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A review of the subgenus *Arctolina* KONTKANEN, 1959 of the genus *Chrysolina* MOTSCHULSKY, 1860 (Coleoptera: Chrysomelidae: Chrysomelinae)

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ABSTRACT. 18 species are included in the subgenus *Arctolina* herewith.There are two groups of species: one is distributed in the mountains of E.Kazakhstan, Altai, and N.-W. China, and the other - mostly in N. Eurasia and Alaska. Type specimens of 22 nominal taxa belonging to *Arctolina* are examined. Lectotypes of *Chrysomela birulai* JACOBSON, 1910, *Ch. birulai* var. *glacialis* JACOBSON, 1910, *Ch. birulai* var. *novosibirica* JACOBSON, 1910, *Ch. birulai* var. *wollosowiczi* JACOBSON, 1910, *Ch. bungei* JACOBSON, 1910, *Ch. saurica* JACOBSON, 1924, *Ch. sculpturata* JACOBSON, 1895, *Ch. septentrionalis* var. *tundralis* JACOBSON, 1910, *Ch. subsulcata* MANNERHEIM, 1853, and *Ch. teleuta* JACOBSON, 1922 are designated. Neotype of *Chrysomela sulcata* GERMAR, 1824 is designated. The following new synonymy is established: *Chrysolina magniceps* (SAHLBERG, 1887) (= *birulai* var. *wollosowiczi*, = *birulai* var. *novosibirica*), *Ch. septentrionalis* (MÉNÉTRIÉS, 1851) (= *caurina* BROWN, 1962), *Ch. subsulcata* (= *birulai* var. *glacialis*), *Ch. borochorensis* LOPATIN, 2000 (= *naratica* LOPATIN, 2000). *Ch. boeberi* (HAROLD, 1874) is a separate species, not a subspecies of *Ch. subsulcata*; *Ch. tundralis* is a separate species, not a subspecies of *Ch. septentrionalis*. *Ch. magniceps* is a good species, not a synonym of *Ch. subsulcata*. *Ch. dubeshkoae* is excluded from the subgenus *Arctolina*.

Key words: Entomology, systematics, Coleoptera, Chrysomelidae, *Chrysolina*, *Arctolina*.

MATERIAL

I have examined the type specimens from the Zoological Institute of Russian Academy of Sciences (ZIN), Naturhistorisches Museum Wien (NHMW), the Smithsonian Institution, the National Museum of Natural History (USNM), and additional materials from the Zoological Institute of Russian Academy of Sciences, the Zoological Museum of Moscow State University, Museum für Tierkunde

Dresden, Deutsches Entomologisches Institut, the Zoological Museum of University of Helsinki, Museum für Naturkunde der Humboldt-Universität, the Smithsonian Institution, and from private collections.

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Subgenus *Arctolina* KONTKANEN, 1959

Chrysolina (*Arctolina*) KONTKANEN, 1959: 31.
Chrysolina (*Pleurosticha*): LOPATIN 1977: 149; LOPATIN & KULENOVA 1986: 103.
Chrysolina (*Arctolina*): MEDVEDEV 1982: 83; JOLIVET 1992: 43; MEDVEDEV and DUBESHKO 1992: 107.

Type species: *Chrysomela birulai* JACOBSON, 1910, by the original designation.

Etymology was not explained by KONTKANEN (1959). It is a composite name and derived from the Latin word „*arctous*" meaning „northern" and part of the generic name „*Chrysolina*"; these may refer to the distribution of the species which were originally included in the subgenus.

DISTRIBUTION

There are two groups of species: one is distributed in the mountains of E. Kazakhstan, Altai, and N.-W. China, and the other - mostly in N. Eurasia and Alaska.

DIAGNOSIS

1. Dorsum dark metallic or black.
2. Last segment of maxillary palpus does not differ in both sexes or slightly broader in male than in female.
3. Pronotum swollen laterally at entire length, lateral callus separated from disk by impression at least in basal half.
4. Elytron without humeral callus or with very weak callus, striato-punctate. Rows regular or 5-8th partly irregular, placed at equal distance from each other (in some specimens of *Ch. valichanovi* rows slightly paired). Intervals from flat to strongly elevated, similar in appearance or alternating intervals more elevated.
5. Epipleuron visible at entire length in lateral view.
6. Hind wings vestigial or absent.
7. Ventral part of tarsi entirely pubescent in both sexes, or in female first segment sparsely ciliate, or with narrow glabrous stripe in basal half. In male all tarsi or only fore and mid ones broadened, in female tarsi narrow.
8. Pygidium with weak longitudinal sulcus basally or evenly convex.
9. Male last abdominal sternum more or less convex or swollen, mostly with narrow sulcus along apical margin; female last abdominal sternum more or less convex or swollen, with narrow apical sulcus or without it.
10. Aedeagus oval in cross-section or flattened, curved, with small but always distinct alae, flagellum invisible.

DIFFERENTIAL DIAGNOSIS

Subgenus *Arctolina* is very close to subgenus *Pleurosticha* MOTSCHULSKY, 1860, which I revised before (BIENKOWSKI, 1999). KONTKANEN (1959) separated *Arctolina* from *Pleurosticha* as follows: „das letzte Bauchsegment sowohl beim Weibchen als auch beim Männchen einfach gebaut ist und der Aedoeagus ein anderen und einfacheren Bauplan aufweist". According to MEDVEDEV & DUBESHKO (1992), in *Pleurosticha*, aedeagus with large, projected alae, last abdomonal sternum with deep transverse-oval apical impression; in *Arctolina*, aedeagus with small, weakly developed alae, last abdominal sternum without deep apical impression, usually with narrow apical sulcus. However, the shape of the last abdominal sternum, which is typical of *Arctolina*, is present also in some members of the subgenus *Pleurosticha*, namely in both sexes of *Ch. latimargo*, in female of *Ch. tolli*, *Ch. gebleri*, and *Ch. sylvatica*. Therefore, I think that only the shape of alae of aedeagus gives us a clear character for the separation of these two subgenera.

Chrysolina ballioni (LOPATIN, 1968)

(Fig. 46)

Chrysomela (*Pleurosticha*) *ballioni* LOPATIN, 1968: 549 (Kazakhstan: „Sergiopol", ZIN).

Chrysolina (*Pleurosticha*) *ballioni* (LOPATIN, 1968): LOPATIN 1977: 149; LOPATIN & KULENOVA 1986: 103.
Chrysolina (*Arctolina*) *ballioni* (LOPATIN, 1968): LOPATIN 1990: 54.

Length 6.3-6.5 mm (male), 7.0 mm (female).

Body elongate oval, slightly convex. Dorsum shagreen, sericeous shining in both sexes, or moderately shining in male; violaceous. Underside and legs blackish brown with bronze reflection.Antennae brown with segments 1 and 2 rufous below.

Last segment of maxillary palpus broadly oval, truncate, 1.3 times longer than wide, 1.4 times longer and 1.3 times broader than previous one, similar in both sexes.

Antenna inserted at equal distance between clypeus and eye, narrow, with segments 6-11 slightly broadened. Segment 10 c. 1.6 times longer than wide.

Pronotum broadest near mid-length (male) or basally (female), arc-shaped laterally, slightly narrowed towards base, more distinctly narrowed anteriorly. Anterior margin ciliate. Disk covered with dense minute punctures. Lateral sides swollen at entire length. Lateral impressions moderately deep at the entire length (more deepened and bearing sharp outer border in basal 1/2 and apical 1/3), filled with a few large punctures.

Propleura slightly convex, with shallow impression filled with obsolete transverse wrinkles along outside. Basal fold of propleura distinct.

Elytron with very weak humeral callus, with abbreviate scutellar row and 10 regular, sometimes slightly undulate rows of dense punctures. Row 10 with distinct punctures. Intervals slightly convex, finely punctate, punctures as large as those on pronotal disk but sparser.

Epipleura inclined outside, visible at entire length in lateral view, with several setae near sutural angle.

Hind wings vestigial.

In male, tarsi wholly pubescent below, segments 1-3 of all tarsi strongly dilated. In female, tarsi narrow, segments 1-3 pubescent below, segment 1 of mid and hind tarsi with very narrow glabrous stripe in basal half.

Pygidium with weak impression in basal half.

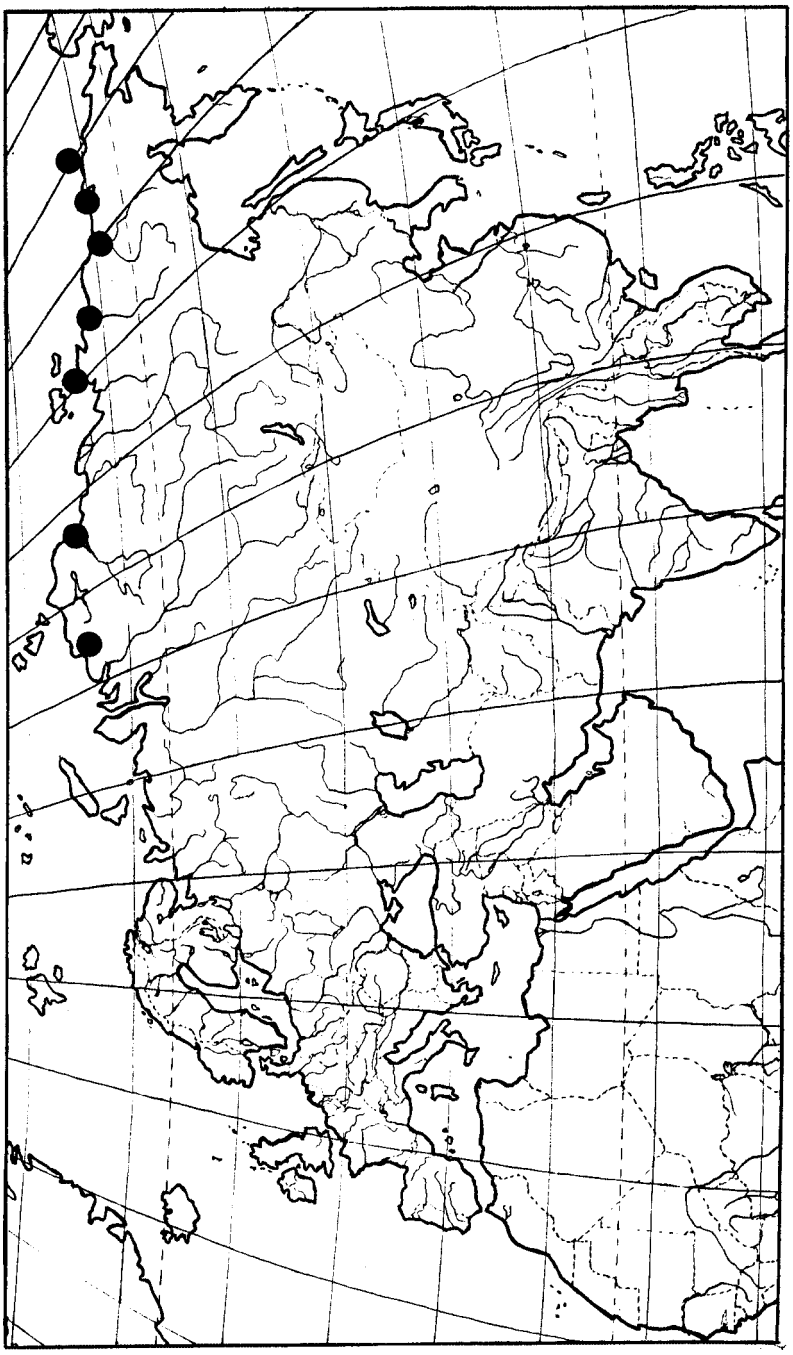
Last abdominal sternum slightly convex, flattened, with narrow sulcus along apical margin in male; slightly convex, flattened, with narrow sulcus along apical margin in female.

DISTRIBUTION

S-E. Kazakhstan

MATERIAL EXAMINED

TYPES. Holotype (male) with labels: „Sergiopol", „*Chrysomela ballioni* sp.n. I. LOPATIN det. 1964", „Holotypus" [red] (ZIN); paratype (female) with labels: „Sergiopol", „*Chrysomela ballioni* sp.n. I. LOPATIN det. 1964", „Paratypus" [red] (ZIN).



1. Distribution of *Chrysolina bungei*

ADDITIONAL SPECIMENS. Tien Shan: „Ala Tau": 1 male. „Songaria, MOTSCHULSKY": 1 female.

Chrysolina boeberi (HAROLD, 1874)

(Figs 3, 7)

Chrysomela sulcata GERMAR, 1824: 589 (Kamchatka, type probably lost, neotype in NHMW).
Chrysomela boeberi HAROLD in GEMMINGER & HAROLD, 1874: 3415 nom. nov. pro *sulcata* GERMAR, 1824: 589 nec GEBLER, 1823: 123.
Chrysomela boeberi HAROLD, 1874: WEISE 1916: 61.
Chrysolina subsulcata boeberi (HAROLD, 1874): MEDVEDEV & KOROTYAEV 1980: 80; MEDVEDEV 1992: 568.

Length 6.3-7.3 mm (male), 7.5-7.6 mm (female).

Body convex, elongate oval. Dorsum moderately shining, bright green, dark green or bronze, with elytral and pronotal margins and head (partly) usually violaceous. Legs dark metallic or black. Antennae black, with segments 1 and 2 rufous below.

Last segment of maxillary palpus as long as broad, 1.1-1.3 times longer and 1.1-1.4 times broader than previous segment, does not differ in both sexes.

Antenna inserted 1.6-1.9 times closer to clypeus than to eye, short, thick, gradually broadened from segment 5 to apex. Segment 10 as long as wide.

Pronotum broadest near mid-length, arc-shaped laterally. Anterior margin ciliate. Disk densely moderately large punctate. Lateral sides swollen at entire length, lateral sulci broad, shallow or moderately deep in basal 1/3-1/2, almost obsolete anteriorly, filled with moderately large dense punctures.

Propleura convex, impressed and irregularly wrinkled or without wrinkles and impression along outside. Basal fold of propleura weak.

Elytron with very weak humeral callus, with abbreviated scutellar row or without it, with 10 regular rows (or 7th irregular) of dense punctures. Intervals covered with minute punctures, intervals 2-8 almost evenly moderately convex, 9 more convex, 10 concave.

Epipleura inclined outside, visible at entire length in lateral view, sparsely ciliate near apex.

Hind wings vestigial.

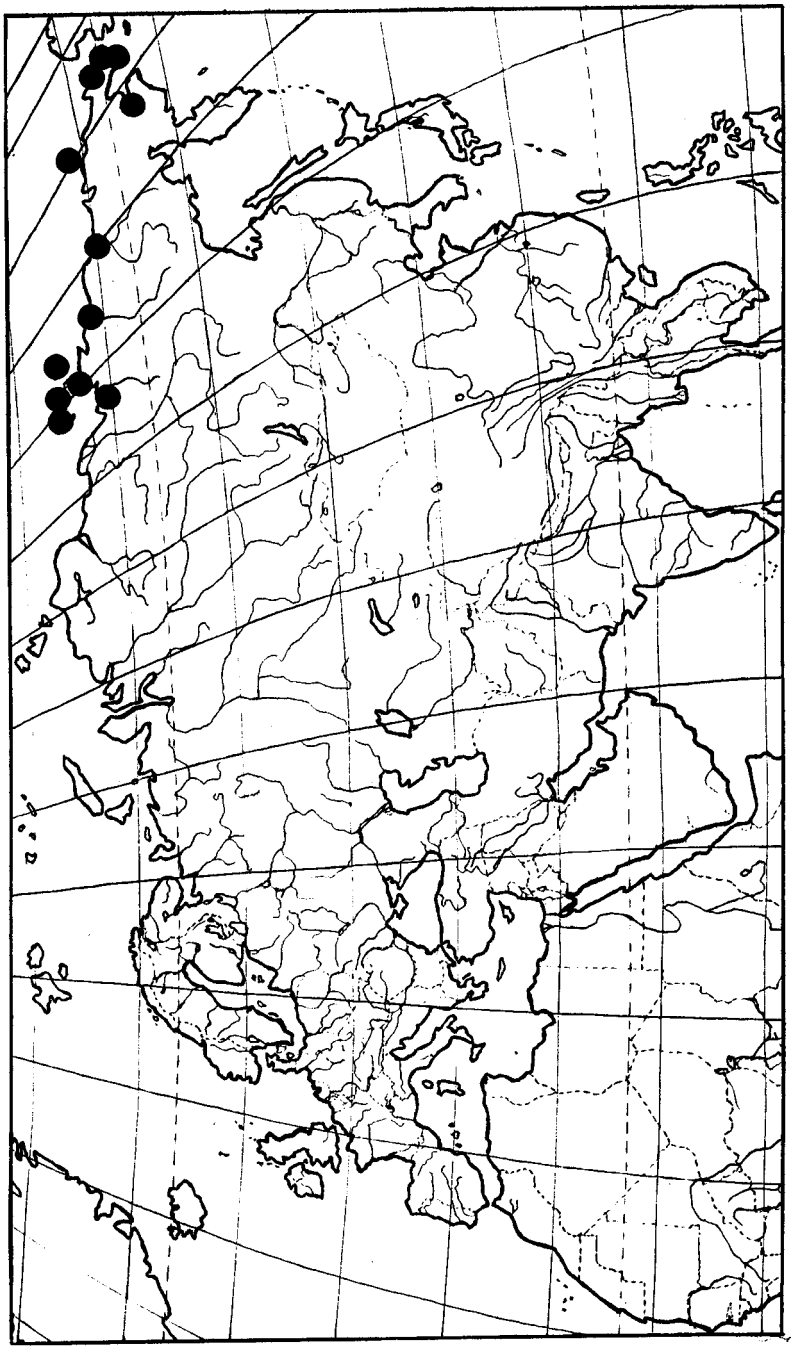
Tarsi pubescent below in both sexes, only in female segment 1 of hind tarsus with sparsely ciliate longitudinal stripe. In male all tarsi strongly dilated, in female tarsi narrow.

Pygidium with weak impression in basal half.

Last abdominal sternum convex, with weak apical impression medially in male, evenly convex or with weak apical impression in female.

DISTRIBUTION

Kamchatka, Yakutia, Okhotsk Sea shore (Fig.3).



2. Distribution of *Chrysolina magniceps*

REMARKS

GERMAR (1824) described „*Chrysomela sulcata*" from „Kamschatka" and indicated „*Boeberi*" as the author of the species. Beetles from the collection by GERMAR are deposited in Deutsches Entomologisches Institut (Eberswalde) and Museum für Naturkunde der Humboldt-Universität (Berlin) (HORN & KAHLE, 1935-1937). I examined *Chrysolina* collection in the both Museums but, unfortunately, could not find any specimen which can be considered as the type of *Chrysomela sulcata*. However, the fixation of the type of this taxon is necessary for the conservation of the recent interpretation of *Chrysolina boeberi* (= *sulcata*). Therefore, I designate a specimen, which I found in the collection by HAMPE (deposited in Naturhistorisches Museum Wien), as a neotype of *Chrysomela sulcata*. This is a female, with dorsum green with golden reflection, pronotal lateral calli with blue reflection, elytral suture, epipleurae, and lateral interval violet, intervals 1-8 convex (3, 5, 7 more convex than others), 9 ridge-shaped, 10 concave. It is corresponded to the original description, collected in the type locality, and probably received by HAMPE (1802-1884) from the author, GERMAR (1786-1853).

MEDVEDEV & KOROTIAEV (1980) reduced *Ch. boeberi* to the subspecies of *Ch. subsulcata*. Having examined the specimens of both taxa, I found the invariable differences in the shape of pronotal sulci and structure of aedeagus (see key to species) and I believe them to be two separate species.

MATERIAL EXAMINED

TYPES. *Chrysomela sulcata*, neotype (female), designated here, with labels: small pink square, „376 +", „*sulcata* Bob. Kamt." [written by Hampe], „specimen from Hampe collection" [yellow], „Neotype *Chrysomela sulcata* Germar, 1824. Bienkowski design. 2003" [red], „*Chrysolina boeberi* Har. Bienkowski det. 2003" (NHMW).

ADDITIONAL SPECIMENS. Yakutia: Yakutsk, Cygnaeus, MANNERHEIM coll.: 2 females; Okhotsk: 3 males, 1 female; the same place, F. SAHLBERG leg.: 3 males, 2 females; Okhotsk Sea shore: 16 km from estuary of Yana river, Semenov TJAN-SHANSKIJ leg., 16.8.1930: 1 male; delta Yana river, envir. Taujsk, Carex, 10.7.1975: 1 male, 1 female; Ola, 59°30'N, 152°E, L. BAGROV leg., 5-10.6.1913: 2 males, 3 females.

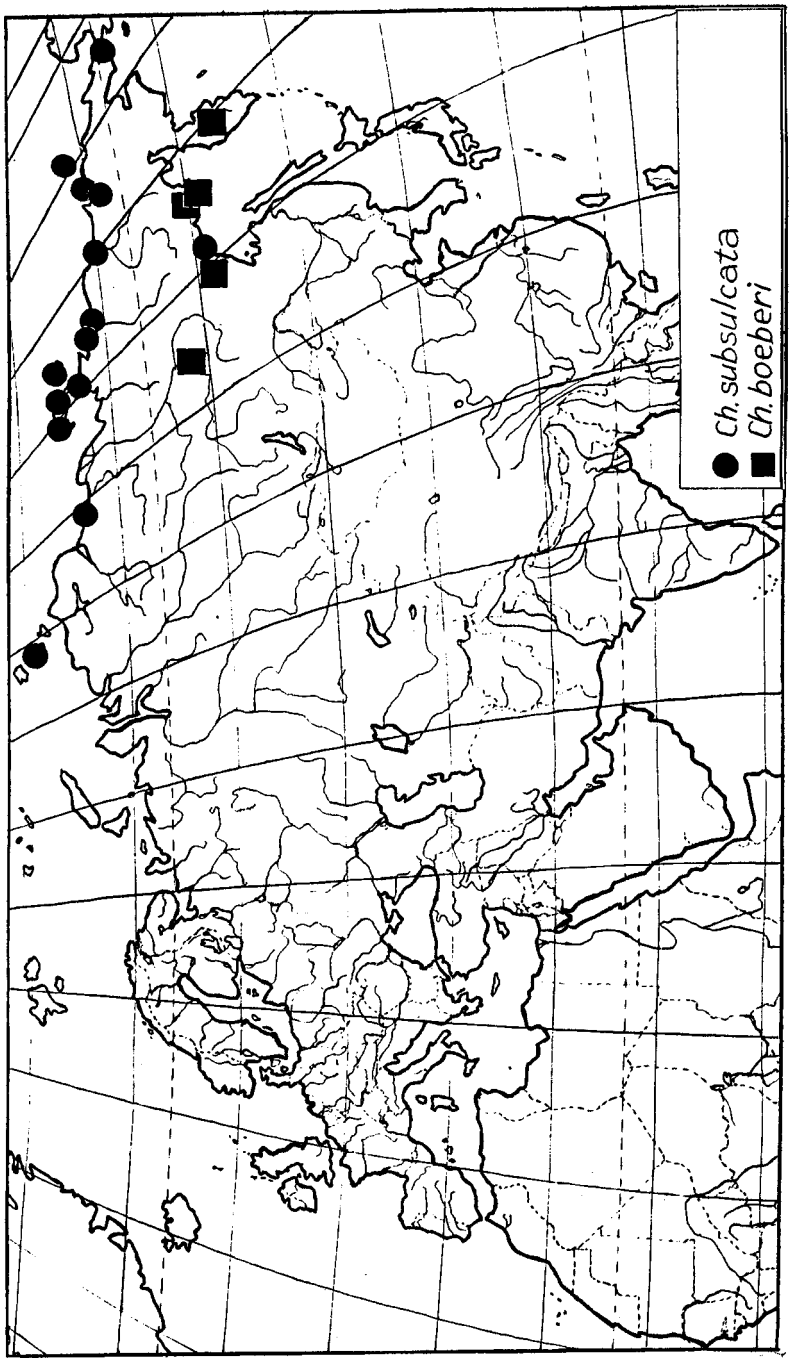
Chrysolina borochorensis LOPATIN, 2000

(Figs 31, 32)

Chrysolina borochorensis LOPATIN, 2000: 133 (China: Xinjiang: Boro-Khoro, ZIN).
Chrysolina naratica LOPATIN, 2000: 134 (China: Xinjiang: SSE Tekes, ZIN). **Syn. nov.**

Length 5.0-6.0 mm (male), 6.1-6.7 mm (female).

Body convex, oval. Dorsum shagreen, sericeous shining. Body dark metallic: entirely bronze or coppery, or bicolored: head bronze with vertex coppery,



3. Distribution of *Chrysolina subsulcata* and *Ch. boeberi*

pronotum bronze, elytra coppery.Antennae and legs piceous.Antennal segments 1 and 2 rufous below.

Last segment of maxillary palpus obovate, narrowly truncate apically, similar in both sexes, as broad as previous segment and 1.6 times longer than latter.

Antenna inserted 1.3 times closer to clypeus than to eye, with segments 6-10 gradually broadened. Segment 10 c. 1.3 times longer than wide.

Pronotum 1.8 times broader than long, broadest before mid-length or basally, arc-shaped laterally in apical half, almost parallel-sided in basal half. Anterior margin ciliate. Disk covered with very fine, distinct or obsolete, dense punctures. Lateral sides swollen at entire length. Lateral impressions wide, shallow or indistinct, evenly impressed at entire length or slightly deeper apically and basally or only basally. Lateral impressions covered with more or less distinct sparse moderately large punctures.

Propleura slightly convex, without impression and wrinkles along outside. Basal fold of propleura weak.

Elytron with very weak humeral callus, with scutellar row (0-4 punctures) and 10 regular puncture rows. Punctures in rows 1-9 moderately large, dense; punctures in row 10 sparse and indistinct or missing. Intervals slightly convex or flat, covered with dense, very minute punctures.

Epipleura inclined outside, visible at entire length in lateral view, densely ciliate near apex.

Hind wings absent.

Tarsi pubescent below in both sexes. In male segments 1-3 of all tarsi dilated, fore and mid tarsi wider than hind tarsi. In female tarsi narrow.

Pygidium with weak impression at entire length.

Last abdominal sternum convex in both sexes.

DISTRIBUTION

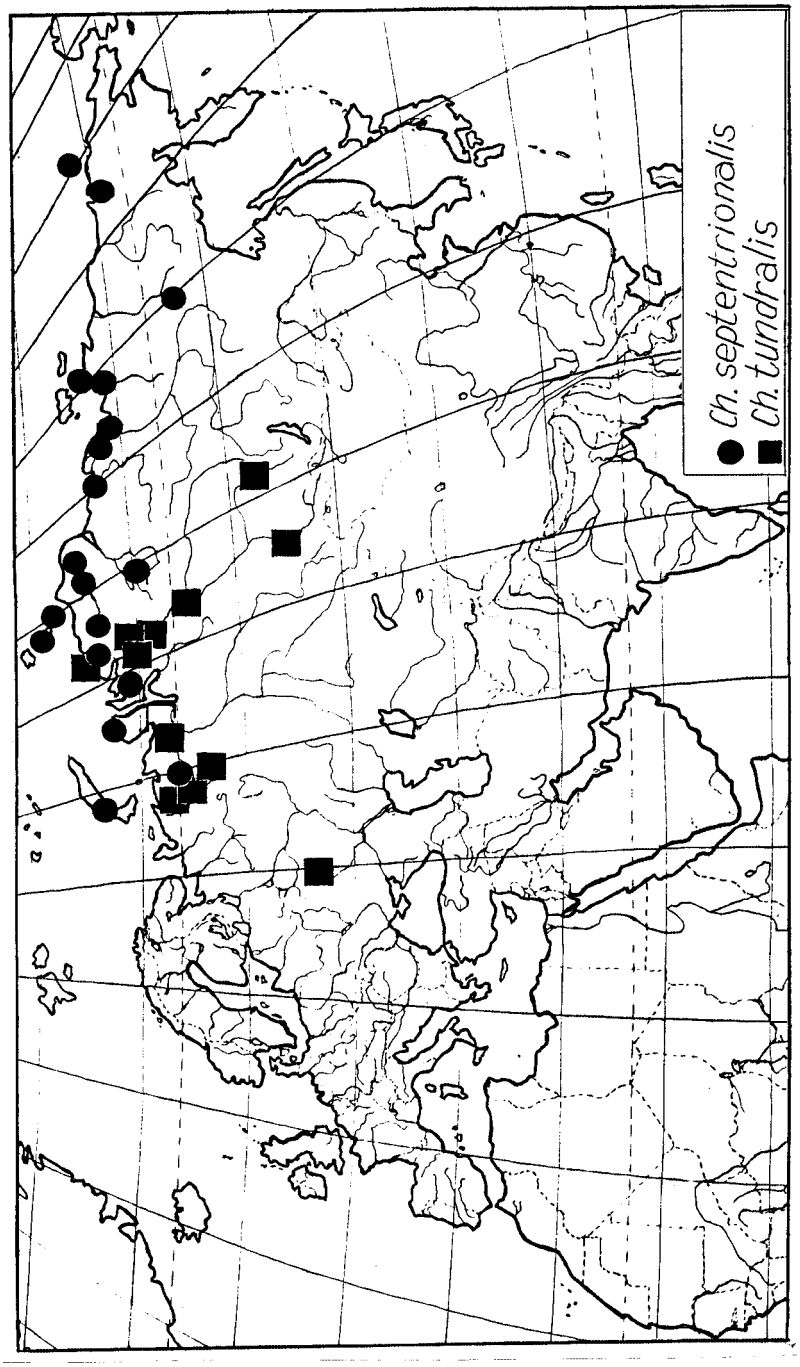
W China: Xinjiang Uygur Autonomous Region.

REMARKS

I have examined type specimens of both *Ch. borochorensis* LOPATIN (Fig. 31) and *Ch. naratica* LOPATIN (Fig. 32). According to the original descriptions, these taxa differ in the shape and punctation of lateral impressions of pronotum. However, I believe that these differences belong to the intraspecific variability. Shape of male aedeagus is similar in both taxa. Therefore, I think that *Ch. naratica* is a new junior synonym of *Ch. borochorensis*.

MATERIAL EXAMINED

TYPES. *Chrysolina borochorensis*, paratypes (1 male, 1 female) with labels: „CH, Xinjiang. S Arshan Mts., nr Karagaisu Pass, NNE of Araltiube 2700-2900 m, 22.6.99 BELOUSOV & KABAK leg.", „Paratypus" [red], „*Chrysolina borochorensis* sp.n. det. I. LOPATIN" (ZIN).



4. Distribution of *Chrysolina septentrionalis* and *Ch. tundralis*

Chrysolina naratica, holotype (male) with labels: „CH, Xinjiang, SSE Tekes Narat MR, Tshon-Kushtai=l.trib. Kokbulak Riv. r.b.-nk. 3200-3300m. 18.6 1999, BELOUSOV & KABAK", „Holotypus" [red], „*Chrysolina naratica* sp.n. det. I. LOPATIN, 2000" (ZIN); paratype (male) with labels: „CH, Xinjiang, SSE Tekes Narat MR, Tshon-Kushtai=l.trib. Kokbulak Riv. l.b.-nk. 3400m. 18.6 1999, BELOUSOV & KABAK leg.", „Paratypus" [red], „*Chrysolina naratica* sp.n. det. I. LOPATIN, 2000" (ZIN);

ADDITIONAL SPECIMEN. China: Xinjiang Uygur Autonomous Region: S. slope of Narat ridge, riverhead of Bayantaya river (left tributary of Ich-Juldus river), 3100-3400m, 19.7.2001: 1 male.

Chrysolina bungei (JACOBSON, 1910)

(Figs 1, 8)

Chrysomela (*Pleurosticha*) *bungei* JACOBSON, 1910: 62 (New Siberian Isls.: Liakhov Isl., ZIN).
Chrysomela bungei JACOBSON, 1910: WEISE 1916: 62.
Chrysolina (*Arctolina*) *bungei* (JACOBSON, 1910): MEDVEDEV & DUBESHKO 1992: 107.

Length 5.3-7.0 mm (male), 5.7-7.4 mm (female).

Body convex, elongate-oval (male) or oval (female). Whole dorsum moderately shining (male), or moderately shining with sericeous elytra (female), black. Legs rufous.Antennae rufous, brown, or black (with segment 1 rufous below).

Last segment of maxillary palpus 1.2 times longer than broad, as broad as previous segment and 1.1 times longer than latter, does not differ in both sexes.

Antenna inserted 2.4 times closer to clypeus than to eye or at equal distance between them.Antenna short, with segments 7-11 broadened, segment 10 c. 2 times longer than wide.

Pronotum broadest near mid-length or before base, arc-shaped laterally. Anterior margin ciliate. Disk densely minutely punctate. Lateral sides swollen at entire length, lateral sulci broad, strongly impressed posteriorly, shallower anteriorly, filled with numerous large punctures.

Propleura convex, weakly impressed and transversely rugose along outside, or only impressed, without wrinkles, or propleura evenly convex. Basal fold of propleura weak.

Elytron without humeral callus, with scutellar row and 10 regular rows of dense large punctures. Intervals 2-9 elevated into ridges, similar in appearance, minutely punctate.

Epipleura inclined outside, visible at entire length in lateral view, sparsely ciliate near apex.

Hind wings absent.

Tarsi wholly pubescent below in both sexes, in male all tarsi strongly dilated, in female tarsi narrow.

Pygidium with weak impression in basal 2/3.

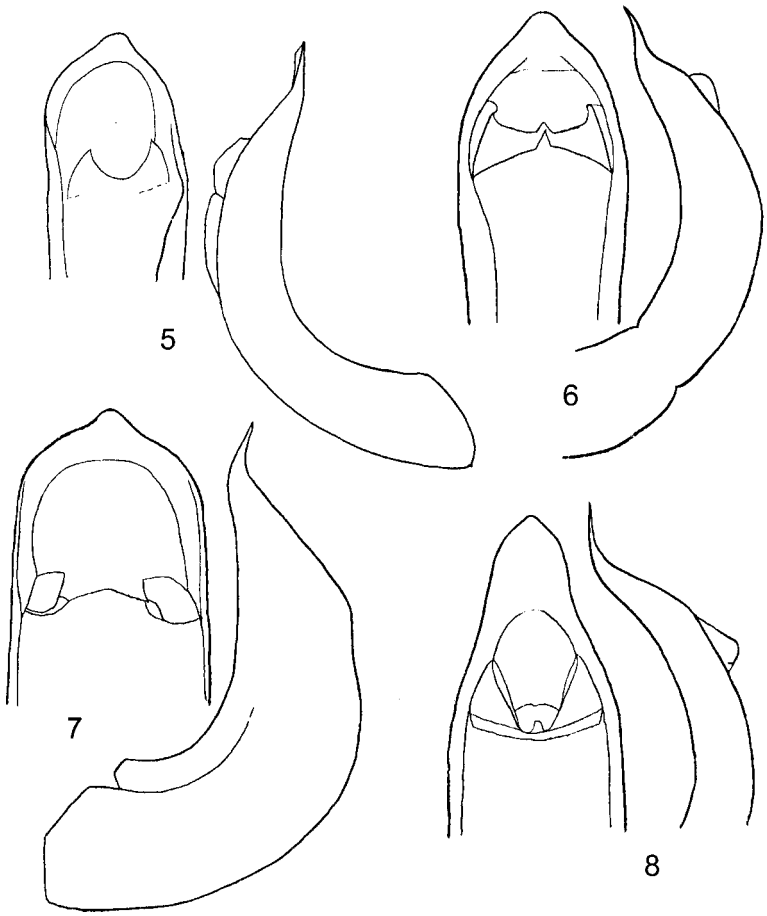
Last abdominal sternum swollen, medially depressed, with weak impression along apical margin in male, swollen, without impression along apical margin in female.

DISTRIBUTION

Arctic Asia (Fig. 1).

MATERIAL EXAMINED

TYPES. *Chrysomela bungei*, lectotype (female), designated here, with labels: „Liakhov Isl., New Siberian Isls., BUNGE leg., 28.6.-22.7.1886", „*bungei* m.", „Lectotype *Chrysomela* (*P.*) *bungei* JACOBSON, 1910. BIEŃKOWSKI design., 1997"



5-8. Aedeagus: 5-6 - *Chrysolina magniceps* (5 – Liakhov Isl., lectotype *Chrysomela birulai* var. *novosibirica*; 6 - Novaja Sibir Isl., lectotype *Ch. birulai* var. *wollosowiczi*), 7 - *Ch. boeberi* (Okhotsk Sea shore), 8 - *Ch. bungei* (Taimyr Penins.)

[red], „*Chrysolina bungei* Jcbs., A. BIEŃKOWSKI det., 1997" (ZIN). 2 paralectotypes with labels: „Liakhov Isl., New Siberian Isls., BUNGE leg., 28.6.-22.7.1886": 1 female (ZIN), „Liakhov Isl., New Siberian Isls., BUNGE leg., 23.7.1886": 1 female (ZIN). Both paralectotypes with my „paralectotype" label similar to „lectotype".

ADDITIONAL SPECIMENS. Taimyr Penins.: 2 km from estuary of Gushka river, JAKOVLEV leg., 29.7.1933: 2 males; Lenivaja river, 20 km from sea shore, P.TOMKOVICH leg., 16.7.1983: 1 female; Korennoj Isl., estuary of Balakhnja river, JAKOVLEV leg., 15-16.7.1933: 1 female. New Siberian Isls.: Liakhov Isl., river bank, S.KUZMINA leg., 7.8.1999: 1 female, 14.8.1999: 1 male, 2 females, tundra, 18.8.1999: 1 female. Yakutia: Indigirka river, Russkaja Ustrichnaja branch, tundra, A.BABENKO leg., 14-15.7.1994: 3 males; Kolyma lowland, Galgavaam river, flood lands, tundra, S.P.DAVYDOV leg., 8.1987: 1 male. Wrangel Isl.: Gidrografov mouth, Vrezanny stream, O.KHRULEVA leg., 2.7.1985: 3 males; lower reaches of Tundrovaja river, O.Khruleva leg., 10-15.6.1989: 1 female, 18.6.1989: 1 male, 2 females, 25.6.-19.7.1989: 2 males, 4 females, 15-25.6.1989: 2 males, 1 female. Chukot Autonomous Area: Karchyk Penins., near Ajon Isl., 69°50'N, 167°38'E, tundra, L.STAROKADOMSKY leg., 31.7.1913: 1 male; Ajon Isl., V.LEBEDEV leg., 9.6.1958: 1 female.

Chrysolina cyanella (GEBLER, 1830)

Chrysomela cyanella GEBLER, 1830: 213 (Altai: Riddersk, type probably lost).
Chrysomela cyanella GEBLER, 1830: WEISE 1916: 67.
Chrysolina (*Arctolina*) *cyanella* (GEBLER, 1830): LOPATIN 1990: 54; MEDVEDEV & DUBESHKO 1992: 108.

I do not have any specimens of this species at my disposal. Therefore, I include the original description:

„Oblongo-ovata, violacea, thorace vage punctulato, lateribus incrassato, elytris punctato-striatis, interstitiis laevibus. Long. 3 1/2 l., lat. 2 l. Aptera, nitida, glabra. Caput vage punctulatum, linea arcuata inter antennas impressa, fronte canaliculata, laevi; oculis nigris.Antennae thorace longiores, nigrae, articulis 2 basis piceis. Thorax laevis, antice emarginatus, angustior, lateribus parum dilatatus, postice bisinuatus; supra ad latera profunde impressus, disco sparsim punctulatus. Scutellum triangulare, laeve. Elytra thorace parum latiora et 4plo longiora, lateribus postice subdilatata, dense punctato-striata, striis marginalibus basin non attingentibus, interstitiis laevibus. Corpus subtus nigro-violaceum, vage punctulatum, pedes nitidi, validi, tibiis apice tarsisque cinereo-tomentosis. Semel prope Riddersk capta. A *Ch. sylvatica* differt colore, statura angustiori, et elytris interstitiis impunctatis." (GEBLER, 1830).

DISTRIBUTION
Siberia: Altai.

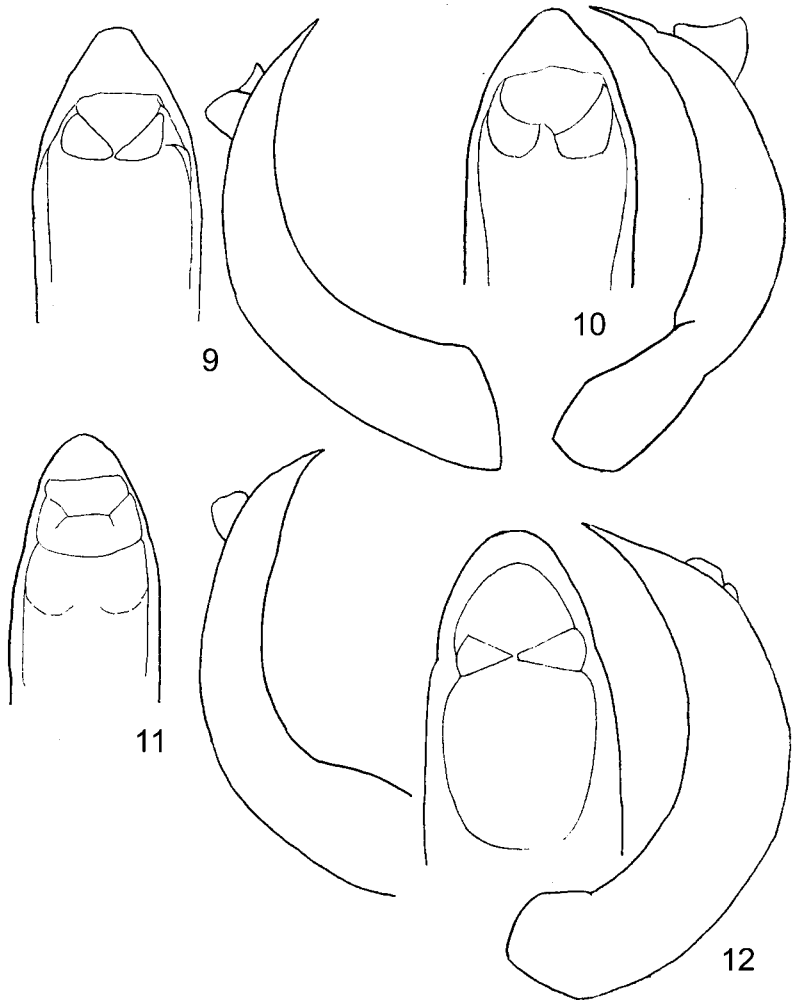
Chrysolina dolini LOPATIN, 1999

(Figs 48-57)

Chrysolina (*Arctolina*) *dolini* LOPATIN, 1999: 891 (S-E. Kazakhstan: Dzungarian Ala Tau, ZIN).

Length 5.8 mm (male), 7.0 mm (female).

Body elongate oval, slightly convex (Fig. 48). Dorsum shagreen, moderately shining (male), moderately shining with elytra sericeous (female), dark bronze with golden reflection, head and pronotum with weak violet reflection (male) or



9-12. Aedeagus of *Chrysolina subsulcata* (9 – Faddejevskij Isl., lectotype *Chrysomela birulai*; 10 - Yakutia; 11 - Liakhov Isl., lectotype *Ch. birulai* var. *glacialis*; 12 - St. Paul Isl., lectotype *Ch. subsulcata*)

head and pronotum violet (female), scutellum dark blue.Antennae, underside, and legs blackish brown.Antennal segments 1 and 2 rufous below, maxillary palpi of male rufous.

Last segment of maxillary palpus broadly oval, truncate, 1.3 times longer than wide, 1.5 times longer and 1.1 times broader than previous one, similar in both sexes (Fig. 52).

Antenna inserted 1.7 (male) or 1.3 (female) times closer to clypeus than to eye, narrow, with segments 6-11 slightly broadened (Fig. 56). Segment 10 c. 2.5 times longer than wide.

Pronotum broadest basally in both sexes, laterally almost straight and slightly convergent anteriorly in basal half, more distinctly convergent in anterior half (Figs. 49, 57). Anterior margin ciliate. Disk covered with dense minute punctures, only narrow longitudinal medial stripe devoid of punctures. Lateral sides swollen at entire length. In male lateral impressions narrow, deep, with sharp outer border, filled with dense small separate punctures in basal 1/4, moderately deep, filled with small, dense, mostly separate punctures in anterior 3/4; in female they are narrow, deep, with sharp outer border in basal 1/3 and anterior 1/4, moderately deep medially, without punctures in in basal 1/3, filled with moderately large, mostly separate punctures anteriorly.

Propleura weakly convex, without impression and wrinkles in male, with shallow impression filled with irregular wrinkles along outside in female. Basal fold of propleura distinct.

Elytron with very weak humeral callus, with abbreviate scutellar row and 10 regular rows of moderately large dense punctures. Row 6 slightly undulate in male. Row 10 with punctures as large as in other rows, but slightly sparser. In male intervals mostly flat, slightly convex between rows 4-8, finely punctate, punctures as large and as dense as those on pronotal disk. In female intervals mostly slightly convex, ridge-shaped between rows 4-9 in posterior 4/5.

Epipleura inclined outside, visible at entire length in lateral view, with several setae near sutural angle.

Hind wings absent.

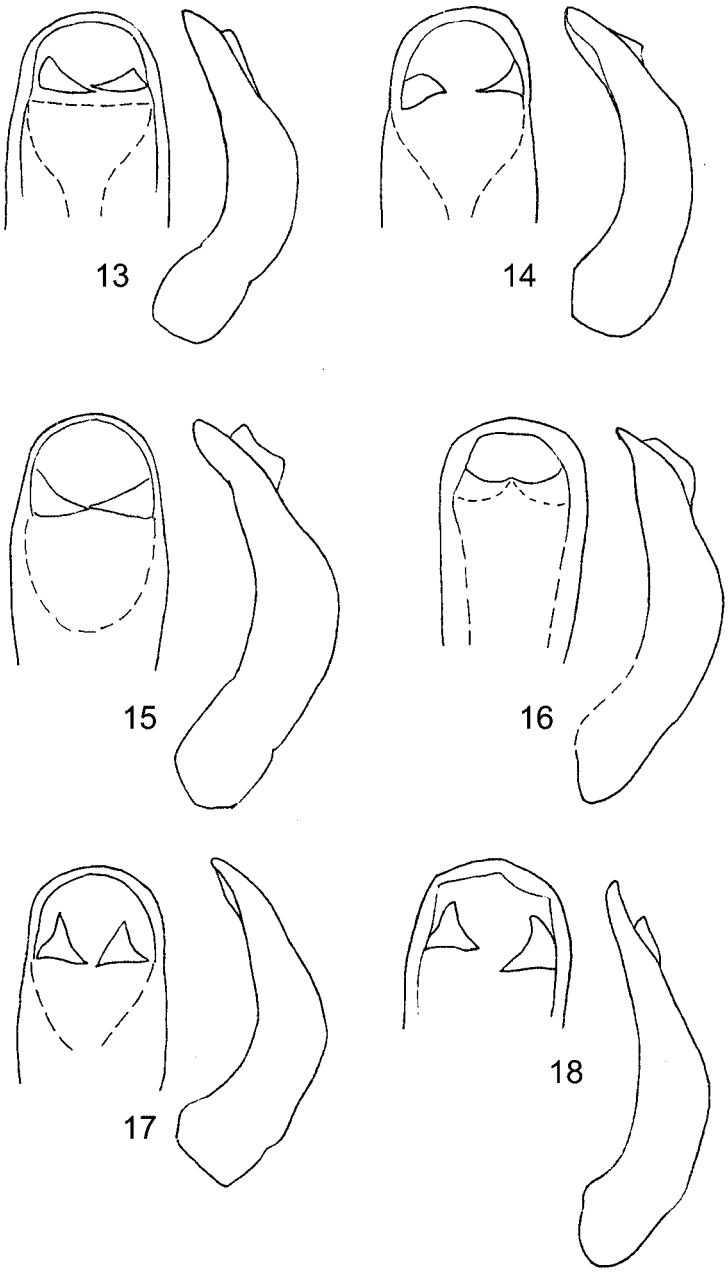
In male, tarsi wholly pubescent below, segments 1-3 of all tarsi strongly dilated (Figs. 50, 51). In female, tarsi narrow (Figs. 54, 55), segments 1-3 pubescent below, segment 1 of mid and hind tarsi with very narrow glabrous stripe in basal half.

Pygidium with very weak impression in basal 1/4.

In male last abdominal sternum weakly convex, depressed and strongly punctate medially in apical half, with apical margin straight, turned down medially, but without apical sulcus. In female last abdominal sternum evenly moderately convex, sparsely minutely punctate, with apical margin straight, with narrow sulcus along apical margin.

DISTRIBUTION

S-E. Kazakhstan: Dzhungarian Ala Tau.



13-18. Aedeagus of *Chrysolina septentrionalis* (13 - Olenek bay; 14 - Severnaya Zemlya: Bolshevik Isl.; 15 – Putorana plateau; 16 - Novaya Zemlya, holotype *Chrysomela septentrionalis*; 17 - Taimyr Penins.; 18 - Yakutia)

MATERIAL EXAMINED

TYPES. *Chrysolina dolini*, holotype (male) with labels: „Lepsinsky forestry, Chernaya rechka cordon, 1200 m, 2.6.91, DOLIN" [S.-E. Kazakhstan, Dzhungarian Ala Tau], „Holotypus" [red], „*Chrysolina dolini* sp. n. det. I. LOPATIN, 1998" (ZIN); paratype (female) with labels: „Lepsinsky forestry, Chernaya rechka cordon, 1200 m, 31.5.91, DOLIN", „Paratypus" [red], „*Chrysolina dolini* sp. n. det. I. LOPATIN, 1998" (ZIN).

Chrysolina kaikana LOPATIN, 1992

(Figs 58-67)

Chrysolina (*Arctolina*) *kaikana* LOPATIN, 1992: 5 (Kazakhstan: Dzungarian Ala Tau, ZIN).

Length 7.0 mm (male), 7.5 mm (female).

Body elongate oval, slightly convex (Fig. 58). Dorsum shagreen; male: black with strong goldish-greenish reflection, head and pronotum shining, elytra moderately shining; female: head and pronotum black with strong goldish-greenish reflection, shining, elytra black with strong golden reflection. Tibiae, femora, and underside black, maxillary palpi and tarsi piceous, antennae piceous, in male with segment 1 rufous below apically, in female with segments 1 and 2 rufous below.

Last segment of maxillary palpus broadly oval, truncate, 1.3 times longer than wide, slightly longer and 1.3 times broader than previous, slightly broader in male (Fig. 62), than in female (Fig. 67).

Antenna inserted in the middle between clypeus and eye, narrow, with segments 7-11 very slightly broadened (Fig. 66). Segment 10 c. 2.5 times longer than wide.

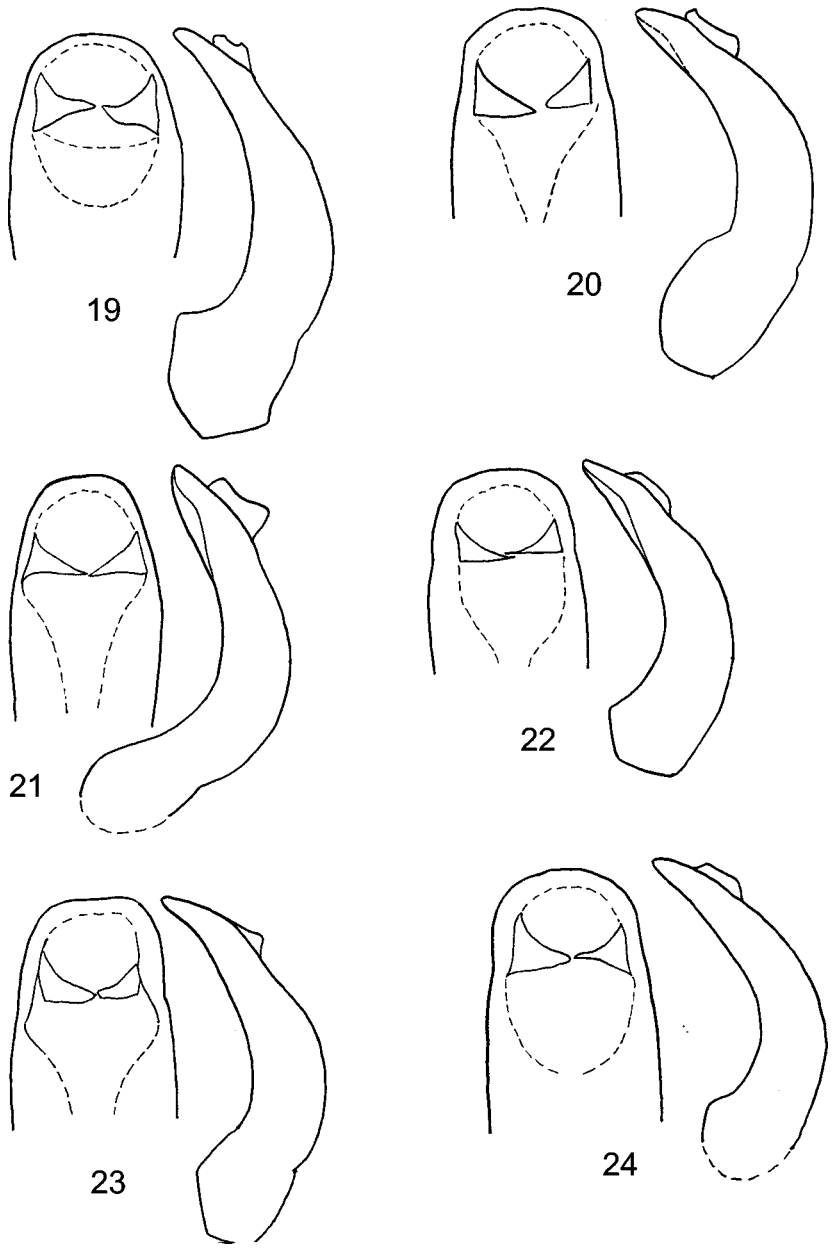
Pronotum broadest before base, arc-shaped laterally, slightly narrowed towards base and more distinctly narrowed anteriorly (Fig. 59). Anterior margin densely ciliate. Disk covered with dense minute punctures. Lateral sides swollen at entire length. Lateral impressions very deep, narrow, furrow-shaped in basal 1/3 (male) or 1/4 (female), deep and filled with moderately large, separate punctures in anterior 1/3, shallow medially.

Propleura weakly convex, with very shallow impression filled with small wrinkles along outside. Basal fold of propleura distinct.

Elytron with very weak humeral callus, with abbreviate scutellar row and 10 regular rows of moderately large dense punctures. Row 10 with punctures as large as in other rows, but slightly sparser. Intervals mostly flat, slightly convex between rows 3-7 (male) or 2-9 (female), finely punctate, punctures as large and as dense as those on pronotal disk.

Epipleura inclined outside, visible at entire length in lateral view, with several setae near sutural angle.

Hind wings absent.



19-24. Aedeagus of *Chrysolina septentrionalis* (19-20 - Chukot Penins., 21 - Tiksi, 22 - Bykovsky Penins., 23 - Wrangel Isl., 24 - Yakutia, Yana river)

In male, tarsi wholly pubescent below, segments 1-3 of fore and mid tarsi and segment 1 of hind tarsi strongly dilated, segments 2-3 of hind tarsi slightly dilated (Figs. 60, 61). In female, tarsi narrow (Figs. 64, 65), segments 1-3 pubescent below, segment 1 of all tarsi with narrow glabrous stripe in basal half.

Pygidium with wide, shallow impression in basal half.

In male last abdominal sternum convex, weakly longitudinally impressed medially, covered with sparse, minute punctures and several strong punctures in impression; apical margin weakly concave, with narrow sulcus. In female last abdominal sternum evenly moderately convex, sparsely minutely punctate; apical margin straight, with narrow sulcus.

DISTRIBUTION

S-E. Kazakhstan: Dzhungarian Ala Tau.

MATERIAL EXAMINED

TYPES. *Chrysolina kaikana*, holotype (male) with labels: „N. Dzhungar, S. slope of Kaikan ridge, N from Glinovka, 27.5.90, KABAK", „Holotypus" [red], „*Chrysolina kaikana* sp. n. det. I. LOPATIN, 1990" (ZIN); paratype (female) with labels: „N. Dzhungar, S. slope of Kaikan ridge, N from Glinovka, 27.5.90, KABAK", „Paratypus" [red], „*Chrysolina kaikana* sp. n. det. I. LOPATIN, 1990" (ZIN).

Chrysolina kryzhanovskii (LOPATIN, 1968)

(Fig. 44)

Chrysomela (*Pleurosticha*) *kryzhanovskii* LOPATIN, 1968: 550 (Kazakhstan: Dzungarian Ala Tau, ZIN).

Chrysolina (*Pleurosticha*) *kryzhanovskii* (LOPATIN, 1968): LOPATIN 1977: 149; LOPATIN & KULENOVA 1986: 103.

Chrysolina (*Arctolina*) *kryzhanovskii* (LOPATIN, 1968): LOPATIN 1990: 54; 1992: 8.

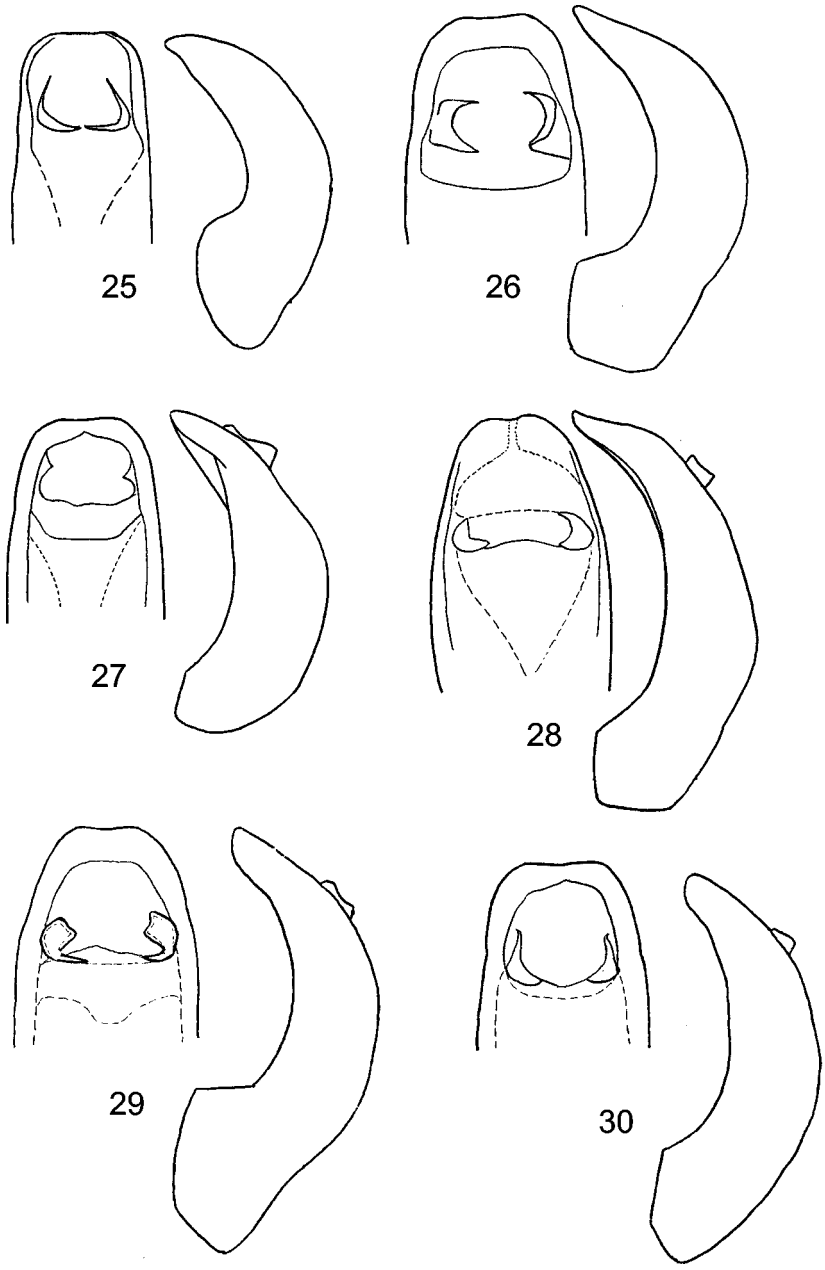
Length 5.5 mm (male), 6.6 mm (female).

Body elongate-obovate in both sexes, moderately convex. Dorsum shagreen, entirely moderately shining (male) or with elytra dull (female), bluish-black. Underside and legs black. Antennae dark brown or pale brown, with segments 1 and 2 rufous below.

Last segment of maxillary palpus 1.3 times longer than wide, as long as previous one, and 1.2 times broader than latter one, does not differ in both sexes.

Antenna inserted at equal distance between clypeus and eye, narrow, with segments 6-11 weakly broadened. Segment 10 c. 1.7 times longer than wide.

Pronotum broadest at level 1/3 from base, arc-shaped laterally, more narrowed anteriorly. Anterior margin ciliate. Disk covered with dense minute punctures. Lateral sides swollen at entire length. Lateral impression narrow at the entire length, represented by deep furrow in basal 1/3 and by moderately deep



25-30. Aedeagus of *Chrysolina tundralis* (25 - Polar Ural, 26 - Lipetsk reg., 27 - Yenisei river, Dudinka Vill., 28 - Taimyr, Ilimsk, 30 - Bolshaja Synia river basin)

sulcus anteriorly. Impression filled with large obsolete punctures, which are partly confluent in basal furrows.

Propleura slightly convex, with shallow depression filled with obsolete transverse wrinkles along outside. Basal fold of propleura weak or obsolete.

Elytron with very weak humeral callus, with scutellar row and 10 regular rows of dense punctures. Row 10 with punctures obsolete. In male intervals almost flat, in female intervals slightly convex. Intervals covered with minute, sparse punctures which are finer and sparser than those on pronotal disk.

Epipleura inclined outside, visible at entire length in lateral view, sparsely ciliate near apex.

Hind wings absent.

Tarsi pubescent below in both sexes, in female segment 1 of hind tarsi with narrow glabrous stripe. In male segments 1-3 of all tarsi dilated, segment 1 as wide as 3. In female tarsi narrow.

Pygidium without sulcus.

Last abdominal sternum weakly swollen, medially depressed, with narrow sulcus along apical margin in male, convex, with shallow depression along apical margin in female.

DISTRIBUTION

S-E. Kazakhstan: Dzungarian Ala Tau.

MATERIAL EXAMINED

TYPES. Holotype (male) with labels: „Dzungarian Ala Tau, Tentek river", „riverhead of Malyj Tentek, Mai-tiube, alpine meadows, 9.7.926. DOBRZANSKI leg.", „Holotypus" [red], „*Chrysomela kryzhanovskii* sp.n. I. LOPATIN det. 1966" (ZIN).

ADDITIONAL SPECIMENS. Tien Shan: Dzungarian Ala Tau: Kungei ridge, riverhead of Poznakovka, 2700m, 4.8.1991, B. KATAEV leg.: 1 male, 1 female; Zhabyn ridge, southwards from Koktumy, 2800m, I. KABAK leg., 3.6.1990: 1 male.

Chrysolina magniceps (SAHLBERG, 1887)

(Figs. 2, 5, 6, 69, 70, 73)

Chrysomela magniceps SAHLBERG, 1887: 38 (Chukot: Kap Jakan, paratypes studied by KONTKANEN, 1959).

Chrysomela magniceps SAHLBERG, 1887: WEISE 1916: 79.

Chrysolina (*Arctolina*) *magniceps* (SAHLBERG, 1887): KONTKANEN 1959: 30, fig. 4b.

Chrysolina magniceps (SAHLBERG, 1887): BROWN 1962: 62.

Chrysolina subsulcata subsulcata (MANNERHEIM, 1853) (=*magniceps* SAHLBERG, 1887): L. MEDVEDEV & KOROTYAEV 1980: 80.

Chrysomela (*Pleurosticha*) *birulai* var. *wollosowiczi* JACOBSON, 1910: 59 (New Siberian Isls.: Novaja-Sibir Isl., ZIN) **Syn. nov.**

Chrysomela birulai ab. *wollosowiczi* JACOBSON, 1910: WEISE 1916: 61.

Chrysomela (*Pleurosticha*) *birulai* var. *novosibirica* JACOBSON, 1910: 60 (New Siberian Isls.: Liakhov Isl., ZIN) **Syn. nov.**

Chrysomela birulai ab. *novosibirica* JACOBSON, 1910: WEISE 1916: 61.

Chrysolina (*Arctolina*) *bungei* (JACOBSON, 1910): KONTKANEN 1959: 29, fig. 2a, c, 30, fig. 4a.

Length 5.6-7.0 mm (male), 5.6-7.2 mm (female).

Body convex, elongate oval (male) or obovate (female). Dorsum moderately shining, black, blackish green, bluish green, or green. Femora and tibiae dark metallic, tarsi brown, or legs rufous or brown.Antennae black or brown, with segment 1 rufous below and apically, segment 2 mostly rufous or black.

Last segment of maxillary palpus as long as broad, 1.1-1.3 longer and 1.1-1.4 times broader than previous segment, does not differ in both sexes.

Antenna inserted 1.7-2.3 times closer to clypeus than to eye.Antenna short, thick, with segments 7-11 broadened. Segment 10 c. 1.2 times longer than wide.

Pronotum broadest at base, with lateral sides arc-shaped or almost parallel in basal half. Anterior margin ciliate. Disk covered with dense fine or moderately large punctures. Lateral sides swollen at entire length, lateral sulci narrow, deep in basal 1/3, shallower anteriorly, filled with numerous large punctures.

Propleura convex, impressed and irregularly rugose along outside. Basal fold of propleura distinct or weak.

Elytron with very weak humeral callus or without humeral callus. Scutellar row absent or present.Elytron with 10 rows of small or moderate, distinct or obsolete punctures. Intervals 3, 5, 7, and 9 strongly elevated into ridges, 2 and 4 slightly elevated or flat, 6 and 8 flat, or intervals 1-9 evenly convex, 10 flat or convex. Ridge-shaped intervals connected by several transverse ridges.

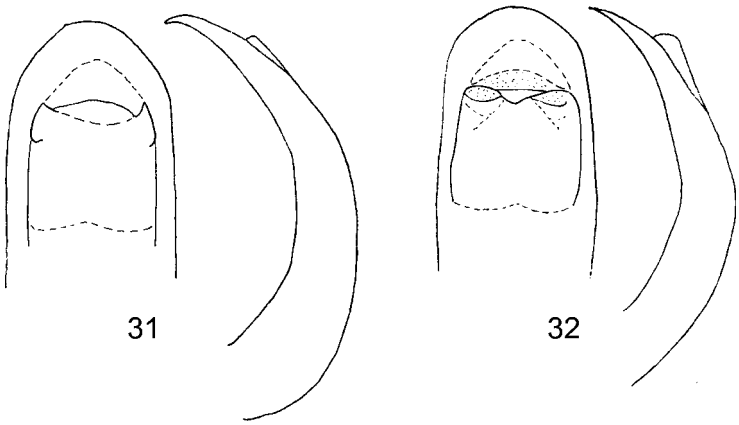
Epipleura inclined outside, visible at entire length in lateral view, sparsely ciliate near apex.

Hind wings absent.

Tarsi wholly pubescent below in both sexes, in male fore and middle tarsi moderately dilated (Fig. 73), in female tarsi narrow.

Pygidium with groove in basal 2/3.

Last abdominal sternum convex, medially depressed in male, evenly convex in female, with narrow sulcus along apical margin in both sexes.



31-32. Aedeagus of *Chrysolina borochorensis* (31 - China, Xijiang, paratype *Chrysolina borochorensis*, 32- China, Xijiang, holotype *Ch. naratica*)

DISTRIBUTION

Arctic Asia (Fig.2), Isls. of Bering Sea, Alaska.

REMARKS

Ch. magniceps was treated as an junior synonym of *Ch. subsulcata subsulcata* by MEDVEDEV & KOROTIAEV (1980). KONTKANEN (1959) examined two paratypes of *Ch. magniceps* and published a figure of aedeagus. This figure differs from the aedeagus of *Ch. subsulcata subsulcata*. The type specimens of *Chrysomela birulai* var. *wollosowiczi* (Fig. 6) and *Ch. birulai* var. *novosibirica* (Fig. 5) are conspecific with *Ch. magniceps*, however they differ from *Ch. subsulcata* in the shape of aedeagus. Therefore *Ch. magniceps* is a valid species, and *Ch. birulai wollosowiczi* and *Ch. birulai novosibirica* are new junior synonyms of *Ch. magniceps*.

HOST PLANTS

This species develops on Cyperaceae (*Carex lugens*, *C. stans*) and Brassicaceae (*Parrya nudicaulis*) in field and in cages on Wrangel Isl. (O. A. KHRULEVA, personal communication).

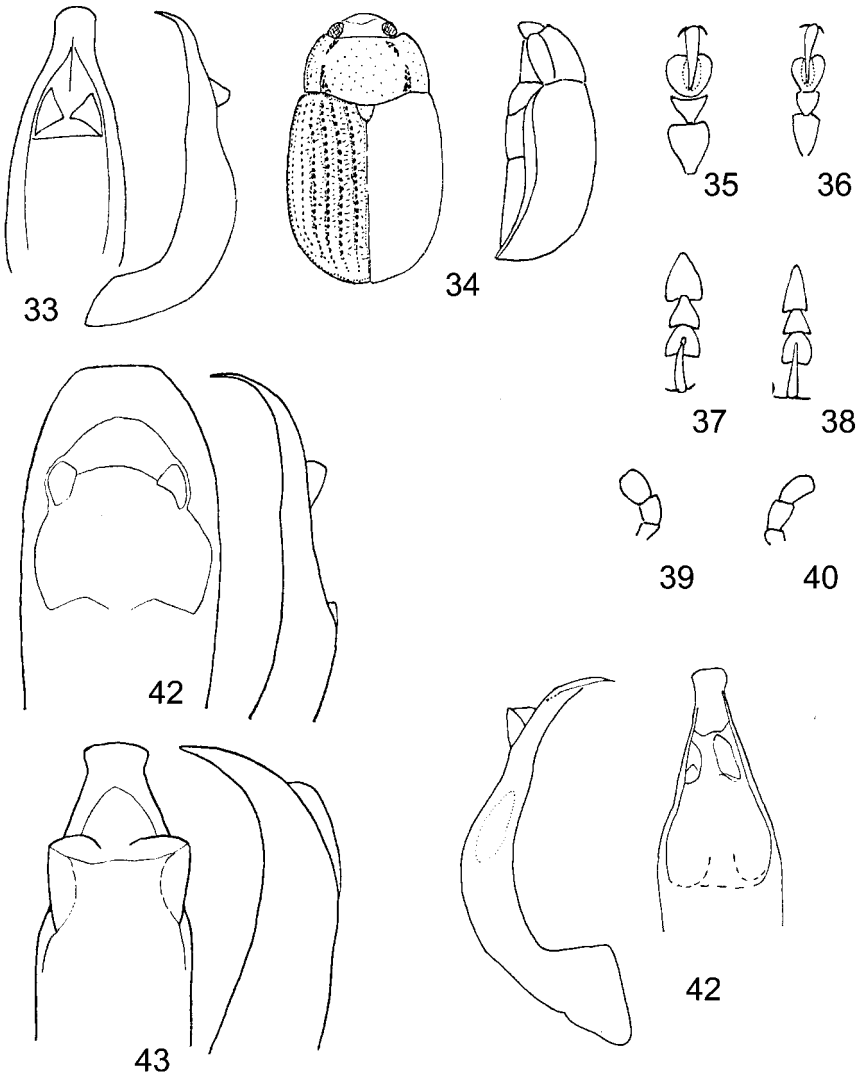
MATERIAL EXAMINED

TYPES. *Chrysomela birulai* var. *novosibirica*, lectotype (male), designated here, with labels: „Ins. Liakhov, New Siberian Isls. BUNGE leg. 19-27.VI.1886", „var *novosibirica* m.", „Lectotype *Chrysomela birulai* var. *novosibirica* JACOBSON, 1910. BIENKOWSKI design. 1997" [red], „*Chrysolina wollosowiczi* Jcbs. A. BIENKOWSKI det. 1997" (ZIN).

Chrysomela birulai var. *wollosowiczi*, lectotype (male), designated here, with labels: „N1 20.V-1.VI.01. WOLLOSOWICZ", „Insula Novaja-Sibir, 20.V-1.VI.1901. K. WOLLOSOWICZ leg.", „var. wolossowiczi m.", „Lectotype *Chrysomela* (*Pleurosticha*) *birulai* var. *wollosowiczi* JACOBSON, 1910. BIEŃKOWSKI design. 1997" [red], „*Chrysolina wollosowiczi* JCBS. A. BIEŃKOWSKI det., 1997" (ZIN).

ADDITIONAL SPECIMENS. New Siberian Isls. (Novaja-Sibir, Kotelnyj, Liakhov): 15 males; Faddeyevski Isl., M. BERERZIN and A. BABENKO leg., 10-11.7.1994: 7 males, 1 female; Liakhov Isl., river bank, S. KUZMINA leg., 7.8., 11.8., 14.8., 17.8., 27.8., 4.9.1999: 28 males, 30 females. Chukot Autonomous Area: Anadyr, Grin leg., 1890: 1 male, 1 female; Medvezhka river, V.F. SHILOV leg., 16.8.1972: 2 males, 1 female; Koliuchinskaja bay, 67°4'N, 174°25'W, under driftwood, moss, L. STAROKADOMSKY leg., 18.9.1913: 2 males, 2 females, the same place, STAROKADOMSKY leg., 6/19.8.1914: 1 male; Providence Bay, Ien bay bar, M. ROZANOV leg., 18.7.1938: 2 males, 2 females. Yakutia: mouth of Yana river (Ular river), A. BABENKO leg., 5-6.8.1994: 2 males; Indigirka river, Russkaja Ustrichnaja branch, tundra, A. BABENKO leg., 14-15.7.1994: 1 female; Lopatka Penins., Shilkina lake, tundra, M.V. BEREZIN leg., 14-15.7.1994: 1 male, 4 females; Kolyma lowland, Galgavaam river, flood lands, tundra, S.P. DAVYDOV leg., 8.1987: 2 males. Wrangel Isl.: Tundrovy peak, foothills, N. slope, O. KHRULEVA leg., 21.6.1991: 3

males, 1 female; Tundrovy peak, O. KHRULEVA leg., 22.6.1991: 1 female; middle reaches of Mamontovaya river, O. KHRULEVA leg., 20-30.6.1992: 2 males, 11-20.6.1994: 1 male, 20.6.-1.7.1994: 3 males, 1 female; lower reaches of Gusinaja river, S. slope, pit-fall traps, O. KHRULEVA leg., 1984: 1 male, 1 female; lower



33-40. *Chrysolina octocosta* (Kazakhstan: envir. Sarkand): 33 - aedeagus, 34 - general view, 35 - fore tarsus of male, 36 – fore tarsus of female, 37 - hind tarsus of male, 38 - hind tarsus of female, 39 - maxillary palpus of male, 40 - maxillary palpus of female. Figures 41-43. Aedeagus: 41 - *Ch. teleuta* (Altai), 42 - *Ch. valichanovi* (S.-E. Kazakhstan), 43 - *Chrysolina saurica* (E. Kazakhstan, lectotype)

reaches of Tundrovaya river, O. KHRULEVA leg., 10-15.6.1989: 2 males, 15-25.6.1989: 3 males, 25.6.-19.7.1989: 4 males; upper reaches of Neizvestnaja river, O. KHRULEVA leg., 3.6.-15.7.1993: 1 male, 6.6.1991: 1 male, 1 female, pitfall traps, 13-19.6.1991: 1 male; Bajdzharakhi, O. KHRULEVA leg., 2.7.1985: 2 males, 2 females; Somnitelnaja bay, O. KHRULEVA leg., 18-24.6.1989: 1 male; Krasny Flag river, PORTENKO leg., 18.8.1938: 1 male; Wrangel Isl., S. part, A. MINEEV leg., 17.7.1931: 1 male, 1 female; Wrangel Isl., A. ARTIUKHOV leg., 4.7.1972: 1 male; Zvezdny Vill., A. VARICH leg., 5.7.1972: 1 male. Bering Strait: Ratmanova Isl., N. MIKHAILOVA leg., 1.8.1958: 1 male. Bering Sea: St. Paul Isl., A.G. WHITNEY leg., 6.-8.1914: 3 males.

Chrysolina octocosta (JACOBSON, 1924)

(Figs 33-40)

Chrysomela (*Pleurosticha*) *octocosta* JACOBSON, 1924: 78 (Dzhungarian Ala Tau, type absents in JACOBSON's collection, ZIN, probably lost).

Chrysolina (*Pleurosticha*) *octocosta* (JACOBSON, 1924): LOPATIN 1977: 149; LOPATIN & KULENOVA 1986: 103.

Chrysolina (*Arctolina*) *octocosta* (JACOBSON, 1924): LOPATIN 1990: 54; 1992: 8.

Length 6.1 mm (male), 6.6 mm (female).

Body slightly convex, elongate (Fig. 34). Dorsum shagreen, shining, in female with sericeous elytra, black, dark bronze, or coopery-violaceous.

Last segment of maxillary palpus broadly oval, truncate, slightly broader and longer than previous one in male (Fig. 39); oval, narrower than in male, as wide as and as long as previous segment in female (Fig. 40).

Antenna inserted 2 times closer to clypeus than to eye.

Pronotum broadest just before base, arc-shaped laterally. Anterior margin ciliate. Disk densely minutely punctate. Lateral sides very swollen at entire length, lateral impressions narrow, deep, furrow-shaped in basal half, shallowest slightly before mid-length and moderately deep in anterior 1/4, filled with strong punctures.

Propleura slightly convex, flattened and obsoletely transversely rugose along outside. Basal fold of propleura distinct.

Elytron with very weak (male) or weak (female) humeral callus. Scutellar row absent or present. 10 regular rows of dense small punctures forming shallow furrows. In female intervals glabrous, almost without punctures, intervals 3, 5, 7, and 9 ridge-shaped, others flat or slightly convex; in male intervals wrinkled, covered by very minute punctures, all intervals covered with minute punctures, convex or ridge-shaped.

Epipleura inclined outside, visible at entire length in lateral view, ciliate near apex.

Hind wings absent.

Tarsi entirely pubescent below in male; segment 1 of all tarsi with narrow glabrous stripe in basal half in female. In male tarsi broad (Figs 35, 37), in female tarsi narrow (Figs 36, 38).

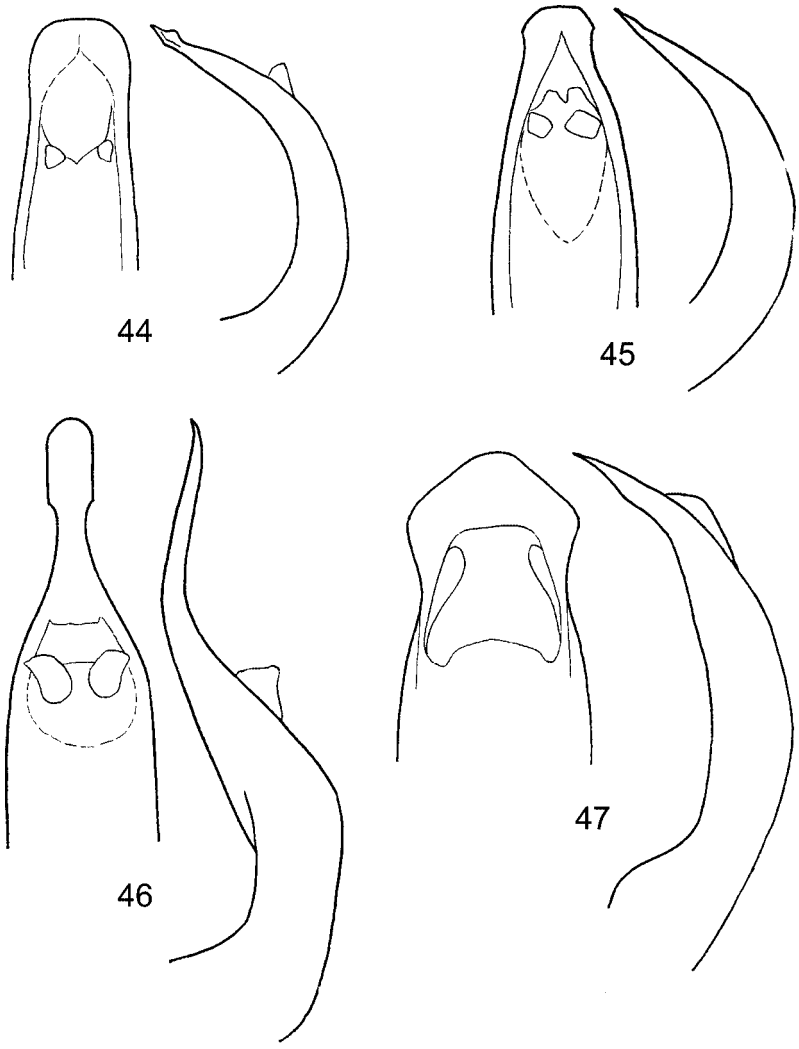
Last abdominal sternum convex.

DISTRIBUTION

S-E. Kazakhstan: Dzhungarian Ala Tau.

MATERIAL EXAMINED

Kazakhstan: envir. Sarkand, Aman-Bukhter, DOLIN leg., 20.6.1990: 1 male, the same place, DOLIN leg., 22.6.1990: 1 female.



44-47. Aedeagus: 44 - *Chrysolina kryzhanovskii* (Dzungarian Ala Tau), 45 - *Ch. tastavica* (Dzungarian Ala Tau), 46 - *Ch. ballioni* („Ala Tau"), 47 - *Ch. oirota* (Altai, holotype)

Chrysolina oirota LOPATIN, 1990
(Fig. 47)

Chrysolina (*Arctolina*) *oirota* LOPATIN, 1990: 50 (Altai, ZIN).

Length 5.9 mm (male).

Body convex, oval. Dorsum shagreen, moderately shining.Body black, pronotum and elytra with bluish reflection laterally. Legs blackish brown with metallic reflection.Antennae blackish brown, with segments 1, 2 rufous below.

Last segment of maxillary palpus as long as wide, slightly broader and longer than previous segment.

Antenna inserted 1.7 times closer to clypeus than to eye. Segments 2-6 narrow, 7-11 broad. Segment 10 c. 1.4 times longer than wide.

Pronotum broadest near mid-length, arc-shaped laterally. Anterior margin ciliate. Disk densely minutely punctate. Lateral sides swollen at entire length. Lateral sulci narrow, very deep, with vertical outer and inner borders in basal 1/3, they are shallow, covered by dense minute punctures near mid-length, they are broader, moderately deep, covered by numerous, partly coalescent punctures anteriorly.

Propleura slightly convex, without distinct impression and wrinkles along outside. Basal fold of propleura distinct.

Elytron without humeral callus, without scutellar row, with 10 regular puncture rows. Punctures in rows 1-9 dense, shallow, indistinct, mixed with irregular wrinkles, punctures in row 10 sparse, more distinct. Intervals covered with distinct fine dense punctures, ridge-shaped.

Epipleura inclined outside, visible at entire length in lateral view, ciliate near apex.

Hind wings absent.

Tarsi entirely pubescent below, in male segments 1-3 all tarsi strongly dilated, in female tarsi narrow.

Pygidium with weak impression at the entire length.

Last abdominal sternum convex.

DISTRIBUTION

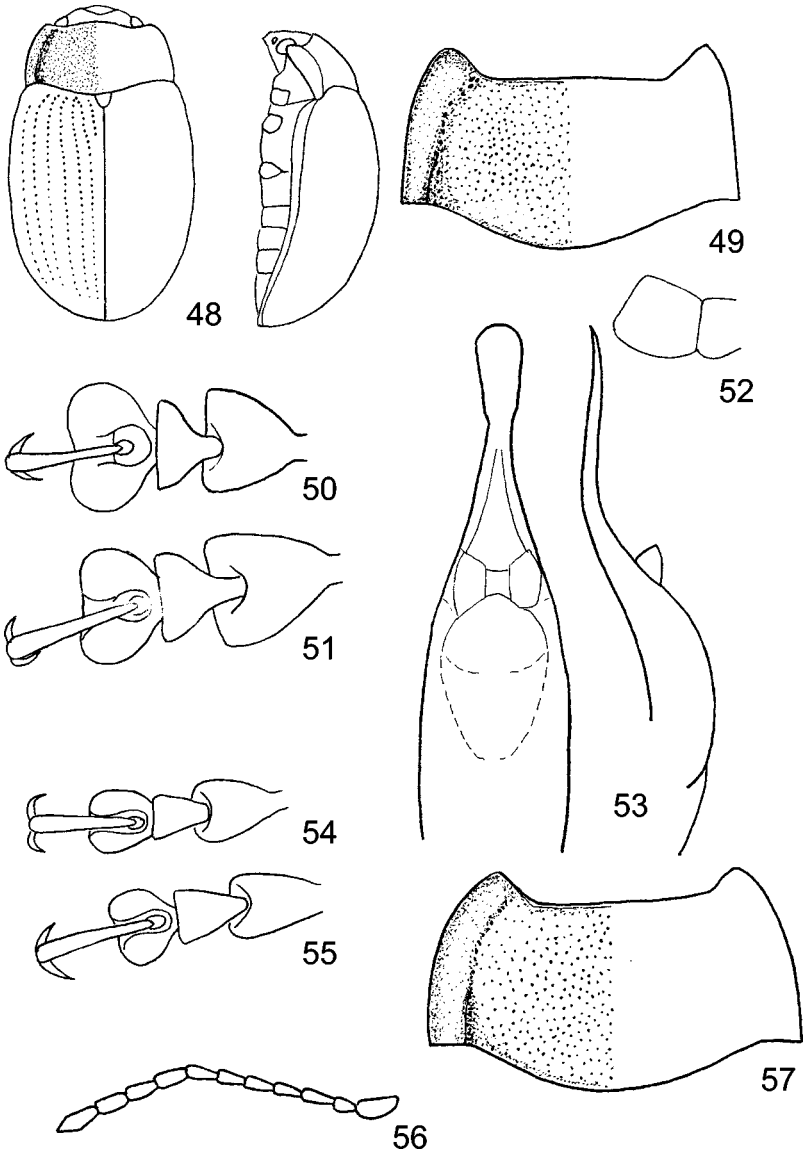
Siberia: Altai.

MATERIAL EXAMINED

TYPE. *Chrysolina* oirota, holotype (male) with labels: „Altai", „Siberia Alai" (sic!), „*Chrysomela undulata* GEBL.", „Holotypus" [red], „*Chrysolina oirota* sp.n. det. I. LOPATIN, 1985" (ZIN).

Chrysolina saurica (JACOBSON, 1924)
(Fig. 43)

Chrysomela (*Pleurosticha*) *saurica* JACOBSON, 1924: 78 (Tien Shan: Saur ridge, ZIN).



48-53. *Chrysolina dolini* (Dzhungarian Ala Tau, holotype, male): 48 - general view, 49 - pronotum, 50 - fore tarsus, 51 – hind tarsus, 52 - last segment of maxillary palpus, 53 - aedeagus. 54-57. *Chrysolina dolini* (Dzhungarian Ala Tau, paratype, female): 54 – fore tarsus, 55 - hind tarsus, 56 - antenna, 57 - pronotum

Chrysolina (*Pleurosticha*) *saurica* (JACOBSON, 1924): LOPATIN 1977: 149; LOPATIN & KULENOVA 1986: 103.
Chrysolina (*Arctolina*) *saurica* (JACOBSON, 1924): LOPATIN 1990: 54; 1992: 8.

Length 5.6-6.4 mm (male), 6.7-7.0 mm (female).

Body convex, elongate with almost parallel lateral sides (male), or elongate-obovate (female). Dorsum moderately shining (male) or sericeous shining (female), entirely dark green, greenish-black, or posterior 2/3 of elytra violaceous. Legs black.Antennae piceous, with segments 1 and 2 rufous below, 3 and 4 entirely piceous or reddish apically.

Last segment of maxillary palpus oval, truncate, slightly broader in male than in female; 1.4 times longer than broad, 1.2 times longer and 1.2 times broader than previous segment in male, 1.3 times longer than broad, as long as previous segment and 1.1 times broader than the latter in female.

Antenna inserted 1.3-1.8 times closer to clypeus than to eye. Segments 7-11 moderately broadened. Segment 10 c. 1.8 times longer than wide.

Pronotum broadest at base or near mid-length, arc-shaped laterally. Anterior margin ciliate. Disk densely minutely punctate. Lateral callus convex at entire length, lateral sulci narrow, deep in basal 1/3-1/2, they are wide, shallow, filled with large punctures anteriorly.

Propleura slightly convex, with shallow impression filled with obsolete irregular wrinkles along outside. Basal fold of propleura distinct.

Elytron with very weak humeral callus, without scutellar row, with 9 regular rows of dense punctures, punctures in 10th row invisible. Intervals covered with indistinct minute punctures, convex or ridge-shaped.

Epipleura inclined outside, visible at entire length in lateral view, more or less densely ciliate near apex.

Hind wings vestigial.

Tarsi entirely pubescent below in both sexes, in male segments 1-3 all tarsi strongly dilated, in female tarsi narrow.

Pygidium with weak impression at the entire length.

Last abdominal sternum convex, with narrow apical sulcus in male, evenly convex in female.

DISTRIBUTION

E. Kazakhstan.

MATERIAL EXAMINED

TYPES. *Chrysomela saurica*, lectotype (male), designated here, with labels: „upper reaches of Dzhemeni river, Saur, 2150m, 12.VI.910, A. JACOBSON", „Lectotype *Chrysomela saurica* JACOBSON, 1924. BIEŃKOWSKI design., 2002" [red], „*Chrysolina saurica* (JCBS.) A. BIEŃKOWSKI det., 2002" (ZIN); paralectotype (female) with my „paralectotype..." and determination labels similar to lectotype, (ZIN).

ADDITIONAL SPECIMENS. Tien Shan: Saur ridge: 1 male, 1 female; Saur ridge, 2200 m, A. KLIMENKO leg., 8-9.6.1999: 1 male.

Chrysolina septentrionalis (MÉNÉTRIÉS, 1851)

(Figs 4, 13-24, 68)

Chrysomela septentrionalis MÉNÉTRIÉS, 1851: 73 (Novaya Zemlya Isl., ZIN).
Chrysomela septentrionalis MÉNÉTRIÉS, 1851: WEISE 1916: 90.
Chrysolina (*Arctolina*) *septentrionalis* (MÉNÉTRIÉS, 1851): MEDVEDEV & DUBESHKO 1992: 107.
Chrysomela sculpturata JACOBSON, 1895: 548 („Sibiria", ZIN)
Chrysomela (*Pleurosticha*) *septentrionalis* var. *sculpturata*: JACOBSON 1910: 65.
Chrysomela septentrionalis ab. *sculpturata* JACOBSON, 1895: WEISE 1916: 90.
Chrysolina caurina BROWN, 1962: 60, 64 (Alaska: Inaru River, Canadian National Collection, Ottawa and USNM). **Syn. nov.**

Length 4.8-5.8 mm (male), 4.8-6.4 mm (female).

Body convex, oval. Dorsum shagreen, strongly or moderately shining, body and legs bronze, green, blue, or pronotum (entirely or with lateral calli green) bronze and elytra green, rarely body black.Antennae dark brown with segments 1 and 2 rufous below.

Last segment of maxillary palpus as long as broad, 1.5 times broader than previous segment, as long as the latter, in male slightly broader than in female.

Antenna inserted 1.2 times closer to clypeus than to eye, rather gradually broadened from segment 6 to apex. Segment 10 c. 1.2 times longer than wide.

Pronotum broadest near mid-length, arc-shaped laterally. Anterior margin ciliate. Disk covered with dense rather small punctures. Lateral sides swollen at entire length. Lateral sulcus narrow, deep, furrow-shaped in basal 1/3-1/2, anteriorly more shallow to obsolete, filled with punctures slightly larger than punctures on disk.

Propleura very slightly convex, without impression and wrinkles along outside. Basal fold of propleura weak.

Elytron with very weak humeral callus, with scutellar row and 10 regular rows of very dense punctures. Punctures in row 10 distinct or obsolete. Intervals covered with dense minute punctures, moderately or weakly convex, rarely flat.

Epipleura inclined outside, almost vertical in posterior half, visible at entire length in lateral view, sparsely ciliate near apex.

Hind wings absent.

Tarsi pubescent below in both sexes, in female segment 1 of all tarsi with sparsely ciliate longitudinal stripe. In male segments 1-3 of all tarsi dilated, fore and mid tarsi wider than hind tarsi, in female tarsi narrow.

Pygidium with weak impression at entire length.

Last abdominal sternum slightly convex, with narrow sulcus along apical margin in male, convex, with narrow sulcus along apical margin in female.

DISTRIBUTION

Polar Urals, Arctic Asia (Fig. 4), Alaska.

REMARKS

WEISE (1916) reduced *Ch. septentrionalis* var. *sculpturata* to the aberration level. I have examined the type of this taxon and additional specimens, which conspecific with *Ch. sculpturata*. They are similar to the holotype of *Ch. septentrionalis* in the shape of pronotal lateral impressions and aedeagus structure and differ only in the shine and punctation of dorsum and elytral relief. The holotype of *Ch. septentrionalis* is elongate, above black and dull, with pronotal disk very finely densely punctate, pronotal lateral impression quite invisible in anterior 1/3, elytral rows 6 and 7 confuse, elytral intervals flat. I have only one similar specimen from N.-E. Taimyr and I believe that this specimen and holotype of *Ch. septentrionalis* represent a rare infraspecific variation. Therefore, I consider *Ch. sculpturata* a junior synonym of *Ch. septentrionalis*.

BROWN (1962) in the original diagnosis of *Ch. caurina* mentioned: „The species is evidently closely allied to the Siberian species *septentrionalis* (MÉN.). KONTKANEN's (1959) figure of the male genitalia of that speciesshows a much less slender organ with a broadly truncated apex". I have examined one paratype (male) of *Ch. caurina*, the original description and aedeagus figure of this species (BROWN 1962) and decide that *Ch. caurina* is conspecific with *Ch. septentrionalis* and differs from *Ch. tundralis* (aedeagus of the latter, but not aedeagus of *Ch. septentrionalis* was actually pictured by KONTKANEN, 1959 under the name „*Ch. septentrionalis*"). Therefore, *Chrysolina caurina* is a new junior synonym of *Chrysomela septentrionalis*. CHERNOV et al. (1993) suggested this synonymy previously.

HOST PLANTS

Chrysolina septentrionalis develops on Caryophyllaceae (*Silene repens*, *Cerastium arvense*, *Minuartia* sp.) on Wrangel Isl. in field and in cages (O. A. KHRULEVA, personal communication). Besides that, Ranunculaceae (*Ranunculus borealis*, *Delphinium middendorffii*) and Asteraceae (*Arnica iljinii*) are recorded by CHERNOV et al. (1993) and MEDVEDEV (1996) as host plants of this species, however, these data probably refer to *Ch. tundralis*, too.

MATERIAL EXAMINED

TYPES. *Chrysomela septentrionalis*, holotype (male) with labels: „ad Matotschkin Shar. ab 28 Juli", „*Chr. septentrionalis*. Nova Semljia", „Holotype *Chrysomela septentrionalis* MENETRIES, 1851" [red] (ZIN).

Chrysomela sculpturata, lectotype (female), designated here, with labels: „Sibiria", „*Chrysomela sculpturata* m. G. JACOBSON det", „G. JACOBSON coll.", „*sculpturata* m.", „Lectotype *Chrysomela sculpturata* JACOBSON, 1895. BIEŃKOWSKI design. 1997" [red], „*Chrysolina septentrionalis* MEN., A. BIEŃKOWSKI det. 1997" (ZIN).

Chrysolina caurina, paratype (male) with labels: „68°20'N. 151°30'W. Alaska 28.8.48. N.A. WEBER 48 - 15332", „*Chrysolina* n. sp. HSB. 49", „68°20'N. 151°30'W. Alaska 28.8.48. N.A. WEBER 2314", „*Chrysolina septentrionalis* (MEN.) Det. 1961 W. J. BROWN", „Paratype *Chrysolina caurina* BROWN, 1962. identified by A. BIEŃKOWSKI , 2003" [red], „*Chrysolina septentrionalis* (MEN.) (=*caurina* BROWN) A. BIEŃKOWSKI det. 2003" (USNM). I recognize this specimen as paratype because its geographical label and place of deposition correspond to those mentioned by BROWN (1962) in the original description.

ADDITIONAL SPECIMENS. Polar Urals: F. ZAITSEV leg., 20.7.1909: 1 male. Yamalo-Nenets Autonomous Area: Gydanski Penins., mouth of Yuribei river, NAUMOV leg., 31.7.1927: 1 male. Yakutia: Sviatoj Nos cape, sea shore, VERESCHAGIN leg., 10-14.8.1972: 1 male; Lena river delta, „Ust-Lenskij" reserve, „Belaya Skala" forestry, A. TSYBULSKIJ leg., 15.8.1988: 5 males, 4 females; Lena river delta, tundra, 19.7.1998: 1 female; Lena river delta, Samoilovskij Isl., tundra, S. KUZMINA leg., 18.8.2002: 2 males, 2 females, 1.9.2002: 1 male, 2 females, 2.9.2002: 2 males; Lena river delta, Sokol Vill., S. KUZMINA leg., 23.8.2002: 2 males; estuary of Yana river, Ular river, A. BABENKO leg., 5-6.8.1994: 1 male, 1 female; Olenek bay, A. BABENKO leg., 6-8.7.1994: 2 males; Tiksi, tundra, S. KUZMINA leg., 18.7.1998: 6 males, 2 females, Tiksi, S. KUZMINA leg., 7.9.2002: 2 males, 8.9.2002: 1 male, 1 female; Bykovsky Penins., tundra, S. KUZMINA leg., 1.8., 2.8., 8.8.1998: 4 males, 3 females; E. Yakutia: Suntar-Haiata ridge, upper reaches of Kubiumbe river, 1800m, O. KHRULEVA leg., 19-30.7.2002: 1 male. Chukot Autonomous Area: Chaun Bay, SEMENOV leg., 25.8.1937: 4 males, 2 females; Milkera, S. KISELEV leg., 29.7.1978: 5 males, 3 females, 22.8.1978: 2 males, 1 female, 9.8.1978: 2 males, 4.8.1978: 1 male. Taimyr: N.-E. part, A. BABENKO leg., 10-12.8.1994: 1 male; Putorana plateau, Sobachie lake, N. shore, S. slope, 700-900m, tundra, A. BABENKO and O. MAKAROVA leg., 22.7.-11.8.1996: 1 male; Tareja, 1969: 1 female; N.-W. part, Meduza bay, Carex, moss, O. KHRULEVA leg., 10-15.7.1998: 2 females, 5-10.7.1999: 1 female; Taimyr lake, Blizhnij cape, tundra, O. MAKAROVA leg., 25.7-18.8.1994: 1 male, 2 females; 60 km from Dikson, Ragozinka river, Yu. I. CHERNOV leg.: 8.1980: 6 males, 10.7.1983: 1 male. Yamal Penins., N. part, A. BABENKO leg., 20-21.8.1994: 1 male, 1 female. Wrangel Isl.: Tundrovy peak, S. slope, O. KHRULEVA leg., 23.6.1992: 2 males, 2 females; Tundrovy peak, O. KHRULEVA leg, 22.6.1991: 2 males; middle reaches of Mamontovaya river, O. KHRULEVA leg., 11-20.6.1994: 1 male, 20.6-1.7.1994: 4 males, 1 female; lower reaches of Tundrovaja river, O. KHRULEVA leg., 10-15.6.1989: 1 male, 25.6.-19.7.1989: 1 male; Somnitelnaja bay, hill, O. KHRULEVA leg., 12-15.6.1989: 3 males, 1 female; Wrangel Isl., A. ARTIUKHOV leg., 28.7.: 1 male, 9-10.7.: 1 male, 24.6.: 1 male, 30.6.: 2 males, 25.6.1973: 1 female; Zvezdny Vill., A. VARICH leg., 5.7.1972: 2 males; 7km S-W. from Tundrovaja Mt., Tundrovaja river, A. ARTIUKHOV leg., 8.7.1973: 1 female. Severnaya Zemlya: Bolshevik Isl., left bank of Shumnaja river, 1 km from mouth, pit-fall traps, O. MAKAROVA leg., 22.7.-9.8.2000: 3 males, 17-22.8.2000: 1 female; October Revo-

lution Isl., Raz'emnaya and Gremiastchaya rivers, uninhabited hole of lemmings, 3.8.1983: 1 male.

Chrysolina subsulcata (MANNERHEIM, 1853)

(Figs 3, 9-12, 71, 72)

Chrysomela subsulcata MANNERHEIM, 1853: 254 (St. Paul Isl., ZIN).
Chrysomela subsulcata MANNERHEIM, 1853: WEISE 1916: 92.
Chrysolina subsulcata (MANNERHEIM, 1853): BROWN 1962.
Chrysolina (*Arctolina*) *subsulcata* (MANNERHEIM, 1853): KONTKANEN 1959: 29, fig. 2b,d, 31, fig. 5a, c; MEDVEDEV 1992: 568; MEDVEDEV & DUBESHKO 1992: 108.
Chrysomela (*Pleurosticha*) *birulai* JACOBSON, 1910: 56 (New Siberian Isls.: Faddejevskij Isl., ZIN)
Chrysolina subsulcata subsulcata (MANNERHEIM, 1853) (=*birulai* JACOBSON, 1910): MEDVEDEV & KOROTYAEV 1980: 80.
Chrysomela (*Pleurosticha*) *birulai* var. *glacialis* JACOBSON, 1910: 59 nec WEISE, 1884: 391 (New Siberian Isls.: Liakhov Isl., ZIN). **Syn. nov.**
Chrysomela birulai ab. *glacialis* JACOBSON, 1910: WEISE 1916: 61.

Length 5.7-8.2 mm (male), 5.9-7.4 mm (female).

Body convex, elongate oval. Dorsum moderately shining, greenish bronze, bluish green, or black with greenish tinge or without it. Some specimens from St. Paul Isl. bicolored: dorsum green, pronotum blue except green lateral calli. Legs dark metallic, brownish, or reddish.Antennae piceous or black, with segment 1 rufous below.

Last segment of maxillary palpus as long as broad, 1.1 times longer and 1.2 times broader than previous segment, slightly broader in male than in female.

Antenna inserted 1.1-1.9 times closer to clypeus than to eye.Antenna short, thick, with segments 4-11 gradually broadened. Segment 10 as long as broad.

Pronotum broadest at mid-length, or behind mid-length, arc-shaped laterally. Anterior margin ciliate. Disk densely minutely punctate. Lateral sides swollen at entire length, lateral sulci narrow, very deep in basal 1/3; they are broad, shallower and filled with numerous large punctures anteriorly.

Propleura convex, obsolete rugose along outside. Basal fold of propleura distinct.

Elytron with very weak humeral callus or without it, with scutellar row, with 10 regular rows of large dense punctures. Elytral intervals sparsely minutely punctate, intervals 2-9 convex, ridge-shaped, similar, or 3, 5, 7 (rarely also 9) more elevated than 2 and 4, 6 and 8 flat or slightly convex, interval 10 convex.

Epipleura inclined outside, visible at entire length in lateral view, sparsely or densely ciliate near apex.

Hind wings absent.

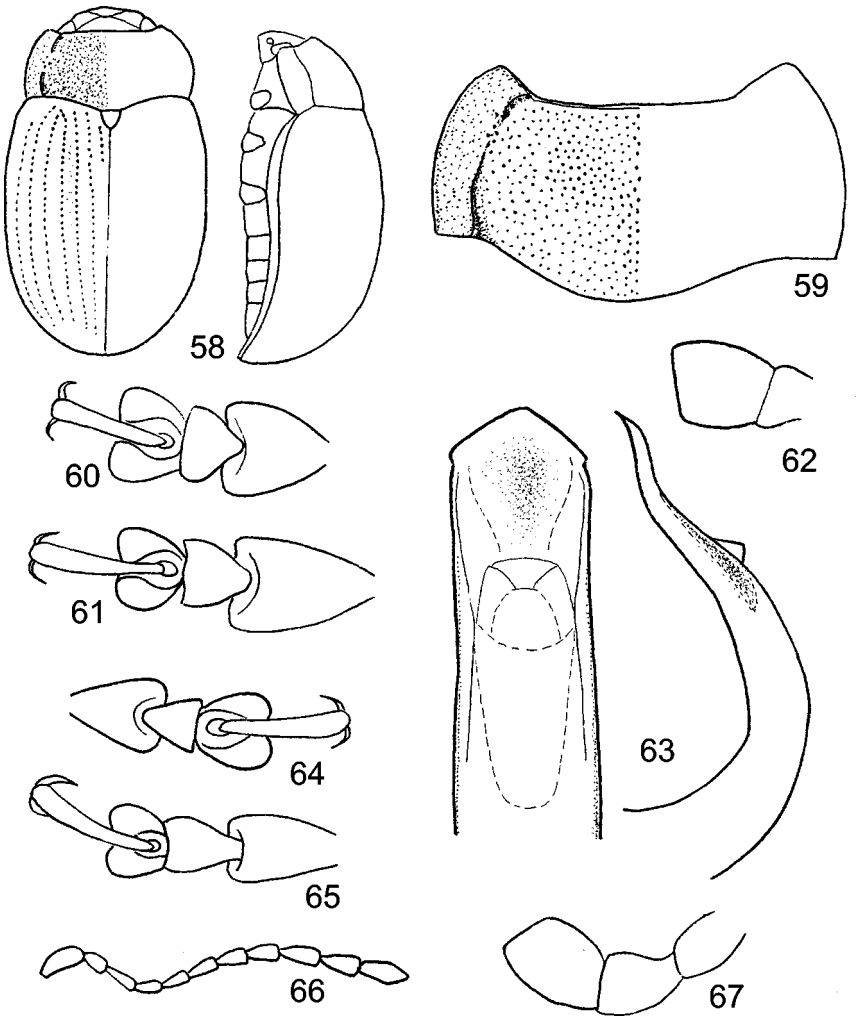
Tarsi wholly pubescent below in both sexes; in male fore and middle tarsi strongly dilated (Fig. 72), hind tarsi slightly dilated; in female tarsi narrow.

Pygidium with weak impression in basal 1/2-2/3.

Last abdominal sternum convex, medially slightly depressed in male, slightly swollen in female, with narrow sulcus along apical margin in both sexes.

DISTRIBUTION

Arctic Asia, Okhotsk Sea shore, Isls. of Bering Sea and Bering Strait (Fig. 3), Alaska.



58-63. *Chrysolina kaikana* (Dzhungarian Ala Tau, holotype, male): 58 - general view, 59 - pronotum, 60 - fore tarsus, 61 - hind tarsus, 62 - last segment of maxillary palpus, 63 - aedeagus; 64-67 - *Chrysolina kaikana* (Dzhungarian Ala Tau, paratype, female): 64 - fore tarsus, 65 - hind tarsus, 66 - antenna, 67 - maxillary palpus

REMARKS

Chrysomela birulai was treated as a junior synonym of *Ch. subsulcata subsulcata* by MEDVEDEV & KOROTYAEV (1980). Having examined the types of *Chrysomela subsulcata* (Fig. 12), *Ch. birulai* f. typ. (Fig. 9), and *birulai* var. *glacialis* (Fig. 11), I concluded they to be conspecific.

MATERIAL EXAMINED

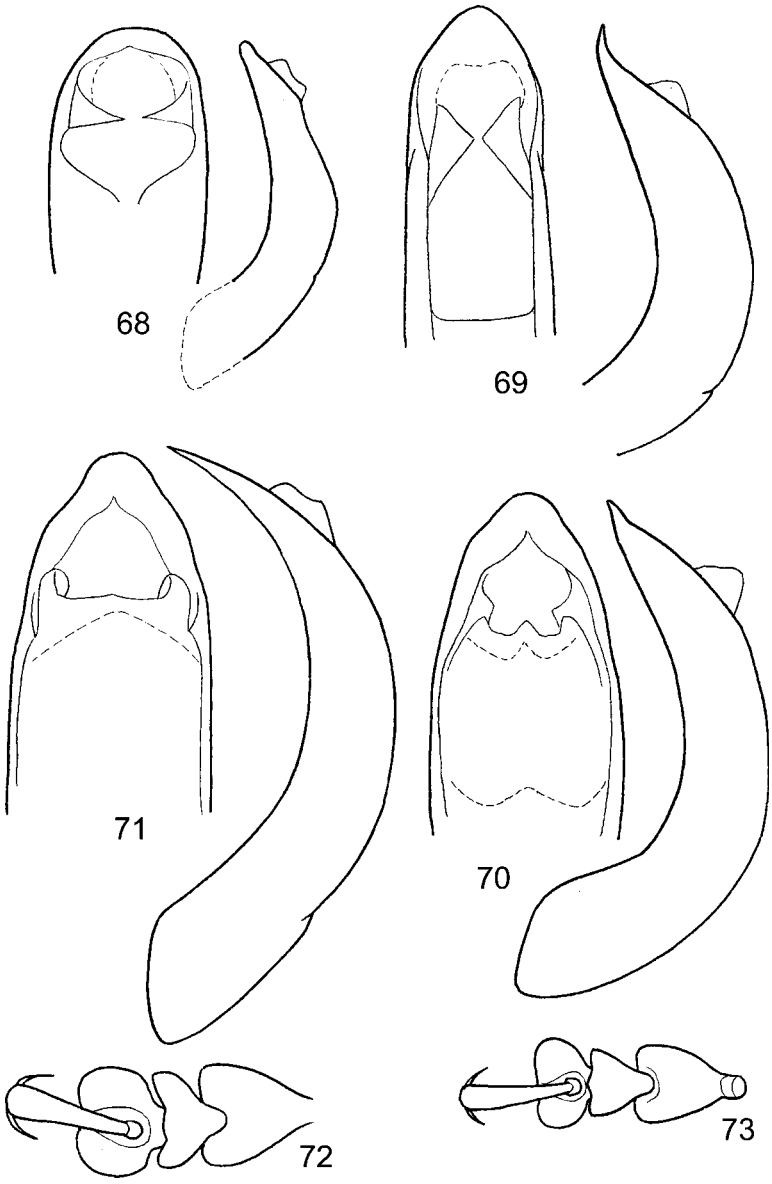
TYPES. *Chrysomela subsulcata*, lectotype (male), designated here, with labels: „Ins. St. Paul. 8873-1" [pink], „8873. *subsulcata* MANH.", „Lectotype *Chrysomela subsulcata* MANNERHEIM, 1853. BIEŃKOWSKI design., 1997" [red], „*Chrysolina subsulcata* MNNH. A. BIEŃKOWSKI det. 1997" (ZIN).

Chrysomela birulai, lectotype (male), designated here, with labels: „Ins. Faddejevskij, 11. (24.) vi. 1903, P. OLENIN leg.", „*birulai* m.", „Lectotype *Chrysomela* (*Pleurosticha*) *birulai* JACOBSON, 1910, f.typ. BIEŃKOWSKI design., 1997" [red], „*Chrysolina subsulcata* MNNH. A. BIEŃKOWSKI det. 1997" (ZIN).

Chrysomela birulai var. *glacialis*, lectotype (male), designated here, with labels: „Ins. Liakhov, New Siberian Isls., BUNGE leg. 19-27.VI.86", „Lectotype *Chrysomela birulai* var. *glacialis* JACOBSON, 1910. BIEŃKOWSKI design., 1997" [red], „*Chrysolina subsulcata* MNNH. A. BIEŃKOWSKI det. 1997" (ZIN).

ADDITIONAL SPECIMENS. Severnaya Zemlya: October Revolution Isl., sea shore, meadow, moss, lichen, M. V. GAVRILO leg., 4.7.1985: 1 female. Bering Sea: Saint Paul Isl.: E. C. JOHNSTON leg., 12.7.1939: 1 male; A. G. WHITNEY leg., 30.4.1913: 1 male, 5.-7.1914: 2 males, the same place: 1 male, 2 females; St. George Isl.: E. C. JOHNSTON leg., 21.7.1941: 1 male, 3 females, the same place, 21.7.[18]95: 1 male. New Siberian Isls. (Novaja-Sibir, Faddejevskij, Kotelnyj, Liakhov): 14 males; Faddejevskij Isl., A. BABENKO leg., 10-11.7.1994: 2 males, 1 female; Liakhov Isl., river bank, S. KUZMINA leg., 4.9.1999: 2 males, 1 female, 11.8.1999: 1 female. Wrangel Isl.: Somnitelnaja bay, O. KHRULEVA leg., 9.7.-8.8.1989: 3 males, 2 females, 17.7.-2.8.1989: 1 male, 3 females, 18-24.6.1989: 2 males, 1 female; the same place, GORODKOV leg., 6.7.1972: 1 male. Somnitelnaja bay, Tundrovaja river, 9.7.1972: 1 male; Tundrovy peak, O. KHRULEVA leg., 22.6.1991: 1 male; middle reaches of Mamontovaya river, O. KHRULEVA leg., 13.6.-20.7.1992: 1 female, 20-30.6.1992: 1 female; foot of Tundrovy peak, S. slope, O. KHRULEVA leg., 10-24.6.1989: 1 male, 1 female; lower reaches of Tundrovaja river, O. KHRULEVA leg., 25.6.-19.7.1989: 2 males; upper reaches of Neizvestnaja river, pitfall traps, O. KHRULEVA leg., 13-19.6.1991: 1 male. Yakutia: sea shore, O. STARIKOVA leg., 14.7.1990: 1 male, 1 female; Lopatka Penins., Indigirka river estuary, SSW shore of lake Shilkina, 72°70'N, 148°28'E, Ja. RED'KIN leg., 14-15.7.1994: 4 males, 1 females; Indigirka river, Russkaja Ustrichnaja branch, tundra, BABENKO leg., 14-15.7.1994; Kolyma river estuary, right bank, mountains, M.V. BEREZIN leg., 18-19.7.1994: 1 male. Okhotsk: 2 males. Laptev Sea shore between Olenek and Anabar rivers, E.TOLL leg., 13-20.8.1893: 1 male. Chukot Autonomous Area: Uelen, P. TOMKOVICH leg., 22.7.1980: 1 male; the same place, N. MIKHAILOVA leg.,

10.8.1958: 1 male; Koliuchinskaja bay, V. VORONETSKIJ leg., 7.1972: 1 male; Chaun Bay, SEMENOV leg., 24.8.1937: 1 male; Milkera, S. KISELEV leg., 9.8.1978: 2 males, 11.8.1978: 1 male, 22.8.1978: 1 female, 18.8.1978: 1 female; Shelagski cape, SEMENOV leg., 26.7.1938: 1 male.



68-70. Aedeagus: 68 - *Chrysolina septentrionalis* (Alaska, paratype *Ch. caurina*), 69-70 - *Ch. magniceps* (St. Paul Isl.), 71 - *Ch. subsulcata* (St. George Isl.). 72-73. Fore tarsus of male: 72 - *Ch. subsulcata* (St. Paul Isl.), 73 - *Ch. magniceps* (St. Paul Isl.)

Chrysolina tastavica LOPATIN, 1992
(Fig. 45)

Chrysolina (*Arctolina*) *tastavica* LOPATIN, 1992: 6 (Kazakhstan: Dzungarian Ala Tau, ZIN).

Length 6.3 mm (male), 7.4 mm (female).

Body elongate, slightly convex (female) or flattened (male). Dorsum shagreen, sericeous shining in both sexes, violaceous or bluish-violaceous. Underside, femora, and tibiae black.Tarsi and antennae brown or blackish brown.

Last segment of maxillary palpus broadly oval, truncate, 1.3 times longer than wide, as long as previous one, and slightly broader than latter one, does not differ in both sexes.

Antenna inserted 1.1 times closer to clypeus than to eye, narrow. Segment 10 c. 1.5 times longer than wide.

In female pronotum broadest at base, straight laterally, slightly convergent in basal half, rounded anteriorly, or pronotum broadest just before base and weakly evenly arc-shaped laterally; in male pronotum broadest near mid-length, arc-shaped laterally, more narrowed anteriorly. Anterior margin ciliate. Disk covered with dense minute punctures. Lateral sides swollen at entire length. Lateral impression deep, narrow at the entire length (more deep in basal half), filled with large punctures.

Propleura slightlyconvex, with shallow impression filled with transverse wrinkles along outside. Basal fold of propleura weak.

Elytron with very weak humeral callus, with scutellar row represented by 2-5 punctures and 10 regular rows of dense punctures. In male intervals slightly convex, 9th interval sometimes ridge-shaped on apical slope, in female intervals slightly convex, interval 3 ridge-shaped on apical slope, intervals 5, 7, 9 ridge-shaped in apical half, interval 10 flat and covered with transverse wrinkles in apical half.

Epipleura inclined outside, visible at entire length in lateral view, sparsely ciliate near apex.

Hind wings vestigial or absent.

Tarsi pubescent below in both sexes, only in female segment 1 of all tarsi with sparsely ciliate longitudinal stripe. In male segments 1-3 of all tarsi strongly dilated, in female tarsi narrow.

Pygidium with weak impression at entire length.

Last abdominal sternum medially depressed, with narrow sulcus along apical margin in male; convex, with narrow transverse apical sulcus, bordered anteriorly by ridge in female.

DISTRIBUTION

S-E. Kazakhstan: Dzhungarian Ala Tau.

MATERIAL EXAMINED

TYPES. Holotype (male) with labels: „N. Dzungar., Tastau ridge, 3000m, northern slope and crest, 5.6.1990, I. KABAK", „Holotypus" [red], „*Chrysolina*

tastavica sp.n. det. I. LOPATIN, 1990" (ZIN); paratype (female) with labels: „N. Dzungar., Tastau ridge, 3000m, northern slope and crest, 5.6.1990, I. KABAK", „Paratypus" [red], „*Chrysolina tastavica* sp.n. det. I. LOPATIN, 1990" (ZIN);

ADDITIONAL SPECIMENS. Tien Shan: Dzungarian Ala Tau, N. slope, Tentek river basin, 2600m, Abatas ridge, 8.8.1995, I. KABAK leg.: 1 male, 1 female.

Chrysolina teleuta (JACOBSON, 1922)

(Fig. 41)

Chrysomela teleuta JACOBSON, 1922: 521 (Altai: Ust'-Inya, ZIN).
Chrysolina (*Arctolina*) *teleuta* (JACOBSON, 1922): LOPATIN 1990: 54.
Chrysolina (*Arctolina*) *teleutica* L. MEDVEDEV et DUBESHKO, 1992: 108, lapsus calami.

Length 7.1 mm (male), 7.8 mm (female).

Body slightly convex, elongate, parallel-sided (male), or elongate-obovate (female). Dorsum violaceous, wholly moderately shining or with elytra sericeous. Femora and tibiae black with metallic tinge, tarsi piceous or black. Antennae brown with segments 1 and 2 mostly rufous.

Last segment of maxillary palpus as long as broad, 1.1 times longer and 1.3 times broader than previous segment in male; it is oval, truncate, 1.3 times longer than broad, 1.2 longer and 1.3 times broader than previous segment in female; slightly broader in male than in female.

Antenna inserted 1.4-2.1 times closer to clypeus than to eye.Antenna narrow, with segments 7-11 slightly broadened. Segment 10 c. 1.8 times longer than broad.

Pronotum broadest at mid-length, arc-shaped laterally. Anterior margin ciliate. Disk densely finely punctate. Lateral sides swollen at entire length, forming broad calli, lateral sulci narrow, deep in basal 1/3, shallow anteriorly, filled with punctures which are as large as punctures on disk or slightly larger than latter ones.

Propleura slightly convex, with shallow impression filled with weak irregular wrinkles or witout impression and with only wrinkles along outside. Basal fold of propleura strong.

Elytron with weak humeral callus, with scutellar row and 10 regular rows of dense punctures. Intervals covered with dense minute punctures, convex.

Epipleura inclined outside, visible at entire length in lateral view, sparsely ciliate near apex.

Hind wings vestigial.

In female tarsi narrow, segment 1 of all tarsi with narrow glabrous stripe below; in male all tarsi strongly dilated, entirely pubescent below.

Pygidium with weak impression at the entire length.

Last abdominal sternum convex, with medial depression in male, weakly swollen in female; in both sexes with narrow apical sulcus.

DISTRIBUTION

Siberia: Altai.

MATERIAL EXAMINED

TYPE. *Chrysomela teleuta*, lectotype (female), designated here, with labels: „Chujsk. trakt, Ust'-Inya, 15.VII.1907", „Lectotype *Chrysomela teleuta* JACOBSON, 1922. BIEŃKOWSKI design., 2002" [red], „*Chrysolina teleuta* (Jcbs.) A. BIEŃKOWSKI det., 2002" (ZIN).

ADDITIONAL SPECIMENS. Russia: Altai, v. BODEMEYER leg.: 1 male; Altai: Ongudai, A. JACOBSON leg., 8.6.1908: 13 males, 3 females, 16.6.1908: 6 males, 14.7.1908: 4 females. Kazakhstan: Syr-Darya, v. BODEMEYER leg.: 1 male, 1 female.

Chrysolina tundralis (JACOBSON, 1910)

(Figs 4, 25-30)

Chrysomela (*Pleurosticha*) *septentrionalis* var. *tundralis* JACOBSON, 1910: 65 (Yenissei river: Nikandrovskij Isl., ZIN).
Chrysomela septentrionalis ab. *tundralis* JACOBSON, 1910: WEISE 1916: 90.
Chrysolina (*Arctolina*) *septentrionalis* (MÉNÉTRIÉS, 1851): KONTKANEN 1959: 31, fig. 5b.

Length 5.4-5.9 mm (male), 5.7-7.0 mm (female).

Body convex, oval. Dorsum shagreen, weakly or moderately shining or dull, dark blue, greenish-bronze, or bronze. Legs and ventral side black or brown with bronze reflection.Antennae pale brown with segment 1 rufous below.

Last segment of maxillary palpus as long as broad, 1.4 times broader than previous segment, as long as the latter in male; 1.4 times longer than broad, 1.3 times broader than previous segment, as long as the latter in female, in male slightly broader than in female.

Antenna inserted at equal distance between clypeus and eye; broadened from segment 6 to apex. Segment 10 c. 1.5 times longer than wide.

Pronotum broadest at mid-length, arc-shaped laterally. Anterior margin ciliate. Disk covered with dense rather small punctures. Lateral sides swollen at entire length, lateral sulci narrow, deep, furrow-shaped in basal 1/2-2/3, moderately deep or shallow, with sharp outer border anteriorly, filled with large punctures, coalescent basally.

Propleura very slightly convex or almost flat, with obsolete irregular wrinkles along outside. Basal fold of propleura weak.

Elytron with very weak humeral callus, with scutellar row or without it, with 10 slightly undulate rows of dense punctures. Rows regular or 6th-8th partly confuse. Intervals covered with dense minute punctures (smaller than those on pronotal disk), flat or slightly convex.

Epipleura inclined outside, almost vertical in apical half, visible at entire length in lateral view, densely ciliate near apex.

Hind wings absent.

Tarsi pubescent below in both sexes, in female segment 1 of all tarsi with sparsely ciliate longitudinal stripe. In male segments 1-3 of all tarsi strongly dilated, in female tarsi narrow.

Pygidium convex, with weak impression basally.

Last abdominal sternum convex, depressed medially, with narrow sulcus along apical margin in male, evenly convex, with narrow sulcus along apical margin in female.

DISTRIBUTION

European Russia: Arkhangelsk reg., Lipetsk reg., Komi, Urals; north of W. Siberia, E. Siberia: Krasnojarsk Krai, Irkutsk reg. (Fig. 4).

REMARKS

WEISE (1916) reduced *Ch. septentrionalis* var. *tundralis* to the aberration level. I examined the type of this taxon and additional specimens. Among the characters mentioned in the original description (JACOBSON 1910), the size of body, shine of dorsum, and shape of pronotal lateral impressions can be used to distinguish *Ch. septentrionalis* and *Ch. tundralis* (see key to species). Besides that, they differ in the aedeagus structure (Figs 13-24 and 25-30). Areas of these forms partly overlap. Therefore, I consider them to be two separate species.

All examined males from one locality in Taimyr (environs of Ladannakh lake) have aedeagus (Fig. 28) more slender (in lateral view) and more narrowed at sides of apical orifice than it is typical of *Ch. tundralis* (Figs 25-27, 29, 30). However, the small alae of aedeagus and all external characters in these specimens correspond to those in *Ch. tundralis*.

HOST PLANTS

This species develops on Asteraceae (*Arnica iljinii* and *Saussurea* sp.) in field and in cages in Taimyr (environs of Ladannakh lake) (O.A. KHRULEVA, personal communication).

MATERIAL EXAMINED

TYPES. *Chrysomela septentrionalis* var. *tundralis*, lectotype (male), designated here, with labels: „1888", „Ins. Nikandr.", „J. SAHLB.", „J. SAHLBERG 900", „Lectotype *Chrysomela* (*Pleurosticha*) *septentrionalis* var. *tundralis* JACOBSON, 1910. BIEŃKOWSKI design. 1997" [red], „*Crysolina tundralis* (JCBS.) A. BIEŃKOWSKI det., 2002" (ZIN); 4 paralectotypes with labels: „Ins. Nikandr.", „J. SAHLB.", „J. SAHLBERG 900: 1 male; „Poloi" [Yamal: Poluj river], „J. SAHLB.", „J. SAHLBERG 900": 2 females; „Chantaika ad fl.Jenissej", „RYBAKOV coll.": 1 female, (ZIN). All paralectotypes with my „paralectotype..." label similar to „lectotype..."

ADDITIONAL SPECIMENS. European Russia: Arkhalgensk reg.: Bolshezemelskaja Tundra, Vashutkiny lakes, ZHURAVSKY leg., 27.7.: 1 female; Karskaja Tundra, F. ZAITSEV leg., 24.7.1909: 1 female; Komi: Bolshaja Synia river basin, Turun-Jol' river, ZHURAVSKY leg., 7.6.1908: 1 male; Bolshaja Synia river, Dzelia-Syn-vom, ZHURAVSKY leg., 7.6.1908: 1 female; Bolshaja Synia river valley, ZHURAVSKY leg., 13.6.1908: 1 female; Lipetsk reg., Pliuschan' forestry, *Chrysanthemum* clearing, pit-fall trap, PANTELEEVA leg., 27.7.1977: 1 male. Yamal Penins.: S. part, Malaya

Ob' river, Samgonpan Vill., V. GRICHIK leg., 4.7.1987: 1 male. Polar Ural: Neroika Mt., meadow, V. MALOZEMOV leg., 10-21.7.1989: 1 male, 16-20.6.1989: 1 female; Krasnyi Kamen', 66°55'N, 65°40'E, 230 m, S. KOPONEN leg., *Aconitum* grove, 3-17.7.1994: 1 male, meadow in birch for, 8-18.7.1994: 1 male. S. Taimyr: 80 km northwards from Norilsk, upper reaches of N. Agapa river, 2 km westwards from Ladannakh lake, meadow, O. MAKAROVA leg., 2-13.8.1999: 1 male, the same place, O. KHRULEVA leg., 7-11.7.2001: 1 male, 14-20.7.2001: 3 males, 18.7.2001: 2 males, 1 female, 14-16.7.2001: 1 male; lower reaches of Yenisei river, Dudinka Vill., S. TOLSTOI leg., 18.6.1908: 1 male, 1 female, 22.6.1908: 1 female, the same place, Wuorentaus leg.: 2 males, 1 female; 60 km from Dikson, Ragozinka river, Yu.I. CHERNOV leg., 8.1980: 1 male, 2 females, 12.7.1983: 2 males, 20.7.1983: 1 female. Irkutsk reg.: Nizhne-Ilimsk, A. KRESLAVSKY and V. ZHERIKHIN leg., 28.5.: 1 female, 31.5.: 2 females, 2.6.: 2 males, 4 females, 3.6.1965: 1 female. Krasnoyarsk Krai: Lower Tunguska: 1 female; envir. Krasnoyarsk, 7.9.1955: 1 male; Turukhansk, J. SAHLBERG leg.: 1 male.

Chrysolina valichanovi LOPATIN, 1990

(Fig. 42)

Chrysolina (*Arctolina*) *valichanovi* LOPATIN, 1990: 53 (S-E. Kazakhstan: Dzungarian Ala Tau, ZIN).
Chrysolina (*Arctolina*) *valichanovi* LOPATIN, 1990: LOPATIN 1992: 8.

Length 6.2 mm (male), 7.0 mm (female).

Body elongate oval, slightly convex. Dorsum shagreen, in male sericeous, in female pronotum moderately shiny and elytra sericeous; black with bronze reflection. Underside dark brown with bronze reflection. Legs and antennae rufous.

Last segment of maxillary palpus as broad as long, 1.5 times longer and 1.5 times broader than previous one in male, oval, truncate, 1.3 times longer than broad, as long as previous one and 1.3 times broader than the latter in female.

Antenna inserted at equal distance between clypeus and eye, narrow, with segments 7-11 moderately broadened. Segment 10 c. 1.1 times longer than wide.

Pronotum broadest before base, weakly arc-shaped laterally, narrowed anteriorly. Anterior margin ciliate. Disk covered with sparse, minute punctures which denser and larger basally near lateral impressions. Lateral sides swollen at entire length. Lateral impression deep, furrow-shaped in basal half, shallow and narrow anteriorly, almost obsolete at 1/3 length from anterior margin, filled with large, partly confluent punctures.

Propleura slightly convex, with obsolete impression along outside. Basal fold of propleura distinct.

Elytron with very weak humeral callus. Scutellar row absent or represented by several sparse punctures.Elytron with 10 regular rows of dense punctures, rows equidistant, or rows 3-4, 5-6, and 7-8 slightly arranged in pairs. Row 10 with obsolete punctures. Intervals sparsely finely punctate, slightly convex (female) or flat (male).

Epipleura inclined outside, almost vertical in apical 1/3, visible at entire length in lateral view, densely ciliate near apex.

Hind wings vestigial.

Tarsi wholly pubescent below in both sexes, in male segments 1 and 3 of all tarsi strongly dilated, in female tarsi narrow.

Pygidium with weak impression in basal half.

Last abdominal sternum convex, slightly emarginate apically in both sexes, with furrow along apical margin in male.

DISTRIBUTION

S-E. Kazakhstan: Dzhungarian Ala Tau.

MATERIAL EXAMINED

TYPES. Holotype (male) with labels: „Dzungarian Ala Tau, Bien-Koksu, 25km S. from Arsan-canal, alpine meadow, under stone, 2950m, 4.8.1984, K. Z. KULENOVA leg.", „Holotypus" [red], „*Chrysolina valichanovi* sp.n. det. I. LOPATIN, 1988" (ZIN); paratype (female) with labels: „Dzungarian Ala Tau, Bien-Koksu, 25km S. from Arsan-canal, alpine meadow, 2950m, 4.8.1984, K. Z. KULENOVA leg.", „Paratypus" [red], „*Chrysolina valichanovi* sp.n. det. I. LOPATIN, 1988" (ZIN);

ADDITIONAL SPECIMENS. S-E. Kazakhstan: Baskan river, N. SKOPIN leg., 17.6.1968: 1 male. Tien Shan: S.-E. Dzungarian Ala Tau, riverhead of Maizhurak, riverhead of Kazan, Koksu river basin, 2600-3100 m, I. KABAK leg, 13.6.1991: 1 male, 2 females.

KEY TO SPECIES OF THE SUBGENUS *ARCTOLINA* FROM N. EURASIA AND ALASKA

1(4) Apex of aedeagus broadly truncate or rounded, but neither gradually attenuated nor drawn off (Figs 13-30).

2(3) Dorsum strongly or moderately shiny, one-coloured bronze, green, blue, or pronotum bronze (sometimes with lateral calli green) and elytra green, rarely above black. Pronotal impressions narrow, deep, furrow-shaped in basal 1/3-1/2, shallower or obsolete, without sharp outer border anteriorly. Elytral intervals moderately or slightly convex, rarely flat. Aedeagus usually more slender (in lateral view), slightly curved, with larger triangular alae (Figs 13-24, 68).Body mostly smaller: male 4.8-5.8 mm long, female 4.8-6.4 mm long ..... ***Ch. septentrionalis***

3(2) Dorsum weakly or moderately shiny or dull, dark blue, greenish-bronze, or bronze. Pronotal impressions narrow, deep, furrow-shaped in basal 1/2-2/3, moderately deep or shallow, but always with distinct outer border anteriorly. Elytral intervals flat or slightly convex. Aedeagus usually thicker (in lateral view), more distinctly curved, with smaller alae (Figs 25-30).Body mostly larger: male 5.4-5.9 mm long, female 5.7-7.0 mm long ..... ***Ch. tundralis***

4(1) Aedeagus with triangular apical projection of various shape (Figs 5-12).
5(6) Aedeagus with apical projection narrow, elongate, recurved before apex (in lateral view) (Fig. 8). Pronotal sulci broad, strongly impressed posteriorly, weaker impressed anteriorly. Elytral intervals 2-9 evenly elevated into ridges, interval 10 convex in anterior half, ridge-shaped in posterior half. Dorsum black, wholly moderately shining in male, with sericeous elytra in female. Legs rufous ..... ***Ch. bungei***
6(5) Aedeagus blunt at apex, with short apical projection (Figs 5-7, 9-12, 69-71). Dorsum moderately shiny in both sexes.
7(10) Ventral side of aedeagus more or less distinctly recurved before apex (in lateral view) (Figs 5-7, 69, 70).
8(9) Apex of aedeagus broadly rounded and then triangularly drawn off (Fig. 7). Pronotal sulci broad, shallow or moderately deep in basal 1/3-1/2, almost obsolete anteriorly. Elytral intervals 2-8 moderately convex, interval 9 more convex, interval 10 concave. Dorsum bright green, dark green, or bronze, usually with pronotal and elytral lateral sides and head (partly) violaceous. Legs dark metallic or black ..... ***Ch. boeberi***
9(8) Apex of aedeagus gradually attenuated into blunt point (Figs 5-6, 69, 70). Pronotal sulci narrow and deep in basal 1/3, shallower anteriorly. Elytral intervals 3, 5, 7, and 9 strongly elevated forming ridges, 2 and 4 slightly elevated or flat, 6 and 8 flat, or intervals 2-9 evenly convex, interval 10 flat or weakly convex. Dorsum black, blackish-green, bluish-green, or green. Femora and tibiae dark metallic, tarsi brown, or legs entirely rufous or brown .... ***Ch. magniceps***
10(7) Ventral side of aedeagus evenly curved (in lateral view), with apex attenuated into blunt point (Figs 9-12, 71). Pronotal sulci narrow, deep in basal 1/3, shallower anteriorly. Elytral intervals 2-9 evenly convex, or 3, 5, 7 (rarely also 9) more elevated than 2 and 4, 6 and 8 flat or weakly convex, interval 10 convex. Dorsum greenish bronze, bluish green, or black with greenish tinge or without it. Legs dark metallic, brownish, or reddish ..... ***Ch. subsulcata***

KEY TO SPECIES OF THE SUBGENUS *ARCTOLINA* FROM E. KAZAKHSTAN, ALTAI, AND N.-W. CHINA

1(2) Pronotal impressions shallow or indistinct, not forming, deep sulci basally. Aedeagus as in Figs 31, 32 ..... ***Ch. borochorensis***
2(1) Pronotal impressions distinct, forming narrow, deep sulci basally.
3(4) Pronotal disk sparsely, finely punctate. Elytral intervals flat, densely shagreen, without punctures. Dorsum violaceous.Length: 6.0-7.0 mm ..... ***Ch. cyanella***
4(3) Pronotal disk with dense, distinct punctures. Elytral intervals punctate, however punctures sometimes hardly visible among strong microsculpture.
5(6) Pronotal lateral calli broad, pronotum laterally strongly arc-shaped.Body larger, length 7.2-8.6 mm (male), 7.7-9.4 mm (female). Aedeagus as in Fig. 41 ..... ***Ch. teleuta***

6(5) Pronotal lateral calli narrow, pronotum laterally weakly convex.Body smaller, length 5.6-6.5 mm (male), 6.0-7.5 mm (female). In species belonging to this group, colouration, shape of pronotum and elytral intervals variable. Examination of male aedeagus is necessary for the correct identification.
7(10) Aedeagus with long narrow apical projection which broadened at apex (Figs 46, 53).
8(9) Pronotal lateral sides rounded. Aedeagus as in Fig. 46 ..... ***Ch. ballioni***
9(8) Pronotal lateral sides weakly rounded in anterior 1/2, almost rectilinear in posterior 1/2 (Fig. 49). Aedeagus as in Fig. 53 ..... ***Ch. dolini***
10(7) Aedeagus with apical projection short: triangular or truncate (Figs 33, 42-45, 47, 63).
11(14) Aedeagus with apex broad, triangular (Figs 47, 63).
12(13) Pronotal disk covered with distinct, dense punctures. Elytral intervals convex, ridge-shaped in both sexes, covered with fine, distinct, dense punctures. Dorsum black, pronotum and elytra laterally with bluish reflection. Aedeagus as in Fig. 47 ..... ***Ch. oirota***
13(12) Pronotal disk glabrous, covered with very fine, sparse punctures. Elytral intervals very slightly convex, sparsely and very finely punctate. Dorsum dark bronze with golden reflection. Aedeagus as in Fig. 63 ..... ***Ch. kaikana***
14(11) Aedeagus with apex truncate (Figs 33, 42-45).
15(16) Aedeagus almost parallel-sided up to apex (Fig. 44) ..... ***Ch. kryzhanovskii***
16(15) Aedeagus strongly narrowed at sides of apical orifice, with apex short, drawn off (Figs 33, 42, 43, 45).
17(18) Alae of aedeagus projecting over lateral sides of apical orifice (in dorsal view) (Fig. 43) ..... ***Ch. saurica***
18(17) Alae of aedeagus not projecting over lateral sides of apical orifice (in dorsal view) (Figs 33, 42, 45).
19(20) Femora and tibiae brown, antennae and tarsi rufous. Aedeagus as in Fig. 42 ..... ***Ch. valichanovi***
20(19) Femora and tibiae black, antennae and tarsi dark brown.
21(22) Aedeagus strongly curved downwards at apex (in lateral view) (Fig. 33). Elytron with all intervals or only intervals 3, 5, 7, and 9 ridge-shaped .... ***Ch. octocosta***
22(21) Aedeagus weakly curved upwards at apex (in lateral view) (Fig. 45). Elytral intervals slightly convex (in female several intervals ridge-shaped on apical slope) ..... ***Ch. tastavica***

SPECIES EXCLUDED FROM THE SUBGENUS *ARCTOLINA*

Chrysolina dubeshkoae L.Medvedev, 1974

Chrysolina (*Arctolina*) *dubeshkoae* L. Medvedev, 1974: 181 (Mongolia: Bajan-Khongor Aimak).
Chrysolina (*Arctolina*) *dubeshkoae* L. Medvedev, 1974: Medvedev 1982: 83.
Chrysolina bannikovae L. Medvedev, 1978: 193 (Mongolia: Ara-Khangai Aimak).

Chrysolina bannikovay L. MEDVEDEV, 1978: 193, lapsus calami.
Chrysolina (*Arctolina*) *dubeshkoae* L. MEDVEDEV, 1974 (=*bannikovae* L. MEDVEDEV, 1978): L. MEDVEDEV 1982: 245.

Ch. dubeshkoae was originally included (MEDVEDEV & KOROTIAEV 1974) in the subgenus *Arctolina* on the base of the external morphology, including structure of pronotum, elytra, and tarsi. However, the aedeagus, as it is figured in the original publication, has not alae. Therefore, the taxonomic position of this species will be unclear until the specimens are examined. I have placed *Ch. dubeshkoae* as *Incerte sedis* within the genus *Chrysolina*.

NOMEN DUBIUM

Chrysomela kuznetzowi JACOBSON, 1897

Chrysomela kuznetzowi JACOBSON, 1897: 434 (N. Urals: Loswa river, type was deposited in coll. by P. SEMENOV, probably lost).
Chrysolina septentrionalis (MENETRIES, 1851) (=*kusnetzovi* (sic!) JACOBSON, 1897): MEDVEDEV & KOROTYAEV 1980: 80.

I could not find the type of *Chrysomela kuznetzowi* among the materials of the collection of P. SEMENOV deposited in ZIN. The taxonomic position of this species is unclear without a study of the type. According to the original description, it is probably conspecific with *Ch. septentrionalis* or *Ch. subcostata*.

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