A review of two *Trachycarabus* species of the genus *Carabus* known from Xinjiang, China (Coleoptera: Carabidae: Carabini)

Обзор двух видов подрода *Trachycarabus* рода *Carabus*, известных из Сыньцзяна, Китай (Coleoptera: Carabidae: Carabini)

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Ключевые слова: жужелицы, Китай, Синьцзян, таксономия, Coleoptera, Carabidae, *Carabus*, новый подвид, синонимия

INTRODUCTION

Carabid fauna of the Mongolian Altay Mountains is poorly known. New material on the genus *Carabus* Linnaeus, 1758 collected in this region over last years allows us to review local members of the subgenus *Trachycarabus* Géhin, 1876.

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a Canon EOS 40D digital camera, using stacking and subsequently processed with the Zerene stacker software version 1.04 (http://zerenesystems.com/stacker).

The following measurements were taken: body length (BL) from the anterior margin of the labrum to the elytral apex; head width (HW) across the eyes; pronotal length (PL) along its median line; elytral length (EL) from the apex of the scutellum to the apex of the elytra; width of the pronotum (PW) and elytra (EW) at their broadest point. The average values of measurements and indices are given in parentheses.

Under the “material” section, the number of specimens studied is followed by the number of the genitalic preparations given in parentheses.

The examined material are deposited in the following public institutions and private collection (the names of the curators of institution collections are in brackets): ICXU, College of Life Science and Technology, Urumqi, Xinjiang, China (H.-Y. Hu); IOZ, Institute of Zoology, Chinese Academy of Science, Beijing, China (H.-B. Liang); MFNB, Museum für Naturkunde Berlin, Germany (J. Frisch); ZIN, Zoological Institute of Russian Academy of Sciences, Saint Petersburg, Russia (B.M. Kataev); cBK, private collection of I.A. Belousov and I.I. Kabak, Saint Petersburg, Russia.

**TAXONOMY**

Tribe **CARABINI** Latreille, 1802

Genus **Carabus** Linnaeus, 1758

Subgenus **Trachycarabus** Géhin, 1876

**Carabus (Trachycarabus) sibiricus oblitteratus** Fischer von Waldheim, 1828

(Figs 1–10)

**Carabus obsoletus** Fischer von Waldheim, 1823: pl. 29, fig. 1 (non Rossi, 1790) (type locality: “Sibiriia”).

**Carabus oblitteratus** Fischer von Waldheim, 1828: 211 (type locality: “Sibiriia”); Kraatz, 1879: 391.

**Carabus riphaeus** Motschulsky, 1844: 110 (type locality: “Irtysch à Pianojarsk”), syn.: Obydov, 2002: 357.

**Carabus sibiricus var. frontosus** Lapouge, 1905: 302 (type locality: “entre Kholdja et Ourga”), syn.: Obydov, 2002: 357; Lapouge, 1908: 53 “Mongolie septentrionale”.

**Carabus (Carabus) sectio Trachycarabus oblitteratus** Jacobson, 1906: 248 “Semipalat. Semi-retsh.”.

**Carabus (Trachycarabus) sibiricus var. oblitteratus ab. frontosus** Csiki, 1927: 273 “Kuldsha”.

**Carabus (Carabus) sectio Trachycarabus sibiricus n. oblitteratus m. riphaea** Breuning, 1932: 483, 486 “Ufer des Irtysch: Pianojarsk, Ust-Kamenogorsk”.

**Carabus (Carabus) sectio Trachycarabus sibiricus n. oblitteratus** Breuning, 1932: 483, 486 “Sibirien: Ufer des Irtysch von Semipalatinsk bis Buchtarminsk, Ust-Kamenogorsk, Tarbagatai; Ajagus”.

**Carabus (Carabus) sibiricus pseudoblitteratus** Korell et Kleinfeld, 1982: 214 (type locality: “NW-China, Xinjiang, Ake Tei A Zhu Pai [oder Ala Tei A Zhu Pai]-Tempel”), syn. nov.


**Carabus (Morphocarabus) sibiricus** (pars.): Deuve, 1991: 50.
Figs 1–10. Carabus (Trachycarabus) sibiricus obliteratus (1–3, general view; 4–6, 8, median lobe; 7, same, distal portion; 9, 10, endophallus). 1, 4, Fuhai forest land (1, male, BL = 27.6 mm); 2, 6, 7, Kran Valley (2, male, BL = 25.5 mm); 3, female paratype of C. s. pseudobliteratus (BL = 25.9 mm); 5, Hualin Park; 8, Azutau; 9, 10, Ulbinske. Lateral view (4–6, 8, 9), postero-lateral view (7), dorsal view (10). Scale bars: 5 mm.
de Bolshenarymskoe et de Kokpekty, Mongolia: Kobdo).

*Carabus* (Morphocarabus) *sibiricus pseudobliteratus*: Deuve, 1994: 110; Deuve, 1997: 95


*Carabus cicatricosus*: Hu & Huang, 2013: 65, Fig. 4 (non Fischer von Waldheim, 1842) “Ta-cheng”.

*Type material examined.*


*Description* (seven specimens measured).

Large-sized subspecies with elongate and convex body (Fig. 1–3), BL = 25.2–28.1 (26.7) mm. Appendages average in size for subgenus. Dorsum entirely black, slightly shiny.

Head larger than average in size for subgenus, PW/HW = 1.51–1.61 (1.56). Forehead evenly convex, frontal foveae sharply impressed anteriorly, rather shallow posteriorly (especially in females), usually extending behind the level of anterior margin of eyes. Dorsal surface deeply rugulose. Eyes nearly hemispheric. Labial tooth narrow, acute, shorter than the lateral lobes. Antennae surpassing the base of pronotum by 2.5–3.5 distal segments.

Pronotum wide, PW/PL = 1.52–1.62 (1.58), broadest near or slightly before the middle, with two marginal setae on each side, one near hind angle and one near the middle. Lateral margins evenly rounded throughout or with a subrectilinear portion behind the middle, not sinuate before hind angles. Anterior margin concave, its border complete. Pronotal base wider than anterior margin, rectilinear or slightly convex medially. Hind angles large, lobed, widely rounded at apices, produced backwards. Marginal groove wide, dilated posteriorly, lateral margins moderately reflexed. Basal foveae shallow, vaguely outlined. Disk convex, basal surface not flattened. Median line fine, not impressed, reaching anterior border and nearly reaching posterior margin. Surface roughly rugulose, more sparsely medially, very densely toward margins, without distinct punctures.

Elytra elongate and ovate, broadest near or slightly behind the middle, EL/EW = 1.45–1.55 (1.49), EW/PW = 1.24–1.32 (1.28), EL/PL = 2.94–3.12 (3.02). Shoulders rounded, slightly prominent. Disk convex, not flattened along suture. Marginal groove rather wide, margins slightly reflexed. Elytral sculpture shallow, punctures of striae small and dense; intervals uniform, flat or slightly convex, punctured or very faintly granulate; primary foveae small and shallow.

Prosternum smooth, metepisternum short and punctate, abdominal sternites nearly glabrous laterally, abdominal sulci sharp. Anal segment with a row of setae along apical margin.

Median lobe of aedeagus (Figs 4–6) rather stout, markedly bent in basal third, its ventral margin in lateral view straight at the middle, right wall with a characteristic
plica near apical orificium (Fig. 7), apical lamella rather short, narrow, curved ventrally.

Comparison. From all other geographic forms of *C. sibiricus*, this subspecies is distinguished by the larger body size and wider head.

Distribution. Based on the examined material and the literature data on distribution included in the synonymy section, the range of the subspecies is restricted to the southwestern and southern Altay (Eastern Kazakhstan) and the central part of the Mongolian Altay Mountain Range (China, Xinjiang Uygur Autonomous Region): Kran Valley, Fuhai forest land, Azubai in the Dzhelty Basin. The records from “Kobdo” (= Khovd, 1999; Obydov, 2002) are doubtful, since no further specimens were found in these well-explored areas during the last several decades. The record from the Tien Shan Mountains near Korla City (Schütze & Kleinfeld, 1995) seems to be based on the misinterpretation of the label data. The records from the European part of Russia, West and East Siberia (Bousquet et al., 2003) should be referred to other subspecies of *C. sibiricus*.

Bionomics. In the Mongolian Altay Mountain Range, specimens of this taxon were collected at elevations of 870–1800 m.

Remarks. The first record of *C. sibiricus* from the territory of China was published by Lapouge (1905), who described *C. s. frontosus* on the basis of a specimen taken by J. Chaffanjon’s expedition in 1894–1896 from the area between “Kuldzha” and “Urga”, most likely in the Chinese part of the Mongolian Altay. The type specimen of *C. s. frontosus* has been lost (Toulgoët, 1976). Breuning (1932) synonymized *C. s. obliteratus* with *C. s. frontosus*. Obydov (2002) followed this interpretation in his revision. In 1982, Korell and Kleinfeld described *C. s. pseudobliteratus* based on two specimens from “NW-China, Xinjiang, Ake Tei AZhu Pai-Tempel”. Later, Schütze and Kleinfeld (1995: 69) erroneously placed this locality to the north of Korla City on the southern slopes of the eastern part of the Tien Shan Mountains. In fact, Korell and Kleinfeld (1982) incorrectly translated the Chinese label, and the type specimens of this taxon were collected in “Ala Tei [= Altay] Azhu Pai [= Azubai]” (ca. 47°51’42” / 88°48’54” E), the Altay Mountains. Many authors subsequently considered *C. s. pseudobliteratus* to be a valid subspecies since no further material from Xinjiang was collected. Based on the examined paratype, a photograph of the holotype, and some additional specimens from the Chinese part of the Mongolian Altay, we treat *C. s. pseudobliteratus* as a junior synonym of *C. s. obliteratus*. The southernmost finding of the latter was known from the Azutau Mountain Range located in Eastern Kazakhstan not far from the Chinese boundary. Since the male genitalia of *C. s. obliteratus* were figured too schematically in the revision of Obydov (2002), herewith we provide photographs of the aedeagus (Fig. 9) and endophallus (Figs 9–10) of this taxon.

**Carabus (Trachycarabus) mandibularis abakkereiorum** subsp. nov.
(Figs 11–17)

**Holotype.** Male (1) (ZIN), China, Xinjiang, Altay Mt. R., Kran Valley, N of Altay Town, 47°55’37”N / 88°08’23”E, h = 1015 m, 31.VII.2015 (I.I. Kabak leg.)

**Paratypes.** One (1) male, 2 females (cBK), same data as holotype; 1(1) male (ICXU), Xinjiang, without exact geographic data, labelled: “72002”.

**Description** (five specimens measured). Medium-sized subspecies with elongate and moderately convex body (Figs. 11, 12), BL = 21.7–24.0 (22.6) mm. Appendages average in length. Dorsum entirely black, rarely elytra and margins of pronotum tinged with brownish, surface rather shiny.

Head average in size, PW/HW = 1.60–1.65 (1.63). Forehead evenly convex, frontal foveae narrow and deep anteriorly, rather shallow posteriorly, extending behind the level of anterior margin of eyes. Dorsal surface faintly rugulose, without punctures.
Figs 11–21. Carabus (Trachycarabus) mandibularis. 11–17, C. (T.) m. abakkereiorum subsp. nov.; 18, C. (T.) m. mandibularis; 19–21, C. (T.) m. bukhtarmensis (11, 12, general view; 13–15, 18, 19, median lobe; 16, 17, same, distal portion; 20, 21, endophallus). 11, 13, 16, male from "Xinjiang" (BL = 22 mm); 12, female (BL = 21.7 mm); 14, 15, 17, males from "Kran Valley"; 18, Blagodatnoe; 19, paralectotype from Tshernovaya; 20, 21, paralectotype from Bolshenarymskoe. Lateral view (13–15, 18–20), postero-lateral view (16, 17), dorsal view (21). Scale bars: 5 mm.
Eyes markedly protruding. Labial tooth narrow, acute, shorter than the lateral lobes. Antennae surpassing pronotal base by 3.5 distal segments.

Pronotum not wide, PW/PL = 1.41–1.54 (1.47), broadest near or slightly before the middle, with two marginal setae on each side, one near hind angle and one near the middle. Lateral margins evenly rounded throughout, rarely subrectilinear posteriorly, not sinuate before hind angles. Anterior margin concave, completely bordered. Basal margin usually subconvex, occasionally straight medially. Hind angles very large, triangularly lobed, shortly rounded at apices, protruding backwards. Marginal groove very wide, dilated posteriorly, lateral margins markedly reflexed. Basal foveae not deep, vaguely outlined. Disk convex, basal surface slightly impressed. Median line shallow, reaching anterior border and not reaching posterior margin of pronotum. Wrinkles on disk fine, marginal groove and basal surface more roughly and densely rugulose.

Elytra elongate and ovate, broadest near or slightly behind the middle, EL/EW = 1.44–1.53 (1.48), EW/PW = 1.24–1.34 (1.30), EL/PL = 2.69–2.91 (2.82). Shoulders rounded, moderately prominent. Disk convex, seldom slightly flattened along suture anteriorly. Marginal groove wide, lateral margins distinctly reflexed throughout. Elytral sculpture homodynamic, striae consisting of regular rows of punctures, intervals uniform, flat or subconvex, very finely punctate or granulate, primary foveae small but distinct.

Prosternum and visible abdominal sternites smooth, abdominal sulci complete. Anal segment more or less distinctly rugulose, with a row of setae along apical margin.

Median lobe of aedeagus (Figs. 13–15) thin, more or less evenly arched, apical lamella rather short, dilated distally (Figs. 16–17).

Comparison. By its elongate body, the new subspecies is similar to C. (T.) m. mandibularis Fischer von Waldheim, 1828, but
differs from it in the more regular elytral sculpture: striae deeper, interspaces nearly smooth, primary foveae distinct. From C. (T.) m. bukhtarmensis Kryzhanovskij, 1953, C. (T.) m. abakkereiorum subsp. nov. is readily distinguished by the larger size, elongate body and pronotal lateral margins less widely reflexed. Additionally, the new taxon is easily recognizable among the above-mentioned subspecies by having the aedeagal median lobe thin and evenly curved, with apical lamella broad and widened distally (see Figs 13–15 and Figs 18, 19).

Etymology. The species name is derived from Abak-kerei, the name of a tribe of the Kazak people living in the Chinese part of the Altay.

Distribution. The new subspecies was collected on the left bank of the Kran River to the north of the Altay City, Xinjiang Uygur Autonomous Region of China.

Bionomics. This taxon was found at an elevation of 1015 m, in steppe habitats on foothills.

Remarks. Up to now, two subspecies of C. (T.) mandibularis were known. The nominotypical one is endemic to the Saur and Tarbagatai mountains; its records for “Kobdo” (= Khovd) in Northwestern Mongolia (Kryzhanovskij, 1953; Obydov, 2002, 2009; Dudko & Zintshenko, 2009) are wrong. Carabus (T.) m. bukhtarmensis is distributed in the Southern Altay Mountains (including Kalbinskyi Mountain Range). Since the male genitalia of C. mandibularis were figured too schematically in the revision of Obydov (2002), herewith we provide photographs of the aedeagus (Figs 18, 19) and endophallus (Figs 20, 21) of the nominotypical subspecies and of C. (T.) m. bukhtarmensis.

CONCLUSION

In the Xinjian Uygur Autonomous Region of China, two species of the subgenus Trachycarabus have been found on the southwestern slopes of the Mongolian Altay Mountain Range. Carabus sibiricus is represented there by the subspecies C. s. obliteratus, which is distributed also in the Southern and Southwestern Altay (Eastern Kazakhstan). Despite of the fact that two subspecies names (C. s. frontosus and C. s. pseudobliteratus) were proposed for the Xinjiang race of this species, the latter does not differ significantly from C. s. obliteratus and, therefore, the above mentioned names fall into synonymy. Carabus mandibularis is the second Trachycarabus species found in Xinjiang. Its nominotypical subspecies inhabits the Saur-Tarbagatai Mountain system while C. m. bukhtarmensis is described from Southern Altay. In China this species is represented by the subspecies C. m. abakkereiorum subsp. nov. which seems to be endemic to the Mongolian Altay Mountain Range.

Key to the taxa of the subgenus Trachycarabus from the Xinjiang Uygur Autonomous Region of China

1. Size larger, body length (without mandibles) more than 25 mm. Hind angles of pronotum shorter, rounded at apices. Dorsal surface of head and pronotum roughly wrinkled. Elytral sculpture irregular, punctures on interspaces as deep as those in striae, primary foveae hardly perceptible. Median lobe of aedeagus stouter and less evenly curved (Figs 4–6), its right side near apical orifice with a large plica (Fig. 7); apical lamella narrow and curved ventrally in lateral view ................. C. sibiricus obliteratus

Size smaller, body length (without mandibles) less than 24 mm. Hind angles of pronotum longer, triangular. Wrinkles on dorsal surface of head and pronotum shallow. Elytral sculpture more regular, punctures in striae deeper than those on interspaces, primary foveae well-developed. Median lobe of aedeagus thinner, more evenly curved (Figs 13–15), its right side near the apical orifice simple (Figs 16, 17); apical lamella broad in lateral view ......................... C. mandibularis abakkereiorum subsp. nov.

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