounded at tip; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum long, with fine, dense punctures, at base punctures less dense, glabrous.

Elytra oblong, widest at middle; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures; penultimate lateral interval with a few long single setae. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.32. Pygidium weakly convex and dull, coarsely and densely punctate, without smooth midline, with a few long setae at apex, otherwise glabrous.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of

width/length: 1/3.3; dorsal margin moderately carinate, with one group of spines, only; former basal group reduced to a single spine at middle, apical group at three quarters of metatibial length; with a blunt carina beside dorsal margin in basal half bearing a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, coarsely but sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex moderately truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, with fine sparse punctures dorsally; metatarsomeres with a strongly serrated ventral ridge; metatarsomere I as long as following two tarsomeres combined and half of its length longer than dorsal tibial spur. Protibia short, bidentate, not widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 3A–C.

Female unknown.

Diagnosis. *Neoserica gulingqingensis* sp. n. differs from *N. calvoides* by the shape of the parameres: the left paramere is not reduced in length, subequal in length to the less widened dorsal lobe of the right paramere.

Etymology. The new species is named after its type locality, Gulingqing.

***Neoserica* (s.l.) *anonyma* sp. n.**

<http://zoobank.org/5596AE75-4B9B-44CB-8C69-71B36A90FC96>

Figs 3E–H, 6

Type material examined. Holotype: ♂ “China, W. Yunnan, env. Baoshan, 2500m, 2.–3.viii.2002, leg. S. Murzin, I. Shokhin” (CPPB). Paratypes: 2 ♂♂, 16 ♀♀ “China, W. Yunnan, env. Baoshan, 2500m, 2.–3.viii.2002, leg. S. Murzin, I. Shokhin” (CPPB, ZFMK).

Description. Body length: 5.1 mm, length of elytra: 3.9 mm, width: 3.5 mm. Body oval, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus subtrapezoidal, distinctly wider than long, widest at base; lateral margins strongly convergent and convex anteriorly; anterior angles blunt; anterior margin distinctly sinuate medially, sharply reflexed medially; margins moderately reflexed; surface strongly elevated medially and shiny, finely and densely punctate, with a few single setae. Frontoclypeal suture indistinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye narrow, approximately as wide as long. Ocular canthus short and narrow, finely and sparsely punctate, with a single terminal seta. Frons on posterior half dull; finely and densely punctate; with a few erect setae beside eyes and behind frontoclypeal suture, with dense, fine setae on posterior half. Eyes small, ratio diameter/interocular width: 0.58. Antenna with ten antennomeres, club with four antennomeres and straight, as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median sinuation.

Pronotum moderately transverse, widest at base; lateral margins weakly evenly convex and weakly convergent anteriorly; anterior angles distinctly produced and sharp; posterior angles blunt, slightly rounded at tip; anterior margin straight with a very fine and complete marginal line; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum large, with fine, dense punctures, glabrous.

Elytra short-oval, widest shortly behind middle; striae weakly impressed, finely and moderately densely punctate; intervals weakly convex, with moderately dense punctures concentrated along striae, with minute setae in punctures. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdomen missing in the holotype. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.2.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.3; dorsal margin distinctly carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; in basal half with a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, finely and sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex moderately truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, impunctate dorsally; metatarsomeres with a strongly serrated ventral ridge; metatarsomere I slightly shorter than following two tarsomeres combined and nearly half of its length longer than dorsal tibial spur. Protibia short, bidentate, not widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 3E–G.

Diagnosis. *Neoserica anonyma* sp. n. differs from all other species of the *N. calva* group with small eyes and short antennal club by the parameres being both subequal in length.

Etymology. This new species was named based on the Latin word “*anonymus*” (anonymous), with reference to its inconspicuous external appearance what made it hard initially to group this species systematically. Therefore type specimens were originally labelled as “*Maladera anonyma*”.

Variation. Body length of the paratypes: 5.1–6.1 mm, length of elytra: 3.9–4.2 mm, width: 3.5–3.6 mm. Female has the antennal club composed of three antennomeres, as long as the remaining antennomeres combined.

Remarks. Abdomen of the holotype was lost during specimens shipment after genitalia already were dissected.

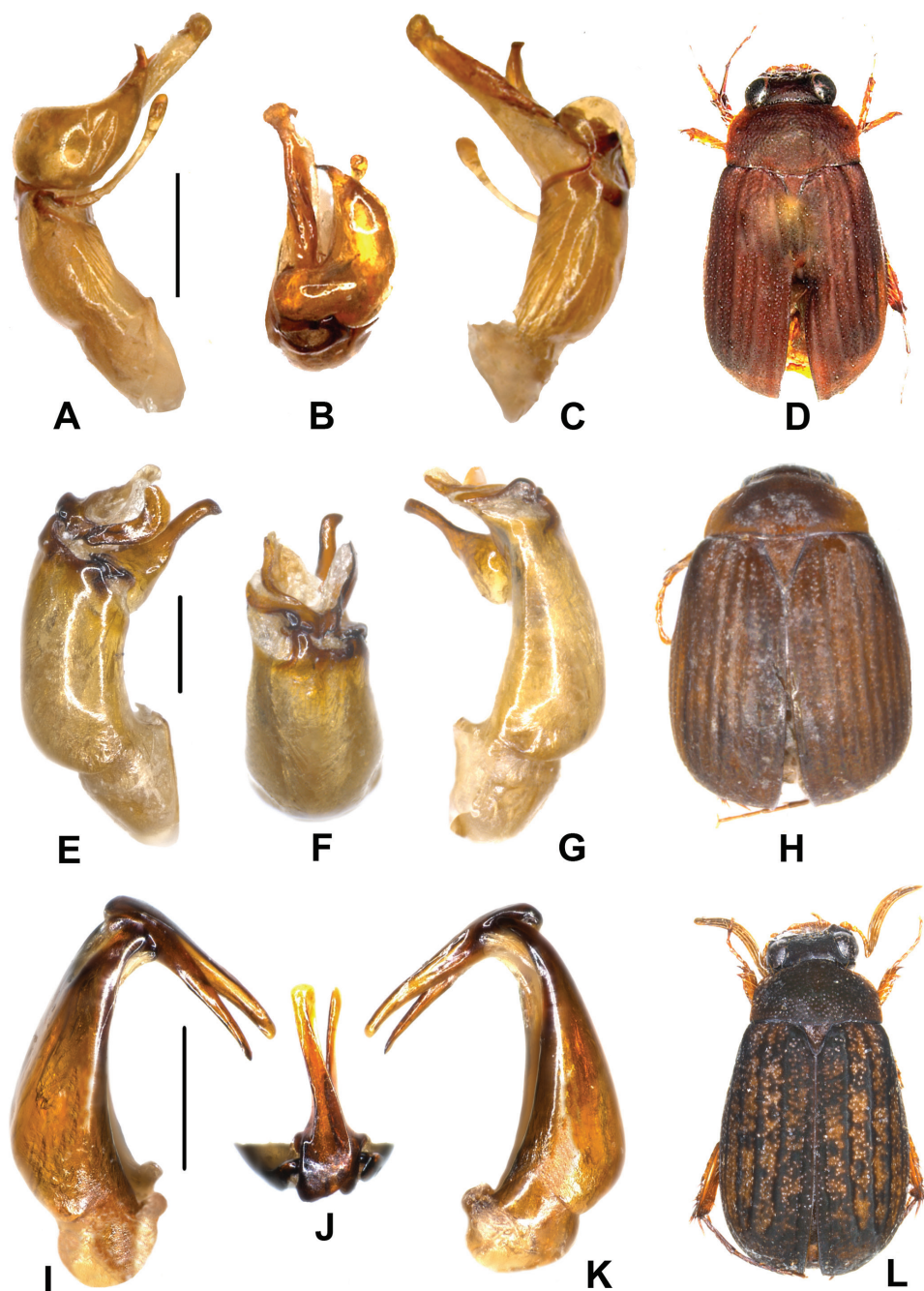


Figure 3. **A–D** *Neoserica gulinqingensis* sp. n. (holotype) **E–H** *N. anonyma* sp. n. (holotype) **I–L** *N. zhejiangensis* sp. n. (holotype). **A, E, I** aedeagus, left side lateral view **C, G, K** aedeagus, right side lateral view **B, F, J** parameres, dorsal view **D, H, L** habitus. Scale: 0.5 mm. Habitus not to scale.

***Neoserica* (s.l.) *zhejiangensis* sp. n.**

<http://zoobank.org/15082F5C-3FD3-48FC-93A1-0178651935DA>

Figs 3 I–L, 6

Type material examined. Holotype: ♂ “China, SW Zhejiang, 5.VI. Fangyangshan, Huangmao Jian 27°53'N, 119°11'E, 1500–1850m Jaroslav Turna leg., 2008” (ZFMK). Paratypes: 1 ♂ [China] “Kuatun (2300 m) 27,40 n.Br. 117,40 ö.L. J. Klapperich 19.5. 1938 (Fukien)” (NMPC), 1 ♂ [China] “Longmenhe River, Xingshan, Hubei, 7.V.1994, 1300m, leg. Yao Jian” (IZAS), 1 ♂ [China] “San’gang, Chong’anxingcun, Fujian, 27.V.1960, 740m, leg. Zhang Yiran” (IZAS).

Description. Body length: 5.9 mm, length of elytra: 4.0 mm, width: 3.2 mm. Body oblong, dark reddish brown, labroclypeus and irregular spots on elytra reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus subrectangular, little wider than long, widest at base; lateral margins convex and moderately convergent anteriorly; anterior angles strongly rounded; anterior margin moderately sinuate medially; margins moderately reflexed; surface flat and shiny, coarsely and finely, very densely punctate, with a few single setae. Frontoclypeal suture distinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately 1.5 times as wide as long. Ocular canthus moderately long and narrow, finely and sparsely punctate, with a terminal seta. Frons on posterior half dull; coarsely and densely punctate; with a few erect setae beside eyes and behind frontoclypeal suture, otherwise only with minute setae. Eyes large, ratio diameter/interocular width: 0.83. Antenna with ten antennomeres, club with four antennomeres and strongly reflexed, 2.3 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median sinuation.

Pronotum short, widest at base; lateral margins nearly straight and subparallel in basal half, moderately convex and strongly convergent anteriorly; anterior angles weakly produced and blunt, slightly rounded at tip; posterior angles nearly right-angled and moderately rounded at tip; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum long, triangular, with fine, very dense punctures, glabrous, along midline punctures less dense.

Elytra oblong, widest in posterior third; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa

glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctuate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.5. Pygidium weakly convex and dull, coarsely and moderately densely punctate, without smooth midline, with a few long setae at apex, otherwise glabrous.

Legs slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin in apical half serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.4; dorsal margin sharply carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; basally with a few short robust setae in single robust punctures; external face longitudinally convex, coarsely and densely punctate; ventral margin finely serrated, with three robust setae, with the apical one being slightly more distant; medial face densely and finely punctate, glabrous, apex sharply truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, with fine sparse punctures dorsally; metatarsomeres with a strongly serrated ventral ridge, punctures dense and longitudinally impressed dorsally, sharply carinate laterally; metatarsomere I as long as following two tarsomeres combined and half of its length longer than dorsal tibial spur. Protibia moderately long, bidentate, not widened before basal lateral tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 3I–K.

Female unknown.

Diagnosis. *Neoserica zhejiangensis* differs from all other species of the *N. calva* group by the bicoloured elytra having reddish spots on the dark background, as well as by the antennal club being composed of five antennomeres.

Etymology. The new species is named after its occurrence in Zhejiang Province.

Variation. Body length of the paratypes: 5.1–5.9 mm, length of elytra: 3.9–4.0 mm, width: 2.9–3.2 mm.

***Neoserica* (s.l.) *zhibenshanica* sp. n.**

<http://zoobank.org/1FC196B0-78CA-4200-B1DB-7ACF7CDB4704>

Figs 4A–D, 6

Type material examined. Holotype: ♂ [China] “Mts. Zhibenshan, Yunlong, Yunnan, 20.VI.1981, 2500m, leg. Zhang Xuezhong” (IZAS).

Description. Body length: 6.6 mm, length of elytra: 5.0 mm, width: 3.5 mm. Body oblong, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus subrectangular, little wider than long, widest at base; lateral margins straight and subparallel; anterior angles strongly rounded; anterior margin moderately

sinuate medially; margins strongly reflexed; surface flat and moderately shiny, coarsely and very densely punctate, with a few single setae. Frontoclypeal suture distinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately 1.5 times as wide as long. Ocular canthus long and moderately narrow, finely and densely punctate, with a terminal seta. Frons on posterior half dull; coarsely and densely punctate; with a few erect setae beside eyes and behind frontoclypeal suture, otherwise only with minute setae. Eyes moderately large, ratio diameter/interocular width: 0.64. Antenna with ten antennomeres, club with four antennomeres and strongly reflexed, 3 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median sinuation.

Pronotum short, widest at base; lateral margins nearly straight and subparallel in basal half, moderately convex and strongly convergent anteriorly; anterior angles weakly produced and blunt, slightly rounded at tip; posterior angles nearly right-angled and moderately rounded at tip; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomerion distinctly carinate basally. Scutellum long, triangular, with fine, very dense punctures, glabrous, along midline punctures less dense.

Elytra oblong, widest in posterior third; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.24. Pygidium moderately convex and dull, coarsely and moderately densely punctate, without smooth midline, with a few long setae at apex, otherwise glabrous.

Legs slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin in apical half serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and long, widest at apex, ratio of width/length: 1/4.2; dorsal margin sharply carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; in basal half with a blunt carina beside dorsal margin bearing a few single short and robust setae in robust punctures with serrated margin; external face longitudinally convex, coarsely and moderately densely punctate; ventral margin finely serrated, with three robust equidistant setae; medial

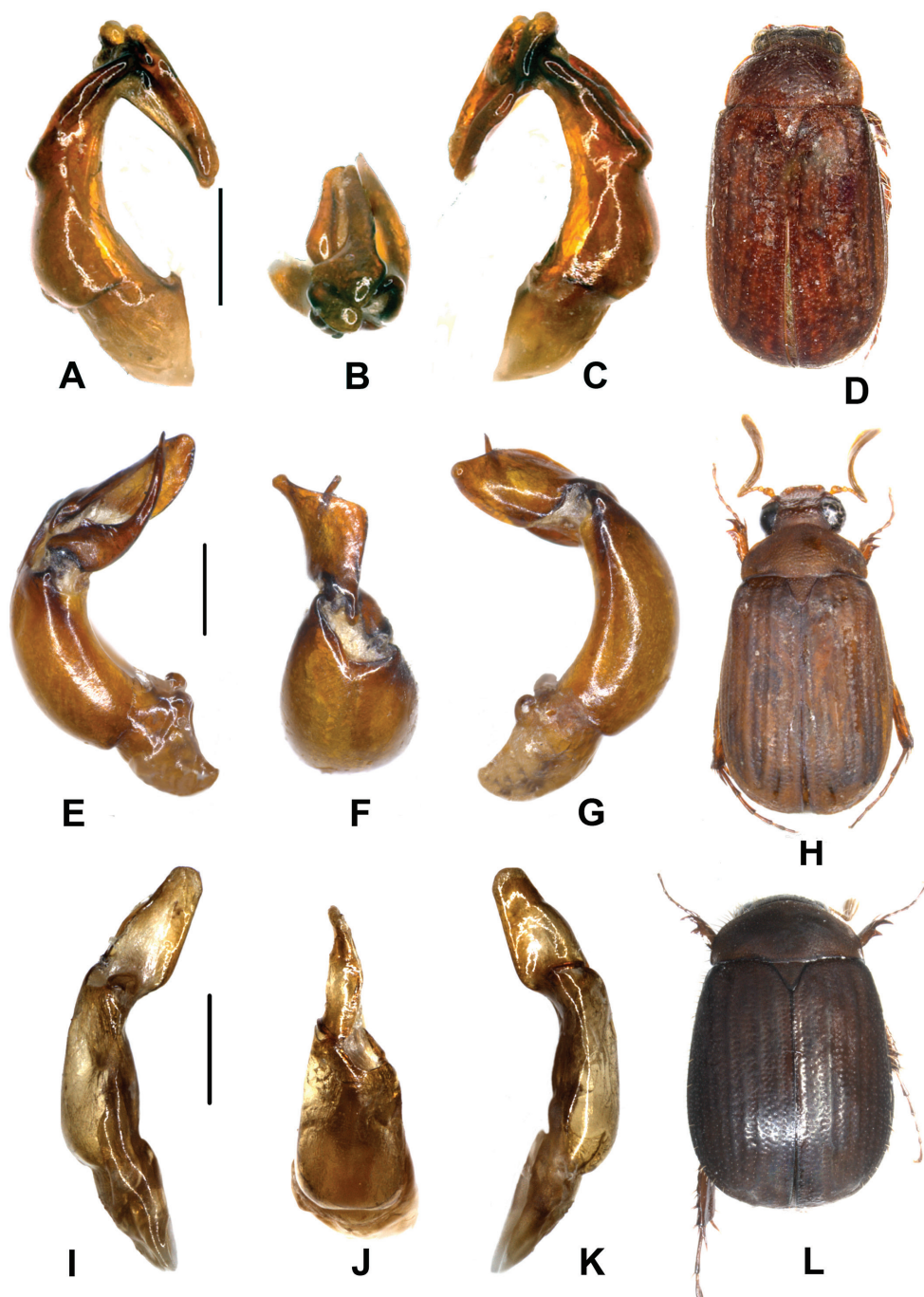


Figure 4. **A–D** *Neoserica zhibenshanica* sp. n. (holotype) **E–H** *N. taipingensis* sp. n. (holotype) **I–L** *N. mengi* sp. n. (holotype). **A, E, I** aedeagus, left side lateral view **C, G, K** aedeagus, right side lateral view **B, F, J** parameres, dorsal view **D, H, L** habitus. Scale: 0.5 mm. Habitus not to scale.

face densely and finely punctate, glabrous, apex sharply truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, without punctures dorsally; metatarsomeres with a strongly serrated ventral ridge; metatarsomere I distinctly shorter than following two tarsomeres combined and nearly half of its length longer than dorsal tibial spur. Protibia moderately long, bidentate, not widened before basal lateral tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 4A–C.

Female unknown.

Diagnosis. *Neoserica zhibenshanica* sp. n. differs from all other species of the *N. calva* group with smaller eyes by the length of the antennal club being 3 times as long as the remaining antennomeres combined.

Etymology. The new species is named after its type locality, Mt. Zhibenshan.

***Neoserica* (s.l.) *taipingensis* sp. n.**

<http://zoobank.org/35C780C3-6489-4D0D-986A-EC2360F43B4F>

Figs 4E–H, 6

Type material examined. Holotype: ♂ “China-Shaanxi, SW Tsinling Mts., Taiping vill., 33°33'N, 106°43'E, June 2000, 1500–2000m, Siniaev & Plutenko leg.” (CPPB). Paratypes: 12 ♂♂, 1 ♀ “China-Shaanxi, SW Tsinling Mts., Taiping vill., 33°33'N, 106°43'E, June 2000, 1500–2000m, Siniaev & Plutenko leg.” (CPPB, ZFMK), 2 ♂♂ “China, Shaanxi, Tsinling Mts., 1600m, Nat. Res. Foping, 33°51'N, 107°57'E, 20.iv.–11.v.1999, V. Siniaev & A. Plutenko lgt.” (CPPB), 1 ♂ “China, Shaanxi, Panda area, Nat. Res. Foping, 1600m, 6–11.iv.1999, 33°45'N, 107°48'E, V. Siniaev & A. Plutenko lgt.” (CPPB), 1 ♂ [China] “Meixian County, Shaanxi, VIII.1963, leg. Chen You'guang” (IZAS).

Description. Body length: 7.2 mm, length of elytra: 4.8 mm, width: 3.7 mm. Body oblong, reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior two thirds of frons shiny.

Labroclypeus subrectangular, little wider than long, widest at base; lateral margins straight and subparallel in basal half, strongly convergent and convex anteriorly; anterior angles moderately rounded; anterior margin moderately sinuate medially; margins moderately reflexed; surface flat and shiny, coarsely and densely punctate, with a few single setae. Frontoclypeal suture distinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye approximately 1.5 times as wide as long. Ocular canthus long and narrow, finely and densely punctate, with a short terminal seta. Frons on posterior third dull; coarsely and densely punctate; with a few erect setae beside eyes and behind frontoclypeal suture, otherwise only with minute setae. Eyes large, ratio diameter/interocular width: 0.85. Antenna with ten antennomeres, club with four antennomeres and strongly reflexed, 2.5 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with weak median sinuation.

Pronotum short, widest shortly behind middle; lateral margins evenly moderately convex and convergent anteriorly and posteriorly; anterior angles weakly produced and blunt, slightly rounded at tip; posterior angles blunt and rounded at tip; anterior margin with a fine and complete marginal line, weakly convexly produced medially; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum long, triangular, with fine, very dense punctures, glabrous.

Elytra oblong, widest shortly behind middle; striae weakly impressed, finely and moderately densely punctate; even intervals flat, with evenly and moderately dense punctures; odd intervals convex, with sparse, fine punctures concentrated along striae, impunctate medially, with minute setae in punctures. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.22. Pygidium strongly convex and dull, coarsely and densely punctate, without smooth midline, with a few long setae.

Legs slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur moderately shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin in apical half serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.4; dorsal margin sharply carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; in basal half with a blunt carina beside dorsal margin bearing a few single short and robust setae in robust punctures with serrated margin; external face longitudinally convex, coarsely and moderately densely punctate; ventral margin finely serrated, with two robust widely distant setae; medial face sparsely and finely punctate, glabrous, apex sharply truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, without punctures dorsally; metatarsomeres with a strongly serrated ventral ridge, weakly carinate laterally; metatarsomere I distinctly shorter than following two tarsomeres combined and nearly half of its length longer than dorsal tibial spur. Protibia moderately long, bidentate, not widened before basal lateral tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 4E–G.

Diagnosis. *Neoserica taipingensis* differs from *N. calva* by the smaller eyes, slightly longer antennal club as well as by the shape of the parameres: the right paramere is shell-like widened and nearly straight.

Etymology. The new species is named after its type locality, Taiping.

Variation. Body length of the paratypes: 6.6–7.8 mm, length of elytra: 4.7–5.2 mm, width: 3.7–4.1 mm. Female has the antennal club composed of three antennomeres, as long as the remaining antennomeres combined.

***Neoserica* (s.l.) *mengi* sp. n.**

<http://zoobank.org/89ECCAD8-A385-4E44-893A-CCDE78E28212>

Figs 4I–L, 6

Type material examined. Holotype: ♂ “X-DA2984 China S. Yunnan (Xishuangbanna) 23km NW Jinghong vic. Na Ban (NNNR), 730m, 22°09.49'N, 100°39.92'E 20.x.2008 L. Meng *Neoserica* spCHz1 ♂” (ZFMK). Paratypes: 1 ♂ [China] “Mt. Wuyanling, Taishun, Zhejiang, 28.VII–3.VIII.2005, leg. Ba Yibin” (HBUM), 4 ♂♂, 1 ♀ [China] “Caiyanghe, Pu'er, Yunnan, 28.VII.2007, leg. Ren Guodong, Hou Wenjun, Li Yalin” (HBUM), 1 ♂ [China] “Caiyanghe, Pu'er, Yunnan, 28.VII.2007, 1700m, leg. Mao Benyong, Xu Jishan” (HBUM), 1 ♂ [China] “Defu, Napo, Guangxi, 15.VIII.1998, 1300m, leg. Huang Fusheng, Li Wenzhu” (IZAS), 1 ♂ [China] “Yunnan, Mt. Fofangshan 2010-7-27/ LW-1056” (ZFMK), 1 ♂ [China] “Yunnan, Mt. Fofangshan 2010-7-27/ LW-1056bis” (ZFMK), 1 ♂ [China] “Yunnan, Nabanhe Nature Reserve, 2008-X-11/ LW-1364” (ZFMK), 2 ♂♂, 1 ♀ [China] “Yexianggu, Jinghong, Yunnan, 3–4.VIII.2006, 850m, leg. Mao Benyong etc.” (HBUM).

Description. Body length: 5.3 mm, length of elytra: 3.9 mm, width: 3.5 mm. Body oval, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus subtrapezoidal, distinctly wider than long, widest at base; lateral margins strongly convergent and convex anteriorly; anterior angles blunt; anterior margin distinctly sinuate medially, sharply reflexed medially; margins moderately reflexed; surface slightly elevated medially and shiny, finely and densely punctate, with a few single setae. Frontoclypeal suture indistinctly incised, weakly elevated and moderately angled medially. Smooth area anterior to eye narrow, approximately as wide as long. Ocular canthus short and narrow, impunctate, with a single terminal seta. Frons on posterior half dull; finely and densely punctate; with a few erect setae beside eyes and behind frontoclypeal suture, with dense, fine setae on posterior half. Eyes small, ratio diameter/interocular width: 0.57. Antenna with ten antennomeres, club with four antennomeres and straight, 1.2 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with median sinuation.

Pronotum moderately transverse, widest at base; lateral margins weakly evenly convex and weakly convergent anteriorly; anterior angles distinctly produced and sharp; posterior angles blunt, broadly rounded at tip; anterior margin straight with a very fine and complete marginal line; surface densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly

carinate basally. Scutellum large, with fine, dense punctures, glabrous, punctures on base less dense.

Elytra short-oval, widest shortly behind middle; striae weakly impressed, finely and moderately densely punctate; intervals weakly convex, with moderately dense punctures concentrated along striae, with minute setae in punctures, penultimate lateral interval with a few single, erect setae. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.33. Pygidium weakly convex and dull, coarsely and densely punctate, without smooth midline, with short adpressed on disc and sides and a few long setae near apex.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur dull and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/2.8; dorsal margin distinctly carinate, with two groups of spines; basal group shortly behind middle, apical group at three quarters of metatibial length; in basal half with a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, finely and sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex moderately truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, impunctate dorsally; metatarsomeres with a strongly serrated ventral ridge; metatarsomere I slightly shorter than following two tarsomeres combined and nearly half of its length longer than dorsal tibial spur. Protibia short, bidentate, not widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 4I–K.

Diagnosis. *Neoserica mengi* sp. n. is similar to *N. anonyma* sp. n. externally but differs from it by the slightly longer antennal club, slightly stouter metatibia, and the shape of the parameres: the left paramere is strongly reduced in size, its length is 1/7 of that of the right paramere.

Etymology. This new species is named after one of the collectors of the type series, L. Meng.

Variation. Body length of the paratypes: 5.2–5.9 mm, length of elytra: 3.8–4.0 mm, width: 3.4–3.6 mm. Female has the antennal club composed of three antennomeres, as long as the remaining antennomeres combined.

***Neoserica* (s.l.) *koelkebecki* sp. n.**

<http://zoobank.org/B6C0FA89-FD9D-41EF-AF9B-9F1716818C17>

Figs 5A–D, 6

Type material examined. Holotype: ♂ “08.07.2010 Mudeungsan, Gwangju (Süd-korea) leg. T. Kölkebeck” (ZFMK).

Description. Body length: 5.8 mm, length of elytra: 4.0 mm, width: 3.2 mm. Body oval, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus subtrapezoidal, distinctly wider than long, widest at base; lateral margins nearly straight and strongly convergent anteriorly; anterior angles weakly rounded; anterior margin distinctly sinuate medially, sharply reflexed medially; margins moderately reflexed; surface slightly elevated medially and shiny, finely and moderately densely punctate, with a few single setae. Frontoclypeal suture invisible. Smooth area anterior to eye narrow, approximately 1.2 times as wide as long. Ocular canthus short and narrow, sparsely punctate, with a single terminal seta. Frons on posterior half dull; finely and sparsely punctate; with a few erect setae beside eyes and behind frontoclypeal suture, with dense, fine setae on posterior half. Eyes small, ratio diameter/interocular width: 0.52. Antenna with ten antennomeres, club with four antennomeres and straight, 1.7 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with median sinuation.

Pronotum moderately transverse, widest at base; lateral margins subparallel in basal half, strongly convex at middle, and weakly evenly convex and convergent anteriorly; anterior angles distinctly produced and sharp; posterior angles blunt, broadly rounded at tip; anterior margin nearly straight, with a fine and complete marginal line; surface moderately densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum large, with fine, dense punctures, glabrous.

Elytra short-oval, widest shortly behind middle; striae weakly impressed, finely and moderately densely punctate; intervals weakly convex, with moderately dense punctures concentrated along striae, with minute setae in punctures, penultimate lateral interval with a few single, erect setae. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.58. Pygidium strongly convex and dull, coarsely and densely punctate, without smooth midline, with short adpressed on disc and sides and a few long setae near apex.

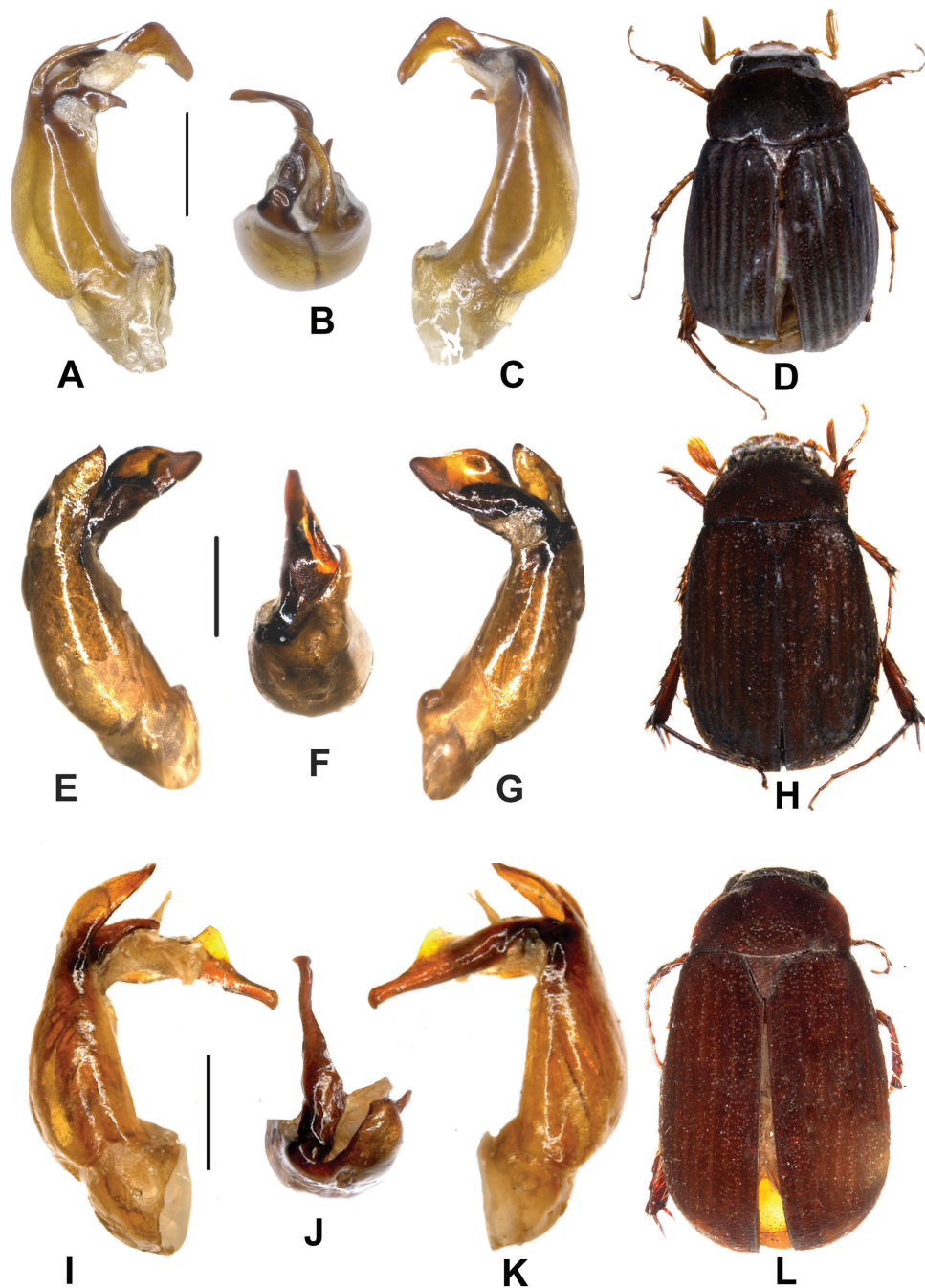


Figure 5. **A–D** *Neoserica koelkebecki* sp. n. (holotype) **E–H** *N. luxiensis* sp. n. (holotype) **I–L** *N. ailaoshanica* sp. n. (holotype). **A, E, I** aedeagus, left side lateral view **C, G, K** aedeagus, right side lateral view **B, F, J** parameres, dorsal view **D, H, L** habitus. Scale: 0.5 mm. Habitus not to scale.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur shiny and sparsely finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.3; dorsal margin indistinctly carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; in basal half with a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, finely and sparsely punctate; ventral margin finely serrated, with three robust setae, with the apical one being more distant; medial face impunctate, glabrous, apex moderately truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, impunctate dorsally; metatarsomeres with a strongly serrated ventral ridge and a few fine punctures dorsally; metatarsomere I as long as following two tarsomeres combined and nearly half of its length longer than dorsal tibial spur. Protibia short, bidentate, slightly widened laterally before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 5A–C.

Female unknown.

Diagnosis. *Neoserica koelkebecki* sp. n. is rather similar to *N. anonyma* sp. n. and *N. mengi* sp. n. externally but differs from them by the slightly longer antennal club and the shape of the aedeagus: the apex of the dorsal phallobase has a narrow process.

Etymology. This new species is named after the collector of the species, Torben Kölkebeck.

***Neoserica* (s.l.) *luxiensis* sp. n.**

<http://zoobank.org/5EA97BA7-B353-4E95-AF9F-EC366F161FA4>

Figs 5E–H, 6

Type material examined. Holotype: ♂ [China] “China (Yunnan) Dehong Dai Aut. Pref., mount. Range 31km E Luxi, 2280m, 24°29'31"N/ 98°52'58"E (grassland/pasture, under stones/ shrubs, in moss/ litter) 3.VI.2007 D.W. Wrase [19]” (ZFMK).

Description. Body length: 6.1 mm, length of elytra: 4.6 mm, width: 3.2 mm. Body oblong-oval, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus shortly subtrapezoidal, distinctly wider than long, widest at base; lateral margins nearly straight and convergent anteriorly; anterior angles strongly rounded; anterior margin distinctly sinuate medially; margins moderately reflexed; surface slightly elevated medially and shiny, finely and densely punctate, with a few single setae. Frontoclypeal suture invisible. Smooth area anterior to eye narrow, approximately 1.2 times as wide as long. Ocular canthus short and narrow, sparsely punctate, with a single terminal seta. Frons on posterior half dull; finely and moderately densely punctate; with a few long and erect setae beside eyes and behind frontoclypeal suture, with

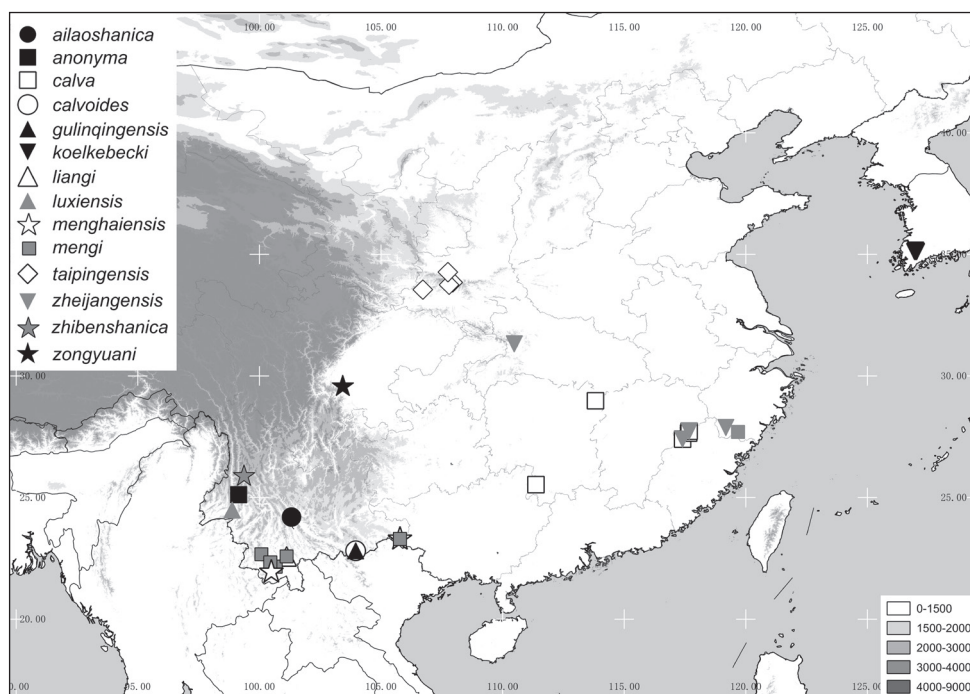


Figure 6. Distribution of the species of the *Neoserica calva* group.

dense, fine setae on posterior half. Eyes small, ratio diameter/interocular width: 0.59. Antenna with ten antennomeres, club with four antennomeres and straight, 1.4 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with median sinuation.

Pronotum moderately transverse, widest at base; lateral margins evenly convex and convergent anteriorly; anterior angles distinctly produced and sharp; posterior angles blunt, moderately rounded at tip; anterior margin nearly straight, with a fine and complete marginal line; surface moderately densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomeron distinctly carinate basally. Scutellum large, with fine, dense punctures, glabrous, on midline punctures less dense.

Elytra short-oval, widest shortly behind middle; striae weakly impressed, finely and moderately densely punctate; intervals weakly convex, with moderately dense punctures concentrated along striae, with minute setae in punctures, lateral odd intervals with a few single, erect setae. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum except long seta on disc nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse

punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.39. Pygidium weakly convex and dull, coarsely and densely punctate, without smooth midline, with a few long setae near apex.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur dull, sparsely and finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.5; dorsal margin finely carinate, with two groups of spines; basal group at middle, apical group at three quarters of metatibial length; in basal half with a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, finely and densely punctate, glabrous; ventral margin finely serrated, with three robust equidistant setae; medial face densely and finely punctate, glabrous, apex moderately truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, impunctate dorsally; metatarsomeres with a strongly serrated ventral ridge and a few fine punctures dorsally; metatarsomere I as long as following two tarsomeres combined and nearly half of its length longer than dorsal tibial spur. Protibia short, bidentate, not widened before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 5E–G.

Female unknown.

Diagnosis. *Neoserica luxiensis* sp. n. is rather similar to *N. koelkebecki* sp. n. in general appearance and the shape of the male genitalia. It differs from the latter by the slightly shorter antennal club and the shape of the aedeagus: the process of the apical phallobase is situated dorsolaterally, the right paramere is much wider than that in *N. koelkebecki*.

Etymology. This new species is named after its type locality, Luxi.

***Neoserica* (s.l.) *ailaoshanica* sp. n.**

<http://zoobank.org/97B5900D-3FFE-4107-9623-AA79F5D270F2>

Figs 5I–L, 6

Type material examined. Holotype: ♂ “Mts. Ailaoshan, Jingdong, Yunnan, 7–9. VIII.2009, 2450m, leg. Xu Jishan, Zhang Liuxiang etc.” (HBUM).

Description. Body length: 6.5 mm, length of elytra: 4.8 mm, width: 3.8 mm. Body oblong, dark reddish brown, antennal club yellowish brown, dorsal surface dull and nearly glabrous, labroclypeus and anterior half of frons shiny.

Labroclypeus subtrapezoidal, widest at base; lateral margins convex and convergent anteriorly; anterior angles moderately rounded; anterior margin distinctly sinuate medially; margins moderately reflexed; surface slightly elevated medially and shiny, finely and densely punctate, with a few single setae. Frontoclypeal suture indistinctly

incised and slightly elevated. Smooth area anterior to eye approximately 1.5 times as wide as long. Ocular canthus moderately long and narrow, sparsely punctate, with a single terminal seta. Frons on posterior half dull; finely and sparsely punctate, anterior midline slightly elevated; with a few long and erect setae beside eyes and behind frontoclypeal suture, with dense, fine setae on posterior half. Eyes small, ratio diameter/interocular width: 0.59. Antenna with ten antennomeres, club with four antennomeres and straight, 1.6 times as long as remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly. Labrum transverse, short, not produced medially, with median sinuation.

Pronotum widest at base; lateral margins evenly convex and convergent anteriorly; anterior angles distinctly produced and sharp; posterior angles blunt, moderately rounded at tip; anterior margin nearly straight, with a fine and complete marginal line; surface moderately densely and finely punctate, with minute setae in punctures; lateral and anterior border sparsely setose; hypomerion distinctly carinate basally. Scutellum large, with fine, very dense punctures, glabrous, on midline impunctate.

Elytra short-oval, widest shortly behind middle; striae weakly impressed, finely and moderately densely punctate; intervals weakly convex, with moderately dense punctures concentrated along striae, with minute setae in punctures, lateral odd intervals with a few single, erect setae. Epipleural edge fine, ending at moderately curved external apical angle of elytra; epipleura densely setose; apical border with a fine rim of microtrichomes (visible at 100× magnification).

Ventral surface dull, finely and densely punctate. Metasternum, except long seta on disc, nearly glabrous, sparsely covered with minute setae in punctures. Metacoxa glabrous, with a few single setae laterally. Abdominal sternites finely and densely punctate, glabrous except minute setae in punctures, with a transverse row of coarse punctures each bearing a robust long seta. Mesosternum between mesocoxae as wide as mesofemur. Ratio of length of metepisternum/metacoxa: 1/1.38. Pygidium weakly convex and dull, coarsely and densely punctate, without smooth midline, with a few long setae near apex.

Legs moderately slender. Femora with two longitudinal rows of setae, finely and sparsely punctate. Metafemur dull, sparsely and finely punctate; anterior margin acute, behind anterior margin without serrated line; posterior margin entirely serrated ventrally and moderately widened at apex; posterior margin finely serrated dorsally, glabrous. Metatibia slender and moderately long, widest at apex, ratio of width/length: 1/3.7; dorsal margin finely carinate, with two groups of spines; basal group shortly behind middle, apical group at three quarters of metatibial length; in basal half with a few short robust setae in single robust punctures with serrated margin; external face longitudinally convex, finely and densely punctate, glabrous; ventral margin finely serrated, with three robust setae, distal one more distant; medial face densely and finely punctate, glabrous, apex moderately truncate interiorly near tarsal articulation. Tarsomeres ventrally with sparse, short setae, not carinate laterally, impunctate dorsally; metatarsomeres with a strongly serrated ventral ridge and a few fine punctures dorsally; metatarsomere I as long as following two tarsomeres combined and nearly half of its length longer than dorsal

tibial spur. Protibia short, bidentate, not widened before basal tooth; anterior claws symmetrical, basal tooth of inner claw sharply truncate at apex.

Aedeagus. Fig. 5I–K.

Female unknown.

Diagnosis. *Neoserica ailaoshanica* sp. n. is rather similar to *N. luxiensis* sp. n. in general appearance and the shape of the male genitalia but differs from it by the slightly longer antennal club and the shape of the aedeagus: the process of the apical phallobase is slightly longer and the right paramere is longer and narrower than that in *N. luxiensis*.

Etymology. The new species is named after its type locality, Ailaoshan.

Acknowledgements

We are grateful to G. Cuccudoro, GD. Ren, J. Hajek, P. Pacholátko, H. Pang and G.A. Samuelson, for kindly loaning to us unidentified specimens, to T. Köllkebeck and D. Wrase for the donation of their Sericini material, and to the Alexander Koenig Foundation (Bonn) for funding in part the technical work of this study. Part of this research was supported by the National Basic Research Program of China (973 Program) (No. 2011CB302102), the National Natural Science Foundation of China (Nos. 51305057), the National Science Fund for Fostering Talents in Basic Research (Special Subjects in Animal Taxonomy, NSFC-J0630964/J0109, J1210002), and by a Humboldt Fellowship (M.B.) from Alexander von Humboldt Foundation. D.A. was in main part of the taxonomic revisions for this work supported by grants from the German Science foundation (GRK 5 503/2, AH175/1-1) and by SYNTHESYS (GB-TAF-63 and 917, SE-TAF 3424).

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A taxonomic review on the species of *Tetraserica* Ahrens, 2004, of China (Coleoptera, Scarabaeidae, Sericini)

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Academic editor: A. Frolov | Received 12 August 2014 | Accepted 29 September 2014 | Published 20 October 2014

<http://zoobank.org/9B49C0CA-19E7-4EB6-B64A-5324E96EFC6B>

Citation: Liu W-G, Fabrizi S, Bai M, Yang X-K, Ahrens D (2014) A taxonomic review on the species of *Tetraserica* Ahrens, 2004, of China (Coleoptera, Scarabaeidae, Sericini). ZooKeys 448: 83–121. doi: 10.3897/zookeys.448.8429

Abstract

A review on the Chinese species of *Tetraserica* Ahrens, 2004, is presented. The lectotype of *Tetraserica tonkinensis* (Moser, 1908), **comb. n.** is designated. Twenty-nine new *Tetraserica* species are described from China and adjacent regions: *Tetraserica anhuaensis* **sp. n.**, *T. changjiangensis* **sp. n.**, *T. changshouensis* **sp. n.**, *T. damaidiensis* **sp. n.**, *T. daqingshanica* **sp. n.**, *T. fikaceki* **sp. n.**, *T. graciliforceps* **sp. n.**, *T. jinghongensis* **sp. n.**, *T. leishanica* **sp. n.**, *T. liangheensis* **sp. n.**, *T. linaoshanica* **sp. n.**, *T. longipenis* **sp. n.**, *T. longzhouensis* **sp. n.**, *T. maoershanensis* **sp. n.**, *T. mengeana* **sp. n.**, *T. menglongensis* **sp. n.**, *T. pingjiangensis* **sp. n.**, *T. ruili-ana* **sp. n.**, *T. ruiliensis* **sp. n.**, *T. sculptilis* **sp. n.**, *T. shangsiensis* **sp. n.**, *T. shunbiensis* **sp. n.**, *T. sigulian-shanica* **sp. n.**, *T. tianchiensis* **sp. n.**, *T. wandingensis* **sp. n.**, *T. wangtongensis* **sp. n.**, *T. xichouensis* **sp. n.**, *T. yaoanica* **sp. n.**, *T. yaoquensis* **sp. n.** A key to the Chinese *Tetraserica* species is given, species distribution as well as the habitus and male genitalia of all species are illustrated.

Keywords

Beetles, chafers, *Tetraserica*, China, new species

Introduction

The genus *Tetraserica* was established by Ahrens (2004). The genus included so far 8 nominal species from Indian subcontinent and Myanmar. Other species are known or described from India, Indochina, Philippines, Sumatra and Borneo, but they are not yet formally transferred to *Tetraserica*. Based on the results of this study, the genus is for the first time recorded for China. Recent molecular work confirmed the monophyly of *Tetraserica* (Ahrens and Vogler 2008; Liu et al., unpublished data).

In this study, we examined the material collected in China mainland and deposited in Chinese institutional collections as well as various European and American collections. We found twenty-nine new taxa, which are described herein. Additionally, non-Chinese records are added to the species recorded from China, while the taxa occurring exclusively out of China are not revised herein. A key to the Chinese *Tetraserica* species is given, species distribution, as well as habitus and male genitalia, are illustrated.

Material and methods

The terminology and methods used for measurements, specimen dissection and genital preparation follow Ahrens (2004). Data from specimens examined are cited in the text with original label contents given in quotation marks, multiple labels are separated by a “/”. Male genitalia were glued to a small pointed card attached to the specimen. Descriptions and illustrations of new taxa are based on the holotype or lectotype specimen, while the variation of other specimens is given separately. All descriptions and measurements were made under an Olympus SZX 12 microscope, and all genital and habitus illustrations were made with a digital camera (AxioCam HRC) attached to a stereo microscope (Zeiss Stereo Discovery V20) and Axio Version 4.8 software. The distribution maps were generated using Q-GIS 2.0.1 and Inscape software.

Type specimens and other examined material are deposited in the following institutions or collections:

- BPBM** Bernice P. Bishop Museum, Honolulu (Hawaii), U.S.A.;
- CAU** Department of Entomology, China Agricultural University, Beijing, China;
- CNAR** Collection A. Napolov, Riga, Latvia;
- CPPB** Coll. Petr Pacholátko, Brno, Czech Republic;
- HBUM** Museum of Hebei University, Baoding (Hebei Prov.), China;
- IZAS** Institute of Zoology, Chinese Academy of Sciences, Beijing, China;
- MZUF** Museo Zoologico „La Specola”, Università di Firenze, Italy;
- NHMW** Natural History Museum Vienna, Austria;
- NME** Naturkundemuseum Erfurt, Germany;
- NMPC** National Museum Prague (Natural History), Czech Republic;

NUYS	Northwest A & F University, Yangling (Shaanxi Prov.), China;
SYUG	Sun Yat-Sen University, Guangzhou (Guangdong Prov.), China;
USNM	National Museum of Natural History, Washington D.C., U.S.A.;
ZFMK	Zoologisches Forschungsmuseum A. Koenig, Bonn, Germany.

Taxonomy

Tetraserica Ahrens, 2004

Tetraserica Ahrens, 2004: 168 (type species by original designation: *Neoserica gestroi* Brenske, 1898).

Diagnosis. Body moderately large to large (6–12 mm), mostly dark brown; ventral surface reddish brown; dorsal surface dull and glabrous.

Labroclypeus subtrapezoidal, wider than long, widest at base, lateral margins moderately convex and convergent to strongly rounded anterior angles, anterior margin weakly sinuate medially, margins moderately reflexed; surface weakly convex, moderately shiny, finely and densely punctate; frontoclypeal suture indistinctly incised, flat and weakly curved medially; ocular canthus short and triangular, impunctate, with a single terminal seta. Frons dull, with sparse, fine punctures, with single erect setae beside each eye. Antenna yellowish, with 10 antennomeres; club composed of 4 antennomeres in male, straight, rarely longer than 1.5 times as the remaining antennomeres combined; club in female composed of 3 antennomeres, as long as the remaining antennomeres combined. Mentum elevated and slightly flattened anteriorly.

Pronotum moderately wide and strongly convex, lateral margins evenly convex, more strongly narrowed anteriorly towards sharp and slightly produced anterior angles. Anterior margin of pronotum slightly convex, with fine complete marginal line. Posterior angles blunt or strongly rounded. Surface finely and densely punctate, except minute setae glabrous, lateral and lateral anterior margins sparsely setose. Hypomeron not carinate. Scutellum triangular, finely and densely punctate.

Elytra oblong, widest just behind middle, striae distinctly impressed, finely and moderately densely punctate, intervals distinctly convex, with coarse and dense punctures concentrated along striae, with very minute setae in punctures; epipleural edge robust, ending at weakly curved and slightly blunt external apical angle of elytra, epipleura densely setose, apical border with a broad fringe of microtrichomes (100×).

Ventral surface weakly shiny, finely and densely punctate, metasternum sparsely covered with fine, short, or very minute setae, metacoxa glabrous, with a few single setae laterally; abdominal sternites finely and densely punctate, with a transverse row of coarse punctures, each bearing a robust seta. Mesosternum between mesocoxae as wide as mesofemur. Pygidium weakly convex and dull, densely punctate, without smooth midline, almost glabrous, but with a few longer setae along apical margin; pygidium without strong sexual dimorphism.

Legs moderately wide; femora finely and sparsely punctate; metafemur wide and moderately shiny or dull, anterior margin acute, posterior margin smooth ventrally and only weakly widened in apical half, posterior margin smooth dorsally, with a few short setae basally. Metatibia moderately wide to wide and moderately long, widest at half of metatibial length, dorsal margin sharply carinate, with two groups of spines; lateral face finely and sparsely punctate; ventral edge finely serrated, with four robust equidistant setae, medial face smooth, apex interiorly near tarsal articulation with a shallow sinuation. Tarsomeres with fine, very dense setae ventrally on distal half, neither laterally nor dorsally carinate, dorsally smooth; metatarsomeres with a strongly serrated ridge ventrally and glabrous; first metatarsomere slightly shorter than two following tarsomeres combined, one third of its length longer than dorsal tibial spine. Protibia short, bidentate; anterior claws symmetrical, basal tooth of both claws bluntly truncate at apex.

Aedoeagus. Phallobasis with a more or less long median ventral extension.

Remarks. So far seven species from Himalaya and the type species from Myanmar have been formally assigned to *Tetraserica* (Ahrens 2004; Ahrens and Fabrizi 2009). Most other oriental species (so far grouped with ‘*Neoserica*’) await taxonomic revision. *Tetraserica* differs from closely related genera *Microserica* Brenske, 1894, and *Trioserica* Moser, 1922, by the lacking ventral carina of hypomeron. From *Microserica* it also differs by the lacking sexual dimorphism of the pygidium, from *Trioserica* by the bidentate protibia. In contrast to the *Microserica*, species of *Tetraserica* are active at night and are attracted by light.

Distribution. The genus is distributed almost in the entire Oriental region; we know described species so far assigned to “*Neoserica*” from Philippines, Indochina, Sumatra, and Borneo (Ahrens 2004). Except in Meghalaya and Himalaya, the genus does not occur on Indian subcontinent south of the Ganges.

Key to the Chinese species of *Tetraserica* (♂♂)

- 1 Labroclypeus completely glabrous. Basal group of dorsal spines of metatibia before middle. Ratio ocular diameter/interocular distance <0.754
- Labroclypeus with few fine setae. Basal group of dorsal spines of metatibia behind middle. Anterior margin of metafemur with continuously serrated adjacent line. Ratio ocular diameter/interocular distance >0.82
- 2 Metatibia more robust, ratio length/width: < 3.3. Metacoxa shorter, ratio length of metepisternum/metacoxa: 1/1.5.....*T. anhuaensis* sp. n.
- Metatibia more slender, ratio length/width: >3.6. Metacoxa longer, ratio length of metepisternum/metacoxa: 1/1.68.....3
- 3 Left paramere with long interior basal lobe (its length almost half of paramere length) *T. yaoanica* sp. n.
- Left paramere with short interior basal lobe (its length less than quarter of paramere length) *T. leishanica* sp. n.
- 4 Posterior margin of metafemur straight or slightly convex10

–	Posterior margin of metafemur with blunt tooth or sharp hook.....	5
5	Posterior margin of metafemur with blunt tooth	6
–	Posterior margin of metafemur with sharp hook.....	9
6	Left paramere long and narrow	<i>T. pingjiangensis</i> sp. n.
–	Left paramere short and stout	7
7	Dorsal lobe of right paramere short, not exceeding length of ventral one	<i>T. maoershanensis</i> sp. n.
–	Dorsal lobe of right paramere longer, exceeding length of ventral one.....	8
8	Left paramere more narrow, dorsal margin weakly and evenly curved	<i>T. sculptilis</i> sp. n.
–	Left paramere stout, dorsal margin bluntly angulate... <i>T. daqingshanica</i> sp. n.	
9	Eyes smaller, ratio diameter/interocular distance: 0.59. Dorsal lobe of right paramere large and directed distally, exceeding ventral lobe by far	<i>T. liangheensis</i> sp. n.
–	Eyes larger, ratio diameter/interocular distance: 0.72. Dorsal lobe of right paramere very small and bent basally	<i>T. wandingsensis</i> sp. n.
10	Ventral process of phallobasis short, distinctly shorter than phallobasis.....	11
–	Ventral process of phallobasis long, subequal to length of phallobasis	19
11	Ventral process of phallobasis short, subequal to at maximum half of length of phallobasis	13
–	Ventral process of phallobasis medium in length, about three quarter of phallobasis length	12
12	Metatibia more slender, ratio length/width ca. 3.4. Right paramere lacking basal lobe	<i>T. shunbiensis</i> sp. n.
–	Metatibia more robust, ratio length/width ca. 3.0. Right paramere with long filiform and curved basal lobe	<i>T. sigulianshanica</i> sp. n.
13	Eyes of medium size, ratio diameter/interocular distance ≥ 0.6	15
–	Eyes small, ratio diameter/interocular distance ≤ 0.5	14
14	Phallobasis in dorsal view only slightly asymmetric. Left and right parameres simple, without two lobes. Posterior angles of pronotum strongly rounded ..	<i>T. graciliforceps</i> sp. n.
–	Phallobasis in dorsal view strongly asymmetric. Right paramere simple, left paramere with ventral lobe shorter than dorsal one. Posterior angles of pronotum moderately rounded	<i>T. longzhouensis</i> sp. n.
15	Both parameres with dorsal and ventral lobe.....	<i>T. fikaceki</i> sp. n.
–	One or both parameres simple, without two lobes	16
16	Both parameres simple, without two lobes.....	<i>T. damaidiensi</i> sp. n.
–	One of parameres complex, with two lobes.....	17
17	Right paramere simple, left one with two lobes; right paramere basiventrally strongly widened towards apex.....	<i>T. yaoquensis</i> sp. n.
–	Left paramere simple, right one with two lobes.....	18
18	Left paramere more slender, strongly evenly bent externally.....	<i>T. changjiangensis</i> sp. n.

- Left paramere more stout, almost straight *T. wangtongensis* sp. n.
- 19 Right paramere basally with brush of robust trichome-like spines 20
- Right paramere without brush of spines 25
- 20 Left paramere composed of two lobes. Ventral lobe of right paramere abruptly and strongly widened at apex *T. changshouensis* sp. n.
- Left paramere simple 21
- 21 Left paramere with small lateral basal tooth *T. linaoshanica* sp. n.
- Left paramere without small lateral basal tooth 22
- 22 Left paramere split in two filiform branches behind middle... *T. mengana* sp. n.
- Left paramere simply filiform 23
- 23 Left paramere bent twice 24
- Left paramere evenly curved, without being clearly bent, before apex with tiny lateral tooth *T. shangsiensis* sp. n.
- 24 Dorsal lobe of right paramere very small *T. xichouensis* sp. n.
- Dorsal lobe of right paramere large, nearly as long as ventral lobe *T. tonkinensis* (Moser)
- 25 Right paramere simple, not composed of two lobes 26
- Right paramere composed of two lobes 27
- 26 Left paramere simple *T. ruiliensis* sp. n.
- Left paramere composed of two lobes *T. longipenis* sp. n.
- 27 Left paramere simple 28
- Left paramere composed of two lobes 29
- 28 Dorsal lobe of right paramere wide, with sickle-shaped, large apical hook..... *T. tianchiensis* sp. n.
- Dorsal lobe of right paramere narrow, evenly curved and sharply pointed..... *T. jinghongensis* sp. n.
- 29 Dorsal lobe of right paramere triangular and short, sharply pointed..... *T. menglongensis* sp. n.
- Dorsal lobe of right paramere convexly widened and elongate... *T. ruiliana* sp. n.

***Tetraserica daqingshanica* sp. n.**

<http://zoobank.org/74654444-A9CA-4349-8BD1-EE5C52AD9530>

Type material examined. Holotype: ♂ [China] “Mt. Daqingshan, Longzhou, Guangxi, 24.IV.1963, 600–700m, leg. Shi Yongshan” (IZAS). Paratype: 1 ♂ [China] “Mt. Daqingshan, Longzhou, Guangxi, 13.IV.1963, 360m, leg. Wang Shuyong” (ZFMK).

Description. Body length: 9.2 mm, length of elytra: 7 mm, width: 5.5 mm.

Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Antennal club 1.1 times as long as remaining antennomeres combined. Eyes small; ratio of diameter/interocular width: 0.53. Ratio of length of metepisternum/metacoxa: 1/1.63. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior

margin with a blunt tooth. Metatibia short and wide, ratio width/length: 1/3.1; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 1A–C. Habitus: Fig. 1D.

Female unknown.

Variation. Body length: 9.2 mm, length of elytra: 7.0–7.3 mm, width: 5.5–5.9 mm.

Diagnosis. The new species differs from all other so far known *Tetraserica* species by the blunt tooth at the posterior margin of the metafemur.

Etymology. The new species is named after the type locality, Mt. Daqingshan.

***Tetraserica sculptilis* sp. n.**

<http://zoobank.org/1DD74C0C-602F-4EFC-970E-8DE9A3A25400>

Type material examined. Holotype: ♂ “China: Hubei; Dahongshan 1700m, Shuizhou VI-2003 leg. Ying et al.” (ZFMK). Paratypes. 1 ♂ [China] “Hekou, Southeast of Yunnan, 9.VI.1956, 1200m, leg. Panfilov” (IZAS), 1 ♂ [China] “Luxi, Yunnan, 22.V.1980, leg. Li Hongxing” (IZAS).

Description. Body length: 9.1 mm, length of elytra: 7.3 mm, width: 5.4 mm.

Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.6. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.7. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin with a blunt tooth. Metatibia short and wide, ratio width/length: 1/3.2; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 1E–G. Habitus: Fig. 1H.

Female unknown.

Variation. Body length: 9.1–9.8 mm, length of elytra: 7.3–7.4 mm, width: 5.4–6.0 mm.

Diagnosis. *Tetraserica sculptilis* sp. n. is in the external shape and morphology of the male genitalia very similar to *T. daqingshanica*. It differs only in the shape of the parameres: the left paramere is more narrow in *T. sculptilis* sp. n., its dorsal margin weakly and evenly curved (Fig. 1E).

Etymology. From the Latin word *sculptilis* – modelled, sculptured, with reference to the shape of the aedeagus.

***Tetraserica wangtongensis* sp. n.**

<http://zoobank.org/57A2C8C3-2985-4255-B59F-DB5329A66490>

Type material examined. Holotype: ♂ [China] “Wang Tong, to light, 29/4/07” (ZFMK). Paratypes: 1 ♂ [China] “Huangniushi, Mt. Jiulianshan, Jiangxi, 16.VI.1975,

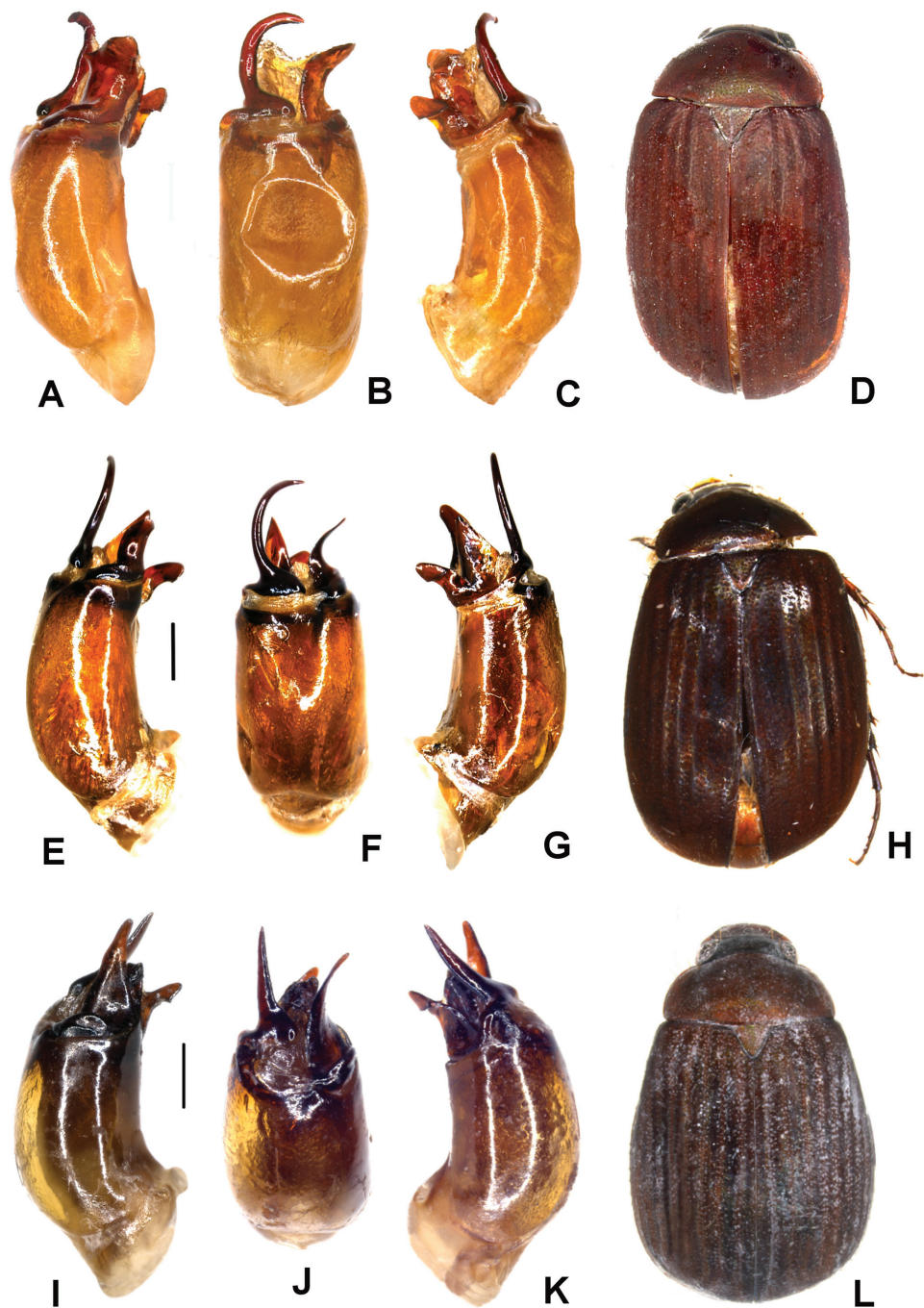


Figure 1. **A–D** *Tetraserica daqingshanica* sp. n. (holotype) **E–H** *T. sculptilis* Ahrens sp. n. (holotype) **I–L** *T. wangtongensis* sp. n. (holotype). **A, E, I** aedeagus, left side lateral view **C, G, K** aedeagus, right side lateral view **B, F, J** parameres, dorsal view **D, H, L** habitus (not to scale). Scale: 0.5 mm.

leg. Zhang Youwei" (IZAS), 1 ♂ [China] "Luoyang, Lianxian County, Guangdong, 22.VI.1965, leg. Zhang Youwei" (IZAS) .

Description. Body length: 9.1 mm, length of elytra: 6.9 mm, width: 5.8 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.6. Antennal club 1.3 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.7. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.2; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 1I–K. Habitus: Fig. 1L.

Female unknown.

Variation. Body length: 8.2–9.1 mm, length of elytra: 6.5–6.9 mm, width: 5.5–5.8 mm.

Diagnosis. *Tetraserica wangtongensis* sp. n. is in the external shape and morphology of the male genitalia similar to *T. daqingshanica* and *T. sculptilis*. It differs by the lacking tooth at the posterior margin of metafemur and in the shape of the parameres: the right paramere is straight (in dorsal view) and not curved as in *T. daqingshanica* and *T. sculptilis* (Fig. 1J).

Etymology. *Tetraserica wangtongensis* sp. n. is named after its type locality, Wang Tong.

***Tetraserica maoershanensis* Ahrens, Liu & Fabrizi, sp. n.**

<http://zoobank.org/BBC43CD4-2FEE-431E-AD26-9B0D56CDC45B>

Type material examined. Holotype: ♂ "Guangxi, Maoershan, 2011-VI-4/ LW-1066" (ZFMK).

Description. Body length: 8.3 mm, length of elytra: 6.8 mm, width: 3.1 mm.

Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.61. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.5.

Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin with a blunt tooth. Metatibia short and wide, ratio width/length: 1/2.84; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 2A–C. Habitus: Fig. 2D.

Female unknown.

Diagnosis. *Tetraserica maoershanensis* sp. n. is in the external shape and morphology of the male genitalia similar to *T. daqingshanica* and *T. sculptilis*. It differs by the shape of the parameres: the dorsal lobe of the right paramere is short and does not exceed the length of the ventral lobe (Fig. 2C).

Etymology. The new species is named after its type locality, Maoershan.

***Tetraserica fikaceki* sp. n.**

<http://zoobank.org/C23EC86C-5F90-4403-9617-826F307FB92C>

Type material examined. Holotype: ♂ “China, Hainan Isl., 4-6.v.2011 Limushan Mts. Frst administr. Centre (at light) 19°10'30"N, 109°44'33"E, 630m, M. Fikáček, V. Kubeček & L. Li leg.” (NMPC). Paratypes: 2 ♂♂, 1 ♀ [China] “Nankai Mingya, Baisha, Hainan, 25–26.V.2008, 450m, leg. Ba Yibin, Lang Juntong” (HBUM, ZFMK), 1 ♂ [China] “East of Mts. Bawangling, Changjiang, Hainan, 5-7.VI.2008, 750m, leg. Ba Yibin, Lang Juntong” (HBUM).

Description. Body length: 9.7 mm, length of elytra: 7 mm, width: 6 mm.

Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.6. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.8. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/2.7; basal group of dorsal spines of metatibia at first third of metatibial length. Aedeagus. Fig. 2E–I. Habitus: Fig. 2J.

Diagnosis. *Tetraserica fikaceki* sp. n. is in the external shape and morphology of the male genitalia similar to *T. wangtongensis*. It differs by the shape of the parameres: the dorsal lobe of the right paramere (in lateral view) is curved ventrally (while being straight in *T. wangtongensis*) (Fig. 2I), the left paramere is reduced in size (Fig. 2E).

Variation. Body length: 8.0–9.7 mm, length of elytra: 6.0–7.0 mm, width: 4.8–6 mm. Head of the female paratype is missing.

Etymology. The new species is named after one of the collectors of the type series, Martin Fikáček (Prague).

***Tetraserica changjiangensis* sp. n.**

<http://zoobank.org/BCABBEB5-D1E5-4639-9042-64DF2FDD6E9B>

Type material examined. Holotype: ♂ “Bawangzhen, Changjiang, Hainan, 5–7. VI.2008, leg. Ba Yibin, Lang Juntong” (HBUM). Paratype: 1 ♂ “Mt. Jianfengling, Hainan, 10.VI.1965” (IZAS).

Description. Body length: 8.4 mm, length of elytra: 6.5 mm, width: 5.4 mm.

Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.63. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.67.

Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/2.74; basal group of dorsal spines of metatibia at first third of metatibial length.

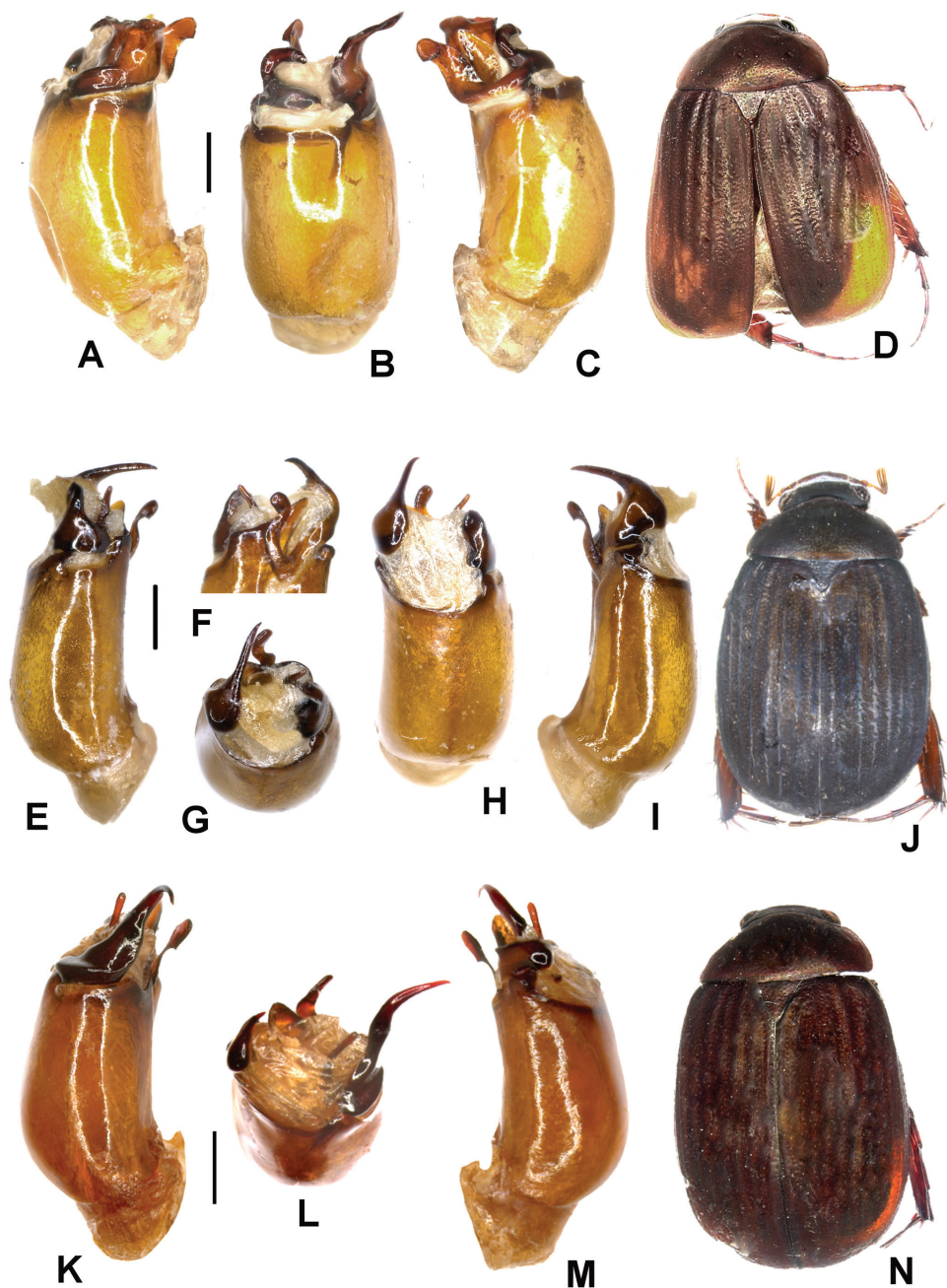


Figure 2. A–D *Tetraserica maoershanensis* sp. n. (holotype) E–J *T. fikaceki* sp. n. (holotype) K–N *T. changjiangensis* sp. n. (holotype). A, E, K aedeagus, left side lateral view C, I, M aedeagus, right side lateral view B, H, L parameres, dorsal view F parameres, distal view G parameres, ventral view D, J, N habitus (not to scale). Scale: 0.5 mm.

Aedeagus. Fig. 2K–M. Habitus: Fig. 2N.

Female unknown.

Variation. Body length: 7.7–8.4 mm, length of elytra: 6.1–6.5 mm, width: 5.0–5.4 mm.

Diagnosis. *Tetraserica changjiangensis* sp. n. differs from the similar *T. fikaceki* sp. n. by the shape of the parameres: the dorsal lobe of the right paramere (in lateral view) is extremely short (Fig. 2M), the left paramere is distinctly longer and curved externally at the apex (Fig. 2K, L).

Etymology. The new species is named after its type locality, Changjiang.

***Tetraserica sigulianshanica* sp. n.**

<http://zoobank.org/745D0838-F4C7-42BA-8C16-A22ECAB1A0B8>

Type material examined. Holotype: ♂ “China: Sichuan; Wolong Reserve, Sigulian Shan, 31°09'N, 103°06'E v.2006, 1500–1800m leg. V. Siniaev” (ZFMK). Paratypes: 1 ♂ “Suifu (nr) Sz. China/ DC Graham coll. Aug 25-7, ‘29” (USNM), 1 ♂ “Szechuen China DC Graham/ bet Yachow and Mupin Jun.23-6 ‘29 2000-3000ft.” (USNM), 3 ♂♂ “Minzhuzhen, Lan'gao County, Shaanxi, 4.VII.2003, leg. Yuan Caixia, Liu Yushuang” (HBUM), 1 ♂ “Longju, Wanxian County, Sichuan, 18.VI.1995, 2500m, leg. Wang Shuyong” (IZAS), 1 ♂ “Foping, Shaanxi, 26.VI.1999, 890m, leg. Zhang Youwei” (IZAS), 1 ♂ “Chongqing, Jinfo Shan, 2010-VI-13, 713m” (IZAS), 1 ♂ “Xiuqizhen, Chengkou, Chongqing, 13.VII.2003, leg. Yuan Caixia, Liu Yushuang” (HBUM), 1 ♂ “Ningshan, Shaanxi, VIII.1982, light trap” (NUYS), 1 ♂ “Zhongmiao, Bikou, Wenxian County, Gansu, 24.VI.1998, 700m, leg. Yuan Decheng” (IZAS), 1 ♂ “China, Sichuan 12.-14.VII.1995 Baoxing env., cca 50km NNW of Yaan 30°22'N, 102°50'E M. Trýzna et O. Šafranek lgt.” (CPPB).

Description. Body length: 7.6 mm, length of elytra: 5.9 mm, width: 4.8 mm.

Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.6. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.4.

Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 3A–C. Habitus: Fig. 3D.

Female unknown.

Variation. Body length: 6.6–7.6 mm, length of elytra: 5.1–5.9 mm, width: 3.9–4.8 mm.

Diagnosis. *Tetraserica sigulianshanica* sp. n. differs from the similar *T. fikaceki* sp. n. by the shape of parameres: the dorsal (= basal) lobe of the right paramere (in

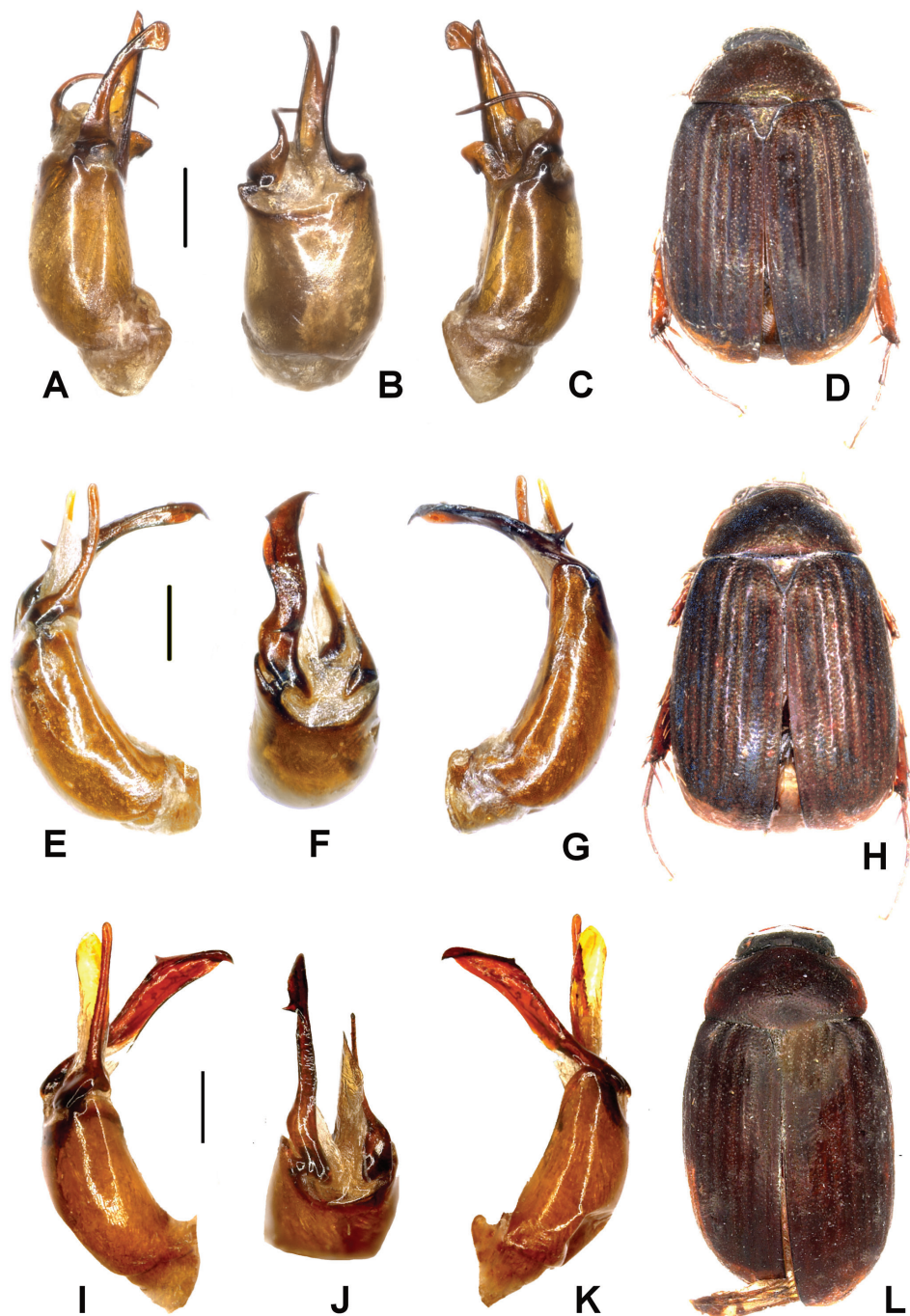


Figure 3. A–D *Tetraserica sigulianshanica* sp. n. (holotype) E–H *T. damaidiensis* sp. n. (holotype) I–L *T. shunbiensis* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view B, F, J parameres, dorsal view D, H, L habitus (not to scale). Scale: 0.5 mm.

lateral view) is long, filiform, and strongly curved (Fig. 3A), the left paramere is much longer than that of *T. fikaceki* sp. n. (Fig. 2K, L).

Etymology. The new species is named after its type locality, Sigulian Shan.

***Tetraserica damaidiensis* sp. n.**

<http://zoobank.org/48AB99AF-AF42-40A8-9775-9FE3054E1D22>

Type material examined. Holotype: ♂ “China: E-Yunnan; Damaidi 2500m, Guangnan near Vietnam VII-2003 leg. Li et al.” (ZFMK). **Paratypes:** **China.** 1 ♂ “China: E-Yunnan; Damaidi 2500m, Guangnan near Vietnam VII-2003 leg. Li et al.” (ZFMK), 1 ♂ “Jiangfu Famuchang, Jiangle, Fujian, 22.VI.1991, 470m, leg. Yang Longlong” (IZAS), 1 ♂ “Mt. Dawuling, Xinyi, 24.V.2002, leg. Jia Fenglong, No. En-048009” (SYUG), 2 ♂♂ “Luoxiang, Jinxiu, Guangxi, 15.V.1999, 400m, leg. Xiao Hui” (IZAS), 1 ♂ “Mt. Daweishan, Pingbian, Yunnan, 18.VI.1956, 1500m, light trap, leg. Huang Keren etc.” (IZAS), 1 ♂ “Mt. Yaoshan, 6.V.1938” (IZAS), 1 ♀ “Beidou, Napo, Guangxi, 9, 11–13.IV.1998, 550m, leg. Wu Min, Qiao Geixa” (IZAS), 1 ♂ “Nongxin, Napo, Guangxi, 12.IV.1998, 440m, leg. Qiao Gexia” (IZAS), 1 ♂ “Beidou, Napo, Guangxi, 9.IV.1998, 550m, leg. Qiao Gexia” (IZAS). **Vietnam.** 1 ♂ “N Vietnam (Tonkin) Ha Noi (city) 4.-5.V.1990 Vit. Kubán leg. (ZFMK), 4 ♂♂, 10 ♀♀ “N-Vietnam Sa Pa env., Lao Cai Prov. 22°19'52"N, 103°50'35"E 1630–1680m 23.–27.V.1999 leg. Fabrizi, Jäger, Ahrens” (ZFMK), 1 ♂, 1 ♀ “N-Vietnam Bac Ha env., Lao Cai Prov. 22°32'05"N, 104°32'32"E 980–1000m 28.–30.V.1999 leg. Fabrizi, Jäger, Ahrens” (ZFMK), 2 ♀♀ “N.-Vietnam Fan Si Pan near Sapa, 1500–1950m 17.–30.VI.1999 A. Kallies leg.” (ZFMK), 1 ♂ “Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 21.–23.6.1998 1250m leg. A. Napolov” (CNAR), 8 ♂♂ “Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 27.V.–15.VI.1995 1250m leg. A. Napolov” (CNAR), 11 ♂♂ “Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 27.5.–3.6.1998 1250m leg. A. Napolov” (CNAR), 1 ♂ “Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 16.–20.VI.1998 1250m leg. A. Napolov” (CNAR).

Description. Body length: 7.6 mm, length of elytra: 5.8 mm, width: 4.6 mm.

Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.67. Antennal club 1.3 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.5. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.21; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 3E–G. Habitus: Fig. 3H.

Variation. Body length: 6.9–7.6 mm, length of elytra: 5.1–5.8 mm, width: 4.0–4.6 mm. Female has the antennal club composed of three lamellae, short, as long as the remaining antennomeres combined; eyes as large as those in male.

Diagnosis. The new species differs from the other known *Tetraserica* species by having both parameres simple, not being divided in two lobes.

Etymology. The new species is named after its type locality, Damaidi.

***Tetraserica shunbiensis* sp. n.**

<http://zoobank.org/0E8B453F-D81F-484B-9897-7F615908507C>

Type material examined. Holotype: ♂ “Shunbi, Yangbi, Yunnan, 16.VIII.2009, leg. Shi Fuming” (HBUM).

Description. Body length: 8.9 mm, length of elytra: 6.3 mm, width: 5 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.66. Antenna missing in holotype. Ratio of length of metepisternum/metacoxa: 1/1.5. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.4; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 3I–K. Habitus: Fig. 3L.

Female unknown.

Diagnosis. The new species differs from *T. damaidiensis* in the shape of the parameres: the left paramere is straight instead of being curved dorsally (Fig. 3I), the right paramere is slender in dorsal view, lacking the basal dorsal tooth (Fig. 3J) which is present in *T. damaidiensis*.

Etymology. The new species is named after its type locality, Shunbi.

***Tetraserica longzhouensis* sp. n.**

<http://zoobank.org/21E3E7F4-6784-45F3-8019-7DA174F598F0>

Type material examined. Holotype: ♂ [China] “Nonggang, Longzhou, Guangxi, 15.VI.2000, 330m, leg. Chen Jun” (IZAS).

Description. Body length: 7.5 mm, length of elytra: 5.5 mm, width: 4.6 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes small; ratio of diameter/interocular width: 0.48. Antennal club 1.1 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.48. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.3; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 4A–C. Habitus: Fig. 4D.

Female unknown.

Diagnosis. *Tetraserica longzhouensis* sp. n. differs from all other species with straight or slightly convex posterior margin of metafemur by the small eyes, short ventral process of phallobasis being at maximum subequal to half of the length of the phallobasis, strongly asymmetric phallobasis (dorsal view), right paramere being simple, and left paramere having the ventral lobe shorter than the dorsal one.

Etymology. The new species is named after its type locality, Longzhou.

***Tetraserica yaoquensis* sp. n.**

<http://zoobank.org/90F90FBE-55EC-4183-B7F3-41659BC1E687>

Type material examined. Holotype: ♂ [China] “Yao District, Mengla, Yunnan, 11.V.1991, leg. Liu Guangchun, Cai Wanzhi” (NUYS).

Description. Body length: 8.3 mm, length of elytra: 6.5 mm, width: 5.1 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.62. Antennal club 1.6 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.5. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.2; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 4E–G. Habitus: Fig. 4H.

Female unknown.

Diagnosis. *Tetraserica yaoquensis* sp. n. differs from all other species with straight posterior margin of metafemur by the short ventral process of the phallobasis being subequal to half of the length of phallobasis, right paramere being simple and basiventrally strongly widened towards apex, and left paramere having two lobes.

Etymology. The new species is named after its type locality, Yaoqu.

***Tetraserica longipenis* sp. n.**

<http://zoobank.org/DF2660FC-8E23-4C34-9E1E-986936B883C3>

Type material examined. Holotype: ♂ “China: E-Yunnan; Damaidi 2500m, Guannan near Vietnam VII-2003 leg. Li et al.” (ZFMK). Paratypes: 1 ♂ “China, SE-Yunnan Xichou-E env. 1400–1700m, 13.–18.5.95/ 23°11–16'/ 104°41–49' L.+R. Businský lgt.” (CPPB), 1 ♂ [China] “Yunnan 2000–2500m 25.42N 100.08E Cangshan mts. E slope 21.VI.92 David Král leg.” (NMPC), 1 ♂ [China] “Mts. Laoshan, Weihuo, Tianlin, Guangxi, 4.VI.2002, 1400m, leg. Jiang Guofang” (IZAS), 1 ♂ [China] “Luodian, Guizhou, 29.V.1981, 500m, leg. Li Fasheng” (CAU), 2 ♂♂ [China] “Xinyicun,

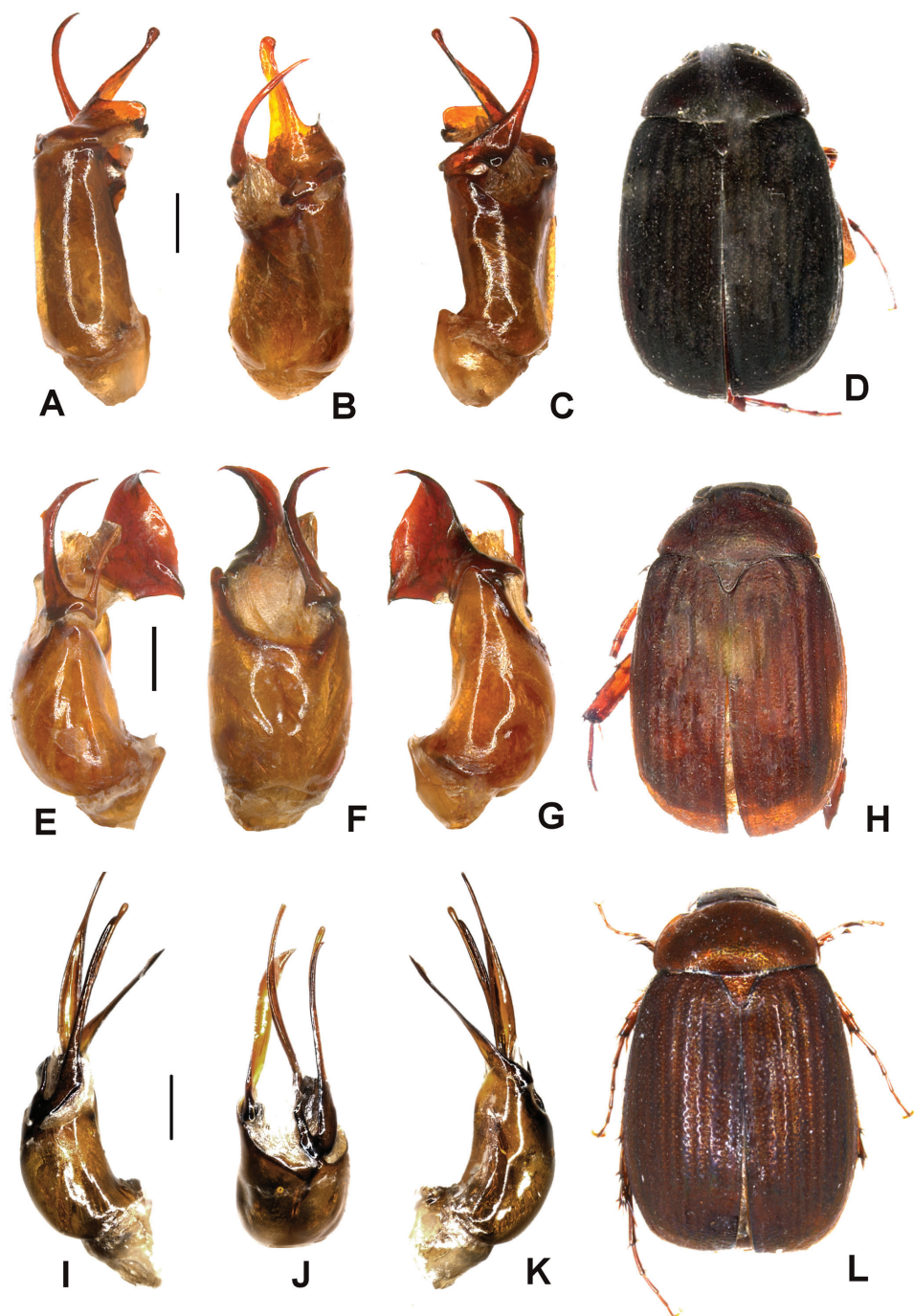


Figure 4. A–D *Tetraserica longzhouensis* sp. n. (holotype) E–H *T. yaoquensis* sp. n. (holotype) I–L *T. longipennis* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view B, F, J parameres, dorsal view D, H, L habitus (not to scale). Scale: 0.5 mm.

Xichang, Sichuan, 18.V.1974, leg. Han Yinhang" (IZAS), 3 ♂♂ [China] "Meng'e, Xishuangbanna, Yunnan, 19.V.1958, leg. Hong Chunpei" (IZAS, ZFMK).

Description. Body length: 7 mm, length of elytra: 5.3 mm, width: 4.6 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.7. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.4. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.3; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 4E–G. Habitus: Fig. 4H.

Female unknown.

Variation. Body length: 7.0–7.8 mm, length of elytra: 5.3–5.6 mm, width: 4.4–4.6 mm.

Diagnosis. *Tetraserica longipenis* sp. n. differs from *T. yaoquensis* by the smaller body, shorter antennal club, and the right paramere being simple, long and narrow.

Etymology. The species name is derived from the combined Latin words, *longus* – long and *penis* – male copulation organ, with reference to the long parameres of the species.

***Tetraserica jinghongensis* sp. n.**

<http://zoobank.org/BFE3EECD-6FE2-4C1D-9D70-F80CEF0D1F31>

Type material examined. Holotype: ♂ "China, S-Yunnan Prov. Xishuangbanna 23km NW Jinghong Na Ban village 680m 22°10.04'N, 100°39.52'E, 20.V.2008, leg. A. Weigel, LF" (NME). Paratypes. 1 ♂ [China] "Xiaomengyang, Yunnan, 7.V.1957, 850m, leg. Pu Fuji" (IZAS), 1 ♂ [China] "Yunnan, Nabanhe Nature Reserve, Guomenshan, 2009-VI-16/ LW-1230" (ZFMK).

Description. Body length: 7.6 mm, length of elytra: 5.8 mm, width: 5 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.63. Antenna missing in holotype. Ratio of length of metepisternum/metacoxa: 1/1.69. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.36; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 5A–C. Habitus: Fig. 5D.

Female unknown.

Variation. Body length: 6.8–7.6 mm, length of elytra: 5.2–5.8 mm, width: 4.1–5.0 mm.

Diagnosis. *Tetraserica jinghongensis* sp. n. differs from all other species with long ventral phallobasal process by the simple left paramere being not separated into lobes,

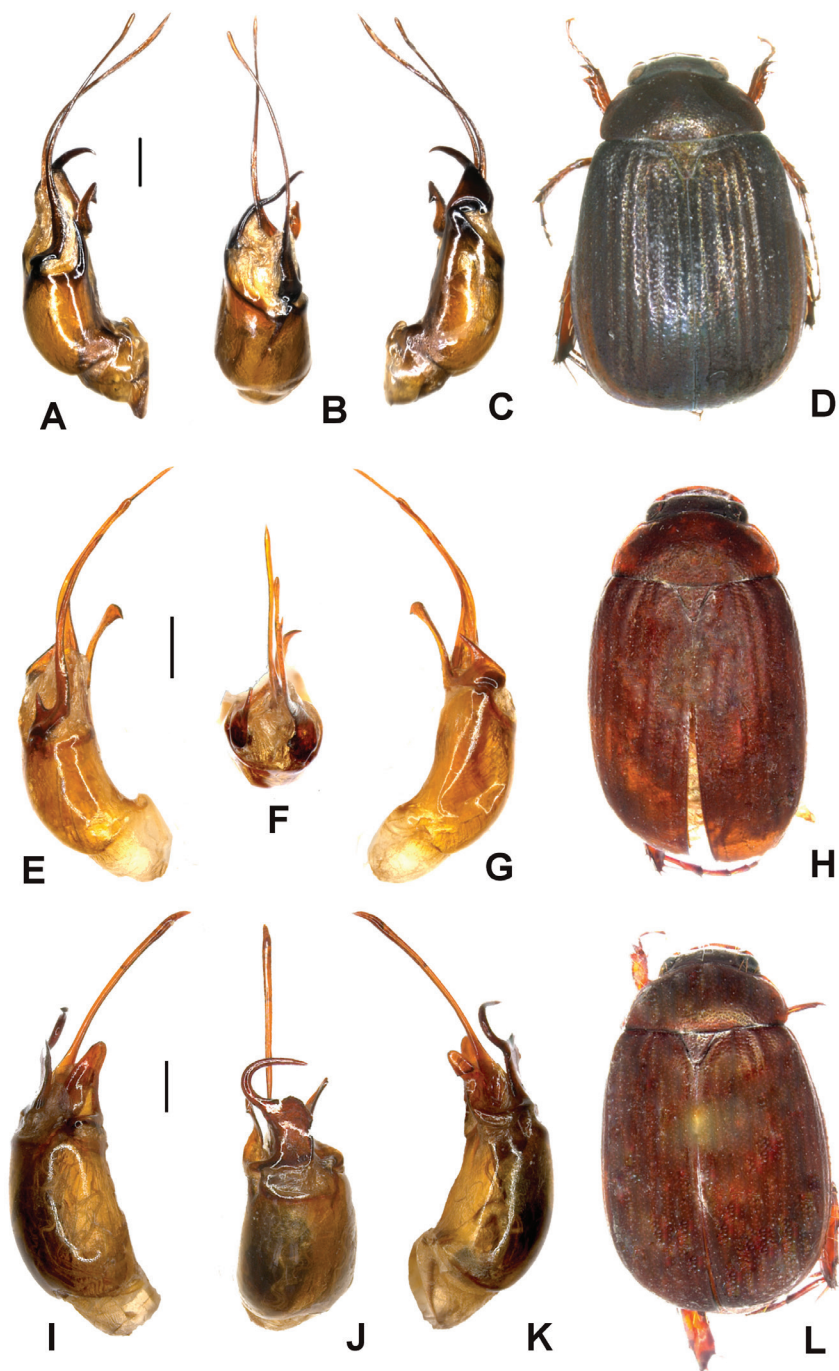


Figure 5. A–D *Tetraserica jinghongensis* sp. n. (holotype) E–H *T. menglongensis* sp. n. (holotype) I–L *T. tianchiensis* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view B, F, J parameres, dorsal view D, H, L habitus (not to scale). Scale: 0.5 mm.

right paramere having no brush of spines and being composed of two lobes: its dorsal lobe is narrow, evenly curved and sharply pointed.

Etymology. The species name is named after its type locality, Jinghong Na Ban village.

***Tetraserica menglongensis* sp. n.**

<http://zoobank.org/D5152BD3-A0F2-4A16-9A8C-DCBC8322BC0F>

Type material examined. Holotype: ♂ [China] “Menglong, Yunnan, 22.IV.1982, light trap, leg. Jiang Shengqiao” (IZAS).

Description. Body length: 7.6 mm, length of elytra: 5.8 mm, width: 4.3 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.59. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.64. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.23; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 5E–G. Habitus: Fig. 5H.

Female unknown.

Diagnosis. *Tetraserica menglongensis* sp. n. differs from *T. jinghongensis* by the slightly lighter colour, bilobate left paramere, as well as the right paramere having the dorsal lobe shorter than the ventral one (Fig. 5E).

Etymology. The new species is named after its type locality, Menglong.

***Tetraserica tianchiensis* sp. n.**

<http://zoobank.org/8BB6DBDE-F5BC-4808-9BE2-3459B99E377D>

Type material examined. Holotype: ♂ “Tianchi, Jianfeng, Hainan, 13.IV.1980, 900m, leg. Wang Shuyong” (IZAS). Paratype: 1 ♂ “Tianchi, Jianfeng, Hainan, 18.IV.1980, 750m, leg. Wang Shuyong” (ZFMK).

Description. Body length: 9.1 mm, length of elytra: 6.9 mm, width: 5.7 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.63. Antennal club 1.3 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.56. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight, without blunt tooth. Metatibia short and wide, ratio width/length: 1/3.24; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 5I–K. Habitus: Fig. 5L.

Female unknown.

Variation. Body length: 9.1–10.5 mm, length of elytra: 6.9–8.4 mm, width: 5.7–6.1 mm.

Diagnosis. *Tetraserica tianchiensis* sp. n. differs from *T. jinghongensis* by dorsal lobe of the right paramere being wide, with a sickle-shaped, large apical hook (Fig. 5J).

Etymology. The new species is named after its type locality, Tianchi.

***Tetraserica liangheensis* sp. n.**

<http://zoobank.org/D3CCF90A-4B08-4141-A735-D2D311ABE1D1>

Type material examined. Holotype: ♂ [China] “Yunnan, Lianghe, 2011-V-4, N: 24.789, E: 98.264, 1130m/ LW-1316” (ZFMK).

Description. Body length: 9.7 mm, length of elytra: 7.3 mm, width: 5.5 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.59. Antennal club 1.1 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.56. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin with a large sharp hook. Metatibia short and wide, ratio width/length: 1/3.1; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 6A–C. Habitus: Fig. 6D.

Female unknown.

Diagnosis. *Tetraserica liangheensis* sp. n. differs from all other known *Tetraserica* species by the large and sharp hook at the posterior margin of metafemur.

Etymology. The new species is named after its type locality, Lianghe.

***Tetraserica graciliforceps* sp. n.**

<http://zoobank.org/63505155-B061-49FC-B407-E0BD37477162>

Type material examined. Holotype: ♂ “China, W Yunnan prov., mts. 60km E Tengchong, 2200m, 19.–22.v.2006, S. Murzin & I. Shokhin” (CPPB). Paratype: 1 ♂ “Yunnan 2200–2500m 24.57N 98.45E 8–16/5. Gaoligong mts. Vit Kubán leg. 1995” (ZFMK).

Description. Body length: 8.9 mm, length of elytra: 7.2 mm, width: 5.7 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes small; ratio of diameter/interocular width: 0.5. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.6. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin with a large sharp hook. Metatibia short and wide, ratio width/length: 1/3.2; basal group of dorsal spines of metatibia at first third of metatibial length.

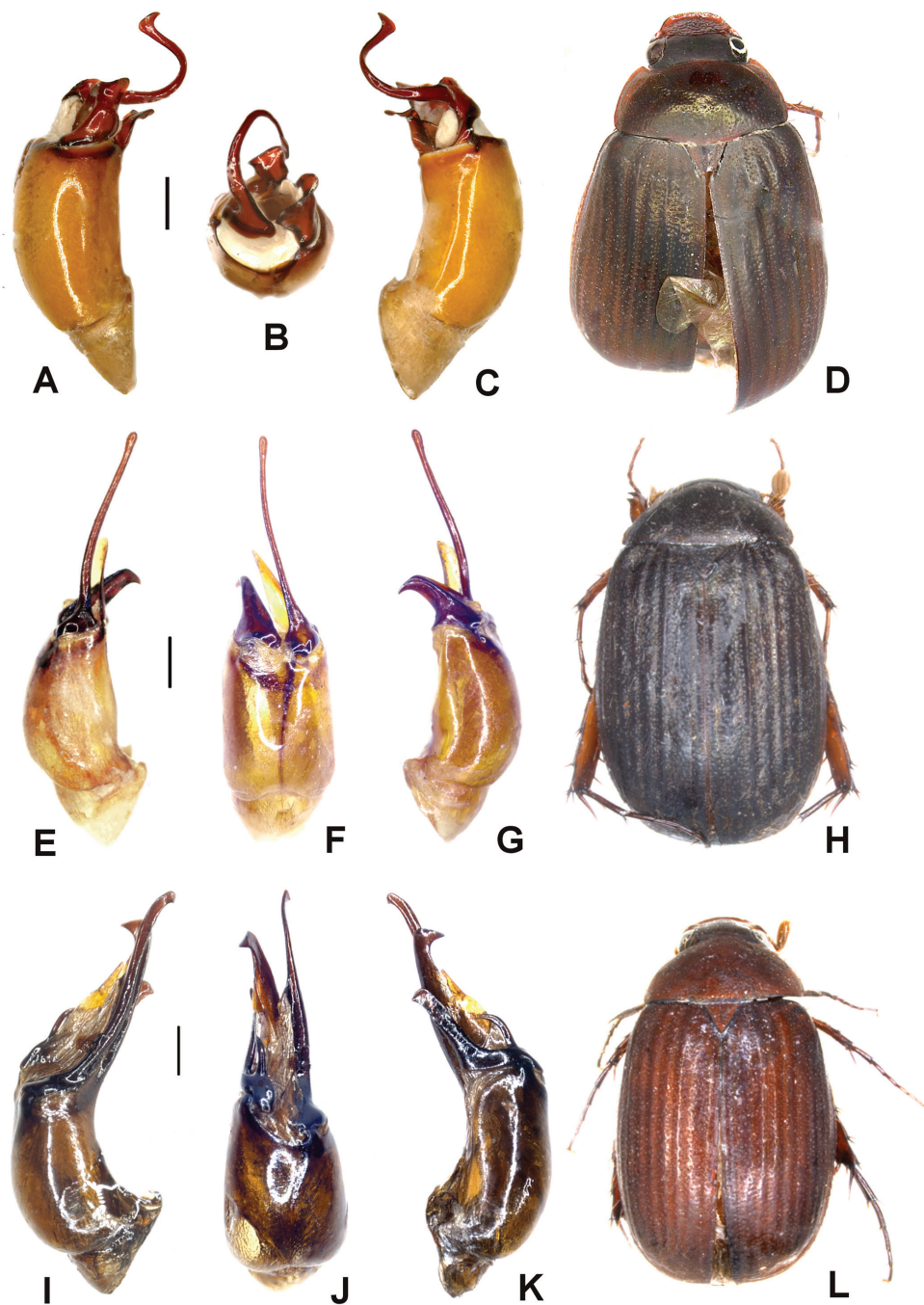


Figure 6. A–D *Tetraserica liangheensis* sp. n. (holotype) E–H *T. graciliforceps* sp. n. (holotype) I–L *T. pingjiangensis* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view B, F, J parameres, dorsal view D, H, L habitus (not to scale). Scale: 0.5 mm.

Aedeagus. Fig. 6E–G. Habitus: Fig. 6H.

Female unknown.

Variation. Body length: 8.9–9.8 mm, length of elytra: 7.1–7.2 mm, width: 5.5–5.7 mm.

Diagnosis. *Tetraserica graciliforceps* sp. n. differs from *T. longzhouensis* by the following features: phallobasis in dorsal view is only slightly asymmetric; left and right parameres are simple, without two lobes; posterior angles of the pronotum are strongly rounded.

Etymology. The species name is derived from the combined Latin words, *gracilis* – fine, and *forceps* – forceps, with reference to the fine and simple parameres of the species.

***Tetraserica pingjiangensis* sp. n.**

<http://zoobank.org/02009348-3716-4747-B9AD-9B82890893C9>

Type material examined. Holotype: ♂ “China: Hunan; Mupu Mt. 1600m, Pingjiang VIII-2003, leg. Li et al.” (ZFMK). Paratypes: **China.** 1 ♀ “China: Hunan; Mupu Mt. 1600m, Pingjiang VIII-2003, leg. Li et al.” (ZFMK), 2 ♂♂, 1 ♀ “China: Hubei; Dahongshan 1700m Shuizhou VI-2003 leg. Ying et al.” (ZFMK), 1 ♂ “China: S-Yunnan Prov. Xishuangbanna 20km NW Jinghong Man Dian (NNNR) 720m 22°07.80'N, 100°40.05'E, 26.v.2008, light trap, leg. A. Weigel” (NME), 1 ♂ “Jingdong, Yunnan, 30.V.1956, 1170m, leg. Krischanovskna” (IZAS), 2 ♂♂ [China] “Jingdong, Yunnan, 22.V, 1.VI.1956, 1170m, leg. Zagulaev, Polov” (IZAS), 2 ♂♂ [China] “Mt. Junzishan, Shizong, Yunnan, 14,16.VII.2006, leg. Mao Benyong etc.” (HBUM), 1 ♂ “Jingdong, Yunnan, 29.IV.1957, 1200m, leg. Zagulaev” (IZAS), 1 ♂ [China] “Yunnan, Honghe, Hekou, Binlangzhai Shuiku, 2011-V-14/ LW-1076” (IZAS), 4 ♂♂ [China] “Jingdong, Yunnan, 26,30.V.1956, 1170m, leg. Krischanovskna, light trap” (IZAS), 3 ♂♂ [China] “Jingdong, Yunnan, 1,3.VII.1956, 1170m, leg. Krischanovskna, light trap” (IZAS), 8 ♂♂ [China] “Jingdong, Yunnan, 2,5,8,12,20,21,28.VI.1956, 1170m, leg. Krischanovskna, light trap” (IZAS), 1 ♂ [China] “Jingdong, Yunnan, 17.V.1957, 1200m, leg. Montschadskij” (IZAS), 1 ♂ [China] “Jingdong, Yunnan, 8.IV.1957, 1200m, leg. Montschadskij” (IZAS), 7 ♂♂, 1 ♀ [China] “Jingdong, Yunnan, 10.V.1957, 1200m, leg. Montschadskij” (IZAS), 1 ♂ [China] “22 km Northeast of Jingdong, 12.V.1957, leg. Montschadskij” (IZAS), 4 ♂♂ [China] “Jingdong, Yunnan, 23,31.V.1956, 1170–1300m, leg. Ivanov, light trap” (IZAS), 2 ♂♂ [China] “Jingdong, Yunnan, 3.VI.1956, 1170m, leg. Zagulaev” (IZAS), 4 ♂♂ [China] “Jingdong, Yunnan, 30.VI.1956, 1170m, leg. Zagulaev” (IZAS), 1 ♂ [China] “Dongjiafen, Jingdong, Yunnan, 27.VI.1956, 1250m, leg. A. Shnitnikov” (IZAS), 1 ♂ [China] “Fulong, Fangcheng, Guangxi, 23.V.1999, 200m, leg. Ke Xin” (IZAS), 1 ♂ [China] “Fulong, Fangcheng, Guangxi, 25.V.1999, 200m, leg. Zhang Xuezhong” (IZAS), 1 ♂ [China] “Hongqi Forestry Farm, Shangsi, Guangxi, 28.V.1999, 300m, leg. Zhang Xuezhong” (IZAS), 3 ♂♂ [China] “Banbaxiang, Fangcheng, Guangxi, 16.V.2000, 550m, leg. Li Wenzhu” (IZAS), 2 ♂♂ [China] “Huanian (Eshan, Yun-

nan), 15.VI.(19)83, No.312,319" (IZAS), 3 ♂♂ [China] "Mengla, Jinping, Yunnan, 17,20.IV.1956, 370m, leg. Huang Keren et.al." (IZAS), 2 ♂♂ [China] "Menglun, Yunnan, 22.IV.1982, leg. Jiang, light trap" (IZAS), 1 ♂ [China] "Menglun, Yiwubanna, 8.VII.1964, 650m, leg. Zhang Baolin" (IZAS). **Myanmar.** 1 ♂ "Burma (Myanmar) E Shan state Kengtung (Kyaingtong) J. Rejsek 14.–15.6.1997" (ZFMK). **Vietnam.** 1 ♂ "N Vietnam (Tonkin) Ha Noi (city) 4.–5.V.1990 Vit. Kubán leg. (ZFMK), 1 ♂ "Vietnam, Cuc Phong, 100km SE of Hanoi; V-1993; leg. Michio Hori" (ZFMK), 1 ♂ "Vietnam N. Tonkin Cuc-Phong Nat. Park 2.–12.V.1991 E. Jendek leg." (ZFMK), 45 ♂♂, 44 ♀♀ "N-Vietnam Bac Ha env., Lao Cai Prov., 22°32'05"N, 104°17'32"E 980-1000m 28.–30.V.1999 leg. Fabrizi, Jager, Ahrens" (ZFMK), 1 ♂ "N. Vietnam: Sontay, 400m, 20.V.1963 leg. Le Van Dyk" (Coll. Kabakov), 1 ♂ "N. Vietnam: Sonla Songma, 500m, 3.V.1990 leg. Schorkov" (Coll. Kabakov), 1 ♂ "N. Vietnam: 40km NE Thainguyen, 300m, 8.V.1963, leg. O. Kabakov" (Coll. Kabakov), 1 ♂ "S. Vietnam (Cat Tien) 120 km NNE Ho Chi Minh, Cat Tien Nat. Park 30.5.–15.6.1995 leg. A. Napolov" (CNAR), 17 ♂♂ "Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 27.5.–3.6.1998 1250m leg. A. Napolov" (CNAR, ZFMK), 2 ♂♂ "Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 27.V.–3.VI.1998 1250m leg. A. Napolov" (CNAR, ZFMK), 1 ♂ "Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 16.–20.VI.1998 1250m leg. A. Napolov" (CNAR), 3 ♂♂ "Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 25.VI.–5.VII.1998 1250m leg. A. Napolov" (CNAR), 3 ♂♂ "Vietnam N (Sa Pa) Lao Cai Prov., 250km from Hanoi bearing 31°, Sa Pa vill. env. Hoang Lien Son Nat. Res. 21.–23.6.1998 1250m leg. A. Napolov" (CNAR), 3 ♂♂ "Vietnam-N (Na Hang) 160km from Ha Noi, NE env. of Na Hang, 26.5.–6.6.1996 150–200m leg. A. Napolov & I. Roma" (CNAR), 1 ♂ "X-DA3434 - Vietnam, N. Vietnam: Hanoi Prov., Ba Vi National Park (at light) 21–24.vi.2012 L. Bartolozzi, S. Bambi, F. Fabiano, E. Orbach" (MZUF). **Thailand.** 2 ♂♂, 3 ♀♀ "Thailand, Nam Nao, Phetchabua; 16°5'N,101°40'E; 19.V.1999; leg. K. Masumoto" (ZFMK), 1 ♂, 1 ♀ "Phu Rua NP (900m alt.), Loei P., NE Thai. 26–30.IV.2006 Takakuwa, M. leg." (ZFMK), 3 ♂♂, 1 ♀ "N. Thailand, Chiang Mai, Erawan Resort; 22.IV.1992; leg. Kazuo Kawano" (ZFMK), 1 ♂, 2 ♀♀ "N. Thailand, Nan, Wiang Sa; 14.V.1993; leg. S. Ohmomo" (ZFMK), 1 ♂ "839493 Tetraserica ThaiSpMU09_1 Thailand S. Murzin 28./31.5.2009 Chiang Dao Hill resort (100km N of Chiang Mai) 600m/ 839493" (ZFMK), 1 ♂, 2 ♀♀ "Thailand bor. Chiang Dao env., 21.5.–4.6.1995 lgt. M. Snizek" (ZFMK), 2 ♂♂ "NW Thailand 24.–27.4.1991 Chom Thong leg. Pacholátko/ TS98" (CPPB), 1 ♂ "Thai 11–15.V.1998 Nan-Pha Khab Pacholátko & Dembický leg." (CPPB), 1 ♂ "NW Thailand, 1991 Chow Thong, 24.–27.4. 18.26N, 98.41E L. Dembický leg." (NHMW), 1 ♂ "Thailand Chiangmai Prov.; Fang (Agr Exp. Station), 600 m 14.VI.1965" (BPBM), 2 ♂♂, 1 ♀ "N. Thailand: Angkhai village, Samoeng Dist. Chiang Mai Prov., 9–11.v.1999 K. Masumoto leg." (ZFMK), 1 ♂ "N. Thailand: Chiang Mai Pref., Ban Angkhai, Samoeng Dist., 750 m, 15–20.V.1998 K. Matsumoto

leg.” (ZFMK). **Laos.** 1 ♂ “Laos, 21°09'N, 101°19'E Louangnamtha pr. Namtha → Muang Sing, 5-31.v.1997, 900-1200m Vit Kubáň leg./ LS11” (CPPB), 1 ♂ “Laos centr., 27.IV.–1.V.1997, 70km NE Vientiane Ban Phabat env., 150m, N18°16.1', E103°10.9' E. Jendek & Šauša leg.” (CPPB), 1 ♂ “Laos, Bolikhamxai pr. 18°16'N, 103°11'E 70km NEE Vientiane, 27-30.iv.1997, 150m, Vit Kubáň leg.” (CPPB), 2 ♂♂ “N. Laos Louang Namtha 1.5.1996 I. Pjushtch lg” (ZFMK), 35 ♂♂, 19 ♀♀ “Laos P.D.R. Xieng Khowang 14–20. May 1994 K. Miura leg.” (ZFMK), 2 ♂♂ “NE-Laos: Hua Phan prov.; Ban Saleui, Phou Pan (Mt.) 20°12'N, 104°01'E 11.iv.–15.v.2012, 1300–1900 m leg. C. Holzschuh → ZFMK Ankauf 2012/13” (ZFMK), 5 ♂♂ “Laos, La Oudomxay 16.6.2005, ex. coll. Sabatinelli” (ZFMK), 4 ♂♂ “Laos-N, Louang Namtha circ. 04.05.1996, I. Pjushtch lg” (ZFMK).

Description. Body length: 10.0 mm, length of elytra: 7.5 mm, width: 6.0 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.6. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.6. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin with a blunt tooth. Metatibia short and wide, ratio width/length: 1/2.9; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 6I–K. Habitus: Fig. 6L.

Diagnosis. *Tetraserica pingjiangensis* sp. n. differs from all other *Tetraserica* species with a blunt tooth at the posterior margin of metafemur by the long and narrow left paramere.

Etymology. The new species is named after its type locality, Pingjiang.

Variation. Body length: 8.8–10.0 mm, length of elytra: 6.9–7.5 mm, width: 5.4–6.0 mm. Female has the antennal club composed of three lamellae, short, as long as remaining antennomeres combined; eyes are as large as those in male.

Tetraserica wandingsensis sp. n.

<http://zoobank.org/D422148E-C6DA-4584-8F5E-07FD832F4CE3>

Type material examined. Holotype: ♂ [China] “Yunnan, Wanding, 2011-IV-29, N: 24.086, E: 98.072, 900m/ LW-1247” (ZFMK). Paratype: 1 ♂ [China] “Yunnan, Wanding, 2011-IV-29, N: 24.086, E: 98.072, 900m/ LW-1247bis” (IZAS).

Description. Body length: 9.3 mm, length of elytra: 6.9 mm, width: 5.4 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes large; ratio of diameter/interocular width: 0.72. Antennal club 1.5 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.56. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin with a large sharp hook. Metatibia short and wide, ratio width/length: 1/3.13; basal group of dorsal spines of metatibia at first third of metatibial length.

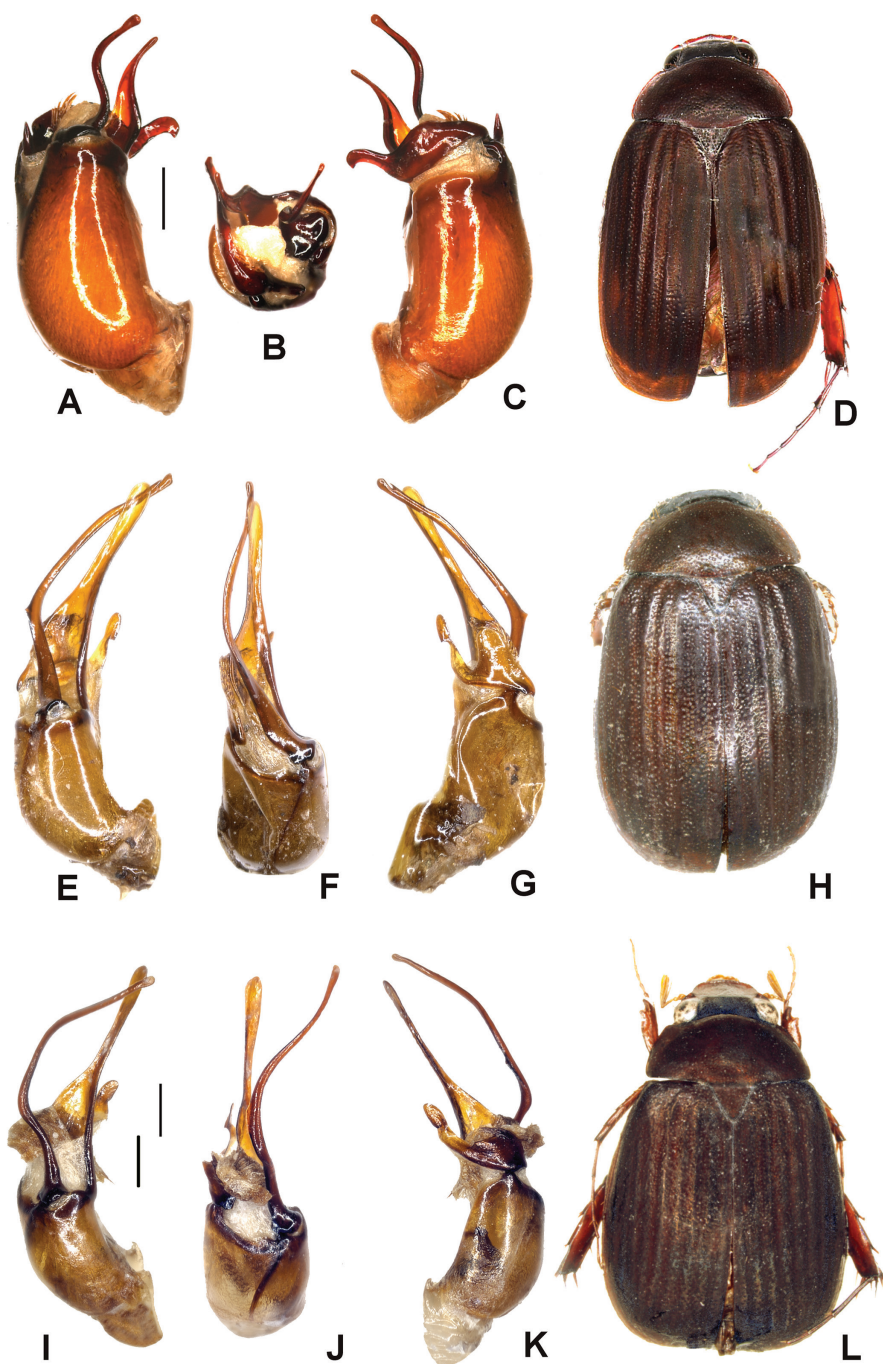


Figure 7. A–D *Tetraserica wandingsensis* sp. n. (holotype) E–H *T. tonkinensis* (Moser) comb. n. (lectotype) I–L *T. xichouensis* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view; B, F, J parameres, dorsal view D, H, L habitus (not to scale). Scale: 0.5 mm.

Aedeagus. Fig. 7A–C. Habitus: Fig. 7D.

Female unknown.

Variation. Body length: 8.8–9.3 mm, length of elytra: 6.9–7.1 mm, width: 5.4–5.6 mm.

Diagnosis. *Tetraserica wandingsensis* sp. n. differs from *T. liangheensis* by the larger eyes (ratio diameter/interocular distance: 0.72 vs. 0.59) and dorsal lobe of the right paramere being very small and bent basally.

Etymology. The new species is named after the type locality, Wanding.

***Tetraserica tonkinensis* (Moser, 1908), comb. n.**

Neoserica tonkinensis Moser, 1908: 328 (type locality: Tonkin, Mt. Mauson).

Type material examined. Lectotype (here designated): ♂ [Vietnam] “Tonkin Montes Mauson April, Mai 2-3000' H. Fruhstorfer/ tonkinensis Mos.” (ZMHB). Paralectotypes: 1 ♀ [Vietnam] “Tonkin Montes Mauson April, Mai 2-3000' H. Fruhstorfer/ tonkinensis Mos.” (ZMHB), 5 ♀♀ [Vietnam] “Tonkin Montes Mauson April, Mai 2-3000' H. Fruhstorfer” (ZMHB).

Additional material examined. 1 ♂ [China] “Luoxiang, Jinxiu, Guangxi, 15.V.1999, 400m, leg. Li Wenzhu” (IZAS).

Redescription. Body length: 9.0 mm, length of elytra: 7.0 mm, width: 5.9 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes large; ratio of diameter/interocular width: 0.66. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/ metacoxa: 1/1.45. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin with a large sharp hook. Metatibia short and wide, ratio width/length: 1/3.25; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 7E–G. Habitus: Fig. 7H.

Variation. Body length: 8.7–9.0 mm, length of elytra: 6.7–7.0 mm, width: 5.4–5.9 mm. Female has small eyes (ratio of diameter/interocular width: 0.6) and antennal club composed of 3 antennomeres being as long as the remaining antennomeres combined.

Remarks. The species is recorded for the first time for China.

***Tetraserica xichouensis* sp. n.**

<http://zoobank.org/A19A757A-ED28-4613-B2C0-500F3A6068BF>

Type material examined. Holotype: ♂ “China, SE Yunnan, Xichou - E env. 1400–1700m, 13.18.5.95/ 23°22–26'N/ 104°41–49'E L.+R. Businský lgt.” (CPPB).

Description. Body length: 9.0 mm, length of elytra: 6.7 mm, width: 5.8 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes large; ratio of diameter/interocular width: 0.7. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.6. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin with a large sharp hook. Metatibia short and wide, ratio width/length: 1/3.4; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 7I–K. Habitus: Fig. 7L.

Female unknown.

Diagnosis. *Tetraserica xichouensis* sp. n. differs from the very similar *T. tonkinensis* by the smaller dorsal lobe of the right paramere.

Etymology. The new species is named after its type locality, Xichou.

***Tetraserica mengeana* sp. n.**

<http://zoobank.org/63DE72A9-77DD-42CB-AD49-69D2577F3978>

Type material examined. Holotype: ♂ [China] “Meng’e, Xishuangbanna, Yunnan, 19.V.1958, 1050–1080m, leg. Hong Chunpei” (IZAS). Paratypes: 1 ♂ [China] “Menghai, Xishuangbanna, Yunnan, 19.VII.1958, 1200–1600m, leg. Wang Shuyong” (IZAS), 1 ♂ [China] “Menghun, Xishuangbanna, Yunnan, 18.V.1958, 1200–1400m, leg. Zhang Yiran” (IZAS), 1 ♂ [China] “Yunnan, Huanglianshan, 2012-V-9, 1800m/LW-1277” (IZAS), 1 ♂ [China] “Meng’e, Xishuangbanna, Yunnan, 19.V.1958, 1050–1080m, leg. Hong Chunpei” (ZFMK).

Description. Body length: 7.4 mm, length of elytra: 5.7 mm, width: 4.3 mm. Body reddish brown. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes large; ratio of diameter/interocular width: 0.7. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.5. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight. Metatibia short and wide, ratio width/length: 1/3.2; basal group of dorsal spines of metatibia at first third of metatibial length. Aedeagus. Fig. 8A–C. Habitus: Fig. 8D.

Female unknown.

Variation. Body length: 7.4–8.6 mm, length of elytra: 5.7–7 mm, width: 4.3–5.9 mm.

Diagnosis. *Tetraserica mengeana* sp. n. differs from all other species with a brush of robust trichome-like spines at the base of the right paramere by the left paramere being split into two filiform branches behind the middle.

Etymology. The new species is named after its type locality, Meng’e.

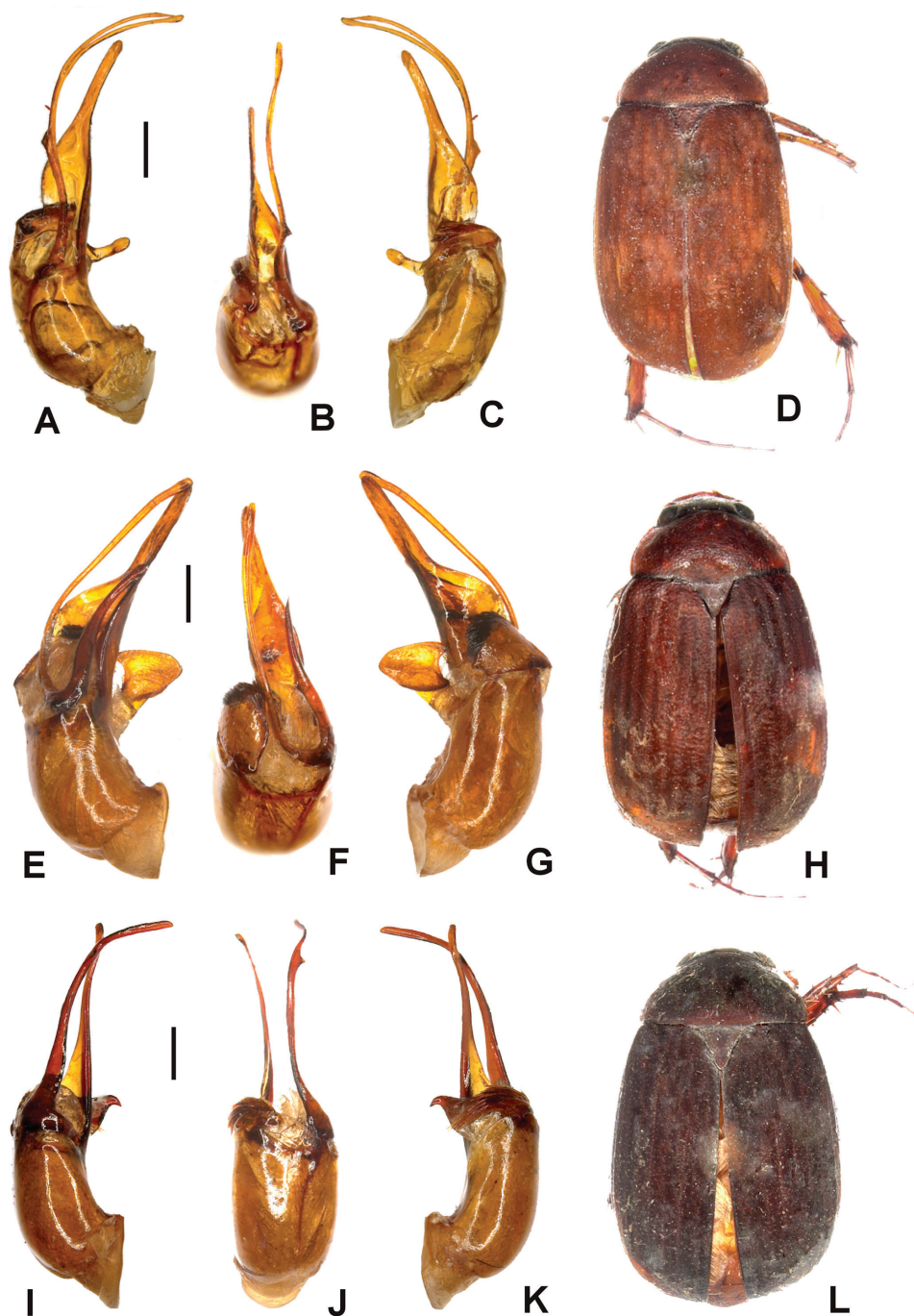


Figure 8. A–D *Tetraserica mengeana* sp. n. (holotype) E–H *T. changshouensis* sp. n. (holotype) I–L *T. shangsiensis* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view B, F, J parameres, dorsal view D, H, L habitus (not to scale). Scale: 0.5 mm.

***Tetraserica changshouensis* sp. n.**

<http://zoobank.org/4CBFFD98-D953-43C8-B15B-8B7A32B5666F>

Type material examined. Holotype: ♂ [China] “Nanmu Garden, Changshou, Sichuan, 9.VI.1994, 450m, leg. Zhang Youwei” (IZAS). Paratype: 1 ♂ [China] “Mt. Xingdoushan, Lichuan, Hubei, 22.VII.1989, light trap, 810m, leg. Wang Shuyong” (ZFMK).

Description. Body length: 8.8 mm, length of elytra: 6.7 mm, width: 5.3 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.65. Antennal club as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.57. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight. Metatibia short and wide, ratio width/length: 1/3.35; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 8E–G. Habitus: Fig. 8H.

Female unknown.

Variation. Body length: 8.0–8.8 mm, length of elytra: 6.0–6.7 mm, width: 5.0–5.3 mm.

Diagnosis. *Tetraserica changshouensis* sp. n. differs from all other species with a brush of robust trichome-like spines at the base of the right paramere by the left paramere being composed of two lobes and the ventral lobe of the right paramere being abruptly and strongly widened at apex.

Etymology. The new species is named after its type locality, Changshou.

***Tetraserica shangsiensis* sp. n.**

<http://zoobank.org/6CC6D618-2F79-4442-94C0-B3862420E683>

Type material examined. Holotype: ♂ [China] “Hongqi Forestry Farm, Shangsi, Guangxi, 29.V.1999, 300m, leg. Ke Xin” (IZAS). Paratypes: 1 ♂ [China] “Nonggang, Longzhou, Guangxi, 21.V.1982, 240m, leg. Li Fasheng” (CAU), 1 ♂ [China] “Fu'ai, Pingxiang, Guangxi, 17.VI.1976, leg. Zhang Baolin” (ZFMK), 2 ♂♂ [China] “Hong Kong: Lantau I: San Shek Wan; v.1988” (BPBM), 1 ♂ [China] “Hongqi Forestry Farm, Shangsi, Guangxi, 29.V.1999, 300m, leg. Ke Xin” (IZAS), 1 ♂ [China] “Taojiang, Leishan, Guizhou, 5.VII.1988, 1000m, leg. Yang Longlong, light trap” (IZAS).

Description. Body length: 8.1 mm, length of elytra: 6.2 mm, width: 4.6 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes large; ratio of diameter/interocular width: 0.76. Antennal club as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.61. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight.

Metatibia short and wide, ratio width/length: 1/3.13; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 8I–K. Habitus: Fig. 8L.

Female unknown.

Variation. Body length: 7.0–8.1 mm, length of elytra: 5.6–6.7 mm, width: 4.4–4.8 mm.

Diagnosis. The new species differs from the similar *T. xichouensis* sp. n. by the left paramere being evenly curved without being clearly bent, and having a tiny lateral tooth before apex which is absent in *T. xichouensis*.

Etymology. The new species is named after its type locality in Shangsi prefecture (Guangxi province).

***Tetraserica ruiliensis* Ahrens, Liu & Fabrizi, sp. n.**

<http://zoobank.org/AA46D770-40D2-4DBE-BC2D-A2C753380157>

Type material examined. Holotype: ♂ [China] “Yunnan, Ruili, 2011-IV-27, N: 24.059, E: 97.955, 825m/ LW-1216” (ZFMK).

Description. Body length: 8.1 mm, length of elytra: 5.8 mm, width: 4.8 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.63. Antennal club 1.2 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.74. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight. Metatibia moderately long and wide, ratio width/length: 1/3.54; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 9A–C. Habitus: Fig. 9D.

Female unknown.

Diagnosis. *Tetraserica ruiliensis* sp. n. differs from all species with straight posterior margin of metafemur, long ventral phallobasis process, and right paramere without brush of spines by the right paramere being simple, not composed of two lobes.

Etymology. The new species is named after its type locality, Ruili.

***Tetraserica linaoshanica* sp. n.**

<http://zoobank.org/7B065A6C-2F05-4F13-8433-B399B296CE08>

Type material examined. Holotype: ♂ [China] “Mts. Linaoshan, Langping, Tianlin, Guangxi, 28.V.2002, 1400m, leg. Jiang Guofang” (IZAS).

Description. Body length: 8.8 mm, length of elytra: 6.6 mm, width: 5.2 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.63. Antennal club as long as remaining antennomeres combined. Ratio of length

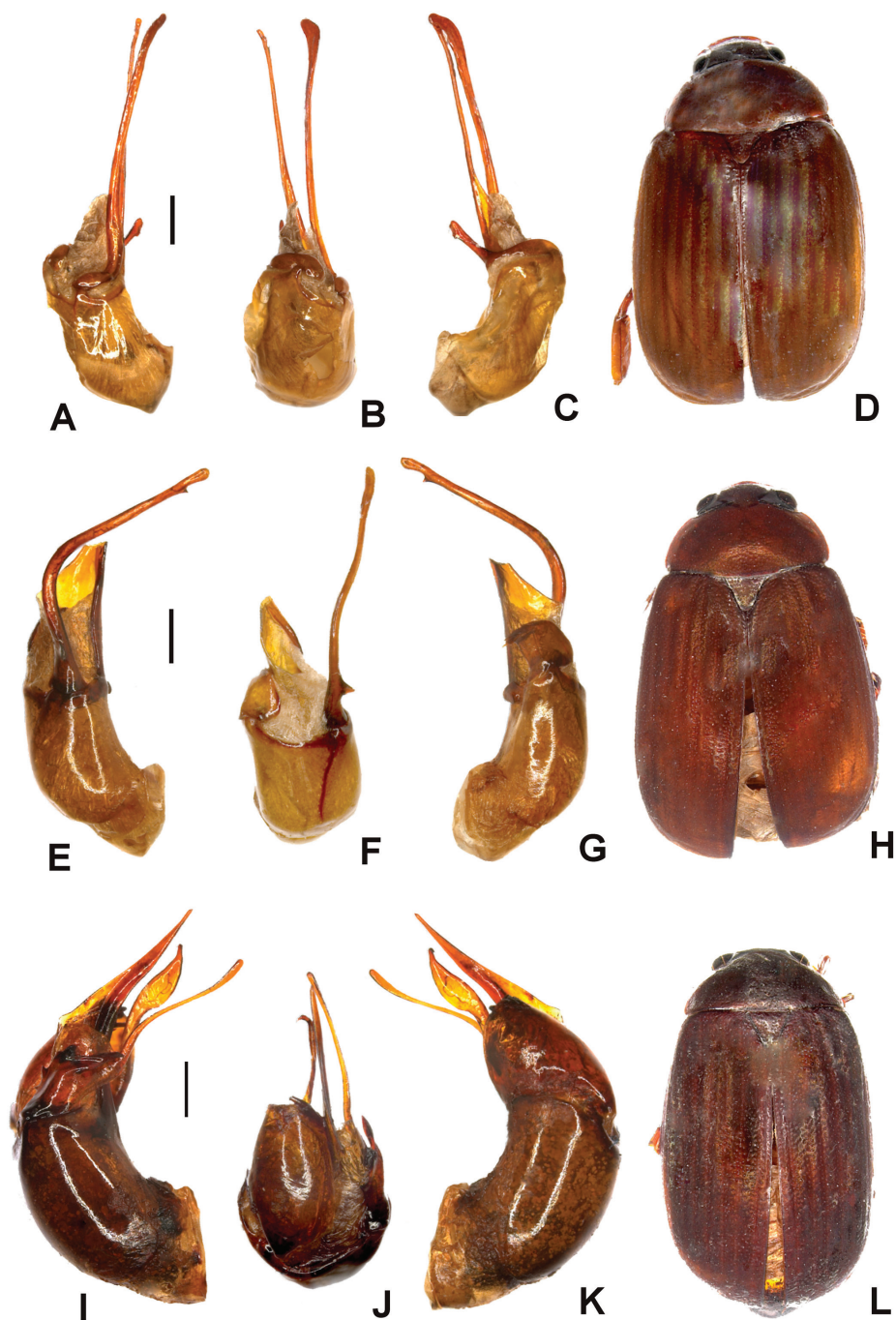


Figure 9. A–D *Tetraserica ruiliensis* sp. n. (holotype) E–H *T. linaoshanica* sp. n. (holotype) I–L *T. ruiliana* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view B, F, J parameres, dorsal view D, H, L habitus (not to scale). Scale: 0.5 mm.

of metepisternum/metacoxa: 1/1.5. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight. Metatibia moderately long and wide, ratio width/length: 1/3.69; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 9E–G. Habitus: Fig. 9H.

Female unknown.

Diagnosis. *Tetraserica linaoshanica* sp. n. differs from all *Tetraserica* species with a brush of robust trichome-like spines at the base of the right paramere by the left paramere possessing a small lateral basal tooth.

Etymology. The new species is named after its type locality, Mt. Linaoshan.

***Tetraserica ruiliana* sp. n.**

<http://zoobank.org/D5CBA763-DBD0-4B9A-8053-A43F48426C92>

Type material examined. Holotype: ♂ [China] “Huyu County, Ruili, Yunnan, 11.VI.1956, 1400m, leg. Zhou Benshou” (IZAS).

Description. Body length: 9 mm, length of elytra: 7 mm, width: 5.3 mm. Surface of labroclypeus and disc of frons glabrous. Smooth area anterior to eye twice as wide as long. Eyes moderately large; ratio of diameter/interocular width: 0.63. Antennal club 1.3 times as long as remaining antennomeres combined. Ratio of length of metepisternum/metacoxa: 1/1.55. Metafemur dull, anterior margin acute, without submarginal serrated line; anterior row of setae-bearing punctures absent; posterior margin straight. Metatibia moderately long and wide, ratio width/length: 1/3.47; basal group of dorsal spines of metatibia at first third of metatibial length.

Aedeagus. Fig. 9I–K. Habitus: Fig. 9L.

Female unknown.

Diagnosis. *Tetraserica ruiliana* sp. n. differs from all *Tetraserica* species with a brush of robust trichome-like spines at the base of the right paramere by the dorsal lobe of the right paramere convexly widened and elongate.

Etymology. The new species is named after its type locality, Ruili.

***Tetraserica anhuaensis* sp. n.**

<http://zoobank.org/341DD0C8-BE82-49FD-AA0F-C3666547B313>

Type material examined. Holotype: ♂ [China] “Cangchang, Anhua, Hunan, 15.VII.2004, leg. Wang Jiliang” (HBUM). Paratypes: 2 ♂♂ [China] “Hong Kong: N.T. Taipokau 12.VII.1965 Hand Net/ Lee Kit Ming & Hai Wai Ming Malaise Trap Bishop Museum” (BPBM, ZFMK), 1 ♂ [China] “Hong Kong: N.T. Taipokau 27.VI.1964/ M.J. Voss & Wai Ming Hui Collectors Bishop Museum” (BPBM), 1 ♂ [China] “Hong Kong: N.T. Taipokau 20.VI.1964/ Lee Kit Ming & Hai Wai Ming Light Trap Bishop Museum” (BPBM), 1 ♂, 2 ♀♀ [China] “Shekou, Fu’an, Fujian, 26.VII.1963, leg.

Zhang Youwei" (IZAS), 1 ♀ [China] "Shekou, Fu'an, Fujian, 27.VII.1963, leg. Zhang Youwei" (IZAS), 2 ♂♂ [China] "Mt. Jiulianshan, Longnan, Jiangxi, 6.VI.1975, leg. Zhang Youwei" (IZAS), 1 ♂ [China] "Sidu, Guidong county, Hunan, 10.VII.2008, 774m, leg. Yang Ganyan" (IZAS), 2 ♂♂, 2 ♀♀ [China] "Qiliqiao, Chong'anxingcun, Fujian, 7,12,13.VII.1963, 840m, leg. Zhang Youwei" (IZAS).

Description. Body length: 7.2 mm, length of elytra: 5.2 mm, width: 4.2 mm.

Labroclypeus surface with a few erect setae. Disc of frons with a few single setae. Smooth area in front of eye approximately 4 times as wide as long. Eyes large; ratio of diameter/interocular width: 0.82. Antennal club 1.4 times as long as remaining antennomeres combined.

Ratio of length of metepisternum/metacoxa: 1/1.5. Metafemur with a serrated continuous line beside anterior margin, with fine sparse punctures behind line each bearing a short seta.

Metatibia moderately long, ratio width/length: 1/3.25; basal group of dorsal spines of metatibia behind middle; beside dorsal margin in basal half with a blunt carina being partly finely serrate.

Aedeagus. Fig. 10A–C. Habitus: Fig. 10D.

Female unknown.

Variation. Body length: 6.8–7.2 mm, length of elytra: 5.0–5.2 mm, width: 3.8–4.2 mm.

Diagnosis. *T. anhuaensis* sp. n. differs in a number of characters from all so far known *Tetraserica* species: metafemur possessing a serrated continuous line beside anterior margin and fine sparse punctures with short setae behind line; the labroclypeus and frons having a few erect setae on disc; basal group of dorsal spines situated behind the middle of metatibia; metatibia beside dorsal margin in basal half with a blunt carina being partly finely serrate.

Etymology. The new species is named after its type locality, Anhua.

Tetraserica leishanica sp. n.

<http://zoobank.org/E2F9DA66-5DB2-40A9-951B-703742353E08>

Type material examined. Holotype: ♂ [China] "Leishan, Guizhou, 28.VI.1988, 800m, leg. Yin Huifen" (IZAS). Paratypes: 1 ♂ [China] "Mts. Fanjingshan, Jiangkou, Guizhou, 13.VIII.1988, 550m, leg. Yang Xingke" (ZFMK), 1 ♂ [China] "Mts. Fanjingshan, Jiangkou, Guizhou, 19.VIII.1988, 550m, leg. Yang Xingke" (IZAS), 1 ♂ [China] "Jiuniutang, Mao'ershan, Guangxi, 13.VII.1985, 1100m, leg. Liao Subai" (IZAS).

Description. Body length: 6.8 mm, length of elytra: 5 mm, width: 4 mm. Body reddish brown. Labroclypeus surface with a few erect setae. Disc of frons with a few single setae. Smooth area in front of eye approximately 4 times as wide as long. Eyes large; ratio of diameter/interocular width: 0.81. Antennal club 1.4 times as long as remaining antennomeres combined.

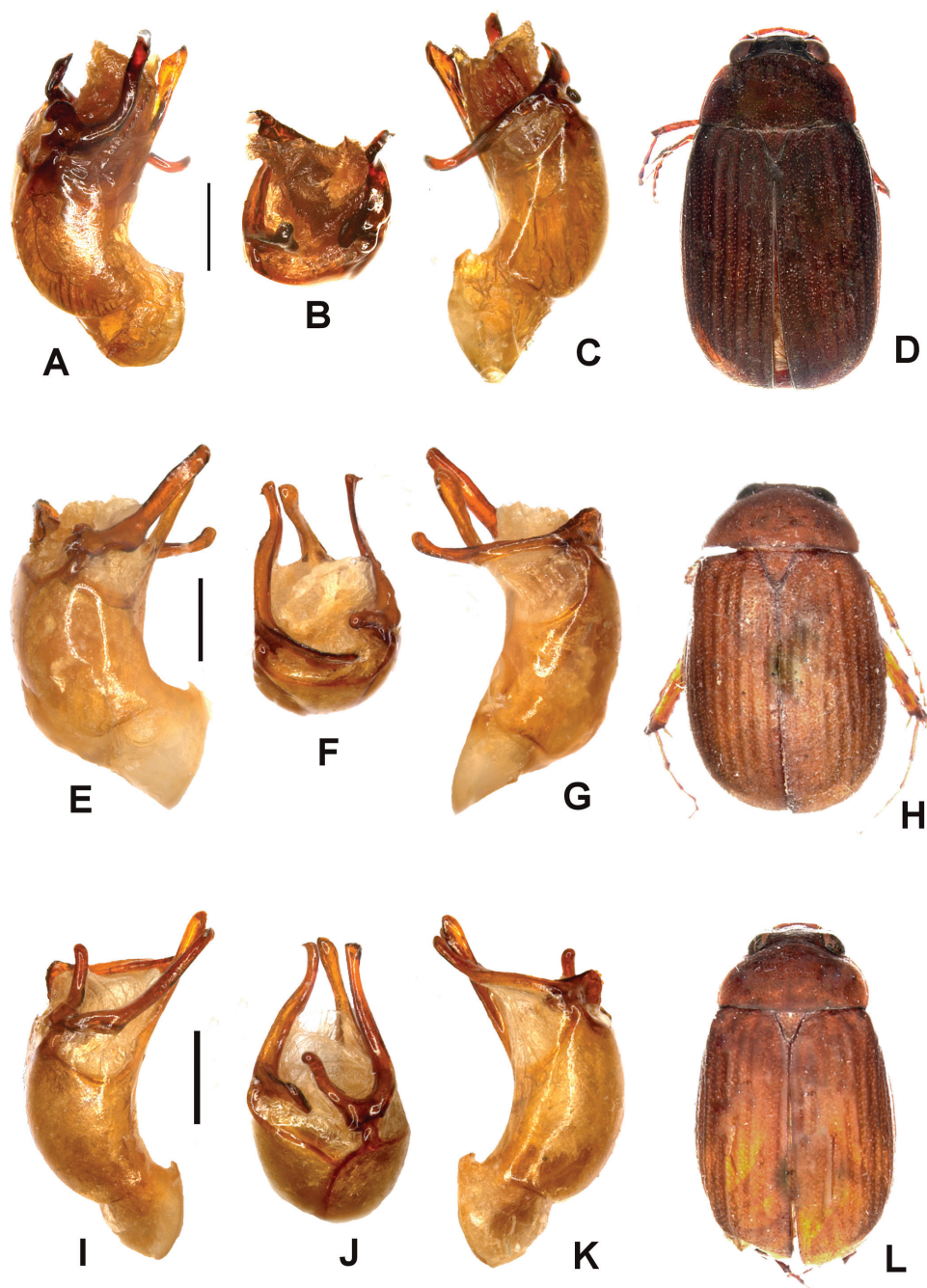


Figure 10. A–D *Tetraserica anhuaensis* sp. n. (holotype) E–H *T. leishanica* sp. n. (holotype) I–L *T. yaoanica* sp. n. (holotype). A, E, I aedeagus, left side lateral view C, G, K aedeagus, right side lateral view B, F, J parameres, dorsal view D, H, L habitus (not to scale). Scale: 0.5 mm.

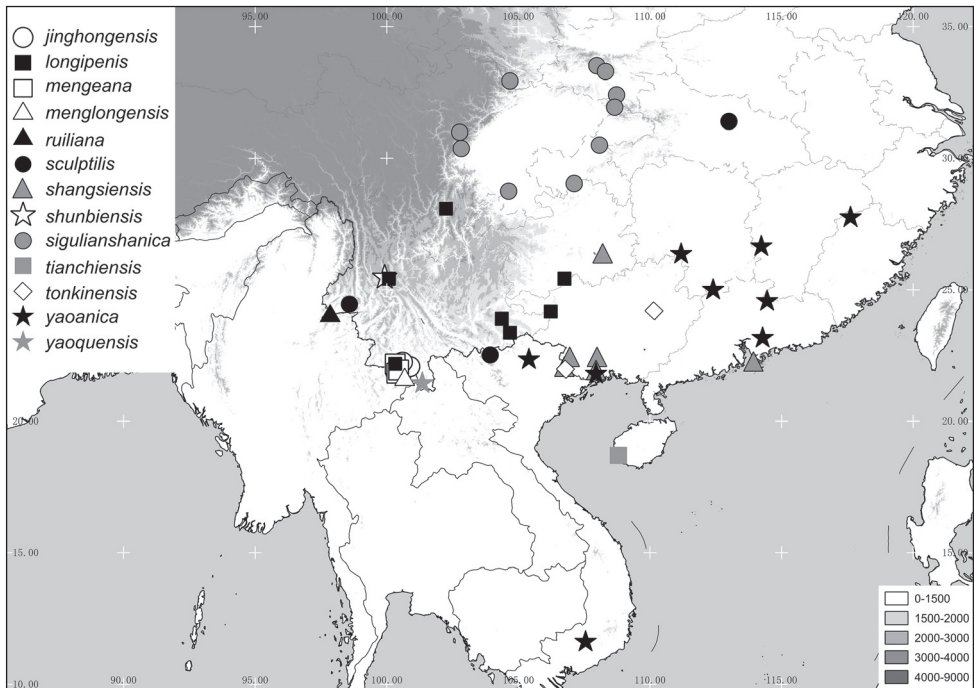


Figure 11. Distribution of *Tetraserica* species: *T. jinghongensis* sp. n., *T. longipenis* sp. n., *T. mengeana* sp. n., *T. menglongensis* sp. n., *T. ruiliana* sp. n., *T. sculptilis* sp. n., *T. shangsiensis* sp. n., *T. shunbiensis* sp. n., *T. sigulianshanica* sp. n., *T. tianchiensis* sp. n., *T. tonkinensis* (Moser), *T. yaoanica* sp. n., and *T. yaoquensis* sp. n.

Ratio of length of metepisternum/metacoxa: 1/1.68. Metafemur with a serrated continuous line beside anterior margin, with fine sparse punctures behind line each bearing a short seta.

Metatibia moderately long, ratio width/length: 1/3.64; basal group of dorsal spines of metatibia behind middle; beside dorsal margin in basal half with a blunt carina being partly finely serrate.

Aedeagus. Fig. 10E–G. Habitus: Fig. 10H.

Female unknown.

Variation. Body length: 6.8–7.7 mm, length of elytra: 5.0–5.6 mm, width: 4.0–4.6 mm.

Diagnosis. *Tetraserica leishanica* sp. n. is similar to *T. anhuaensis* externally and in the shape of male genitalia. *T. leishanica* differs by the reddish brown body colour, more slender metatibia (ratio length/width: >3.6), longer metacoxa. It also differs by the shape of the parameres: the left paramere is straight behind the base (while it is curved in *T. anhuaensis*), with a long basal lobe (basal lobe in *T. anhuaensis* is short); the right paramere is more strongly curved externally at apex than in *T. anhuaensis*.

Etymology. The new species is named after its type locality, Leishan.

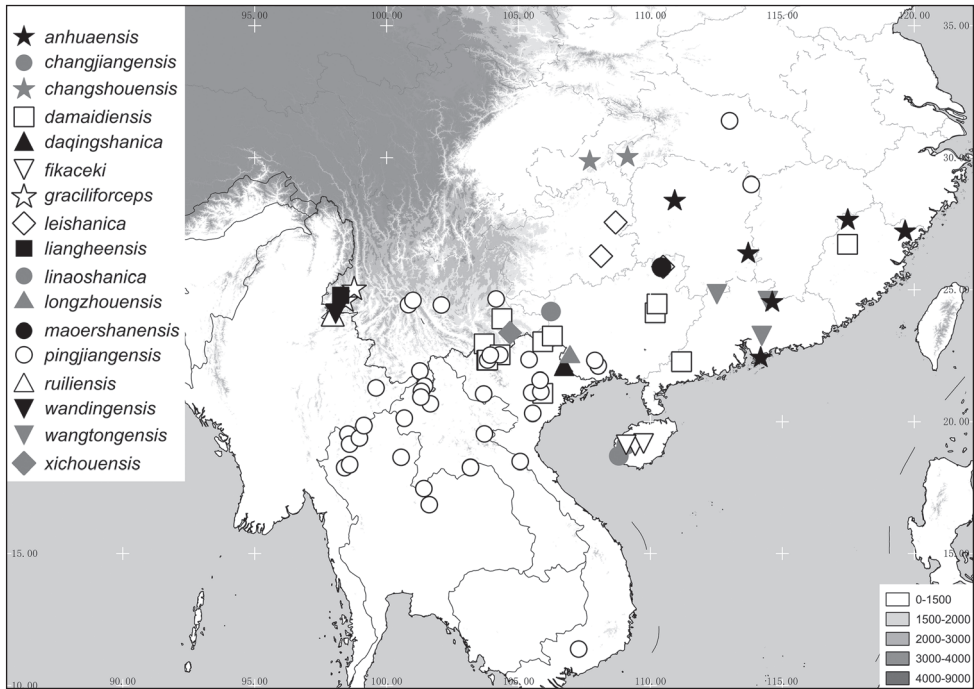


Figure 12. Distribution of *Tetraserica* species: *T. anhuaensis* sp. n., *T. changjiangensis* sp. n., *T. changshouensis* sp. n., *T. damaidiensis* sp. n., *T. daqingshanica* sp. n., *T. fikaceki* sp. n., *T. graciliforceps* sp. n., *T. leishanica* sp. n., *T. liangheensis* sp. n., *T. linaoshanica* sp. n., *T. longzhouensis* sp. n., *T. maoershanensis* sp. n., *T. pingjiangensis* sp. n., *T. ruiliensis* sp. n., *T. wandingensis* sp. n., *T. wangtongensis* sp. n., and *T. xichouensis* sp. n.

Tetraserica yaoanica sp. n.

<http://zoobank.org/BF444964-991A-4682-A924-E4761954EE1E>

Type material examined. Holotype: ♂ [China] “Yaoan, Lianxian County, Guangdong, 28.VI.1965, leg. Zhang Youwei” (IZAS). Paratypes: **China.** 1 ♂ “Qiliqiao, Chong’anxingcun, Fujian, 12,13.VII.1963, 840m, leg. Zhang Youwei” (ZFMK), 1 ♂ “Mt. Jiulianshan, Longnan, Jiangxi, 8.VI.1975, light trap, leg. Zhang Youwei” (IZAS), 1 ♀ “Daqiu Forestry Farm, Mt. Jiulianshan, Longnan, Jiangxi, 11.VI.1975, light trap, leg. Zhang Youwei” (IZAS), 1 ♂ “Mt. Jiulianshan, Longnan, Jiangxi, 8.VI.1975, light trap, leg. Zhang Youwei” (IZAS), 1 ♂ “Changguling Forestry Farm, Mts. Jinggangshan, Jiangxi, 4.VII.1975, light trap” (IZAS), 1 ♂ “Xinzuochang, Boluo, Guangdong, 3.VI.1965, leg. Zhang Youwei” (IZAS), 1 ♂ “Dong’an, Hunan, 20.V.(19)54” (IZAS), 1 ♂ “Guangxi, Shangsi Shiwandashan 2011-VII-7, 263m” (IZAS). **Vietnam.** 3 ♂♂ “Vietnam-N (Na Hang) 160km from Ha Noi, NE env. of Na Hang, 3.–14.6.1996 150-200m leg. A. Napolov & I. Roma” (CNAR, ZFMK), 1 ♂ “S. Vietnam (Cat Tien) 120 km NNE Ho Chi Minh, Cat Tien Nat. Park 30.5.-15.6.1995 leg. A. Napolov” (CNAR).

Description. Body length: 7.2 mm, length of elytra: 5.4 mm, width: 4.3 mm. Body reddish brown. Labroclypeus surface with a few erect setae. Disc of frons with a few single setae. Smooth area in front of eye approximately 4 times as wide as long. Eyes large; ratio of diameter/interocular width: 0.86. Antennal club 1.3 times as long as remaining antennomeres combined.

Ratio of length of metepisternum/metacoxa: 1/1.68. Metafemur with a serrated continuous line beside anterior margin, with fine sparse punctures behind line each bearing a short seta.

Metatibia moderately long, ratio width/length: 1/3.82; basal group of dorsal spines of metatibia behind middle; beside dorsal margin in basal half with a blunt carina being partly finely serrate.

Aedeagus. Fig. 10I–K. Habitus: Fig. 10L.

Female unknown.

Variation. Body length: 6.6–7.9 mm, length of elytra: 4.9–6.0 mm, width: 4.1–4.6 mm. Female has small eyes (ratio of diameter/interocular width: 0.51) and the antennal club composed of 3 antennomeres being as long as the remaining antennomeres combined.

Diagnosis. *Tetraserica yaoanica* sp. n. is very similar to *T. leishanica* external and in the shape of male genitalia. It differs by the shape of parameres only: basal lobe of the left paramere is short (basal lobe in *T. leishanica* is long); basal lobe of the right paramere is wide and more than half as long as the paramere (short in *T. leishanica*).

Etymology. The new species is named after its type locality, Yaoan.

Acknowledgements

We are grateful to L. Bartolozzi (MZUF), J. Hájek (NMPC), M. Hartmann (NME), A. Napolov (Riga), P. Pacholátko (Brno), B. Rattcliffe (USNM), Guo-Dong Ren (HBUM), G.A. Samuelson (BPBM), H. Schillhammer (NHMW), and Xin-Li Wang (CAU), for their kindly loaning to us unidentified specimens, to J. Frisch and M. Uhlig (both ZMHB) for help with the type specimen loans of the ZMHB, to M. Nikodým (Prague) and A. Weigel (Wernburg) for the donation of a part of their Asian Sericini collections. We thank furthermore the Alexander Koenig Gesellschaft (Bonn) for funding in part the technical work of this study. Part of this research was supported by the National Basic Research Program of China (973 Program) (No. 2011CB302102), the National Natural Science Foundation of China (Nos. 51305057), the National Science Fund for Fostering Talents in Basic Research (Special Subjects in Animal Taxonomy, NSFC-J0630964/J0109, J1210002), and by a Humboldt Fellowship (M.B.) from Alexander von Humboldt Foundation. D.A. was in main part of the taxonomic revisions for this work supported by grants from the German Science foundation (GRK 5 503/2, AH175/1-1).

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