

## New apterous cantharids from China (Insecta: Coleoptera: Cantharidae)

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### Abstract

In the present paper, the following new species are described and illustrated: *Lycocerus dongola* Kopetz & Kazantsev sp. nov. (China, Tibet), *Lycocerus lhazeensis* Kopetz & Kazantsev sp. nov. (China, Tibet), *Lycocerus lapidarius* Kopetz & Kazantsev sp. nov. (China, Tibet), *Lycocerus schmidti* Kopetz & Kazantsev sp. nov. (China, Tibet), *Lycocerus alticola* Kopetz & Kazantsev sp. nov. (China, Tibet), *Themus (Haplothemus) dashankouensis* Kazantsev & Kopetz sp. nov. (China, Yunnan), *Themus (Haplothemus) hezuoensis* Kazantsev & Kopetz sp. nov. (China, Gansu) and *Silis wrasei* Kazantsev & Kopetz sp. nov. (China, Nei Mongol). Additionally, illustrations and distributional data for some already described apterous *Lycocerus* species are given, as well as a key to all previously known *Lycocerus* species with shortened elytra.

### Zusammenfassung

In der vorliegenden Arbeit werden folgende neue Arten beschrieben und dargestellt: *Lycocerus dongola* Kopetz & Kazantsev sp. nov. (China, Tibet), *Lycocerus lhazeensis* Kopetz & Kazantsev sp. nov. (China, Tibet), *Lycocerus lapidarius* Kopetz & Kazantsev sp. nov. (China, Tibet), *Lycocerus schmidti* Kopetz & Kazantsev sp. nov. (China, Tibet), *Lycocerus alticola* Kopetz & Kazantsev sp. nov. (China, Tibet), *Themus (Haplothemus) dashankouensis* Kazantsev & Kopetz sp. nov. (China, Yunnan), *Themus (Haplothemus) hezuoensis* Kazantsev & Kopetz sp. nov. (China, Gansu) und *Silis wrasei* Kazantsev & Kopetz sp. nov. (China, Nei Mongol). Zusätzlich werden Abbildungen und Verbreitungsdaten für andere, bereits bekannte *Lycocerus*-Art mit verkürzten Flügeldecken gegeben, sowie ein Bestimmungsschlüssel für alle bisher bekannten *Lycocerus*-Arten mit verkürzten Flügeldecken.

**Key words:** *Themus*, *Haplothemus*, *Lycocerus*, *Silis*, apterous, Palaearctic region, taxonomy, new species, faunistics, alpine fauna

### Introduction

The reduction of wings and shortening of elytra, mainly as an adaptation to life at high altitudes, is quite rare, but nevertheless widespread, in the family Cantharidae, and occurs, for example, in the genera *Podistra*, *Rhagonycha*, *Lycocerus*, *Themus* and *Silis* (e. g., KAZANTSEV 1992, 1994; 1998a; 1998b; OKUSHIMA 2005; KOPETZ 2004, 2008, 2010, 2016).

During the study of Central Asian Cantharidae material from various collections by the authors, more specimens with shortened elytra were found, some of which could not be assigned to any of the previously known species. The present work describes new species in the genera *Lycocerus* Gorham, 1889, *Themus* Motschulsky, 1858 and *Silis* Charpentier, 1825.

### Material and Methods

Types and other material used for the studies are from the following collections:

- BMNH: Natural History Museum (British Museum of Natural History), London/Great Britain (M. V. L. Barclay, M. F. Geiser)
- ICM: Insect Center Moscow/Russia (S. V. Kazantsev)
- KURA: Kurashiki Museum of Natural History, Chûô/Japan (Y. Okushima)
- NME: Naturkundemuseum Erfurt/Deutschland (M. Hartmann)
- NMP: National Museum, Praha/Czech Republic (J. Hájek)
- cKo: collection A. Kopetz, Amt Wachsenburg/Deutschland
- cWr: collection D. Wrase, Gusow-Platkow/Deutschland

Research methods. The material was examined under a stereomicroscope Optech FZ-FZT with 20–90x magnification. The habitus photos were taken with the aid of a Leica DF 450 digital camera on a Leica Z6 APO A



**Map 1.** Distribution of the *Lycocerus*-species with shortened elytra.

microscope and the Combine ZM program and finally processed with Adobe Photoshop 7.0. An XL 30 ESEM (Phyletic Museum Jena) was available for electron micrographs. In species where there was very little material, the sputtering was omitted in order not to change the objects. The images were taken using ISM-6510LV in a low vacuum with a backscattered electron beam (Senckenberg Museum für Naturkunde Görlitz).

**Measurement methods.** Body length was measured from the anterior margin of the clypeus to the tip of the longer elytron. In species with shortened elytra, the length was additionally measured from the clypeus to the tip of abdomen (and given in brackets). However, this measurement, due to the elasticity of abdominal segments, is rather inaccurate and variable. Body width was measured across the humeral part of elytra. Length of pronotum was measured in the middle, its width at the widest point. Width of head was measured at the level of eyes.

**Label text.** The information on the labels is cited verbatim. The information on a label is in quotation marks („...”), a single slash (/) separates characters in different lines on the same label. Comments by the authors are enclosed in square brackets [ ].

**Morphological nomenclature.** The colour designation is based on PAULT (1958).

**Distribution map.** The distribution map was created with MapCreator 3.0 Free Edition and contains all the known localities of the species.

### Taxonomy

#### *Lycocerus dongola* Kopetz & Kazantsev sp. nov.

figs. 1, 2, 13, 19, 42–44, 57

**Type locality.** China, Xizang (Tibet) Province, valley SE of Dongo La pass, 4900–5300 m, (28°46'N 87°57'E) (fig. 57).

**Type material. Holotype** (male): „S TIBET 18.VI.2011 / vall. SE of Dongo La pass / 4900–5300m lg. Schmidt/ 28°46'N, 87°57'E”, „HOLOTYPUS / LYCOCERUS / dongola sp. nov. / des. Kopetz & Kazantsev 2019” (NME).

**Paratypes:** same data as holotype, 2 females (NME, ICM); all designated „PARATYPUS / LYCOCERUS / dongola sp. nov. / des. Kopetz & Kazantsev 2019”.

**Description.** Male: Size: Length 4.6 mm (10.7 mm), width 1.8 mm.

**Coloration:** Head, mandibles, two basal antennomeres saffron-yellow to orange; disc with a curved, black, U-shaped spot, extending forward to level of eyes, but not touching them; maxillary palpi, apex of 2nd antennomere and rest of antennae dark; pronotum saffron-yel-

low to orange, with a relatively small dark spot on front of pronotum; scutellum, legs except for slightly darker tarsi, underside as well as last sternites and tergites orange; elytra, as well as anterior sternites and tergites, except for their lighter edges, sepia-brown.

Head: About as long as wide and somewhat narrower than pronotum, surface evenly curved, a longitudinal furrow only slightly pronounced at base, between antennae with a slight longitudinal bulge; eyes moderately prominent, ratio of eye diameter to eye distance approximately 1:2.1; surface of head slightly shining, finely micro-chagrinated, flat and densely punctured on disc, widely punctured in front of midline of eyes; with slightly erect, golden yellow hairs, base of mandibles and densely punctured front edge of clypeus with long yellowish hairs; antennae gradually becoming thinner from relatively strong 3rd antennomere to apex, without any special distinctive marks, reaching approximately to rear coxae, 2nd antennomere shorter than 3rd, 3rd shorter than 4th; length ratio of antennomeres: 20: 10: 13: 15: 17: 18: 16: 16: 15: 15: 19.

Pronotum: About 1.2 times as wide as long, lateral margins equally slightly narrowed forwards and backwards, anterior margin evenly bent forward, posterior margin slightly rounded backward in a wide arc; large and flat pronotum-bumps just behind the middle, touching each other in the middle; surface shining, slightly micro-chagrinated, slightly more densely punctate in hollows, very flat and scattered on bumps, with slightly protruding, yellowish pubescence.

Scutellum: Triangular with straight truncate to slightly rounded apex.

Elytra: Strongly shortened, 2nd tergite only slightly larger, about twice as long as pronotum, together about 1.4 times as long as wide, surface finely wrinkled, dull, pubescence yellowish, slightly erect.

Wings: Very reduced.

Abdomen (fig. 13): Last sternite long, triangular, distally with very short indentation.

Legs: Moderately slender, femur straight, tibia straight to very slightly bent, anterior claw of forelegs with a blunt tooth and anterior claw of middle claws slightly thickened.

Aedeagus (figs. 42–44): Lateral edges of dorsal plate evenly bent, in the middle with deep incision, reaching to base, incision with straight sides, inside dorsal plate, just below the edge, with a rounded ledge; slender, api-

cally pointed laterophyses reaching below this ledge, ventral parameres somewhat hollowed out and slightly twisted, protruding slightly beyond dorsal plate; ventral parameres with angled inclinations.

Female: Size: Length 4.5–5.0 mm (9.5–9.7 mm), width 1.7–1.8 mm. Coloration as in male; antennae slightly shorter, exceeding middle coxae by about one antennomere; last sternite (fig. 19) slightly bent forward in the middle and with a flat, obtuse-angled incision.

**Differential diagnosis.** The new species is very closely related to *Lycocerus lapidarius* sp. nov. The coloration, especially of the antennae, is lighter in *L. lapidarius* sp. nov., but the dark spots on the pronotum are stronger. The sides of the pronotum are slightly concave behind the front angles in *L. lapidarius* sp. nov., while in *L. dongola* sp. nov. they are evenly convex. The two species are also similar in the shape of the aedeagus. The parameres in *L. lapidarius* sp. nov. are slightly more flattened and less strongly angled than in *L. dongola* sp. nov.

The new species differs from *L. terricolus* (Champion), the only species so far known with similarly shortened elytra, by, among other things, the bright colour of the head, pronotum and legs, as well as by the longer parameres.

**Derivatio nominis:** The name ‘dongola’ refers to the locality, the Dongo La Pass, where the species was found. This is located southeast of Sa’gya, a district of the city Xigazê; noun in apposition.

**Distribution.** China: Xizang Province.

***Lycocerus lhazeensis* Kopetz & Kazantsev sp. nov.**  
figs. 3, 14, 45–47, 58

Type locality. China, Xizang (Tibet) Province, Gyatso La pass south of Lhaze, 5200–5300m, (28°57'10"N, 87°26'15"E) (fig. 58).

**Type material. Holotype** (male): „SC TIBET 21.VI.2011 / Gyatso La S Lhaze / 5200–5300m lg. Schmidt / 28°57'10N, 87°26'15E”, „HOLOTYPUS / LYCOCERUS / lhazeensis sp. nov. / des. Kopetz & Kazantsev 2019” (NME).

**Paratype:** same data as holotype, 1 male (cKo); designated „PARATYPUS / LYCOCERUS / lhazeensis sp. nov. / des. Kopetz & Kazantsev 2019”.

**Description.** Male: Size: length 3.2–3.4 mm (7.5 mm), width 1.4 mm.

Coloration: Head with antennae and last part of maxillary palpi mostly sepia to black, only mandibles, first two segments of maxillary palpi, 1st antennomere and underside of head slightly lightened to orange; pronotum and legs monochrome saffron-yellow to orange, except for slightly darker tarsi; pronotum and elytra sepia; underside including first five sternites as well as first six tergites sepia to maroon; last three sternites and tergites saffron-yellow to orange.

Head: About as long as wide and about as broad as pronotum, surface evenly domed, between eyes to antennae almost evenly, a longitudinal furrow is only weakly indicated between eyes; eyes relatively small and slightly protruding, ratio of eye diameter to eye distance approximately 1:2.5; surface of head shining, only slightly micro-chagrinated, flat and moderately dense at base, only very widely punctuated on disc, with short and slightly erect, golden-yellow to chestnut-coloured hairs, base of mandibles and densely punctured front edge of clypeus with long yellowish hairs; antennae filiform, golden-haired and without special features, reaching approximately to rear coxae, 2nd antennomere shorter than 3rd, 3rd about as long as 4th; length ratio of antennomeres: 15: 8: 11: 12: 13: 13: 13: 13: 13: 17.

Pronotum: About 1.1 times as wide as long, lateral margins almost straight and very slightly narrowed towards the back, anterior margin very slightly bent forward and very weakly wavy concave in the middle, posterior margin in flat arch slightly rounded backwards, in the middle very weakly concave; pronotal bumps very flat, just behind the middle, central longitudinal groove also only slightly pronounced; surface shining, slightly micro-chagrinated, very flat with scattered punctures, and oblique erect golden yellow hairs.

Scutellum: Triangular with broadly rounded tip and flat central longitudinal groove.

Elytra: Extremely shortened, slightly exceeding the end of 1st tergite, about 1.3 times as long as the pronotum and about as long as wide, surface finely wrinkled, dull, auburn chestnut, pubescence obliquely erect.

Wings: Very reduced.

Abdomen (fig. 14): Last sternite terminating in a triangular point.

Legs: Moderately slender, femur, front and middle tibia straight, only hind tibia slightly bent, all claws

simple, only front claw of front legs with a very weak thickening.

Aedeagus (figs. 45–47): Margins of dorsal plate roundly narrowed to apex, roundly concave on each side before apical margin, with a narrow incision in the middle reaching to base, inner side of dorsal plate just below concave margin on both sides with a short, rounded ledge; somewhat wider, apically bent laterophyses extend dorsally to this ledge, parameres slightly hollowed out ventrally and flattened, about as long as dorsal plate, parameres slightly inclined apically towards each other. Female: Unknown.

**Differential diagnosis.** The new species is closely related to *Lycocerus dongola* sp. nov. and differs from it by the dark head, the more curved sides of the pronotum and the shape of the aedeagus, in which, for example, the lateral parts of the dorsal plate are clearly roundly concave (i.e. strongly roundly incised). From *L. terricolus* (Champion, 1926), the new species differs in the bright coloration of pronotum and legs, as well as by the shape of the aedeagus.

**Derivatio nominis.** The name of the species is derived from the district of Lhazê in the administrative area of the city of Xigazê, in the territory of which the type locality is located; adjective.

**Distribution.** China: Xizang Province.

***Lycocerus lapidarius* Kopetz & Kazantsev sp. nov.**

figs. 4, 15, 48–50, 59

Type locality. China, Xizang (Tibet) Province, Mendju Zari Mountain SE of the Lhasa Valley, 4600–4700 m, (29°34'N, 91°13'E) (fig. 59).

**Type material. Holotype** (male): „S Tibet 4.VI.2011 / Mt. Mendju Zari SE Lhasa / 4600–4700m, leg. Schmidt / 29°34'N, 91°13'E”, „HOLOTYPE / LYCOCERUS / lapidarius sp. nov. / des. Kopetz & Kazantsev 2019” (NME).

**Description.** Male: Size: Length 4.6 mm (8.7 mm), width 1.5 mm.

Coloration: Head, mandibles, maxillary palpi and antennae, which only get a bit darker towards the apex, saffron-yellow to orange; two black patches running diagonally from between eyes, but not reaching them;

pronotum saffron-yellow to orange, in front of pronotal bumps, each with a dark spot; scutellum, legs, underside, and last sternites and tergites orange, elytra, as well as tergites and anterior sternites, except for their lighter edges, sienna to chestnut-brown.

Head: About as long as wide and as wide as pronotum, surface evenly curved, shallow middle longitudinal furrow weak, with a slight bump between antennae; eyes moderately prominent, ratio of eye diameter to eye distance ca. 1:1.95; surface of head slightly shining, finely micro-chagrinated, flat and densely punctured on disc, widely punctured in front of midline of eyes; with slightly erect, golden yellow hairs, base of mandibles and densely punctured front edge of clypeus with long yellowish hairs; antennae filiform, without special features, reaching approximately to rear coxae, 2nd antennomere shorter than 3rd, 3rd as long as 4th; length ratio of antennomeres: 20: 10: 15: 15: 16: 15: 16: 15: 15: 15: 17.

Pronotum: About 1.1 times as wide as long, greatest width in the middle, evenly narrowed backwards, slightly concave behind front angles, rounded anterior margin slightly evenly bent forward, posterior margin slightly rounded backwards in a large curve, slightly concave in the middle; pronotal bumps large and flat, just behind the middle, touching each other in the middle; surface shining, very slightly micro-chagrinated, slightly denser in depressions, very flat and scarcely punctured on bumps, with short erect yellowish hairs.

Scutellum: Triangular with wide rounded apex.

Elytra: Strongly shortened, only slightly surpass 2nd tergite, about 2 times as long as pronotum and about 1.6 times as long as wide, surface finely wrinkled, dull, pubescence golden yellow, obliquely erect.

Wings: Very reduced.

Abdomen (fig. 15): last sternite oblong ovate.

Legs: Moderately slender, femur straight, tibia straight to very slightly curved, anterior claw of fore and middle legs with a blunt tooth, claws of hind legs simple.

Aedeagus (figs. 48–50): Edges of dorsal plate evenly curved, with a deep incision extending to base, this with straight sides, inner side of dorsal plate just below the tip on both sides with a rounded ledge; slender, apically pointed laterophyses reaching below this ledge, parameres flattened ventrally and somewhat widened, about as long as dorsal shield and inclined in regular arc to each another.

Female: Unknown.

**Differential diagnosis.** The new species is very closely related to *Lycocerus dongola* sp. nov. The colour, especially of the antennae, is somewhat lighter in *L. lapidarius* sp. nov., the dark spots on the pronotum being stronger. The sides of pronotum are slightly concave behind the front angles, while in *L. dongola* sp. nov. they run evenly convex. Also, the two species are similar in the shape of the aedeagus. The parameres are somewhat more flattened and less strongly angled than in *L. dongola* sp. nov.

The new species differs from *L. terricolus* (Champion), among other things, by the bright colour of the head, pronotum and legs, as well as by the longer parameres.

**Derivatio nominis:** The name *lapidarius* (Latin) = living under stones, refers to the way of life of the species on high alpine scree tracts; adjective.

**Distribution.** China: Xizang Province.

***Lycocerus schmidti* Kopetz & Kazantsev sp. nov.**

figs. 5, 6, 16, 20, 51–53, 60

Type locality. China, Xizang (Tibet) Province, Budha valley north of Yangpachem, 5000–5200m (ca. 30°10'56"N, 90°29'21"E) (fig. 60).

**Type material. Holotype** (male): “TIBET South Central 17.–20.VI.07 / Budha vall. N of Yangpachem / ca. 30°10'56N, 90°29'21E / 5000–5200m, leg. J.Schmidt”, „HOLOTYPUS / LYCOCERUS / schmidti sp. nov. / des. Kopetz & Kazantsev 2019” (NME).

**Paratypes:** same data as holotype, 7 male, 4 female (cKo, ICM); “TIBET (South Central) 5.VII.07 / W of Shoqu La 4650–4850m / lg. Schmidt 29°50'18N, 90°04'06E / to 29°48'15N, 90°02'21E”, 1 male (cKo); „TIBET (South Central) 5.VII.07 / above Shoqu La Pass 5450m / leg. Schmidt / 29°53'55, 3N, 90°07'57,1E”, 1 male (NME); “TIBET (South Central) 2.VII.07 / lower Shoqu Chu Vall. E Shoqu / La, ca. 29°56'30N, 90°14'06E / 4725–5025m, leg. Schmidt”, 1 female (NME); „TIBET South Centr. 6.VII.07 / Doru Tshu Vall. SW of Donqu / La, 4500–4600m, lg. Schmidt / ca. 29°43'16N, 89°47'12E”, 1 male (NME); “TIBET South Centr. 6.VII.07 / 120km W Lhasa, 2km NE / Dongu La pass, 4800–5000m / ca. 29°45'01N, 89°51'11E, J.S”, 2 male, 2 female (NME, KURA); “TIBET South Centr. 3.–4.VII.07 / NE of Shogu La pass, 5000– / 5350m / 29°54'48–29°57'20N, / 90°08'28–90°07'49E, Schmidt”,

19 male (NME, cKo, ICM); „S TIBET, ca. 30 km W of / Yangpachen, 9.VII.2010 / Linchung Vall. 4950–5270m / 30°06'56N, 90°20'24E”, 2 female (NME); all designated “PARATYPUS / LYCOCERUS / schmidti sp. nov. / des. Kopezt & Kazantsev 2019”.

**Description.** Male: Size: Length 3.0–3.5 mm (7.0–8.4 mm), width 1.3–1.4 mm.

Coloration: Largest part of head, antennae and maxillary palpi sepia to chestnut brown, front part of head to rear edge of antennae and mandibles saffron-yellow, sometimes head and first two or three antennomeres bright yellow, with only a dark spot remaining on vertex; pronotum orange, usually with a more or less pronounced, blurred dark spot, mainly covering the posterior part of the pronotal bumps, sometimes disappearing or fading out; scutellum rusty to maroon; legs orange to sienna, tarsi and base of thighs darker: underside and 1st sternite and tergite, except for their lighter edges, maroon to rusty, sternites and tergites brightening towards the end, with the last two mostly orange; elytra sienna to maroon.

Head: About as long as wide and slightly wider than pronotum, surface evenly domed behind, between eyes to antennae but almost flat, a middle longitudinal furrow only slightly pronounced at level of eyes, between antennae with a weak longitudinal bump; eyes moderately prominent, ratio of eye diameter to eye distance approximately 1:2.5; surface of head slightly shining, finely micro-chagrinated, majority of head relatively evenly densely punctured, distance between punctures slightly larger than punctures themselves, more sparsely punctured between antennae; hairs in front yellowish and slightly erect, behind dark and slightly bristly, base of mandibles and densely punctured front edge of clypeus with long yellowish hairs; antennae very robust, without any special distinctive marks, reaching approximately to rear coxae, 2nd antennomere shorter than 3rd, 3rd shorter than 4th; length ratio of antennomeres: 18: 10: 11: 15: 15: 15: 15: 15: 15: 20.

Pronotum: About 1.2 times as wide as long, lateral margins slightly narrower from the middle to the front, slightly more narrowed backwards, anterior margin very slightly bent forward and slightly undulate concave in the middle, posterior margin slightly rounded in a flat arch, weakly concave in the middle; pronotal bumps clearly behind the middle, dropping steeply

backwards and running flat towards the front, in the middle separated by a shallow longitudinal furrow; surface shining, slightly micro-chagrinated, with very extensive, often indistinct puncturation, pubescence yellowish and obliquely protruding.

Scutellum: Wider than long, with widely rounded to slightly concave rounded tip.

Elytra: Very much shortened, reaching the end of 1st tergite approximately, about 1.25 times as long as pronotum and together about 1.1 times as wide as long, surface finely wrinkled, dull, pubescence yellow to maroon, obliquely erect.

Wing: Very reduced.

Abdomen (fig. 16): Last sternite apically broadly triangular, with short incision.

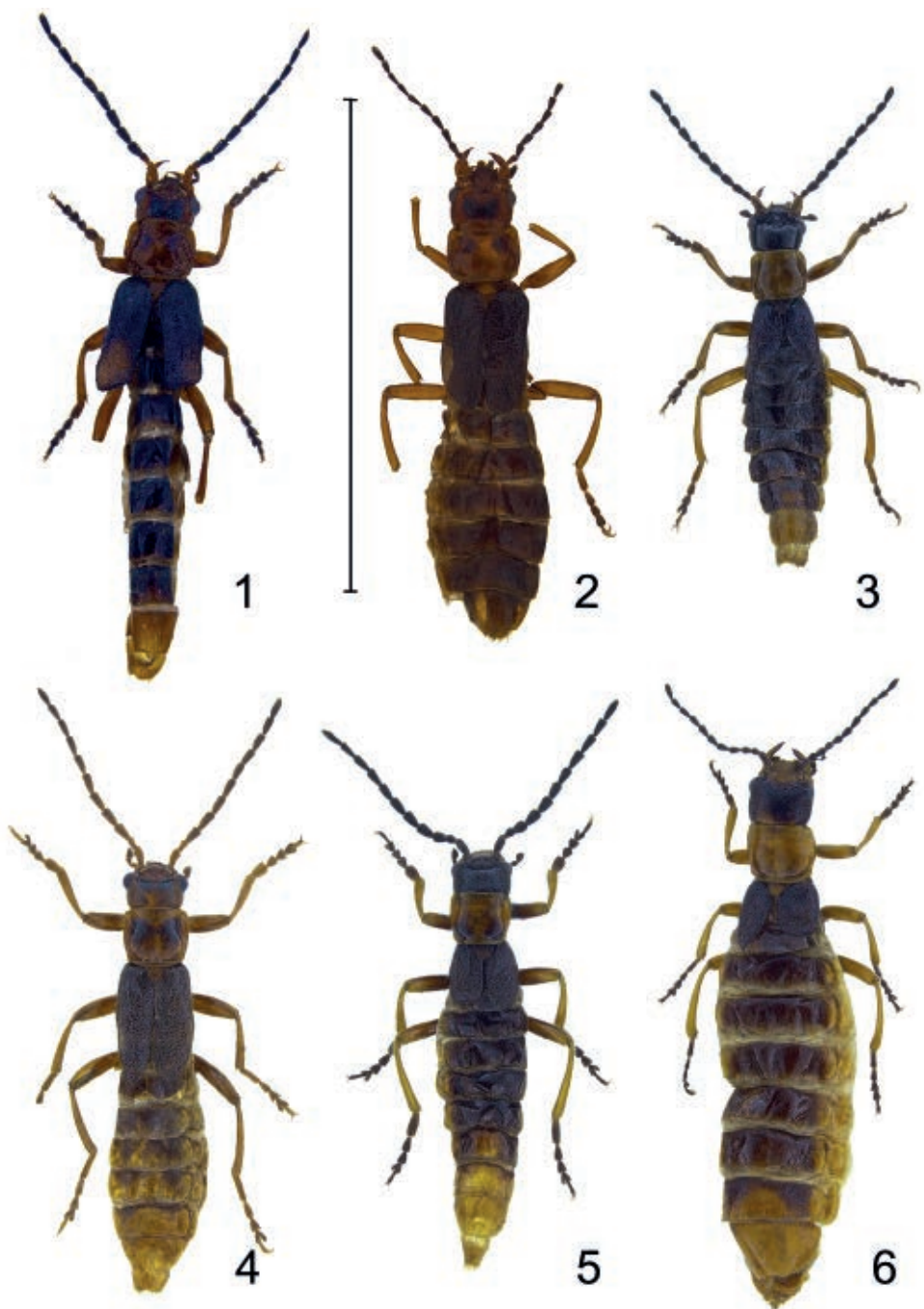
Legs: Moderately slender, femur straight, tibia straight to very slightly bent, all claws simple.

Aedeagus (figs. 51–53): Sides of dorsal plate evenly curved, with a deep incision extending to base, with rounded sides, inner side of dorsal plate just below the tip on both sides with a rounded ledge; slender, slightly flattened and apically pointed laterophyses reaching below this ledge; parameres slender, slightly flattened and slightly inclined to each other, about as long as the dorsal plate. Female: Size: Length 3.5–4.2 mm (7.6–11.3 mm), width 1.5–1.9 mm, abdomen wider. Colouring as in male; antennae slightly shorter, reaching about middle coxae; claws simple, but front claw of anterior legs with a slight thickening; last sternite (fig. 20) with a triangular or rounded incision in the middle.

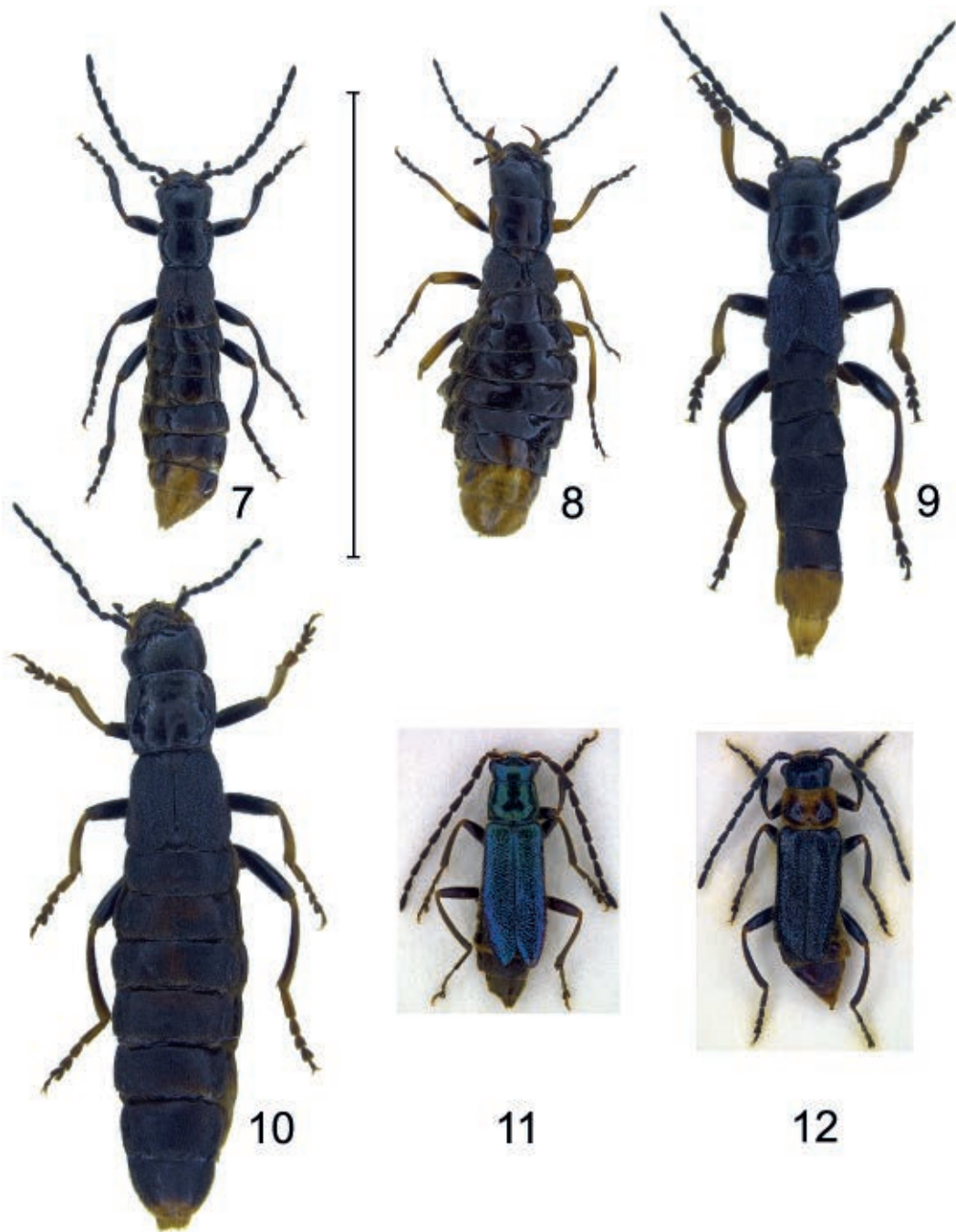
**Differential diagnosis.** The new species is closely related to *Lycocerus lhazeensis* sp. nov. and differs from it by the uniformly black antennae, dark spot on the back of the pronotal bumps, and the shape of the aedeagus. The lateral parts of the dorsal plate are not concave rounded in *L. schmidti* sp. nov. and the parameres are much less flattened than in *Lycocerus lhazeensis* sp. nov. The new species differs from *L. terricolus* (Champion) by the bright coloration of the pronotum and legs, as well as the shape of the aedeagus.

**Derivatio nominis.** The new species is dedicated to our friend Dr. Joachim Schmidt (Admannshagen), a well-known researcher in Carabidae, in gratitude for passing us this valuable material.

**Distribution.** China: Xizang Province.



**Figures 1-6.** *Lycocerus* spp. Habitus. 1 - *L. dongola* sp. nov., Holotype, male; 2 - *L. dongola* sp. nov., Paratype, female; 3 - *L. lhazeensis* sp. nov., Paratype, male; 4 - *L. lapidarius* sp. nov., Holotype, male; 5 - *L. schmidti* sp. nov., Paratype, male; 6 - *L. schmidti* sp. nov., Paratype, female. Scale bars: 10.0 mm.



**Figures 7-12.** *Lycocerus* ssp. Habitus. **7** - *L. alticola* sp. nov., Paratype, male; **8** - *L. alticola* sp. nov., Paratype, female; **9** - *L. terricolus* (Champion, 1926), male; **10** - *L. terricolus* (Champion, 1926), female; **11** - *L. curtipennis* (Švihla, 2004), Holotype, male; **12** - *L. ondreji* (Švihla, 2004), Holotype, male. Scale bars: 10.0 mm.



***Lycocerus alticola* Kopetz & Kazantsev sp. nov.**

figs. 7, 8, 17, 21 54–56

Type locality. China, Xizang (Tibet) Province, Dulong, Kurmu valley northwest of Lhasa, 4900–5200m, (29°42'18"N, 90°35'16"E).

**Type material. Holotype** (male): “TIBET (South Central) 29.VI.07 / Dulong, Kurmu vall. NW Lhasa / 4900–5200 m, leg. Schmidt / ca. 29°42'18"N, 90°35'16"E”, “south ascent of / Tsubu side valley / above Tsurphu Monastery”, “HOLOTYPUS / LYCOCERUS / alticola sp. nov. / des. Kopetz & Kazantsev 2019” (NME).

**Paratypes:** same data as holotype, 2 male, 1 female (cKo, ICM); “CHINA, Tibet / Chak La, 30. VII.2015 / 4800 m, leg. J. Schmidt / 30°06'43"N, 91°16'07"E”, 1 female (ICM); all designated “PARATYPUS / LYCOCERUS / alticola sp. nov. / des. Kopetz & Kazantsev 2019”.

**Description.** Male: Size: length 2.8–3.0 mm (6.3–7.3 mm), width 1.2–1.3 mm.

Coloration: Head, antennae, maxillary palpi, pronotum, elytra, scutellum, underside and legs sepia-brown to black, head just under eyes, margins of pronotum and base of tibia somewhat lightened; mandibles terracotta; abdomen sienna to maroon, only lateral and posterior margins of sternites and tergites more or less lightened, last sternites and tergites almost completely saffron to terracotta.

Head: About as long as wide and slightly wider than pronotum, surface evenly curved, between eyes to the base of antennae with a shallow depression, a medial longitudinal furrow not always pronounced; relatively small eyes moderately prominent, ratio of eye diameter to eye distance about 1:2.5; surface of head slightly shining, slightly micro-chagrinated, punctures at base dense and fine, becoming more extensive in front, only very occasionally punctured between antennae; with slightly erect, golden yellow hairs, base of mandibles and densely punctured front edge of clypeus with slightly longer yellowish hairs; antennae robust, without any special distinctive marks, reaching approximately to rear coxae, 2nd antennomere shorter than 3rd, 3rd shorter than 4th; length ratio of antennomeres: 15: 8: 11: 12: 12: 12: 12: 12: 12: 15.

Pronotum: Approximately 1.2 times as wide as long, lateral margins more rounded toward rear, slightly nar-

rowed toward the front, concave immediately behind front angle, anterior margin almost straight, posterior margin slightly rounded in a flat arc, slightly concave in the middle; broad and very shallow pronotal bumps just behind the middle, separated in the middle by a shallow central longitudinal furrow; shining surface, slightly micro-chagrinated, slightly coarser and denser behind anterior edge, otherwise only very finely and scarcely punctuated, with somewhat erect, golden-yellow hairs. Scutellum: Wide triangular, with widely rounded to slightly concave rounded apex.

Elytra: Very much shortened, not reaching posterior margin of 1st tergite, about as long as pronotum, about 1.2 times as wide as long, separately pointed, surface finely wrinkled, dull, hairs chestnut-brown, slightly erect.

Wings: Very reduced.

Abdomen (fig. 17): Last sternite lanceolate, terminating in a rounded tip.

Legs: Slender, femur straight, tibia straight to very slightly curved, all claws simple.

Aedeagus (figs. 54–56): Margins of dorsal plate evenly curved, with deep V-shaped incision reaching to base, inner side of dorsal plate just below the top on both sides with a rounded ledge; slender, dorsally curved and apically pointed laterophyses reaching below the ledge; slightly club-shaped and thickened parameres barely protruding beyond dorsal shield, parameres slightly inclined to each other.

Female: Size: Length 4.9–5.2 mm (10.0–10.2 mm), width 4.6–4.7 mm, but abdomen usually wider. Colouring as in males, but legs brighter coloured in available specimens; antennae slightly shorter, not quite reaching middle coxae; pronotum relatively wider; all claws simple; last sternite (fig. 21) pulled forward in the middle, and with a V-shaped incision.

**Differential diagnosis.** The new species is closely related to *Lycocerus terricolus* (Champion) and differs from it by the more delicate habitus, even shorter elytra, and the shape of the aedeagus. For example, the parameres are longer than the dorsal shield and barely flattened.

**Derivatio nominis.** The name of the species is derived from the Latin adjective “altus” (high) and the noun “cola” (inhabitant) and refers to the occurrence of the species at high altitude; noun in apposition.

**Distribution.** China: Xizang Province.

***Lycocerus terricolus* (Champion, 1926)** figs. 9, 10, 18, 22

= *Podistra terricola* Champion, 1926: 194.

= *Athemus (Athemellus) terricolus*: Švihla, 2004: 179, figs. 69-71, 200.

= *Lycocerus terricolus*: Okushima, 2005:14.

**Examined Type material.** Syntypes (BMNH) 1 male, 1 female (mating): „Type H.T.” [round with red border] „Everest Exp. Brit. Mus. 1924–386.” „Podistra terricola types Ch.” [written by Champion], „Podistra terricola Champ.” „E.M.M. 1926 det. G.C.C.” „Athemus (Athemellus) / terricola (Champ.) / V. Švihla det. 2003”.

**Other material examined.** „S TIBET 14.VI.2011 / Kampa La, 4800mNN / lg. Schmidt / 29°11'51"N, 90°35'16"E.”, 4 males, 1 female (cKo).

***Lycocerus curtipennis* (Švihla, 2004)** fig. 11

= *Athemus (Andrathemus) curtipennis*: Švihla, 2004: 183–84, figs. 86–89.

= *Lycocerus curtipennis*: Okushima, 2005:14.

**Examined Type material.** Holotype (NMP) 1 male: „CHINA, SE TIBET, ZAYU Co. / right lateral & main valley of / SALWEEN River, MENGONG env. / 1900–3000m, 28°29'–31'N 98°18'–24'E / 13.–14.6.99 L. & R. BUSINSKÝ lgt.”

***Lycocerus andreji* (Švihla, 2004)** fig. 12

= *Athemus* (s. str.) *andreji*: Švihla, 2004: 181–82, figs. 80–82.

= *Lycocerus andreji*: Okushima, 2005:14.

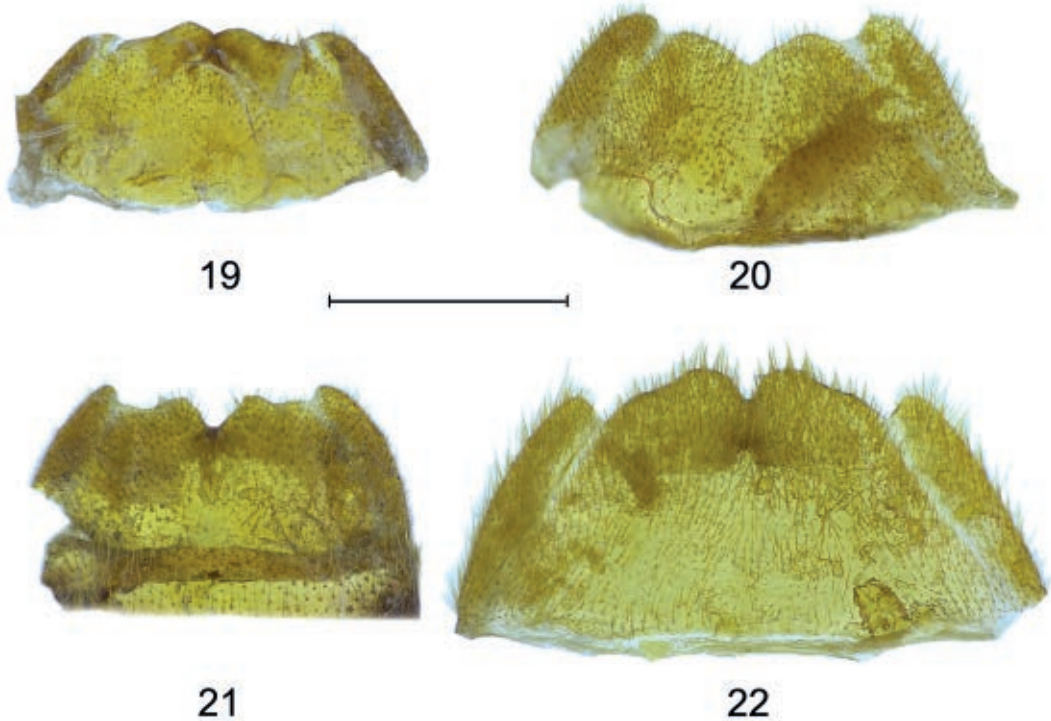
**Examined Type material.** Holotype (NMP) 1 male: „CHINA-W Sichuan, 1997 / Chola Shan mts., 19.VII. / road Dege-Maniganggo, / 40km E of Dege, ca. 4200m / 31°55'N, 98°53'E, picea forest / M. Trýzna et O. Šafránek lgt.”

#### Key to the *Lycocerus* species with shortened wing-covers

- 1 Elytra only slightly shortened, at least twice as long as combined width ..... 2  
1\* Elytra greatly shortened, significantly less than twice as long as combined width ..... 3
- 2 Head, pronotum and elytra metallic blue-green ..... *L. curtipennis* (Švihla)  
2\* Elytra black, without metallic lustre ..... *L. andreji* (Švihla)
- 3 Head, pronotum and elytra black, at best pronotum lightened slightly ..... 4  
3\* at least pronotum mostly orange ..... 5
- 4 larger, ventral process of each paramere flattened, at most as long as dorsal plate ..... *L. terricolus* (Champion)  
4\* smaller, ventral process of each paramere not flattened, slightly longer than dorsal plate ..... *L. alticola* sp. nov.
- 5 ventral process of each paramere flattened, as long as or longer than dorsal plate ..... 6  
5\* ventral process of each paramere not flattened, about as long as dorsal plate and bent to each other, forming a regular arc ..... *L. schmidti* sp. nov.
- 6 Head mostly black, sides of dorsal plate strongly roundly incised ..... *L. lhazeensis* sp. nov.  
6\* Head mostly orange, sides of dorsal plate evenly rounded, not incised ..... 7
- 7 Anterior angles of pronotum broadly rounded, sides bent evenly, ventral process of each paramere bent, angled toward each other ..... *L. dongola* sp. nov.  
7\* Anterior angles of pronotum shortly rounded, sides slightly concave behind anterior margin, ventral process of each paramere evenly bent toward each other ..... *L. lapidarius* sp. nov.



Figures 13-18. *Lycocerus* ssp. last sternite, male. 13 - *L. dongola* sp. nov.; 14 - *L. lhazeensis* sp. nov.; 15 - *L. lapidarius* sp. nov.; 16 - *L. schmidti* sp. nov.; 17 - *L. alticola* sp. nov.; 18 - *L. terricolus* (Champion, 1926). Scale bars: 1.0 mm.



Figures 19–22. *Lycocerus* ssp. last sternite, female. 19 – *L. dongola* sp. nov.; 20 – *L. schmidtii* sp. nov.; 21 – *L. alticola* sp. nov.; 22 – *L. terricolus* (Champion, 1926). Scale bars: 1.0 mm.

***Themus (Haplothemus) dashankouensis* Kazantsev & Kopetz sp. nov.**

figs. 23–24, 26–27, 29–31

Type locality. China, northern Yunnan province, north of Zhongdian, Dashankou Pass, 4400 m.

**Type material. Holotype** (male): „China: N Yunnan / N Zhongdian, Dashankou Pass, 4400 m / VII.15–17.2002 S.Murzin leg.”, „Holotype”, „*Themus (Haplothemus) / dashankouensis* sp.n. / des. Kazantsev et Kopetz sp.n. 2019” (ICM).

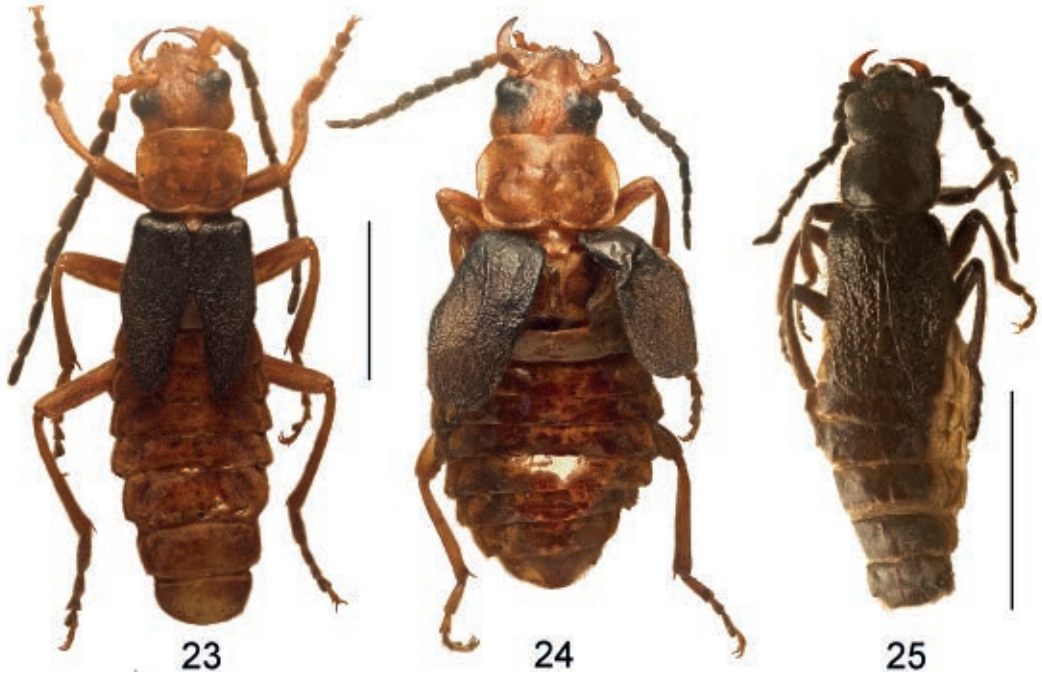
**Paratypes:** same data as holotype, 3 males and 2 females (ICM, NME); all designated „Paratype”, „*Themus (Haplothemus) / dashankouensis* sp.n. / des. Kazantsev et Kopetz sp.n. 2019”.

**Description.** Male: Size: Length 8.4–9.2 mm (11.7–15.2 mm), width 2.9–3.0 mm.

Coloration: Orange-yellow; eyes and vertex around them, antennomeres 3–11 and elytra sepia-brown to black (fig. 23).

Head: Transverse, about 1.1 times wider than long and only slightly more narrow than pronotum, with inconspicuous longitudinal bulge behind eyes; clypeus transverse, semi-circular at anterior margin; ultimate palpomeres relatively small, securiform; eyes small, interocular distance ca. 2.7 times greater than eye diameter; surface of head dull, coarsely punctate; golden pubescence short, decumbent and scarce, denser at sides; antennae filiform, reaching hind femora and 3rd abdominal tergite; antennomere 2 subequal in length to antennomere 3, antennomere 4 ca. 1.4 times as long as antennomere 3; length ratio of antennomeres: 22 : 10 : 10 : 14 : 20 : 19 : 19 : 19 : 15 : 15 : 15 (fig. 23).

Pronotum: About 1.3 times as wide as long, noticeably widened anteriorly, with pronounced anterior and



Figures 23–25. *Themus (Haplothemus)* spp., habitus. 23 – *Th. dashankouensis* sp. nov., Holotype, male; 24 – *Th. dashankouensis* sp. nov., Paratype, female; 25 – *Th. hezuensis* sp. nov., Holotype, male. Scale bars: 4.0 mm.

rounded posterior angles, sides almost straight, anterior margin moderately convex and insignificantly concave in the middle, posterior margin almost straight and insignificantly concave in the middle; surface shining, finely punctate, with short decumbent yellowish pubescence (fig. 23).

Scutellum: Triangular with slightly rounded apex (fig. 23).

Elytra: Strongly shortened, reaching distal margin of 4th tergite, ca. 2.1 times as long as pronotum, together ca. 1.6 times as long as wide, surface coarsely wrinkled, shining, pubescence greyish, semi-erect (fig. 23).

Wings: Vestigial, very reduced.

Abdomen: Ultimate sternite elongate, slightly widened in distal two thirds, narrowed and conspicuously incised at apex; ultimate tergite broadly incised at distal margin (fig. 26).

Legs: Relatively slender; femora and tibiae straight; all

claws simple; length ratio of hind tarsomeres 28 : 16 : 10 : 10 : 15 (fig. 23).

Aedeagus (figs. 29–31): Broad at base and narrowing distally; dorsal plate deeply and narrowly incised, each lobe narrowed and rounded apically; parameres as long as dorsal plate, slightly widened and approximate distally, roundly separated at base ventrally; laterophysies slightly longer than dorsal plate, approximate and hooked at apex. Female: Size: Length 9.5–10.1 mm (12.8–14.7 mm), width 3.6–4.1 mm. Similar to male, but broader, antennae considerably shorter, pronotum broader, ca. 1.7 times wider than long, with more pronounced medial incision at anterior and posterior margins, scutellum shorter, trapezoidal (fig. 24); last sternite medially at distal margin broadly, then narrowly incised (fig. 27).

**Differential diagnosis.** The new species seems to be related to *Themus (Haplothemus) alticola* Kopetz,



**Figures 26–28.** *Themus (Haplothemus)* spp., abdominal terminalia. **26** – *Th. dashankouensis* sp. nov., Holotype, male; **27** – *Th. dashankouensis* sp. nov., Paratype, female; **28** – *Th. hezuoensis* sp. nov., Holotype, male. Scale bars: 4.0 mm.

2016, separable by the shorter elytra and black coloration around the eyes (fig. 23), as well as by the longer laterophyses, more approximate parameres and narrowed, apically rounded lobes of the dorsal plate of the aedeagus (figs. 29–31).

**Derivatio nominis.** The name of the new species refers to the locality, Dashankou Pass, located north of Zhongdian, Yunnan, where the species was found.

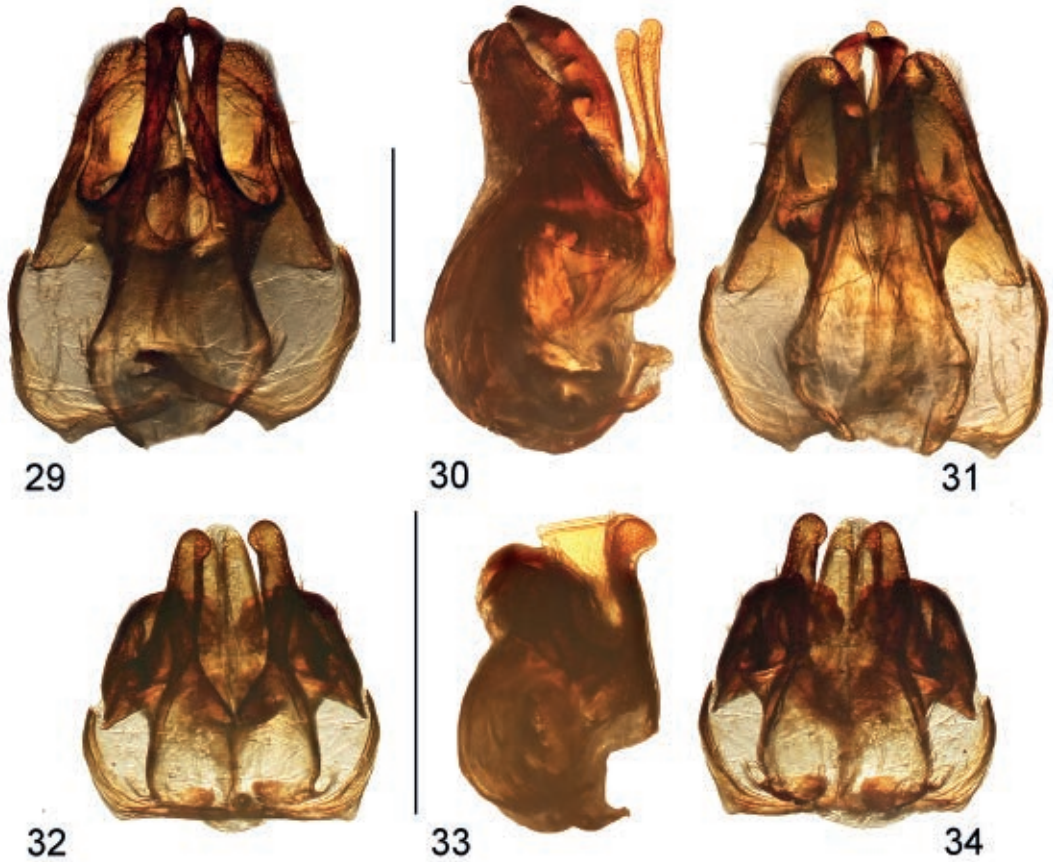
**Distribution.** China: Yunnan province.

***Themus (Haplothemus) hezuoensis* Kazantsev & Kopetz sp. nov.**

figs. 25, 28, 32–34

Type locality. China, Gansu province, north of Hezuo, 4000 m.

**Type material.** **Holotype** (male): “China: Gansu / 25 km N Hezuo / 4400 m July 22, 2001 S.Murzin leg.”, „Holotype”, „*Themus (Haplothemus) / hezuoensis* sp.n. / des. Kazantsev et Kopetz sp.n. 2019” (ICM).



Figures 29–34. *Themus (Haplothemus)* spp., aedeagus. 29–31 – *Th. dashankouensis* sp. nov., Holotype, male; 32–34 – *Th. hezuensis* sp. nov., Holotype, male; 29, 32 – ventrally; 30, 33 – laterally; 31, 34 – dorsally. Scale bars: 2.0 mm.

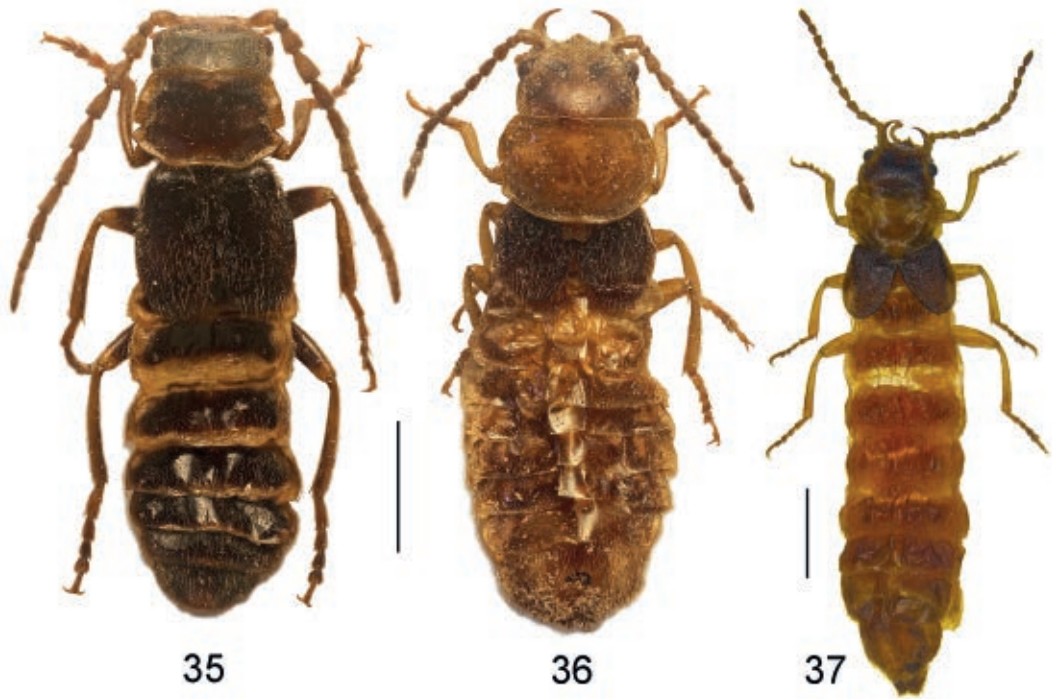
Figures 35–37. *Silis wrasei* sp. nov., habitus. 35 – Holotype, male; 36–37 – Paratypes, female. Scale bars: 2.0 mm.

**Paratypes:** same data as holotype, 4 males (ICM, NME); all designated “Paratype”, “*Themus (Haplothemus) / hezuensis* sp.n. / des. Kazantsev et Kopetz sp.n. 2019”.

**Description.** Male: Size: Length 5.2–6.1 mm (9.1–10.4 mm), width 2.0–2.2 mm.

Coloration: Sepia-brown to black; small round impressions between eyes reddish brown; lateral edges of abdominal tergites light brown (fig. 25).

Head: Transverse, about 1.3 times wider than long and only slightly more narrow than pronotum, with noticeable semi-circular impression and median longitudinal groove between eyes; clypeus transverse, semi-circular at anterior margin; last palpomeres relatively small, securiform; eyes small, interocular distance ca. 2.4 times greater than eye diameter; surface of head shining, finely punctate; brownish pubescence moderately long, decumbent and relatively dense; antennae filiform, gradually narrowing from antennomere 3,



Figures 35–37. *Silis wrasei* sp. nov., habitus. 35 – Holotype, male; 36–37 – Paratypes, female. Scale bars: 2.0 mm.apically. Scale bars: 1.0 mm.

reaching over middle femora; antennomere 2 ca. 1.4 times shorter than antennomere 3, antennomere 3 ca. 1.2 times shorter than antennomere 4; length ratio of antennomeres (measurement taken from a Paratype, as antennomeres 9–11 in the Holotype are distorted): 21 : 10 : 14 : 16 : 15 : 17 : 16 : 20 : 18 : 20 : 24 (fig. 25).

Pronotum: Transverse, about 1.3 times as wide as long, with pronounced anterior and rounded posterior angles; anterior margin moderately convex, posterior margin insignificantly concave, sides almost parallel-sided and straight in the middle; surface shining, finely punctate, with short semi-erect brownish pubescence (fig. 25).

Scutellum: Elongate, almost parallel-sided, with rounded apex (fig. 25).

Elytra: Strongly shortened, slightly reaching over distal margin of 2nd tergite, ca. 2.6 times as long as pronotum, together ca. 1.6 times as long as wide, surface coarsely wrinkled, shining, pubescence brownish, erect (fig. 25).

Wings: Vestigial.

Abdomen: Ultimate sternite elongate, slightly widened in proximal and distal thirds, narrowed distally and truncate at apex; ultimate tergite broadly, then semicircularly incised at distal margin (fig. 28).

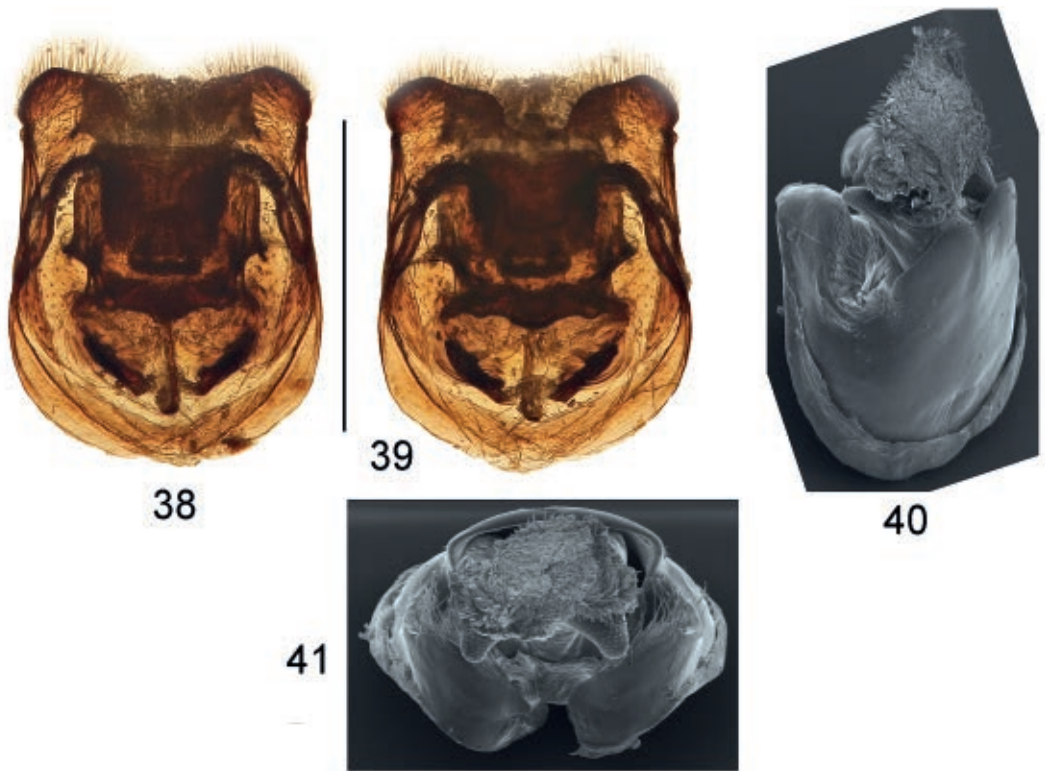
Legs: Relatively robust; femora straight, tibiae slightly curved; all claws simple; length ratio of hind tarsi: 25 : 17 : 13 : 10 : 14 (fig. 25).

Aedeagus (figs. 32–34): Transverse, slightly narrowing distally; dorsal plate shallowly and narrowly incised, each lobe short, slightly narrowed and almost truncate apically; parameres considerably longer than dorsal plate, parallel-sided, clubbed at apices, triangularly separated at base ventrally; laterophyses as long as dorsal plate, fused in proximal half, their distal processes parallel-sided, gradually narrowed and hooked towards dorsal plate.

Female: Unknown.

**Differential diagnosis.** *Themus* (*Haplothemus*) *hezuensis* sp. nov. is easily distinguished from its conge-





**Figures 38–41.** *Silis wrasei* sp. nov., male, aedeagus. **38** – Holotype, ventrally; **39** – Holotype, dorsally; **40** – Paratype, dorso-apically; **41** – Paratype, apically. Scale bars: 1.0 mm.

nerics by a combination of the coloration, short antennomere 2, shortened elytra (fig. 25) and details of the aedeagus (figs. 32–34).

**Derivatio nominis.** The name of the new species refers to the locality, Hezuo, in Gansu, China, where the species was found.

**Distribution.** China: Gansu province.

***Silis wrasei* Kazantsev & Kopetz sp. nov.** figs. 35–41, 61  
Type locality. China, Nei Mongol Autonomous Region, Helan Shan, 2275–2420 m.

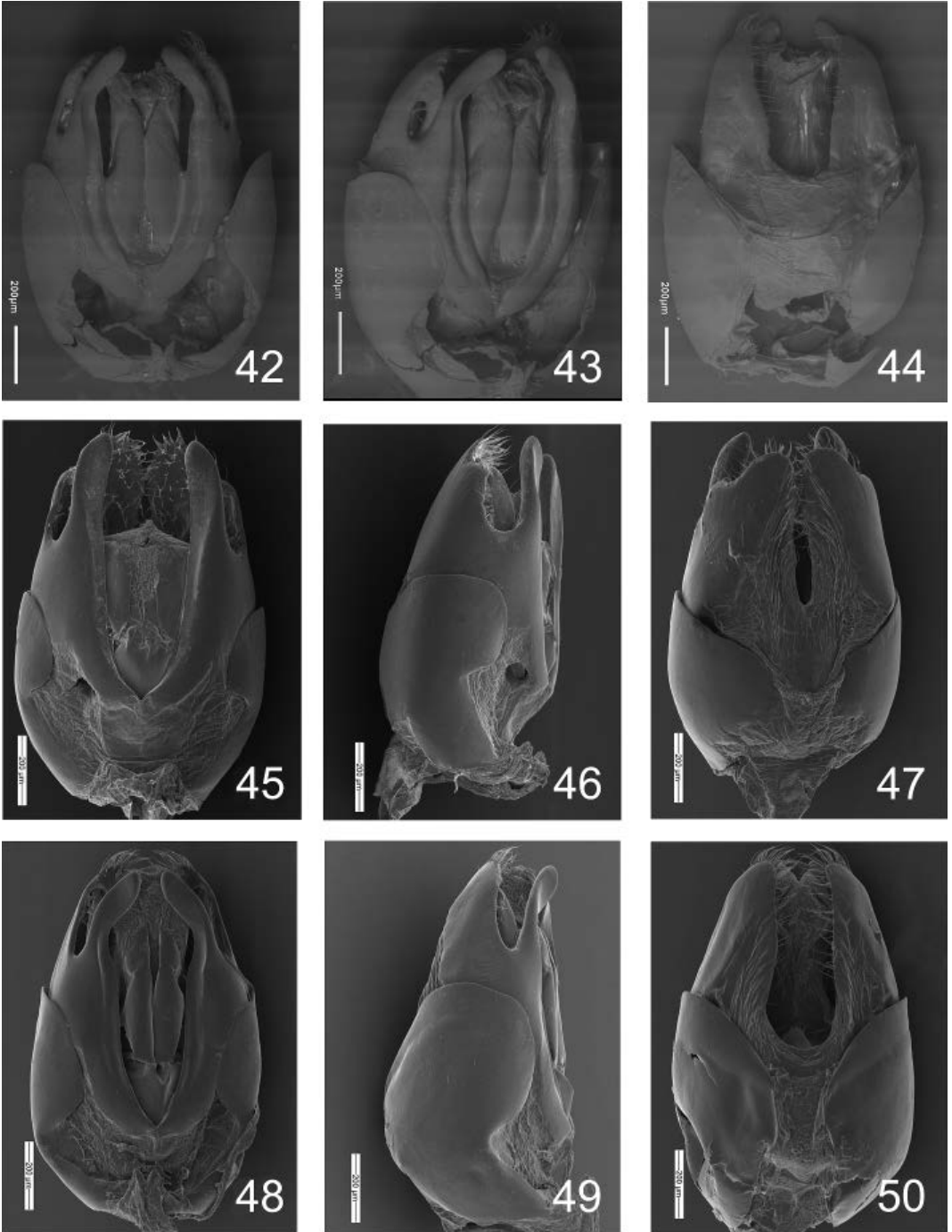
**Type material. Holotype** (male): “China: Nei Mongol Aut. Reg. / Helan Shan / above Guangzong temple / 38°39'17.0"N 105°49'34.7"E / 2275–2420 m (dry creek valley / Picea forest, on stones) / 22.VI.2011 D. W. Wrase (06C2)”, “coll. Wrase / Berlin”, “Holotype”, “*Silis / wrasei* sp.n. / des. Kazantsev et Kopetz sp.n. 2019” (NME).

**Paratypes:** same data as holotype, 16 males and 1 female (ICM, NME, cKo, cWr); “China: Nei Mongol Aut. Reg. / Helan Shan / above Guangzong temple / 38°39'17.0"N 105°49'34.7"E / 2275–2420 m (dry creek valley / Picea forest, under stones / in a small pit in soil) / 22.VI.2011 D. W. Wrase (06C1)”, “coll. Wrase / Berlin”, 1 male and 5 female (ICM, NME, cKo, cWr); all designated “Paratype”, “*Silis / wrasei* sp.n. / des. Kazantsev et Kopetz sp.n. 2019”.

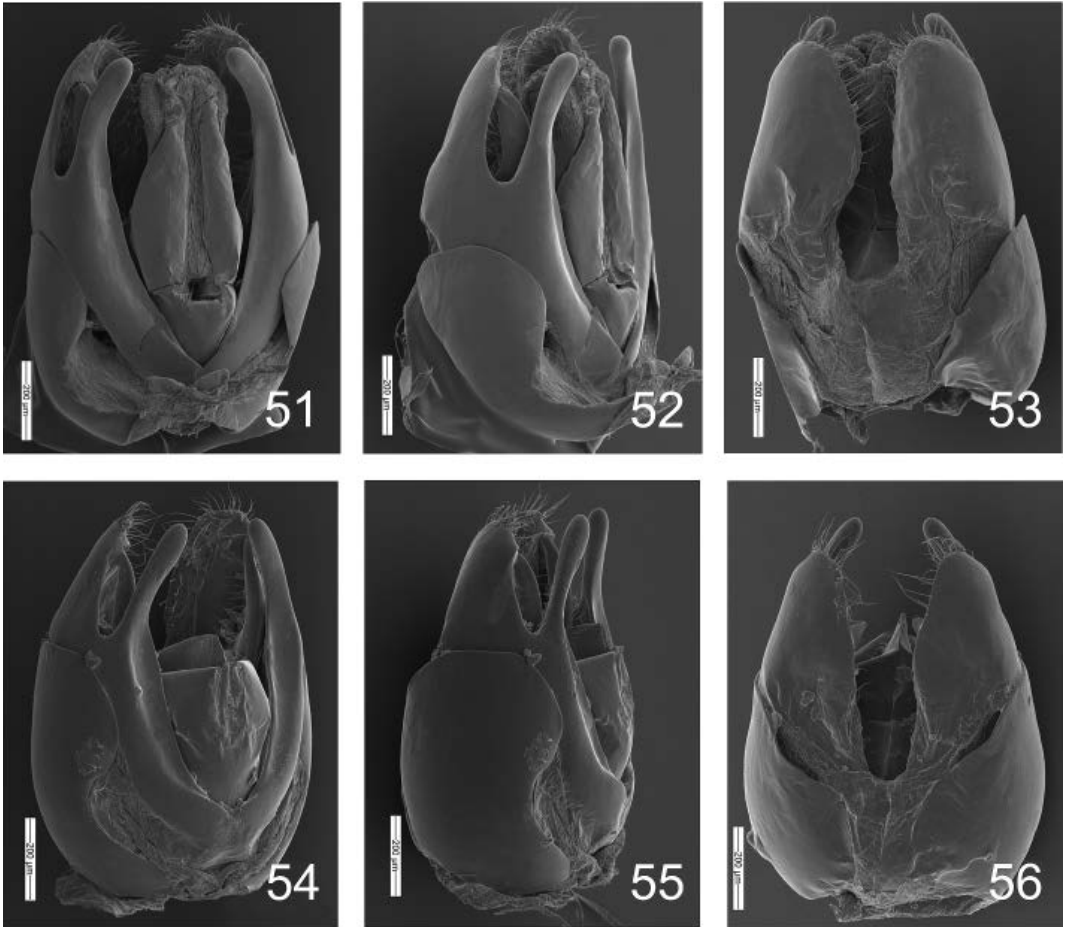
**Description.** Male: Size: Length 3.6–4.5 mm (8.0–9.9 mm), width 1.7–1.9 mm.

Coloration: Sepia-brown to black; antennae, except antennomere 2 distally, pronotal margins, femurs distally, tibiae, tarsomeres 1–2 and margins of abdominal segments 1–3 testaceous (fig. 35).

Head: Transverse, ca. 1.2 times as wide as long and noticeably narrower than pronotum, with conspicuous transverse impression between eyes; clypeus transverse, triangular, slightly incised medially; ultimate



**Figures 42-50.** Electron micrographs of Aedeagus. 42-44 - *Lycocerus dongola* sp. nov. (42: ventral, 43: ventrolateral, 44: dorsal); 45-47 - *Lycocerus lhaeensis* sp. nov. (45: ventral, 46: lateral, 47: dorsal); 48-50 - *Lycocerus lapidarius* sp. nov. (48: ventral, 49: lateral, 50 dorsal).



**Figures 51–56.** Electron micrographs of Aedeagus. **51–53** – *Lycocerus schmidti* sp. nov. (**51**: ventral, **52**: ventrolateral, **53**: dorsal); **54–56** – *Lycocerus alticola* sp. nov. (**54**: ventral, **55**: lateral, **56**: dorsal).

palpomeres relatively small, slightly widening distally; eyes small, almost flat, interocular distance ca. 3.8 times greater than eye diameter; surface of head shining, finely punctate; greyish pubescence short and decumbent; antennae filiform, gradually narrowing from antennomere 3, reaching hind femora; antennomere 2 ca. 1.4 times shorter than antennomere 3, antennomere 4 ca. 1.5 times as long as antennomere 3; length ratio of antennomeres: 30 : 12 : 17 : 25 : 25 : 27 : 27 : 23 : 22 : 22 : 33 (fig. 35).

Pronotum: Transverse, ca. 1.5 times as wide as long, slightly narrowing anteriorly, basally slightly concave, without tooth before posterior angle; anteriorly slightly convex and incised in the middle; medially with com-

plete inconspicuous longitudinal rib and prominent pores near anterior angles; anterior angles obtuse; lateral incision relatively small, sub-triangular; posterior angle moderately produced laterally; pubescence relatively long, decumbent and scarce (fig. 35).

Scutellum: Triangular, with rounded apex (fig. 35).

Elytra: Strongly shortened, only reaching distal margin of 1st tergite, ca. 1.5 times as long as pronotum, together ca. 1.1 times as long as wide, surface coarsely wrinkled, shining, pubescence brownish, erect (fig. 35).

Wings: Vestigial.

Abdomen: Ultimate sternite extremely narrow, needle-shaped; last tergite broad, medially emarginate.



**Figure 57.** Valley SE of Dongo La, approx. 5000 m a.s.l., Type locality of *L. dongola* sp. nov. (Photograph A. Schmidt).

Legs: Relatively slender; femora and tibiae straight; all claws simple; length ratio of hind tarsomeres: 32 : 20 : 17 : 6 : 22 (fig. 35).

Aedeagus (figs. 38–41): Semi-rectangular, slightly concave at sides; with moderately triangularly incised medially ventral plate; dorsal plate broad, widening distally, with rectangular incision and lobes obliquely cut at apices; laterophyses distinctly diverging, curved, acute at apex, not denticulate.

Female: Size: Length 3.8–4.0 mm (8.4–11.8 mm), width 2.0–2.1 mm. Similar to male, but body, except parts of head dorsally and elytra, orange; antennae shorter, hardly reaching middle femora, pronotum not deeply incised at sides, elytra shorter, together ca. 1.1 times wider than long (figs 36–37).

**Differential diagnosis.** *Silis wrasei* sp. nov. may be distinguished from *S. dowgailoi* Kazantsev, 1998, from the Alai Mountains in Kirghizia, to which it keys in the determination key to the Palaearctic *Silis* species (KAZANTSEV 1998a) by the coloration (mostly testaceous antennae, partly testaceous tarsi, etc.), less transverse

pronotum, considerably shorter elytra (fig. 35) and shorter aedeagus with oblique, not rounded apices of dorsal plate lobes (figs. 38–41).

**Derivatio nominis.** The new species is dedicated to our friend David Wrase (Gusow-Platkow), a well-known researcher in Carabidae, in gratitude for passing us the valuable material.

**Distribution.** China: Nei Mongol Autonomous Region.

#### Acknowledgements

We would like to thank Dr. Jiří Hájek (NMP), Maxwell V. L. Barclay, and Dr. Michael Geiser (BMNH) for the possibility to examine the type material. We would also like to thank David Wrase (Gusow-Platkow), Dr. Joachim Schmidt (Admannshagen) and Dr. Sergey Murzin (Moscow) for providing interesting material for our special collections and for the locality photographs, and Prof. Dr. Rolf G. Beutel, PD Dr. Hans Pohl (both Jena) and Dr. Birgit Lang (Görlitz) for their valuable help



**Figure 58.** High valley of Gyatso La, 5200–5300 m a.s.l., Type locality of *L. lhazeensis* sp. nov. (Photograph A. Schmidt).



**Figure 59.** View from Mt. Mendju Zari (5420 m) to the Lhasa Valley in the North. The specimen of *L. lapidarius* sp. nov. were collected along the side valley (foreground) at altitudes of 4600–4700 m (Photograph A. Schmidt).



**Figure 60.** Budha Valley, view from 5200 m to the Damxung Basin in the South, habitat of *L. schmidti* sp. nov. (Photograph A. Schmidt).



**Figure 61.** Helan Shan above Guangzong temple 2275–2420 m a.s.l. Most of the males of *S. wrasei* sp. nov. were collected on stones, the females in a small pit in soil (Photograph D. Wrase).

with the creation of the REM recordings. We express our sincere gratitude to the Thuringian entomologists association r.a., for the possibility to use the photographic equipment. Finally, we would like to thank Maxwell V. L. Barclay for the critical review of the English text.

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