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Research article

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Updates on the *Neoserica vulpes* group (Coleoptera, Scarabaeidae, Melolonthinae, Sericini): new species and records

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Abstract. Here, I describe four new species of the *Neoserica vulpes* species group: *Neoserica daxue* sp. nov., *N. mianningana* sp. nov., *N. myanmarensis* sp. nov., and *N. yanyuan* sp. nov. Genitalia and habitus of the new species are illustrated. Additional records of species from the group are given and the key to species of the *Neoserica vulpes* species group is updated.

Keywords. Beetles, chafers, *Neoserica*, China, Myanmar, new species.

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Introduction

The genus *Neoserica* Brenske, 1894 was recently revised in a series of publications in which many new taxa were established for the fauna of China and adjacent areas (Ahrens *et al.* 2014a, 2014b, 2014c; Liu *et al.* 2014a, 2014b, 2014c, 2015a, 2016, 2019; Bohacz & Ahrens 2020; Ahrens 2021, 2022; Ahrens & Pham 2021; Ahrens & Lukic 2022). *Neoserica* (sensu lato) comprises a polyphyletic mix of larger species with multilamellate antenna (Ahrens 2003, 2004; Liu *et al.* 2015b; Ahrens & Fabrizi 2016; Eberle *et al.* 2017). As previously mentioned, they need a revision of their generic systematics and nomenclature, but this is only possible when their taxonomy, morphology, and phylogeny are better understood. The treatment of species of uncertain systematic assignment remains particularly complicated as the relationships to other groups of species remain obscure and would benefit from future investigations, especially once the neighbouring faunas of Asia are better known. In the current paper we describe four further new species of the *Neoserica vulpes* group (Ahrens *et al.* 2014c) that were received from diverse collectors and institutions.

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 ‘/’. Descriptions and illustrations of new taxa are based on the holotype or lectotype specimen if not otherwise stated, while the variation of specimens is given separately under ‘variation’. Male genitalia were glued to a small, pointed card and

photographed in both lateral and dorsal view using a Leica M125 with a Leica DC420C digital camera. In the Automontage software as implemented in Leica Application Suite (ver. 3.3.0) single focused images were combined to an entirely focused image. The resulting images were subsequently digitally edited.

Abbreviations used in the text for collection depositories are as follows:

CP = collection P. Pacholátko, Brno, Czech Republic
ZFMK = Zoologisches Forschungsmuseum A. Koenig, Bonn, Germany

Results

Description of new species

Class Insecta Linnaeus, 1758
Subclass Pterygota Lang, 1888
Superfamily Scarabaeoidea Latreille, 1802
Family Scarabaeidae Latreille, 1802
Subfamily Melolonthinae Leach, 1819
Tribe Sericini Kirby, 1837
Genus *Neoserica* Brenske, 1894

Neoserica mianningana sp. nov.

urn:lsid:zoobank.org:act:999264AD-0FAB-473B-9D75-2EB977E3ED9D

Fig. 1A–E

Diagnosis

Neoserica mianningana sp. nov. differs from *N. nykli* Ahrens, Liu & Fabrizi 2014 by the shape of the ventral phallobasal process, which is well curved and has a less pronounced ventral distal tooth (compared to that of *N. nykli*) as well as by the shape of both parameres which are longer and more strongly curved.

Etymology

The new species is named (name: adjective in the nominative case singular) for its occurrence close to the city of Mianning, China.

Type material examined

Holotype

CHINA • ♂; “China, Daxue Shan Mts., Sichuan, 40 km W Mianning, 7-8.vi.1999, 2750m, 28°34’N, 102°00’E, V. Siniaev & A. Plutenko lgt. / 1152 Sericini: Asia spec.”; CP.

Paratype

CHINA • 1 ♂; “China, Daxue Shan Mts., Sichuan, 40 km W Mianning, 7-8.vi.1999, 2750m, 28°34’N, 102°00’E, V. Siniaev & A. Plutenko lgt.”; ZFMK.

Description

MEASUREMENTS. Length: 8.8 mm, length of elytra: 6.2 mm, width: 4.6 mm.

HABITUS AND COLORATION (Fig. 1E). Body oblong, reddish brown, ventral surface and antenna yellow, dorsal surface dull and almost glabrous.

HEAD. Labroclypeus subtrapezoidal, widest at base, lateral margins weakly convex and convergent to moderately rounded anterior angles, lateral border and ocular canthus producing a distinct, blunt angle, margins weakly reflexed, anterior margin distinctly sinuate medially; surface flat and shiny, finely and densely punctate, with a few long, erect setae in coarser punctures; frontoclypeal suture feebly incised and medially curved; smooth area in front of eye approximately 1.5 times as wide as long; ocular canthus moderately long and slender, very finely and sparsely punctate, with a fine terminal seta. Frons dull, with fine and moderately dense punctures and with a few long setae beside eyes and behind frontoclypeal suture. Eyes small, ratio of diameter / interocular width: 0.55. Antenna with ten antennomeres; club with four antennomeres, nearly 1.2 times as long as remaining antennomeres combined. Mentum convexly elevated anteriorly.

PRONOTUM. Short and wide, widest shortly before base, lateral margins evenly curved and narrowed anteriorly and posteriorly, anterior angles moderately produced and blunt, posterior angles blunt and slightly rounded at tip; anterior margin convexly produced medially, broad marginal line widely missing; basal margin without marginal line; surface with moderately dense and fine punctures, with minute setae, otherwise glabrous; anterior and lateral borders sparsely setose; hypomeron distinctly carinate at base. Scutellum narrow and long, sharp at apex, with fine and moderately dense punctures and minute setae.

ELYTRA. Oblong, widest in posterior third, striae finely impressed, finely and densely punctate, intervals flat, finely and sparsely punctate, on odd intervals with a few long erect setae, otherwise with minute setae; epipleural edge robust, ending at strongly curved external apical angle of elytra, epipleura densely setose, apical border membranous, with short microtrichomes.

VENTRAL SURFACE. Dull, with large and dense punctures, sparsely and shortly setose, setae partly adpressed; metacoxa glabrous, with fine setae laterally, apical margin convex and external apical angle rounded; each abdominal sternite with a distinct transversal row of coarse punctures each bearing a short seta between fine and moderately dense punctation. Mesosternum between mesocoxae nearly half as wide as mesofemur, with irregularly scattered, fine setae. Ratio of length of metepisternum / metacoxa: 1 / 1.5. Pygidium strongly convex, finely and densely punctate, without smooth midline, with short setae along apical margin.

LEGS. Slender; femora with two longitudinal rows of setae, finely and moderately densely punctate; metafemur ventrally dull, anterior margin sharply carinate, without a submarginal serrated line, posterior margin moderately convex, with a few strong setae medially, only weakly widened externally in apical half and not serrated ventrally in distal half, finely serrated dorsally, with dense, short setae. Metatibia slender and long, widest at apex, ratio width / length: 1 / 3.6, dorsal margin sharply carinate, with two groups of spines, basal group shortly before middle, apical one at about three quarters of metatibial length, basally with a few single, fine spines; external face longitudinally convex, with coarse, sparse punctures, glabrous; ventral margin finely serrated, with four fine, equidistant spines; medial face impunctate, apex concavely truncate anteriorly near tarsal articulation. Tarsomeres dorsally impunctate, with sparse, short setae ventrally; metatarsomeres glabrous dorsally, with a strongly serrated ridge ventrally, and with a fine longitudinal carina immediately beside it; first metatarsomere little longer than following two tarsomeres combined and distinctly longer than dorsal tibial spur. Protibia long, bidentate, protarsal claws symmetrical, basal tooth of inner protarsal claw bluntly truncate apically.

AEDEAGUS. Fig. 1A–D.

Variation

Length: 8.8–9.1 mm, length of elytra: 6.2–6.4 mm, width: 4.6–4.8 mm.

Female
Unknown.

Neoserica myanmarensis sp. nov.
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Fig. 1F–I

Diagnosis

Neoserica myanmarensis sp. nov. differs from *N. baoshana* Ahrens, Liu & Fabrizi, 2014 by the shape of the ventral phallobasal process: its distal hook is shorter and only weakly bent towards the right side (dorsal view).

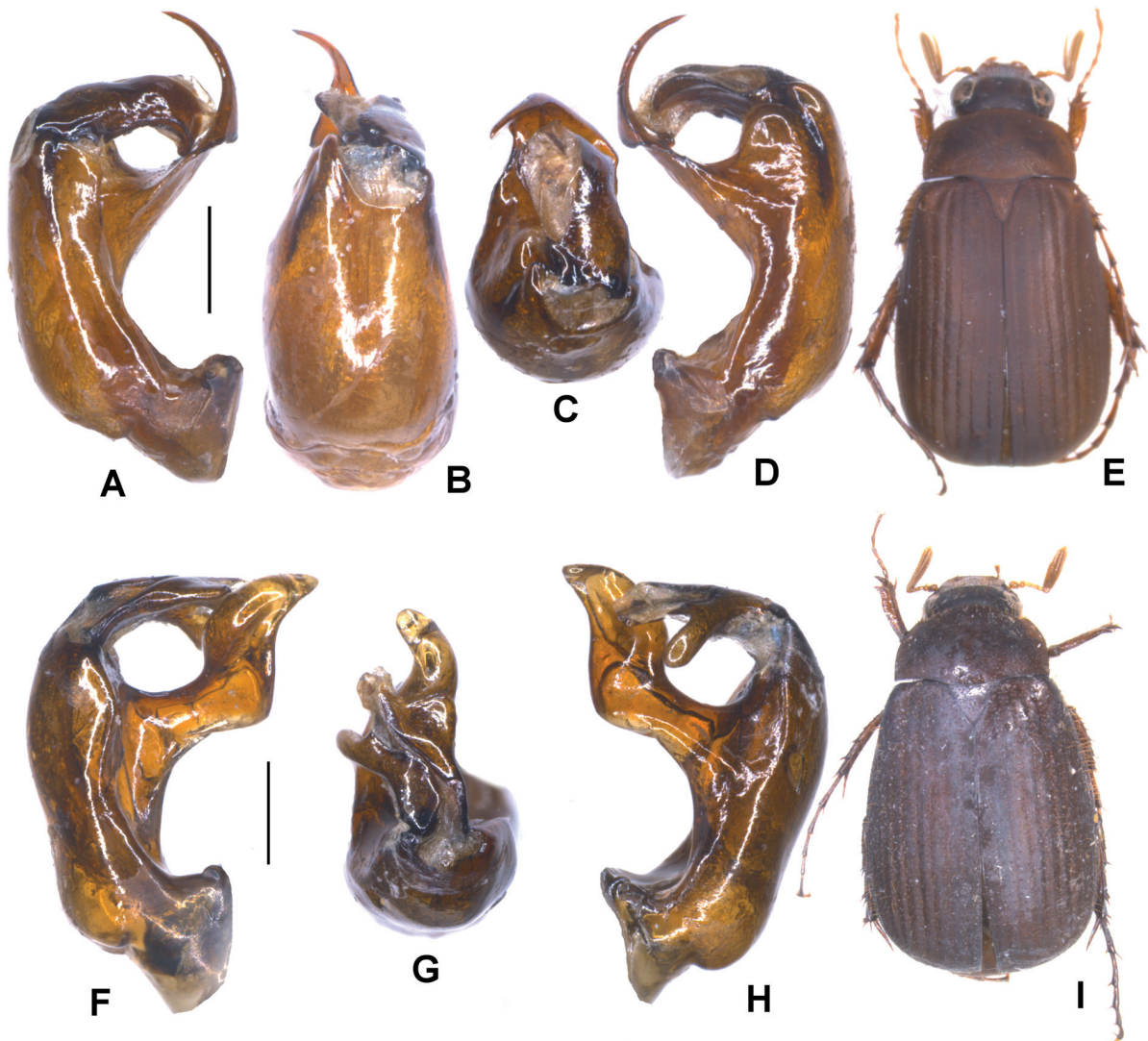


Fig. 1. A–E. *Neoserica mianningana* sp. nov., holotype, ♂ (CP). F–I. *N. myanmarensis* sp. nov., holotype, ♂ (ZFMK). A, F. Aedeagus, left side lateral view. B. Distal phallobase, dorsal view. C, G. Parameres, dorsal view. D, H. Aedeagus, right side lateral view. E, I. Habitus (not to scale). Scale bars = 0.5 mm.

Etymology

The new species is named (name: adjective in the nominative case singular) for its occurrence in Myanmar.

Type material examined

Holotype

MYANMAR • ♂; “Myanmar: Danasho 2800 m, Minshia vi-2004 leg. Yin et al. / Phil #11-2004:4. / 1137 Sericini: Asia spec.”; ZFMK.

Paratypes

CHINA • 1 ♂; “X-DA6902/ X-DA6902 China Yunnan NE Kunming 25°08’35”N, 102°53’49”E 2320m leg. M. Schülke & V. Assing (CH14-6) 13.08.2021 *Neoserica* spTigerThai215”; ZFMK • 1 ♂; “X-DA6905/ X-DA6905 China Yunnan mountain WNW Wuding 25°38’45”N, 102°06’55”E 2390m leg. M. Schülke & V. Assing (CH14-12a) 01.09.2014 *Neoserica* spTigerThai215”; ZFMK.

Description

MEASUREMENTS. Length: 8.5 mm, length of elytra: 6.2 mm, width: 5.0 mm.

HABITUS AND COLORATION (Fig. 1I). Body oblong, dark brown, ventral surface and antenna yellow, dorsal surface dull and with numerous shorter and long, erect setae.

HEAD. Labroclypeus subtrapezoidal, widest at base, lateral margins weakly convex and convergent to moderately rounded anterior angles, lateral border and ocular canthus producing a blunt angle, margins weakly reflexed, anterior margin distinctly sinuate medially; surface convex and moderately shiny, finely and densely, irregularly punctate, with numerous long erect setae in coarser punctures; frontoclypeal suture feebly incised and medially curved; smooth area in front of eye approximately 1.5 times as wide as long; ocular canthus moderately long and slender, very finely and sparsely punctate, with a fine terminal seta. Frons dull, with fine and moderately dense punctures and with long, erect setae. Eyes small, ratio of diameter/ interocular width: 0.55. Antenna with ten antennomeres; club with four antennomeres, nearly 1.2 times as long as remaining antennomeres combined. Mentum convexly elevated anteriorly.

PRONOTUM. Moderately wide, widest at base, lateral margins in basal half subparallel and almost straight, in anterior half evenly curved and narrowed anteriorly, anterior angles distinctly produced and sharp, posterior angles blunt and slightly rounded at tip; anterior margin convexly produced medially, broad marginal line widely missing; basal margin without marginal line; surface with moderately dense and fine punctures, with minute setae and dense, long, erect setae; anterior and lateral borders sparsely setose; hypomeron distinctly carinate at base. Scutellum narrow and long, sharp at apex, with fine and moderately dense punctures and minute setae, a few longer ones.

ELYTRA. Oblong, widest in posterior third, striae distinctly impressed, finely and densely punctate, intervals weakly convex and not densely punctate, with small and larger punctures, with numerous fine adpressed and long erect setae, small punctures with minute setae; epipleural edge robust, ending at strongly curved external apical angle of elytra, epipleura densely setose, apical border membranous, with short microtrichomes.

VENTRAL SURFACE. Dull, with large and dense punctures, sparsely and shortly setose, setae partly adpressed; metacoxa glabrous, with fine setae laterally, apical margin convex and external apical angle rounded; each abdominal sternite with a distinct transversal row of coarse punctures each bearing a short seta between fine and moderately dense punctation. Mesosternum between mesocoxae nearly half as wide as mesofemur, with irregularly scattered, fine setae. Ratio of length of metepisternum/ metacoxa:

1/1.5. Pygidium strongly convex, finely and densely punctate, with narrow smooth midline, with moderately dense, long setae on apical half.

LEGS. Slender; femora with two longitudinal rows of setae, finely and moderately densely punctate; metafemur ventrally dull, anterior margin sharply carinate, without a submarginal serrated line, posterior margin moderately convex, with a few strong setae medially, only weakly widened externally in apical half and not serrated ventrally in distal half, finely serrated dorsally, with dense, short setae. Metatibia slender and long, widest at apex, ratio width/length: 1/3.9, dorsal margin sharply carinate, with two groups of spines, basal group of spines at half of metatibial length, apical one at about three quarters of metatibial length, basally with a few single, fine spines; external face longitudinally convex, with fine, sparse punctures, sparsely minutely setose; ventral margin finely serrated, with four fine, equidistant spines; medial face impunctate, apex concavely truncate interiorly near tarsal articulation. Tarsomeres dorsally impunctate, with sparse, short setae ventrally; metatarsomeres glabrous dorsally, with a strongly serrated ridge ventrally, and with a fine longitudinal carina immediately beside it; first metatarsomere little longer than following two tarsomeres combined and distinctly longer than dorsal tibial spur. Protibia long, bidentate, protarsal claws symmetrical, basal tooth of inner protarsal claw bluntly truncate apically.

AEDEAGUS. Fig. 1F–H.

Variation

Length: 8.4–8.6 mm, length of elytra: 6.1–6.2 mm, width: 4.9–5.0 mm.

Female

Unknown.

Neoserica daxue sp. nov.

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Fig. 2A–E

Diagnosis

Neoserica daxue sp. nov. differs from *N. xiaguanensis* Ahrens, Liu & Fabrizi, 2014 by the shape of the ventral phallobasal process, which is much wider, by the dorsal phallobasal process (dorsal view), which is not widened at apex, as well as by the shape of both parameres being slightly more robust but similar in shape.

Etymology

The new species is named (name: noun in apposition) for its occurrence in the Daxue Shan, China.

Type material examined

Holotype

CHINA • ♂; “China, Daxue Shan Mts., Sichuan, Mianning, 1850 m, 6.vi.1999, 28°33’N, 102°10’E, V. Siniaev & A. Plutenko lgt. / 1153 Sericini: Asia spec.”; CP.

Description

MEASUREMENTS. Length: 8.4 mm, length of elytra: 5.6 mm, width: 4.6 mm.

HABITUS AND COLORATION (Fig. 2E). Body oblong, reddish brown, ventral surface and antenna yellow, dorsal surface dull and almost glabrous.

HEAD. Labroclypeus subtrapezoidal, widest at base, lateral margins weakly convex and convergent to moderately rounded anterior angles, lateral border and ocular canthus producing a distinct, blunt angle, margins weakly reflexed, anterior margin distinctly sinuate medially; surface flat and shiny, coarsely and densely punctate, with a few long, erect setae; frontoclypeal suture feebly incised and medially curved; smooth area in front of eye approximately 1.2 times as wide as long; ocular canthus moderately long and slender, very finely and sparsely punctate, with a fine terminal seta. Frons dull, with fine and moderately dense punctures and with a few long setae beside eyes and behind frontoclypeal suture. Eyes moderately large, ratio of diameter/interocular width: 0.65. Antenna with ten antennomeres; club with four antennomeres, nearly 1.3 times as long as remaining antennomeres combined. Mentum convexly elevated anteriorly.

PRONOTUM. Moderately wide, widest shortly before base, lateral margins evenly curved and narrowed anteriorly and posteriorly, anterior angles well produced and sharp, posterior angles blunt; anterior margin convexly produced medially, broad marginal line widely missing; basal margin without marginal line; surface with moderately dense and fine punctures, with minute setae, otherwise glabrous; anterior and lateral borders sparsely setose; hypomeron distinctly carinate at base. Scutellum narrow and long, sharp at apex, smooth on basal midline, with minute setae in punctures only.

ELYTRA. Oblong, widest in posterior third, striae distinctly impressed, finely and densely punctate, intervals convex, coarsely and moderately densely punctate, on odd intervals with a few long erect setae, otherwise with minute setae; epipleural edge robust, ending at strongly curved external apical angle of elytra, epipleura densely setose, apical border membranous, with short microtrichomes.

VENTRAL SURFACE. Dull, with large and dense punctures, sparsely and shortly setose, setae partly adpressed; metacoxa glabrous, with fine setae laterally, apical margin convex and external apical angle rounded; each abdominal sternite with a distinct transversal row of coarse punctures each bearing a short seta between fine and moderately dense punctation. Mesosternum between mesocoxae nearly half as wide as mesofemur, with irregularly scattered, fine setae. Ratio of length of metepisternum/metacoxa: 1/1.6. Pygidium moderately convex, finely and densely punctate, without smooth midline, with short setae beside apical margin.

LEGS. Slender; femora with two longitudinal rows of setae, finely and moderately densely punctate; metafemur ventrally dull, anterior margin sharply carinate, without a submarginal serrated line, posterior margin moderately convex, with a few strong setae medially, only weakly widened externally in apical half and not serrated ventrally in distal half, finely serrated dorsally, with dense, short setae. Metatibia slender and moderately long, widest at apex, ratio width/length: 1/3.1, dorsal margin sharply carinate, with two groups of spines, basal group shortly before middle, apical one at about three quarters of metatibial length, basally with a few single, fine spines; external face longitudinally convex, with coarse, sparse punctures, glabrous; ventral margin finely serrated, with four fine, equidistant spines; medial face impunctate, apex concavely truncate interiorly near tarsal articulation. Tarsomeres dorsally impunctate, with sparse, short setae ventrally; metatarsomeres glabrous dorsally, with a strongly serrated ridge ventrally, and with a fine longitudinal carina immediately beside it; first metatarsomere little longer than following two tarsomeres combined and distinctly longer than dorsal tibial spur. Protibia long, bidentate, protarsal claws symmetrical, basal tooth of inner protarsal claw bluntly truncate apically.

AEDEAGUS. Fig. 2A–D.

Female

Unknown.

Neoserica yanyuan sp. nov.

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Fig. 2F–I

Diagnosis

Neoserica yanyuan sp. nov. is in external and genital shape very similar to *N. rubellula* Ahrens, Liu & Fabrizi, 2014. *Neoserica yanyuan* differs from *N. rubellula* by the shape of the ventral phallobasal process, which has a slightly more extended apical convexity and being more sharply pointed, as well as by the shape of both parameres: the right paramere has a shorter basal piece, with the lateral branch being longer and more curved; the left paramere is more strongly curved (lateral view).

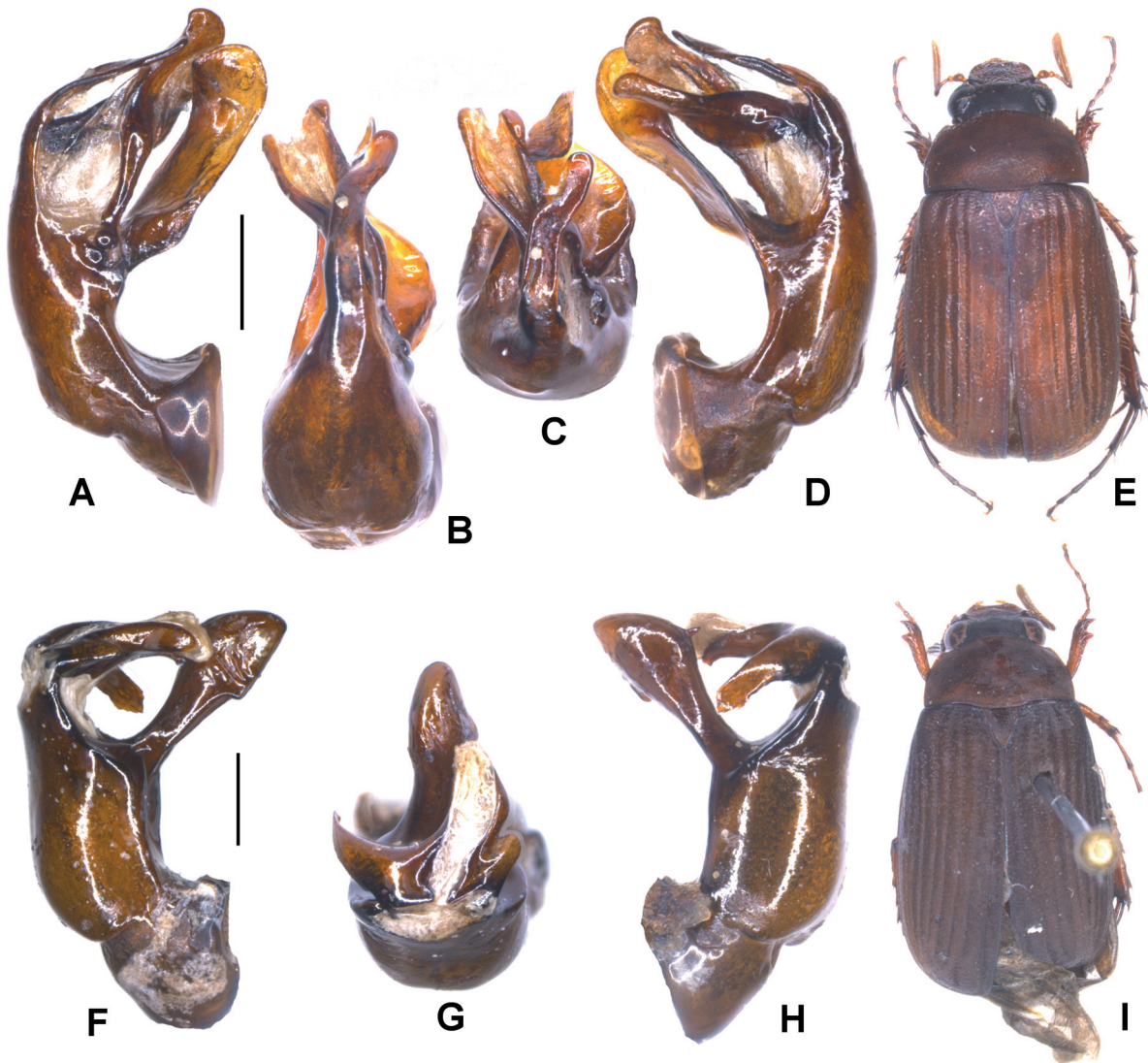


Fig. 2. A–E. *Neoserica daxue* sp. nov., holotype, ♂ (CP). F–I. *N. yanyuan* sp. nov., holotype, ♂ (ZFMK). A, F. Aedeagus, left side lateral view. B. Distal phallobase, dorsal view. C, G. Parameres, dorsal view. D, H. Aedeagus, right side lateral view. E, I. Habitus (not to scale). Scale bars = 0.5 mm.

Etymology

The new species is named (name: noun in apposition) after its type locality, Yanyuan, China.

Type material examined

Holotype

CHINA • ♂; “China S Sichuan 2017 S of Yanyuan, Cguandongzi Massiv, ca. 27:21:04-34 / 101:30:25-33, 3200m 8-19.6. leg. C. Reuter/ 1155 Sericini: Asia spec.”; ZFMK.

Description

MEASUREMENTS. Length: 9.2 mm, length of elytra: 7.1 mm, width: 5.2 mm.

HABITUS AND COLORATION (Fig. 2I). Body oblong, reddish brown, ventral surface light reddish brown, antenna yellow, dorsal surface dull and glabrous.

HEAD. Labroclypeus subtrapezoidal, widest at base, lateral margins weakly convex and convergent to moderately rounded anterior angles, lateral border and ocular canthus producing a distinct, blunt angle, margins weakly reflexed, anterior margin moderately sinuate medially; surface convex and moderately shiny, coarsely and densely punctate, with a few long setae; frontoclypeal suture feebly incised and medially bluntly angled; smooth area in front of eye approximately 1.5 times as wide as long; ocular canthus moderately long and slender, very finely and sparsely punctate, terminal seta absent. Frons dull, with fine and sparse punctures, glabrous. Eyes large, ratio of diameter/interocular width: 0.8. Antenna with ten antennomeres; club with four antennomeres, nearly 1.3 times as long as remaining antennomeres combined. Mentum convexly elevated anteriorly.

PRONOTUM. Moderately wide, widest at base, lateral margins evenly curved and narrowed anteriorly, anterior angles well produced and sharp, posterior angles blunt; anterior margin convexly produced medially, broad marginal line widely missing; basal margin without marginal line; surface with moderately dense and fine punctures, with minute setae, otherwise glabrous; anterior and lateral borders sparsely setose; hypomeron distinctly carinate at base. Scutellum narrow and long, sharp at apex, punctures sparse on basal midline, with minute setae in punctures only.

ELYTRA. Oblong, widest in posterior third, striae finely impressed, finely and densely punctate, intervals weakly convex, finely and moderately densely punctate, on odd intervals with a few short adpressed setae, otherwise with minute setae; epipleural edge robust, ending at strongly curved external apical angle of elytra, epipleura densely setose, apical border membranous, with short microtrichomes.

VENTRAL SURFACE. Dull, with large and dense punctures, sparsely and shortly setose, setae partly adpressed; metacoxa glabrous, with fine setae laterally, apical margin convex and external apical angle rounded; each abdominal sternite with a distinct transversal row of coarse punctures each bearing a short seta between fine and moderately dense punctation. Mesosternum between mesocoxae nearly half as wide as mesofemur, with irregularly scattered, fine setae. Ratio of length of metepisternum/metacoxa: 1/1.33. Pygidium moderately convex, finely and densely punctate, without smooth midline, with short and sparse setae on apical half.

LEGS. Slender; femora with two longitudinal rows of setae, finely and moderately densely punctate; metafemur ventrally dull, anterior margin sharply carinate, without a submarginal serrated line, posterior margin moderately convex, with a few strong setae medially, only weakly widened externally in apical half and not serrated ventrally in distal half, finely serrated dorsally, with dense, short setae. Metatibia slender and long, widest at apex, ratio width/length: 1/4.1, dorsal margin sharply carinate, with two groups of spines, basal group shortly before middle, apical one at about four fifths of metatibial length,

between them with another or two robust spines, basally with a few single, fine spines; external face longitudinally convex, with coarse, sparse punctures, glabrous; ventral margin finely serrated, with four fine, equidistant spines; medial face impunctate, apex concavely truncate interiorly near tarsal articulation. Tarsomeres dorsally impunctate, with sparse, short setae ventrally; metatarsomeres glabrous dorsally, with a strongly serrated ridge ventrally, and with a fine longitudinal carina immediately beside it; first metatarsomere little longer than following two tarsomeres combined and distinctly longer than dorsal tibial spur. Protibia long, bidentate, protarsal claws symmetrical, basal tooth of inner protarsal claw bluntly truncate apically.

AEDEAGUS. Fig. 2F–H.

Female

Unknown.

Further records of species of the *Neoserica vulpes* group

Neoserica biuncinata Ahrens, Liu & Fabrizi, 2014

Additional material examined

CHINA • 1 ♂; “China, S. Sichuan, Kiangshan Mts., S. Xichang h=3000m, 1.vii.2002 leg. S. Murzin, I. Shokhin”; CP.

Neoserica nykli Ahrens, Liu & Fabrizi, 2014

Additional material examined

CHINA • 1 ♂; “China, Yunnan 1993 50 km N Lijiang, 24.-29.6. Yulongshan Nat. Res. Leg. E. Jendek & O. Sausa”; CP.

Updated key to species of *Neoserica vulpes* group (males)

1. Phallobase with a ventral process 4
– Phallobase without a ventral process, but with a lateral one 2
2. Right paramere large and spherical, longitudinal extension half of phallobasal length
..... *N. baishuiensis* Ahrens, Liu & Fabrizi, 2014
– Right paramere small, spherical, longitudinal extension one third of phallobasal length 3
3. Lateral process sharply pointed (dorsal view) *N. lateriuncinata* Ahrens, Liu & Fabrizi, 2014
– Lateral process convexly rounded at apex (dorsal view)
..... *N. leiboensis* Ahrens, Liu & Fabrizi, 2014
4. Phallobase with a dorsal process 5
– Phallobase without a dorsal process 6
5. Ventral phallobasal process narrow. Dorsal phallobasal lobe widened at apex. Both parameres slender *N. xiaguanensis* Ahrens, Liu & Fabrizi, 2014
– Ventral phallobasal process much wider. Dorsal phallobasal lobe not widened at apex. Both parameres more robust *N. daxue* sp. nov.
6. Ventral process of phallobase at apex widened, with sharp hooks or bent processes 7
– Ventral process of phallobase at apex convexly rounded or pointed 18

7. Ventral process of phallobase at apex convexly widened, without sharp hooks	
.....	<i>N. luzhouana</i> Ahrens, Liu & Fabrizi, 2014
– Ventral process of phallobase at apex with sharp hooks or bent processes	8
8. Right paramere deeply bifurcate. Hooks small	9
– Right paramere simple, not bifurcate. Hooks large	11
9. Ventral process in cross section circular	10
– Ventral process dorsoventrally flattened	<i>N. parausta</i> Ahrens, Liu & Fabrizi, 2014
10. Ventral phallobasal process with less extended apical convexity and more less pointed. Right paramere with longer basal piece, its lateral branch is short and straight; left paramere straight (lateral view)	<i>N. rubellula</i> Ahrens, Liu & Fabrizi, 2014
– Ventral phallobasal process with a slightly more extended apical convexity and more sharply pointed. Right paramere with shorter basal piece, its lateral branch is longer and more curved; left paramere strongly curved (lateral view)	<i>N. yanyuan</i> sp. nov.
11. Left paramere at apex strongly curved ventrally	12
– Left paramere at apex straight	<i>N. biuncinata</i> Ahrens, Liu & Fabrizi, 2014
12. Eyes smaller, ratio diameter/interocular with: 0.58. Ventral process of phallobase exceeding parameres	<i>N. usta</i> Ahrens, Liu & Fabrizi, 2014
– Eyes moderate to large, ratio diameter/interocular with > 0.7	13
13. Ventral process of phallobase exceeding parameres	14
– Ventral process of phallobase ending distally at same point as parameres	15
14. Ventral phallobasal process straight (lateral view), its ventral distal tooth well pronounced. Parameres shorter and less strongly curved	<i>N. nykli</i> Ahrens, Liu & Fabrizi, 2014
– Ventral phallobasal process well curved and its ventral distal tooth little pronounced. Parameres longer and more strongly curved	<i>N. mianningana</i> sp. nov.
15. Ventral process of phallobase basally very enlarged and strongly dorsoventrally produced on right side, its width at base subequal to half of phallobase length	16
– Ventral process of phallobase basally only weakly enlarged and not dorsoventrally produced on right side, its width at base subequal to less than third of phallobase length	17
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Discussion

This is the third contribution on the knowledge of the species of the *Neoserica vulpes* group, and it shows that the extensive and comprehensive revisionary works done so far are still far from being conclusive, which makes updates with descriptions of individual species technically and scientifically necessary. We expect further new discoveries with more rigorous light trapping programs all over Asia, although that is technically not always easy for logistical reasons. This study once more reveals a large amount of endemism in Asian Sericini and demonstrates that night active chafers are still rather poorly represented in material from occasional, non-targeted field surveys.

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