

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 Синьцзяна, Китай (Coleoptera: Carabidae: Carabini)

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The paper deals with the taxonomy of two species of the subgenus *Trachycarabus* Géhin, 1876 of the genus *Carabus* Linnaeus, 1758, occurring in the Altay Mountains in the Xinjiang Uygur Autonomous Region of China: *C. (T.) mandibularis* Fischer von Waldheim, 1828 and *C. (T.) sibiricus* Fischer von Waldheim, 1820. A new subspecies, *C. (T.) mandibularis abakkereiorum* **subsp. nov.** is described from the Kran River Valley near Altay City. A new synonym is proposed: *C. (T.) sibiricus obliteratus* Fischer von Waldheim, 1828 = *C. (T.) s. pseudobliteratus* Korell et Kleinfeld, 1982, **syn. nov.** A key to the *Trachycarabus* species currently known from Xinjiang is given.

В статье рассмотрена таксономия двух видов подрода *Trachycarabus* Géhin, 1876 рода *Carabus* Linnaeus, 1758 из Монгольского Алтая в границах Синьцзян-Уйгурского автономного района Китая: *C. (T.) mandibularis* Fischer von Waldheim, 1828 и *C. (T.) sibiricus* Fischer von Waldheim, 1820. Описан новый подвид *C. (T.) mandibularis abakkereiorum* **subsp. nov.** из долины реки Кран у города Алтай. Предложена новая синонимия: *C. (T.) sibiricus obliteratus* Fischer von Waldheim, 1828 = *C. (T.) s. pseudobliteratus* Korell et Kleinfeld, 1982, **syn. nov.** Приведена определительная таблица видов подрода *Trachycarabus*, известных из Синьцзяна.

Key words: ground beetles, China, Xinjiang, taxonomy, Coleoptera, Carabidae, *Carabus*, new subspecies, synonymy

Ключевые слова: жуличицы, 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.

The present study is based on the examination of the material preserved in the public institution collections and the specimens collected by one of the authors (I.I. Kabak) in the mountains of Kazakhstan and Xinjiang.

Specimens were examined with a MBS-10 stereomicroscope and measured with ocular micrometer, the habitus and genitalia photographs were taken with

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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 obliteratus Fischer von Waldheim, 1828 (Figs 1–10)

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

Carabus obliteratus Fischer von Waldheim, 1828: 211 (type locality: “Siberia”); Kraatz, 1879: 391.

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

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

Carabus (Carabus: sectio Trachycarabus) obliteratus: Jacobson, 1906: 248 “Semipalat. Semiretsh.”.

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

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

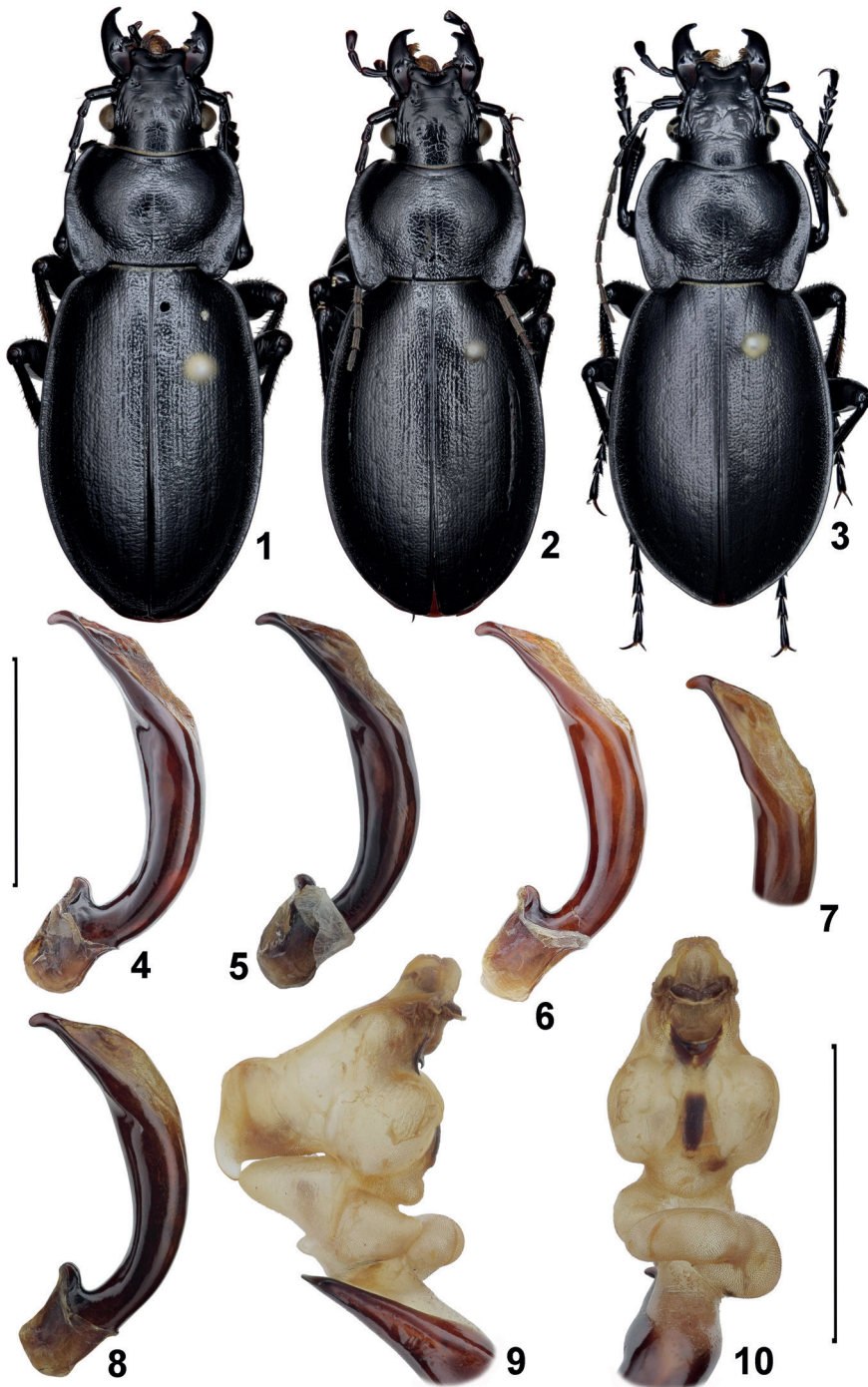
Carabus (Carabus: sectio Trachycarabus) sibiricus n. *obliteratus*: Breuning, 1932: 483, 486 “Sibirien: Ufer des Irtytsch von Semipalatinsk bis Buchtarminsk, Ust-Kamenogorsk, Tarbagatai; Ajagus”.

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

Carabus (Trachycarabus) sibiricus pseudobliteratus: Darge, 1991: 12 “NW-China: Xinjiang, ? Korla env.”; Schütze & Kleinfeld, 1995: 69, 147, 163; Schütze & Kleinfeld, 1997: 67, 179, 190; Lorenz, 1998: 75; Březina, 1999: 22; Obydov, 2002: 358 “North-western China, Xinjiang, Ake Tei A-Zhu Pai Temple (probably to the north from Korla)”; Bousquet et al., 2003: 200 “Xinjiang”; Lorenz, 2005: 79.

Carabus (Morphocarabus) sibiricus (pars.): Deuve, 1991: 50.

Carabus (Trachycarabus) sibiricus obliteratus: Březina, 1994: 22, 113 “N-Mongolia”; Schütze & Kleinfeld, 1995: 24, 138; Shilenkov, 1996: 29 “SE Altay”; Schütze & Kleinfeld, 1997: 32, 169; Lorenz, 1998: 75; Březina, 1999: 22 “? N Mongolia”; Obydov, 2002: 356, figs 1 (4–6), 2 (2), 3 (2) “Eastern Kazakhstan: Mouth of Bukhtarma River and upper level of Irtysh River Valley: Zyrianovsk env., Ognevka env., Serebriansk env., Ulbinskoe env., Ust-Kamenogorsk env., Bolshenarymskoe env., Kokpekty env.; Mongolia: Kobdo”; Bousquet et al., 2003: 199; Lorenz, 2005: 79; Obydov, 2009: 18, figs 6–8, 32 “Kazakhstan oriental: embouchure de la rivière Bukhtarma et cours supérieur de la rivière Irtysh: environs de Zyrianovsk, d’Ogniovka, de Serebriansk, d’Ulbinskoe, d’Ust-Kamenogorsk,



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, Ulbinskoe. Lateral view (4–6, 8, 9), postero-lateral view (7), dorsal view (10). Scale bars: 5 mm.

de Bolshenarymskoe et de Kokpekty. Mongolie: Kobdo”.

Carabus (Morphocarabus) sibiricus pseudobliteratus: Deuve, 1994: 110; Deuve, 1997: 95 “Temple de ‘Ake Tei AZhu Pai’ (ou ‘Ala Tei AZhu Pai’)”; Deuve, 2004: 154 “NW China, Xinjiang, near Korla, ‘Ake-Tei-Azhu-Pai Temple’”; Schütze & Kleinfeld, 2007: 11, 141; Deuve, 2008: 15; Deuve, 2013: 27, 164.

Carabus (Morphocarabus) sibiricus obliteratus: Imura & Mizusawa, 1996: pl. 12, fig. 83–2 “USSR, Siberia, Zyrjanovsk, W Altay”; Deuve, 1994: 110; Deuve, 2004: 152 “N Mongolia”.

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

Type material examined. Holotype of *C. sibiricus pseudobliteratus*: male (IOZ, photograph by H.-B. Liang), China, Xinjiang, with two labels in Chinese: “1960.VIII.7 Wang Shuyong collector”; “Xinjiang: Altay, Azubai, 1750 m, Chinese Academy of Sciences”; “IOZ(E) 220503”; “Holotypus *Carabus (Trachycarabus) sibiricus pseudobliteratus* nov. ssp. Korell et Kleinfeld, 1982”. Paratype: female (MFNB), China, Xinjiang, “Prov. Xinjiang: Ake Tei A Zhu Pai 1750 m, 5.VIII.1960, leg. Wan Su Yung, China Naturwiss. Institut”; “Paratypus *Carabus (Trachycarabus) sibiricus pseudobliteratus* nov. ssp. det. Korell et Kleinfeld, 1982”.

Additional material. China, Xinjiang: 3 (2) males, 2 females (ICXU), Fuhai forest land, 1400–1800 m, 14.VI.2002 (in Chinese) (47°59′21″N / 89°03′16″E, h = 1532 m); 1 (1) male, 2 females (ZIN), “vysok. nagor. bass. r. Krana 20–25.VI.903. Gr. Grzh.” (in Cyrillic) [upland in the Kran River basin, 25.VI.1903, G.E. Grum-Grzhimajlo leg.]; 1 (1) male, 1 female (IOZ), “China, Xinjiang Prov., Aletai city, Hualin park, 2007.VII.26. Liu Y. leg. IOZ. Chinese Acad. Sci.” (ca. 47°51′55″N / 88°07′06″E, h = 870 m).

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 Dzhetly Basin. The records from “Kobdo” (= Khovd) and Northern Mongolia (Březina, 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. oblitteratus* with *C. s. frontosus*. Obydov (2002) followed this interpretation in his revision. In 1982, Korell and Kleinfeld described *C. s. pseudoblitteratus* 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. pseudoblitteratus* 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. pseudoblitteratus* as a junior synonym of *C. s. oblitteratus*. 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. oblitteratus* 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.**

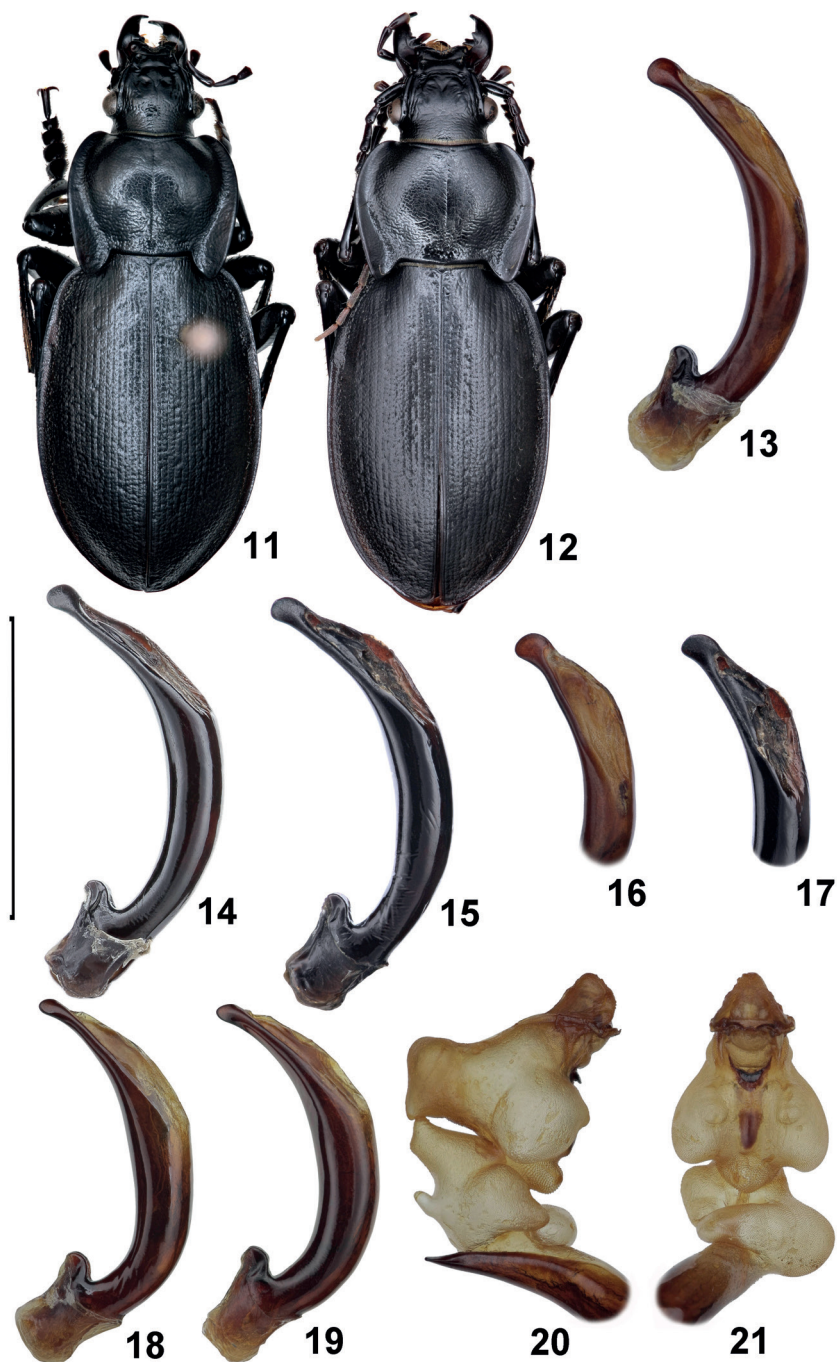
(Figs 11–17)

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.



Fig. 22. Habitat of *Carabus* (*Trachycarabus*) *mandibularis abakkereiorum* subsp. nov. on the right bank of the Kran River.

Eyes markedly protruding. Labial tooth narrow, acute, shorter than the lateral lobes. Antennae surpassing pronotal base by 3.5 distal segments.

Pronotum not wide, $PW/PL = 1.41\text{--}1.54$ (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, $EL/EW = 1.44\text{--}1.53$ (1.48), $EW/PW = 1.24\text{--}1.34$ (1.30), $EL/PL = 2.69\text{--}2.91$ (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 Kalbinskiy 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. obliteratedus*, 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. pseudobliteratedus*) were proposed for the Xinjiang race of this species, the latter does not differ significantly from *C. s. obliteratedus* 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 obliteratedus*
- 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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REFERENCES

- Bousquet Y., Březina B., Davies A., Farkač J. & Smetana A.** 2003. Tribe Carabini Latreille, 1802. In: **I. Löbl & A. Smetana** (Eds). *Catalogue of Palearctic Coleoptera*, **1**: 118–206. Stenstrup: Apollo Books.
- Breuning S.** 1932. Monographie der Gattung *Carabus* L. (2. Teil). *Bestimmungs-Tabelle der europäischen Coleopteren*, **105**: 291–496. Troppau.
- Březina B.** 1994. The check-list of the genus *Carabus* L. (Coleoptera, Carabidae). *Klapalekiana*, **30**(1–2): 1–164.
- Březina B.** 1999. *World catalogue of the genus Carabus L. Pensoft Series Faunistica*, **15**. Sofia–Moscow: Pensoft Publishers. 170 p.
- Csiki E.** 1927. *Carabidae: Carabinae I. Coleopterorum Catalogus*, **91**. Berlin: Ed. Schenckling. 313 S.
- Darge Ph.** 1991. Liste des sous-genres, espèces, sous-espèces et races du genre *Carabus* par Carl L. Blumenthal. *Revue d'entomologie Generale, Lambillionea*, **4**: 1–41.
- Deuve Th.** 1991. *La nomenclature taxonomique du genre Carabus. Bibliothèque entomologique*, **4**. Paris: Sciences Nat. 198 p.
- Deuve Th.** 1994. *Une classification du genre Carabus. Bibliothèque entomologique*, **5**. Paris: Sciences Nat. 296 p.
- Deuve Th.** 1997. Catalogue des Carabini et Cychnini de Chine. *Mémoires de la Société entomologique de France*, **1**: 1–236.
- Deuve Th.** 2004. *Illustrated catalogue of the genus Carabus of the World. Pensoft Series Faunistica*, **34**. Sofia–Moscow: Pensoft Publishers. 462 p.
- Deuve Th.** 2008. *List Blumenthal 2008 (Liste des taxons valides du genre Carabus L., 1758)*. Paris: Magellanes. 46 p.
- Deuve Th.** 2013. *Cychrus, Calosoma et Carabus de Chine. Pensoft Series Faunistica*, **105**. Sofia–Moscow: Pensoft Publishers. 307 p.
- Dudko R.Yu. & Zintshenko V.K.** 2009. To the fauna of Coleoptera of the Markakol Reservation and its environments. *Proceedings of the Markakol State Natural Reservation*. **1**(1): 185–203. (In Russian).
- Fischer von Waldheim G.** 1823. *Entomographie de la Russie* [Entomographia imperii Rossici], **2**. Moscou: Semen. 40 pls.
- Fischer von Waldheim G.** 1828. *Entomographie de la Russie* [Entomographia imperii Rossici], **3**. Moscou: Semen. VIII+314 p.+18 pl.
- Fischer von Waldheim G.** 1842. *Catalogus Coleopterorum in Siberia orientali a Cel. Gregorio Silide Karelin collectorum*. Moscou. 28 p.
- Hu Hongying & Huang Renxin** (Eds), 2013. *Colored pictorial handbook of insects in Xinjiang*. Urumqi: Xinjiang University press. 300 p. [In Chinese].
- Jacobson G.G.** 1906. Fasc. 4. *Zhuki Rossii i Zapadnoy Evropy* [Beetles of Russia and Western Europe]: 241–320. Sankt-Petersburg: A.F. Devrien. [In Russian].
- Imura Yu. & Mizusawa K.** 1996. *The Carabus of the World. Mushi-Sha's Iconographic Series of Insects*, **2**. Mushi-Sha. 261 p.
- Korell A. & Kleinfeld F.** 1982. Eine neue subspecies des *Carabus sibiricus* Fisch. aus China (Col. Carabidae). *Entomologica basiliensia*, **7**: 214–216.
- Kraatz G.** 1879. Ueber die Varietaten und Verwandten des *Carabus sibiricus* Fisch. und *obliteratus* Fisch. *Deutsche Entomologische Zeitschrift*, **23**: 387–398.
- Kryzhanovskij O.L.** 1953. *Zhuzhelitsy Srednei Azii (rod Carabus). Opredeliteli po faune SSSR* [Ground-beetles of Middle Asia (genus *Carabus*). Keys to the fauna of USSR], **52**. Moscow–Leningrad: AN SSSR. 134 p. [In Russian].
- Lapouge G.** 1905. Notes sur les carabes et calosomes recueillis par M. Chaffanjon dans le nord de la Mongolie. *Bulletin du Museum national d'histoire naturelle*, **11**: 301–306.
- Lapouge G.** 1908. Tableaux de détermination des formes du genre "*Carabus*". *L'Echange, Revue Linnéenne*, **24**: 52–53.
- Lorenz W.** 1998. *Systematic list of extant ground beetles of the world (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). First Edition*. Tutzing: typeset and printed by W. Lorenz. 502 p.
- Lorenz W.** 2005. *A systematic list of extant ground beetles of the world (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). Second Edition*. Tutzing: typeset and printed by W. Lorenz. 530 p.
- Motschulsky V.** 1844. Insectes de la Sibirie rapportés d'un voyage fait en 1839 et 1840. *Mé-*

- moires de l'Académie Impériale des Sciences de St-Petersbourg, **5**(1-3): 1-274, I-XV+10 pl.
- Obydov D.** 2002. A review of the "Carabus sibiricus" species group of the Asian Russia (Coleoptera, Carabidae). *Lambillionea*, **102**(3): 353-373.
- Obydov D.** 2009. *Faune des Carabus de Sibérie & d'Extrême-Orient russe – I. Lipastrimorphi*. Collection systématique, **20**. Andrésy: Magellanes. 147 p.
- Schütze H. & Kleinfeld F.** 1995. Die Carabenformen Chinas mit dem ausführlichen Verzeichnis ihrer Fundorte. Supplement Taxonomischer Katalog Chinesischer Carabiden (Coleoptera Carabidae). *Coleoptera*, **3**: 1-164.
- Schütze H. & Kleinfeld F.** 1997. Die Carabenformen Chinas mit dem ausführlichen Verzeichnis ihrer Fundorte (Coleoptera Carabidae). Neuauflage. *Coleoptera*, **3**: 1-231.
- Schütze H. & Kleinfeld F.** 2007. *Die Caraben Chinas. Systematic–alle Taxa–Bibliographie–Lexicon aller literaturbekanntesten Fundorte*, **3**. Völlig überarbeitete Auflage. Schwanfeld: Delta Druck + Verlag Peks. 332 S.
- Shilenkov V.G.** 1996. *Zhuzhelitsy roda Carabus L. (Coleoptera, Carabidae) Yuzhnoy Sibiri* [Carabid-beetles of the genus *Carabus* (Coleoptera, Carabidae) of Southern Siberia]. Irkutsk: Izdatelstvo Irkutskogo Universiteta. 74 p. (In Russian).
- Toulgoët H.**, 1976. Les types du genre *Carabus* (s. l.) du Muséum National d'Histoire Naturelle de Paris (Coléoptères Carabidae Carabinae) (suite et fin). *Nouvelle Revue d'Entomologie*, **6**(1): 25-43.

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