

A review of soldier beetles of the genus *Rhagonycha* Eschscholtz, 1833 (Coleoptera: Cantharidae) of Siberia, with description of a new species

Обзор жуков-мягкотелок рода *Rhagonycha* Eschscholtz, 1833 (Coleoptera: Cantharidae) Сибири, с описанием нового вида

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КЛЮЧЕВЫЕ СЛОВА: Coleoptera, Cantharidae, Cantharinae, *Rhagonycha*, новые виды, таксономия, определительная таблица, Палеарктика.

ABSTRACT. A new species of soldier beetles of the genus *Rhagonycha* Eschscholtz, 1833, *Rh. ussurica* **sp.n.**, is described from the Russian Far East. *Rhagonycha mlikoskyi* Švihla, 1995, **syn.n.** is proposed as a new junior synonym of *Rh. latiuscula* Sahlberg, 1887. An identification key to all forty species of the genus of Siberia and the Russian Far East is provided, along with an annotated checklist of the species. Photos of the holotypes of *Rh. kurbatovi* Kazantsev, 1994, *Rh. amaguensis* Švihla, 1995 and *Rh. dolini* Švihla, 1995 are presented for the first time. Morphological characters that may be used to distinguish *Rhagonycha* species are discussed.

РЕЗЮМЕ. С российского Дальнего Востока описывается новый вид жуков-мягкотелок рода *Rhagonycha* Eschscholtz, 1833, *Rh. ussurica* **sp.n.** Предлагается рассматривать *Rhagonycha mlikoskyi* Švihla, 1995, **syn.n.** в качестве нового младшего синонима *Rh. latiuscula* Sahlberg, 1887. Приводится полная определительная таблица рода для Сибири и Дальнего Востока, насчитывающего в регионе 40 видов, а также аннотированный список этих видов. Впервые приводятся фото голотипов *Rh. kurbatovi* Kazantsev, 1994, *Rh. amaguensis* Švihla, 1995 и *Rh. dolini* Švihla, 1995. Обсуждаются морфологические признаки, по которым возможно разделение видов *Rhagonycha*.

Introduction

Cantharidae, or soldier beetles, are among the most common insects in Siberia and the Far East of Russia. Not only are they vast in numbers in the area, they are

also quite rich in forms. The total number of soldier beetle species registered in this territory is approaching one hundred [Kazantsev, Brancucci, 2007; Kazantsev, 2011]. They are represented by three subfamilies, Cantharinae, Silinae and Malthininae, of which Cantharinae by far surpasses the other two. Among the cantharines, the most species-rich genus in the region is *Rhagonycha* Eschscholtz, 1830, accounting for forty species-level taxa [Kazantsev, Brancucci, 2007; Kazantsev, 2011].

The genus *Rhagonycha* exhibits a distinct holarctic pattern of distribution, its members can be come across almost throughout the Palaearctic and Nearctic realms, but actually not going beyond their boundaries. It includes not less than 250 species, with more than 200 species registered in the Palaearctic [Delkeskamp, 1977; Kazantsev, Brancucci, 2007].

The first *Rhagonycha* of this area was described back in 1822, from Kamchatka, as a *Cantharis* species [Eschscholtz, 1822], followed by half a dozen others in the course of the following 150 years. However, many more species were described after it was found that these often similarly looking dark brown to black soft-bodied beetles can be well separated by the structure of their male genitalia. The more important recent contributions were papers that studied and illustrated the male aedeagi [Švihla, 1995, 2006; Kazantsev, 2008], including reviews of *Rhagonycha* of certain parts of the region [Wittmer, 1971; Medvedev, Ryvkin, 1992] or the whole of it [Kazantsev, 1994, 1995].

An opportunity to study new and reanalyse some of the old Siberian and Far Eastern material allows adding another species to the genus. Its description is presented below, along with a taxonomic note and a checklist and

a key to all species of *Rhagonycha* distributed in Russia east of the Ural mountains.

Material and Methods

The studied beetles were pinned or glued on cardboard plates. Before the examination, they were relaxed in water, then their detached abdomens were kept for several hours in 10% KOH at room temperature. The KOH treated aedeagi and terminal abdominal segments were then placed in micro vials with glycerin for photographing.

MSP-1 zoom stereoscopic dissecting microscope with 8–80 times magnification range was used for examination of diagnostic characters. Photographs were taken with a Canon EOS 6D camera and Canon MP-E 65 mm lens. Images were then stacked using Zerene Stacker version 1.04 and enhancements were made in Adobe Photoshop Elements 9, while tarsus and aedeagus plate preparations were made in Adobe Illustrator CS5 version 15.0.0. In some instances the provided figures illustrate the aedeagal setation and inner sac structures, however, in most cases they do not. The provided label information cites the original labels.

The following acronyms are used the text: ICM — Insect Center, Moscow; NHMB — Naturhistorisches Museum, Basel; ZIN — Zoological Institute of the Russian Academy of Sciences, St-Petersburg; ZMMU — Zoological Museum of Moscow University.

Taxonomy

Family Cantharidae Imhoff, 1856 (1815)
Subfamily Cantharinae Imhoff, 1856 (1815)
Tribe Cantharini Imhoff, 1856 (1815)

Rhagonycha Eschscholtz, 1830

Rhagonycha Eschscholtz, 1830: 64.

type species: *Cantharis fulva* Scopoli, 1763 (designated by Delkeskamp, 1977)

Rhagonycha (s.str.) *latiuscula* Sahlberg, 1887
Figs 129–131.

Rhagonycha latiuscula J.R. Sahlberg, 1887: 32

= *Rhagonycha caroli* Pic, 1905: 121

= *Rhagonycha distinctipes* Pic, 1905: 121

= *Rhagonycha mlikovskiyi* Švihla, 1995: 74, **syn.n.**

REMARKS. The description of *Rhagonycha mlikovskiyi* Švihla, 1995, based on two specimens, one from Buryatia, the other from Korea, compares it to *Rh. sibirica* Wittmer, 1971 [Švihla, 1995], whereas its aedeagus is actually indistinguishable from that of *Rh. latiuscula* Sahlberg, 1887 [Kazantsev, 1994], falling within the range of its intraspecific variability. Besides, the *Rh. sibirica* group of species is characterised by the conspicuous tooth at the base of the distally split male claws [Kazantsev, 1994], while the presence of such tooth is not mentioned in the description, apparently due to its absence. Therefore, also taking into account the identity in all other parameters between the above mentioned taxa, *Rhagonycha mlikovskiyi* Švihla, 1995, **syn.n.** is proposed to be considered a junior synonym of *Rhagonycha latiuscula* Sahlberg, 1887.

DISTRIBUTION. West and East Siberia (Altai, Kemerovo, Chita Oblasts, Krasnoyarsk Krai, Buryatia), Far East (Magadan Oblast, Primorskiy Krai, Sakhalin) – Korea, Japan, Mongolia.

Rhagonycha (s.str.) *ussurica* Kazantsev, **sp.n.**
Figs 9, 17–21, 92–94.

MATERIAL: Holotype, ♂, FE Russia, Primorskiy Kr., Lazovsk. Res., Petrov Bay, 29–31.V.2007, V. Shokhrin leg. (ICM); paratypes (28 ♂♂ and 5 ♀♀): ♂, S Sakhalin, Gornozavodsk, 17.VI.1971, V. Dolin leg.; 2 ♂♂, Kedrovaya Pad' Res., at UV light, 5.VI.1987, D. Fedorenko leg.; ♂ and ♀, Sakhalin, 12 km SW Aniva, Lyutoga R., Urozhainoe, 23.VI.1989, V.V. Dubatolov, V.K. Zinchenko, O. Guseinov leg.; ♂, S(outh) Primorje, Hasan distr., R. Kedrovaya, 23–30.V.1990, S. Kazantsev leg.; ♂, S Sakhalin, Korsakov Rayon, 15 km SE Novikovo, 1.VI.1990, K. Makarov leg.; ♀, S Sakhalin, Korsakov Rayon, 15 km SE Novikovo, 7.VI.1990, K. Makarov leg.; ♂, S Sakhalin, Korsakov Rayon, 15 km SE Novikovo, 8.VI.1990, K. Makarov leg.; ♂, S Sakhalin, Kholmsk distr., Slepikovskiy Cape, 6–8.VII.1990, A. Basarukin leg.; ♂ and ♀, S(outh) Primorje, Ussurijsk, env. Kamenushka, 9.VI.1991, S. Kurbatov leg.; ♂, S(outh) Primorje, Blue Mts, 30 km S Spassk-Dalnij, 16–18.VI.1990, S. Kazantsev leg.; ♂, Russia, Khabarovsk Kr., Bikin, 20 km N Boitsovo, Kamenistaya Griva Hill, 47.02° N, 134.15° E, 300 m, 27.V.1993, L. Zersche et al. leg.; 3 ♂♂, South Primorje, 18 km SE Ussurijsk, Gornotaezhnoe, at light, 24–25.VI.1995, V. Dubatolov, Yu. Dudkov leg.; ♂, FE Russia, Primorskiy Kr., Lazovskiy Res., Amerika Stn, 43°16'16" N, 134°03'01" E, 24.VI.2005, Yu. Sundukov, V. Shokhrin leg.; ♂, Russia, Primorskiy Kr., Lazovskiy Res., Mount Chernaya, 1250 m, 28–29.VI.2005, Yu. Sundukov, V. Shokhrin leg.; ♂, FE Russia, Primorskiy Kr., Lazovskiy Res., Mount Chernaya, 43°11'05" N, 134°03'03" E, 28–30.VI.2006, Yu. Sundukov, V. Shokhrin leg.; ♂, Russia Far East, S Khabarovsk, env. Khekhtsyur, 31.V.2008, A. Napolov leg.; ♂ and 2 ♀♀, Lazovskiy Res., Amerika Stn, 23–31.V.2009, S. Kurbatov leg.; ♂, FE Russia, Primorskiy Kr., Upper Ussuri R., Ussuri Stn, 9–16.VI.2010, Yu. Sundukov leg.; ♂, FE Russia, Primorskiy Kr., Kedrovaya Pad' Res., midstr. Kedrovka R., 24–25.V.2015, A. Zaitsev, K. Makarov leg.; ♂, FE Russia, Primorskiy Kr., Kedrovaya Pad' Res., 28.V.2019, Yu. Sundukov leg.; ♂, FE Russia, Primorskiy Kr., Kedrovaya Pad' Res., upper Listvyanka R., 29.V.2019, K. Makarov leg.; 2 ♂♂ FE Russia, Primorskiy Kr., Kedrovaya Pad' Res., 1.5 km N Listvenichnyj Stn, 30.V.2019, K. Makarov leg.; ♂, FE Russia, Primorskiy Kr., Kedrovaya Pad' Res., Kedrovka vill., FIT, 1–5.VI.2019, K. Makarov leg.; ♂, FE Russia, Primorskiy Kr., Kedrovaya Pad' Res., env. Kedrovka vill., 2.VI.2019, Yu. Sundukov leg. (ICM, ZIN and ZMMU).

DESCRIPTION. **Male.** Dark brown to black (Fig. 9).

Head transverse, about as wide as pronotum. Eyes relatively large, spherical, interocular distance ca. 1.5 times greater than eye diameter. Vertex in dense, moderately coarse punctation. Ultimate maxillary and labial palpomeres subequal in size and shape, weakly widening and obliquely truncate at apex, ca. 3 times longer than wide. Antennae filiform, attaining three fifths of elytra; antennomere 3 ca. 1.4 times longer than antennomere 2 and 1.2 times shorter than antennomere 4; antennal pubescence short and semi-erect (Fig. 9).

Pronotum weakly trapezoidal, ca. 1.1 times wider than long, noticeably narrowed in anterior half, rounded anteriorly, acute posterior angles small and inconspicuous; sides, except in the middle, relatively widely explanate. Scutellum triangular, about as long as wide, rounded at apex (Fig. 9).

Elytra elongate, ca. 3.25 times longer than wide at humeri, slightly widening towards apices, entirely covering abdomen, with three slightly oblique longitudinal costae, indistinct basally and at apices; elytral pubescence uniform and relatively dense, with short sub-erect hairs (Fig. 9).

Legs long and slender; femurs and tibiae straight and narrow, subequal in length; tibial spurs relatively short, subequal

in size and shape; tarsi long, hind tarsomere length ratio 2.5 : 1.9 : 1.4 : 1 : 1.7; tarsomeres 1–3 narrow, tarsomere 4 deeply cleft; front, middle and hind claws similarly cleft, with broadly separated tips, inner tips semi-obtuse (Fig. 17–19).

Ultimate sternite gradually narrowed at apex (Fig. 21).

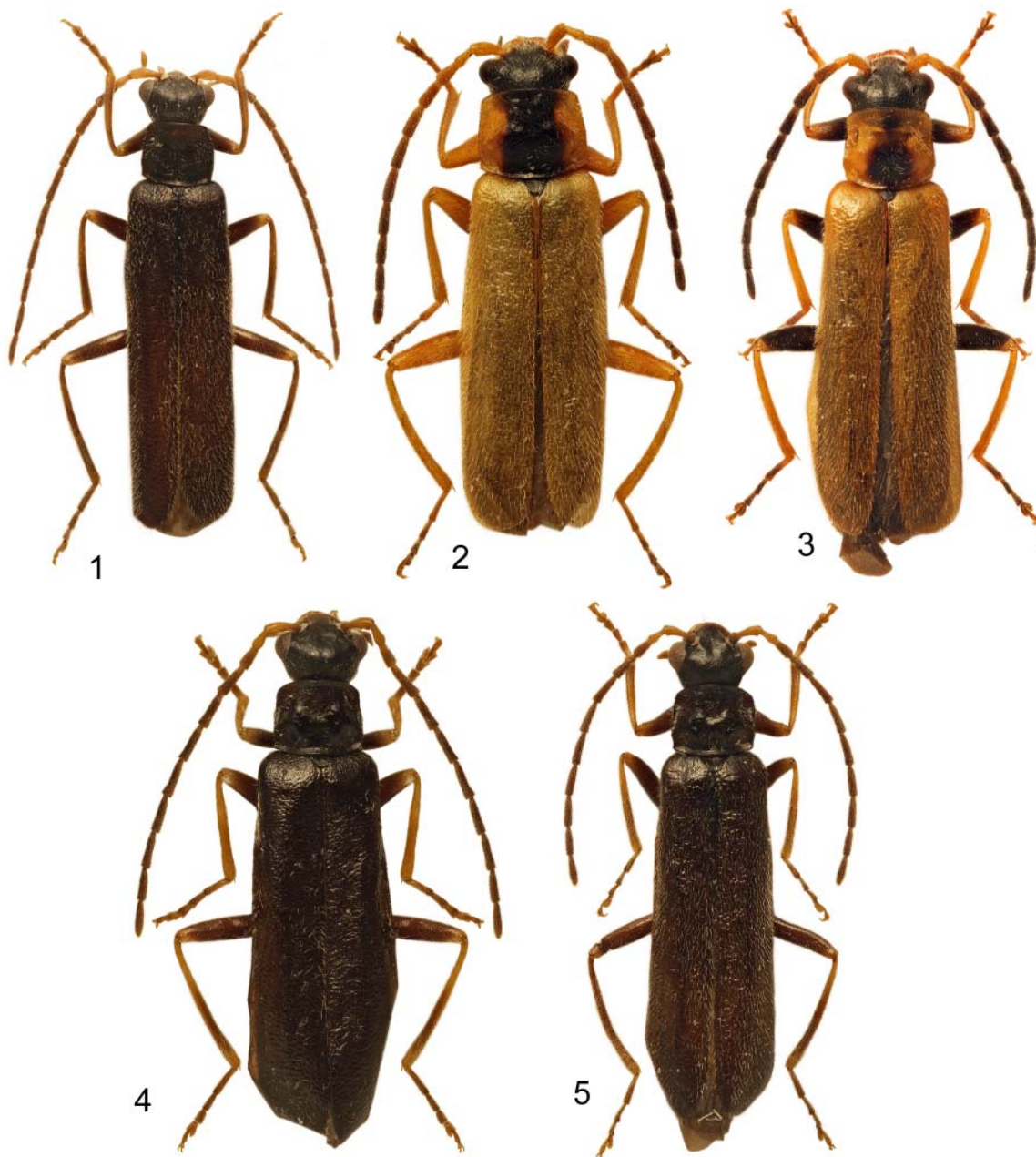
Aedeagus elongate; dorsal plate parallel-sided, with deep narrow incision and widely rounded, appearing obtuse at apex blades; parameres elongate, attaining to three fourths of dorsal plate length, in lateral view slightly widened near the middle

and narrowed distally, in ventral view distinctly inclined to the centre (Figs 92–94).

FEMALE. Similar to male, including in the structure of the claws (Fig. 20), but wider, with smaller eyes and shorter antennae.

Length: 8.0–9.0 mm; width (at humeri): 1.7–2.0 mm.

ETYMOLOGY. The new species is named after its type locality, Primorskij Kraj (formerly known as Ussurijskij Krai, which also included part of the modern Khabarovsk Krai).

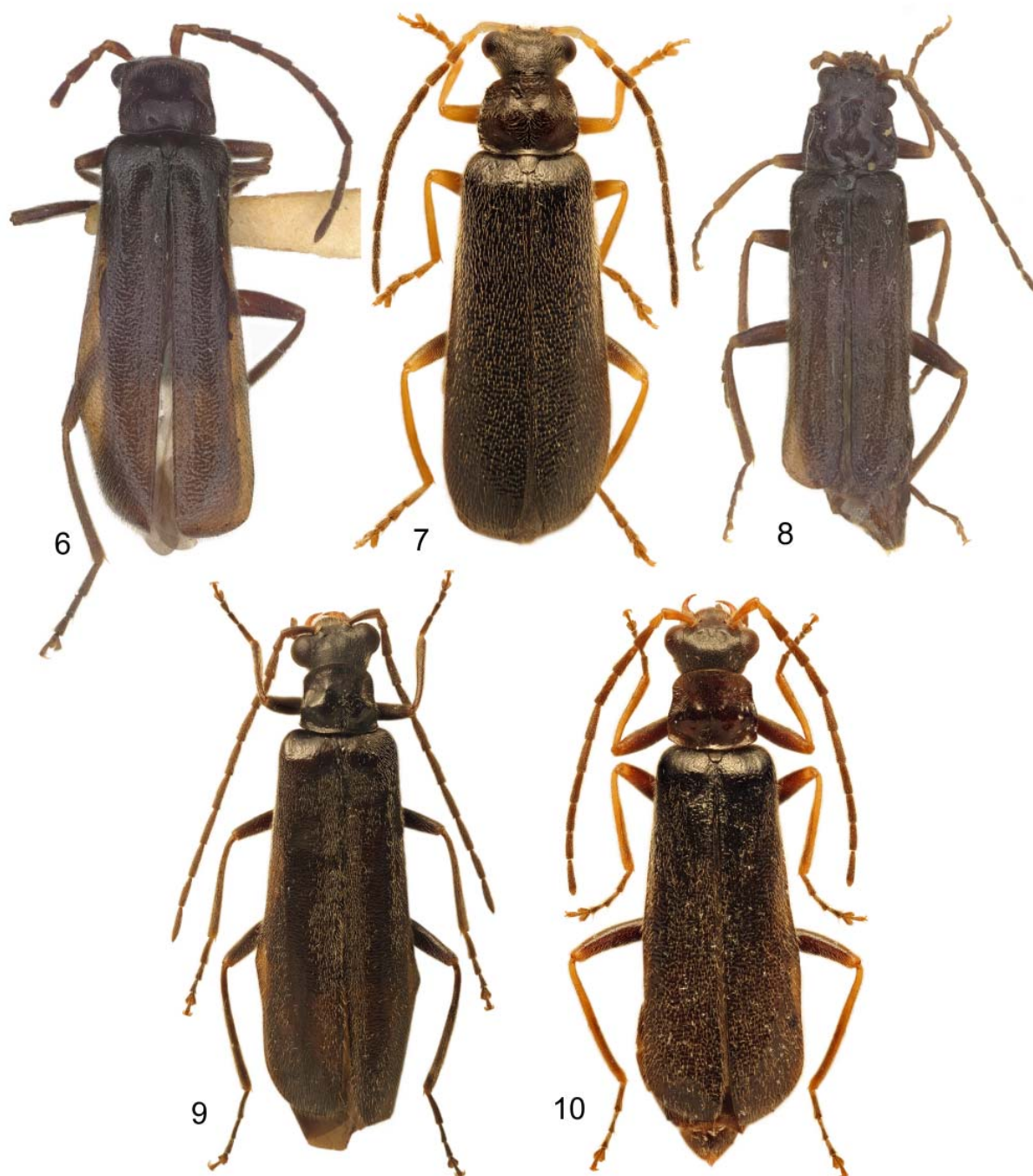


Figs 1–5. General view of *Rhagonycha*, males: 1 — *Rh. kazantsevi*; 2 — *Rh. testacea*; 3 — *Rh. nigriventris*; 4 — *Rh. sibirica*; 5 — *Rh. kurbatovi*; 5 — holotype (2, 3 — after Kazantsev, 2022).

Рис. 1–5. Общий вид *Rhagonycha*, самцы: 1 — *Rh. kazantsevi*; 2 — *Rh. testacea*; 3 — *Rh. nigriventris*; 4 — *Rh. sibirica*; 5 — *Rh. kurbatovi*; 5 — голотип (2, 3 — по: Kazantsev, 2022).

DIAGNOSIS. *Rhagonycha ussurica* **sp.n.** can be distinguished from the similar *Rh. ondreji* Švihla, 2006 from Inner Mongolia (Nei Mongol, China) by the greater size (8–9 mm vs 5.6 mm), parallel-sided dorsal plate and longer parameres of the aedeagus attaining to three fourths of dorsal plate (Figs 92–94) vs

the distally widening dorsal plate and relatively short parameres attaining only to the middle of the dorsal plate in *Rh. ondreji* [Švihla, 2006]. The new species also resembles *Rh. mongolica* Wittmer, 1971 and *Rh. mimica* Medvedev et Ryvkin, 1989, with which it was confused until now, differing from both in the greater



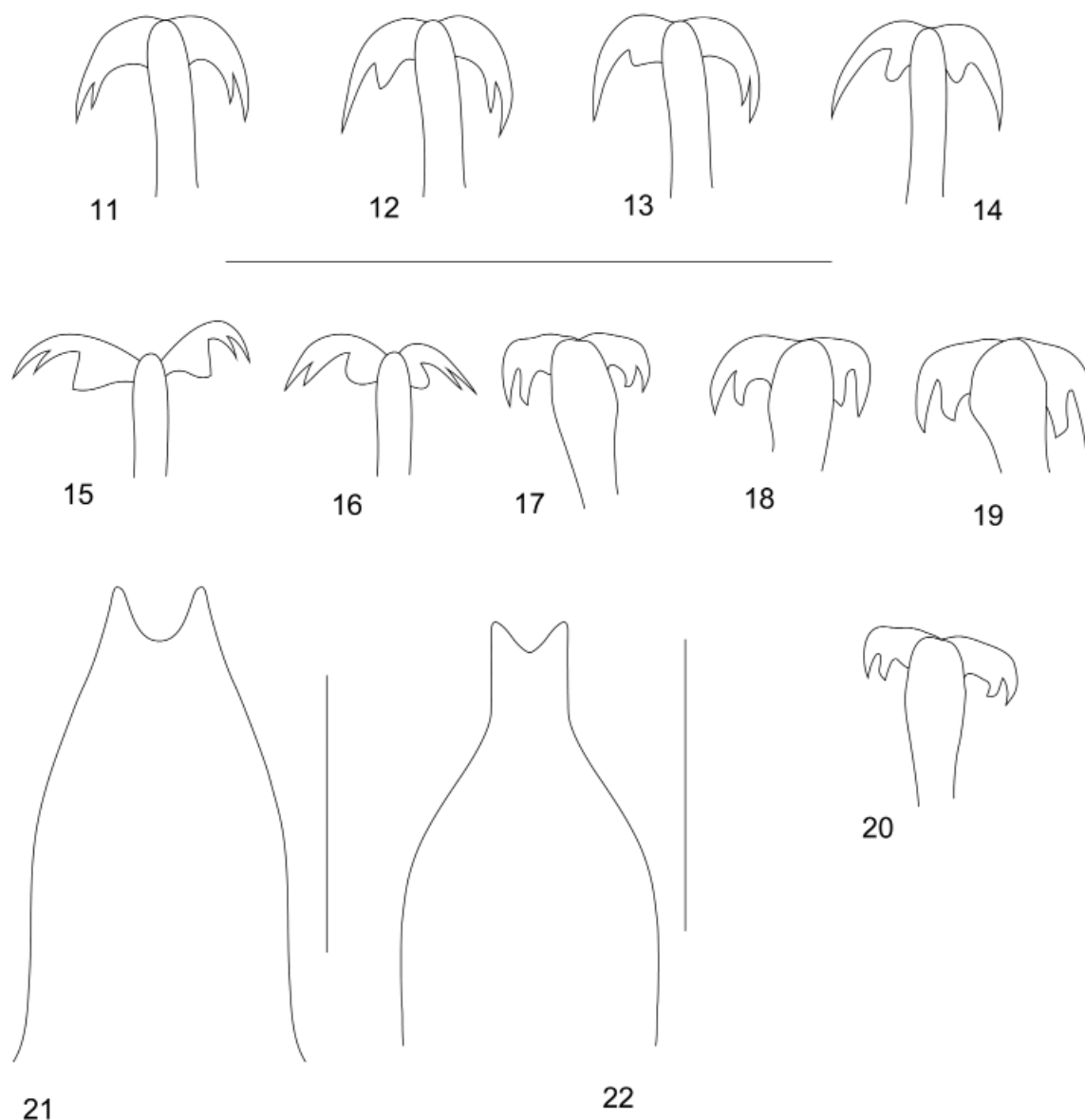
Figs 6–10. General view of *Rhagonycha*, males: 6 — *Rh. amaguensis*; 7 — *Rh. atra*; 8 — *Rh. dolini*; 9 — *Rh. ussurica* **sp.n.**; 10 — *Rh. elongata*; 6, 8, 9 — holotypes (7, 10 — after Kazantsev, 2022) (photos 6, 8 — courtesy M. Borer).

Рис. 6–10. Общий вид *Rhagonycha*, самцы: 6 — *Rh. amaguensis*; 7 — *Rh. atra*; 8 — *Rh. dolini*; 9 — *Rh. ussurica* **sp.n.**; 10 — *Rh. elongata*; 6, 8, 9 — голотипы (7, 10 — по: Kazantsev, 2022) (автор фото 6, 8 — M. Borer).

size (8–9 mm vs less than 7 mm) and, from the former — by the entirely dark brown to black head, antennae and legs, gradually narrowed at apex ultimate sternite and only slightly widened in the middle long parameres (Figs 92–94), and from the latter — by the elongate dorsal plate of the aedeagus with distally rounded blades (Figs 92–94), whereas in *Rh. mongolica* the cheeks, two basal antennomeres and knees are light brownish, the ultimate sternite is abruptly constricted near apex and the parameres are short and strongly widened in the middle (Figs 90, 91), and in *Rh. mimica* the dorsal plate is transverse with distally obtuse blades

(Figs 87–89). The new species is also similar to *Rh. koreaensis* Kang et Kim, 2000, from Korea, differing in the greater size (8–9 mm vs 6–8 mm), more elongate antennomere 2 (1.4 times shorter than antennomere 3 vs 1.5 times shorter than antennomere 3 in *Rh. koreaensis*), more elongate pronotum (1.1 times wider than long vs 1.24 times wider than long in *Rh. koreaensis*) and parallel-sided dorsal plate of the aedeagus (noticeably narrowed distally in *Rh. koreaensis*) [Kang, Kim, 2000].

DISTRIBUTION. South of Primorskij and Khabarovsk Krajs, South Sakhalin.



Figs 11–22. Details of *Rhagonycha*: 11–14 — *Rh. kazantsevi*; 15 — *Rh. sibirica*; 16 — *Rh. kurbatovi*; 17–21 — *Rh. ussurica* sp.n.; 22 — *Rh. mongolica*; 11, 15–17 — male front tarsal claws; 12, 18 — male middle tarsal claws; 13, 19 — male hind tarsal claws; 14, 20 — female front tarsal claws; 21, 22 — ultimate male sternite; 15–19, 21 — holotypes. Scale: 0.5 mm (11–14 — after Kazantsev, 1995; 15, 16 — after Kazantsev, 1994; 22 — after Wittmer, 1971).

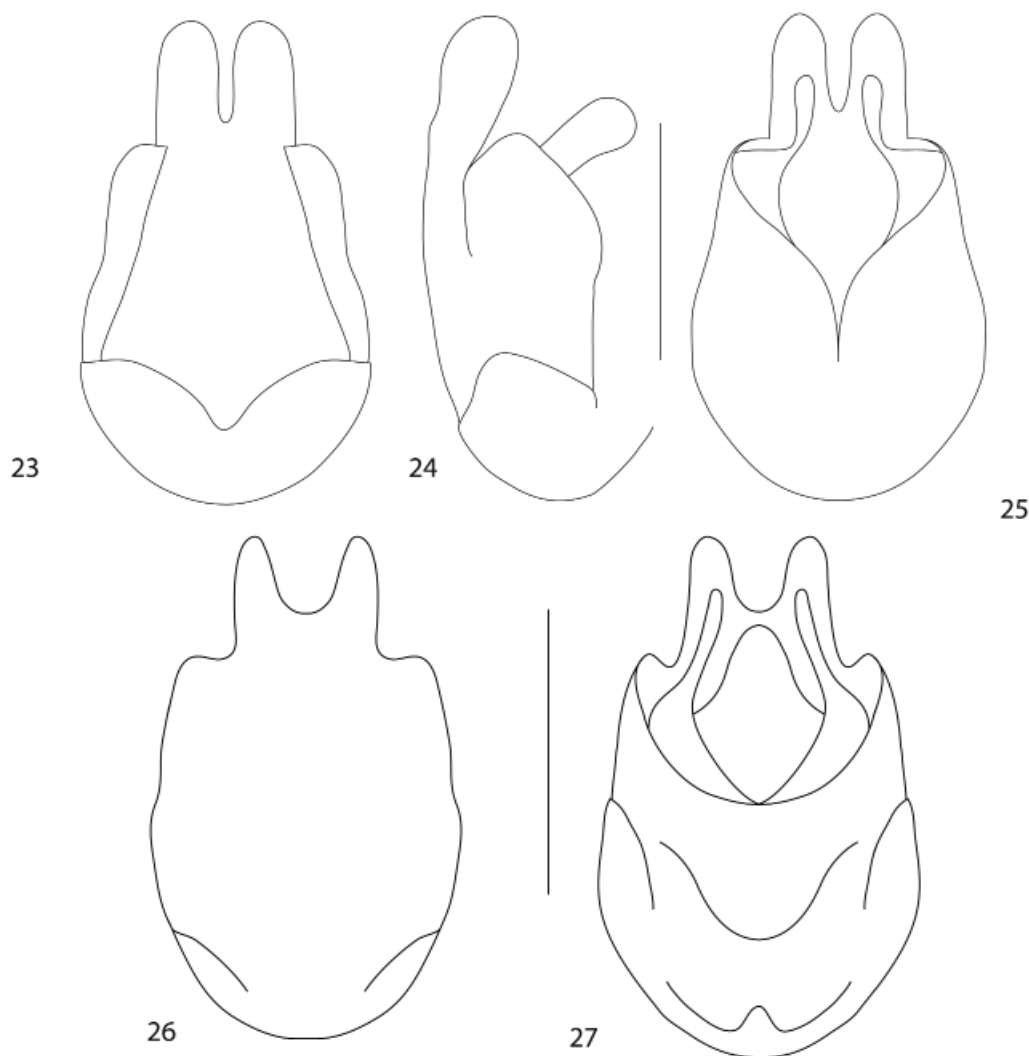
Рис. 11–22 Детали строения *Rhagonycha*: 11–14 — *Rh. kazantsevi*; 15 — *Rh. sibirica*; 16 — *Rh. kurbatovi*; 17–21 — *Rh. ussurica* sp.n.; 22 — *Rh. mongolica*; 11, 15–17 — передние коготки самца; 12, 18 — средние коготки самца; 13, 19 — задние коготки самца; 14, 20 — передние коготки самки; 21, 22 — вершинный стернит самца; 15–19, 21 — голотипы. Масштабная линейка: 0,5 мм (11–14 — по: Kazantsev, 1995; 15, 16 — по: Kazantsev, 1994; 22 — по: Wittmer, 1971).

A key to *Rhagonycha* of Siberia

Distribution of species is given in parentheses, by administrative divisions or, in case of a wider range, by geographical regions; distribution beyond Siberia and the Far East is indicated after a hyphen.

1. Body narrow, male elytra ca. 3.75 times longer than wide at humeri (Fig. 1). Middle and hind posterior tarsal claws in the male simple, only with a tooth at base, all male anterior claws bifid at apex (Figs 11–13); all female claws simple, just with a short blunt tooth at base (Fig. 14); tarsomere 5 attached near the middle of tarsomere 4 (subgen. *Ussurycha*). Parameres broad, only about twice as long as wide (Figs 23–25) (Primorskij Krai) *Rh. (U.) kazantsevi* Švihla
 – Male elytra not more than 3.5 times longer than wide at humeri (e.g., Figs 2–10). All claws of male tarsi bifid at apex

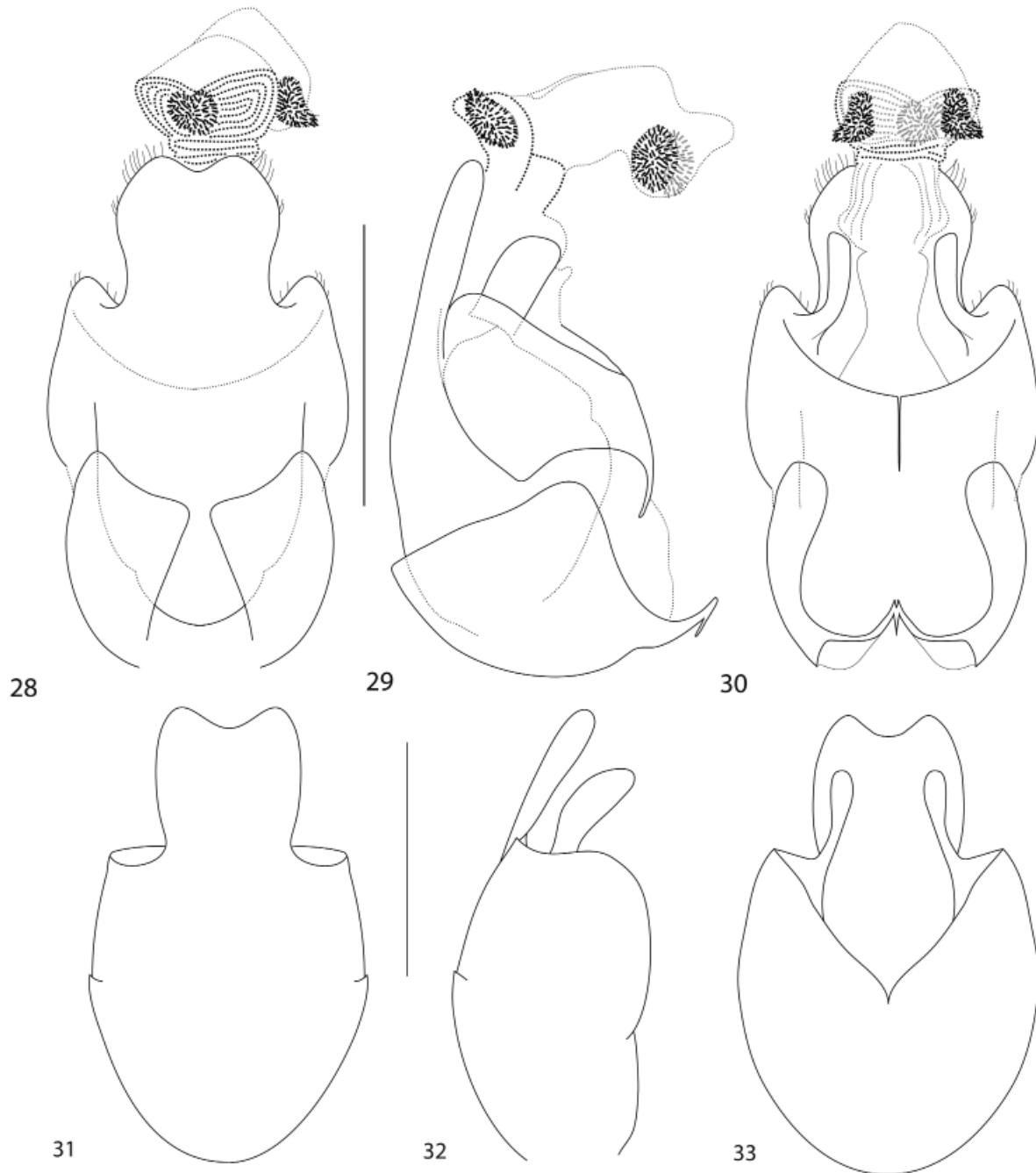
- (e.g., Figs 15–19); tarsomere 5 attached near the base of tarsomere 4 (subgen. *Rhagonycha* s.str.) 2
2. Elytra yellow or yellowish-brown (e.g., Figs 2, 3) 3
 – Elytra dark brown to black (e.g., Figs 4–10) 6
3. Legs uniformly testaceous (Fig. 2). Aedeagus — Figs 26, 27 (Khanty-Mansi A.O., Tomsk, Tyumen Oblasts, Krasnoyarsk Krai, Transbaikalia – centre, north and south of European part of Russia, Urals, Western and Central Europe) *Rh. (s.str.) testacea* Linnaeus
 – At least femurs darkened (e.g., Fig. 3) 4
4. Larger, body length over 7 mm. Parameres more or less parallel-sided (Figs 28–30) (East and West Siberia – south of European part of Russia, Mongolia) *Rh. (s. str.) stusaki* Švihla
 – Smaller, body length less than 7 mm. Parameres widened in the middle and narrowed distally (Figs 31–33) 5
5. Elytra often infuscated. Parameres inconspicuously widened near apex (Figs 31–33) (Altai, Tuva, Transbaikalia – Middle Asia, Mongolia) *Rh. (s.str.) alpicola* Barovskij



Figs 23–27. Aedeagus of *Rhagonycha*: 23–25 — *Rh. kazantsevi*; 26, 27 — *Rh. testacea*; 23, 26 — dorsal view; 24 — lateral view; 25, 27 — ventral view. Scale: 0.5 mm (23–25 — after Kazantsev, 1994; 26, 27 — after Kuska, 1995).

Рис. 23–27. Эдеагус *Rhagonycha*: 23–25 — *Rh. kazantsevi*; 26, 27 — *Rh. testacea*; 23, 26 — сверху; 24 — сбоку; 25, 27 — снизу. Масштабная линейка: 0,5 мм (23–25 — по: Kazantsev, 1994; 26, 27 — по: Kuska, 1995).

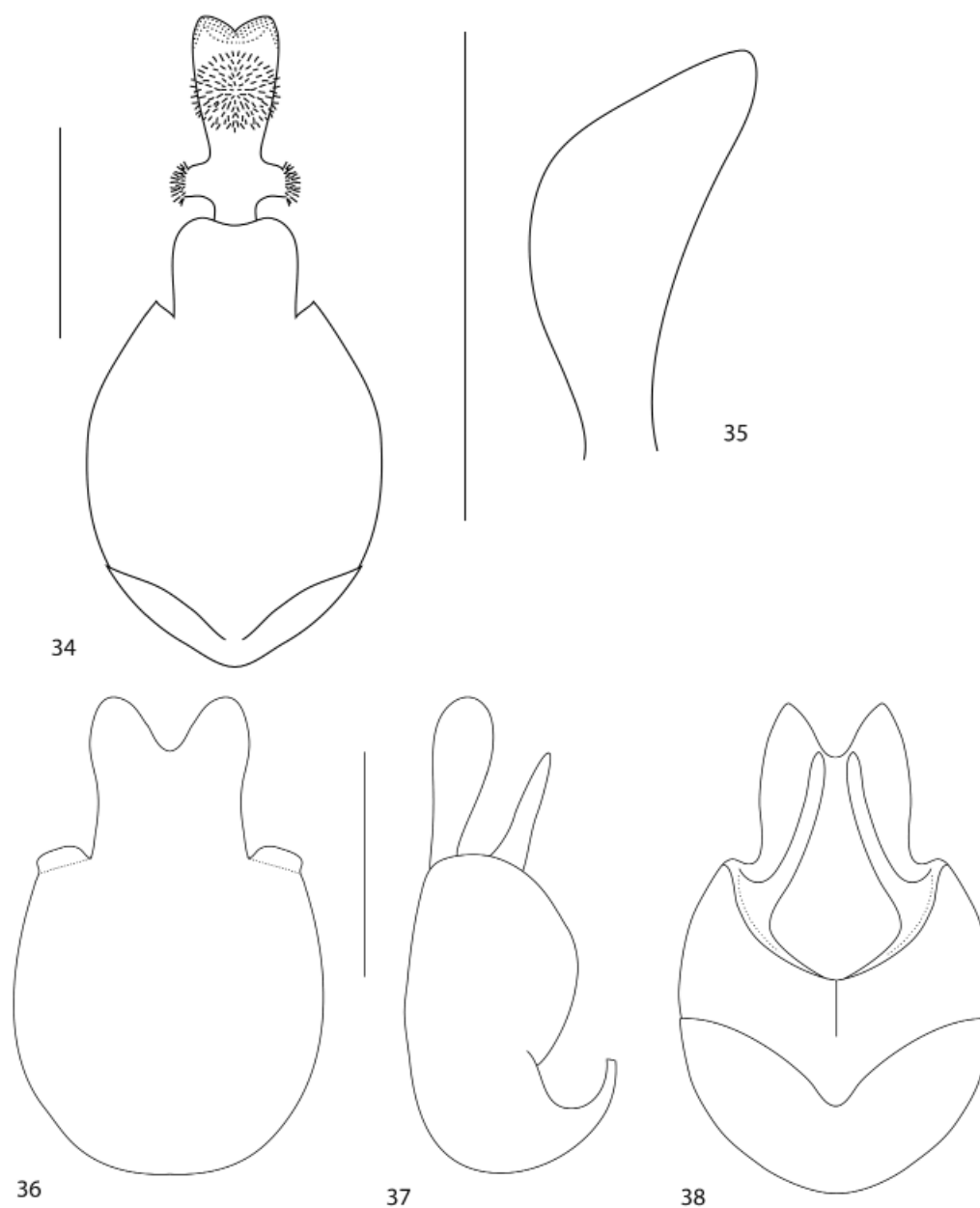
- Elytra always testaceous (Fig. 3). Parameres considerably widened near apex (Figs 34, 35) (East and West Siberia, Kamchatka, Magadan Oblast – centre and north of European part of Russia, Western and Central Europe, Middle Asia, Mongolia) *Rh. (s.str.) nigriventris* Motschulsky
- 6. Pronotum reddish testaceous, sometimes with a black spot at disk 7
- Pronotum uniformly dark brown to black (e.g., Figs 4, 5) 9
- 7. Parameres narrow (Figs 36–38) (Altai, Tuva, Yakutia, Transbaikalia – Kazakhstan, Mongolia) *Rh. (s.str.) transbaikalica* Pic
- Parameres wide (Figs 39–44) 8
- 8. Pronotum uniformly reddish testaceous. Parameres widened in the middle and narrowed towards apex (Figs 39–41) (Irkutsk Oblast – Mongolia) *Rh. (s.str.) oboensis* Kazantsev



Figs 28–33. Aedeagus of *Rhagonycha*: 28–30 — *Rh. stusaki*; 31–33 — *Rh. alpicola*; 28, 31 — dorsal view; 29, 32 — lateral view; 30, 33 — ventral view. Scale: 0.5 mm (31–33 — after Kazantsev, 1994).

Рис. 28–33. Эдеагус *Rhagonycha*: 28–30 — *Rh. stusaki*; 31–33 — *Rh. alpicola*; 28, 31 — сверху; 29, 32 — сбоку; 30, 33 — снизу. Масштабная линейка: 0,5 мм (31–33 — по: Kazantsev, 1994).

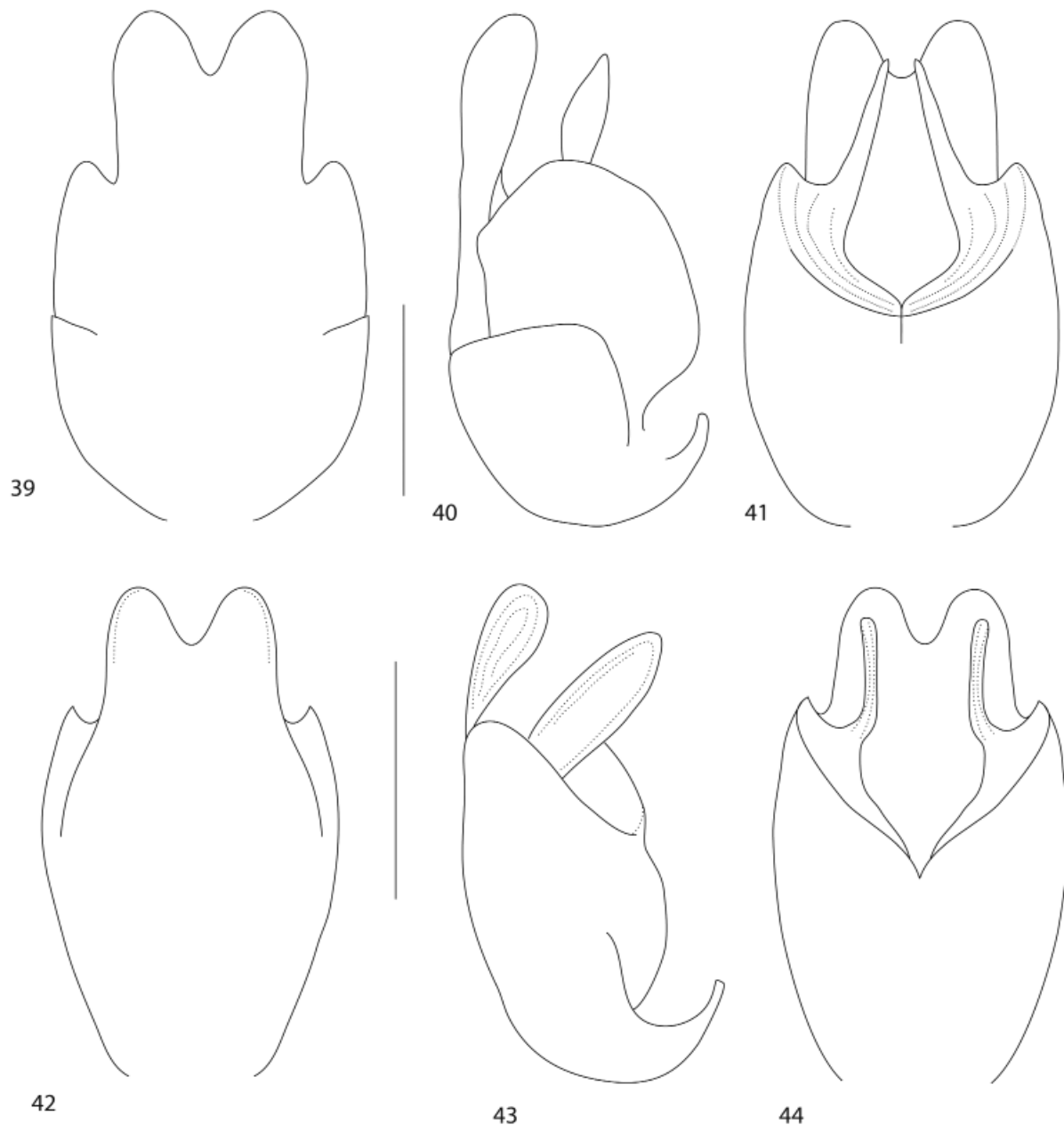
- Disk of pronotum infuscated. Parameres more or less parallel-sided (Figs 42–44) (Tuva) *Rh. (s.str.) uralensis* Dahlgren
- 9. Male claws with a conspicuous tooth at base (Figs 15, 16) 10
- Male claws without a tooth at base (e.g., Figs 17–20) ... 13
- 10. Distance between dorsal plate blades in the middle exceeding the blade's width at the same level; parameres cylindrical (Figs 45–47) (Primorskij Krai) *Rh. (s.str.) sihotana* Kazantsev
- Distance between dorsal plate blades in the middle several times less than the blade's width at the same level (Figs 48–55) 11
- 11. Basal protarsal tooth acute (Fig. 15); parameres relatively short and broad (Figs 48–50) Upperside dark brown to black; basal antennomeres and legs, except femurs, light brown (Fig. 4) (Primorskij Krai, Magadan Oblast – Japan) *Rh. (s.str.) sibirica* Wittmer
- Basal protarsal tooth rounded (Fig. 16); parameres relatively long and narrow (Figs 51–55) 12



Figs 34–38. Aedeagus of *Rhagonycha*: 34, 35 — *Rh. nigriventris*; 36–38 — *Rh. transbaikalica*; 35 — paramere; 34, 36 — dorsal view; 35, 37 — lateral view; 38 — ventral view. Scale: 0.5 mm (34, 35 — after Kuska, 1995; 36–38 — after Kazantsev, 1994).

Рис. 34–38. Эдеагус *Rhagonycha*: 34, 35 — *Rh. nigriventris*; 36–38 — *Rh. transbaikalica*; 35 — параметра; 34, 36 — сверху; 35, 37 — сбоку; 38 — снизу. Масштабная линейка: 0,5 мм (34, 35 — по: Kuska, 1995; 36–38 — по: Kazantsev, 1994).

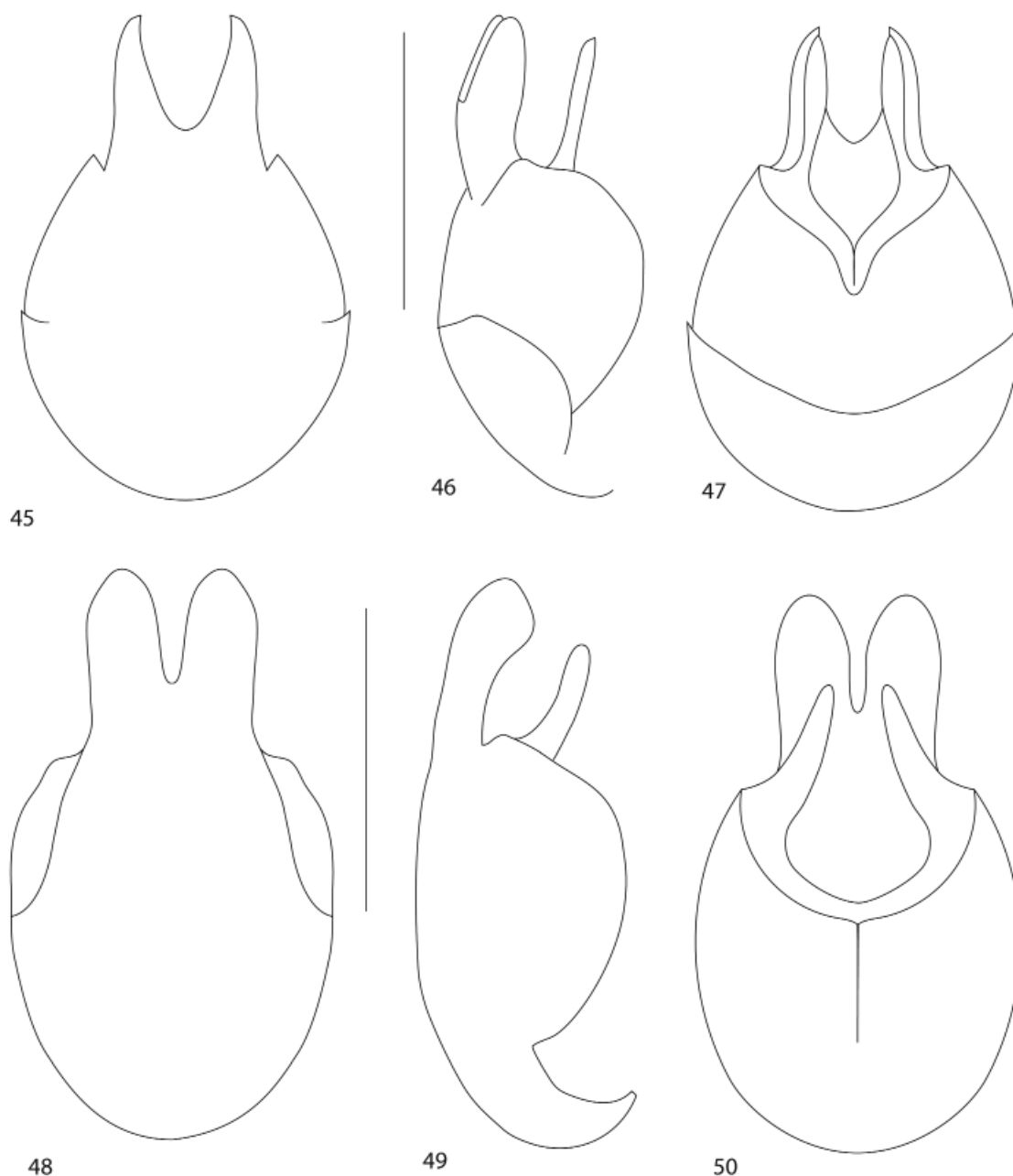
12. Dorsal plate blades separately rounded at apex (Figs 51, 52) (Amurskaya Oblast) *Rh. (s.str.) selemdzhana* Kazantsev
 – Dorsal plate blades jointly rounded at apex (Figs 53–55) Up-
 perside dark brown to black; basal antennomeres and legs,
 except femurs, light brown (Fig. 5) (Primorskij Krai)
 *Rh. (s.str.) kurbatovi* Kazantsev
13. Parameres rounded in cross-section, often thickening at
 apex (Figs 56–67) 14
- Parameres conspicuously flattened, at least before apex,
 sometimes pointed distally (Figs 68–134) 17
14. Pronotum flattened, without conspicuous discal tubercles.
 Dorsal plate with deep triangular incision almost reach-
 ing the dorsal plate base; parameres in lateral view bent
 inside and noticeably widened at base, in ventral view
 noticeably widened distally (Figs 56–58) (Transbaikalia,
 Magadan Oblast, Kuril Islands)
 *Rh. (s.str.) planicollis* Kazantsev



Figs 39–44. Aedeagus of *Rhagonycha*: 39–41 — *Rh. oboensis*; 42–44 — *Rh. uralensis*; 39, 42 — dorsal view; 40, 43 — lateral view; 41, 44 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

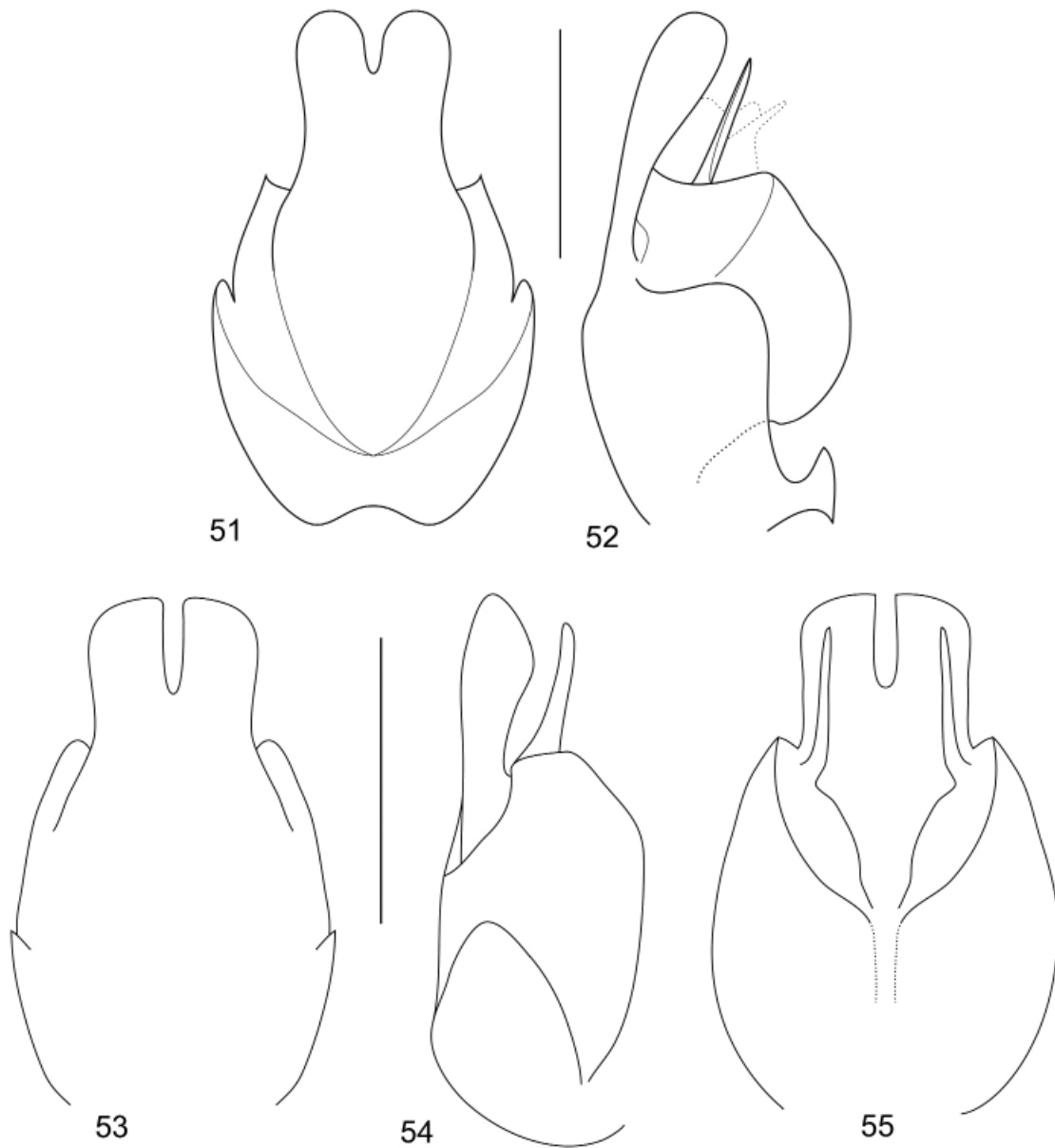
Рис. 39–44. Эдеагус *Rhagonycha*: 39–41 — *Rh. oboensis*; 42–44 — *Rh. uralensis*; 39, 42 — сверху; 40, 43 — сбоку; 41, 44 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

- Pronotum not flattened, with developed discal tubercles. Dorsal plate and parameres of different shape (Figs 59–67) 15
15. Parameres very narrow, both in ventral and lateral views, not thickening at apex, in lateral view bent conspicuously inside (Figs 59–61). Basal antennomeres light brown; legs uniformly dark brown to black (Fig. 6) (Irkutsk Oblast) ..
..... *Rh. (s.str.) amaguensis* Švihla
- Parameres relatively short and broad, thickening at apex (Figs 62–67) 16
16. Body relatively short and broad, elytra only 4.1 times longer than pronotum. Dorsal plate with triangular incision; parameres in lateral view bent at base (Figs 62–64) (Amurskaya Oblast – Mongolia)
..... *Rh. (s. str.) flavotibialis* Medvedev et Ryvkin
- Body elongate, elytra over 5 times longer than pronotum. Inner sides of dorsal plate incision almost parallel-sided proximally; parameres straight in lateral view (Figs 65–67) (Yakutia, Transbaikalia) *Rh. (s.str.) angulosa* Kazantsev



Figs 45–50. Aedeagus of *Rhagonycha*: 45–47 — *Rh. sihotana*; 48–50 — *Rh. sibirica*; 45, 48 — dorsal view; 46, 49 — lateral view; 47, 50 — ventral view. Scale: 0.5 mm (45–47 — after Kazantsev, 1994; 48–50 — after Wittmer, 1971 and Kazantsev, 1994).
Рис. 45–50. Эдеагус *Rhagonycha*: 45–47 — *Rh. sihotana*; 48–50 — *Rh. sibirica*; 45, 48 — сверху; 46, 49 — сбоку; 47, 50 — снизу. Масштабная линейка: 0,5 мм (45–47 — по: Kazantsev, 1994; 48–50 — по: Wittmer, 1971 и Kazantsev, 1994).

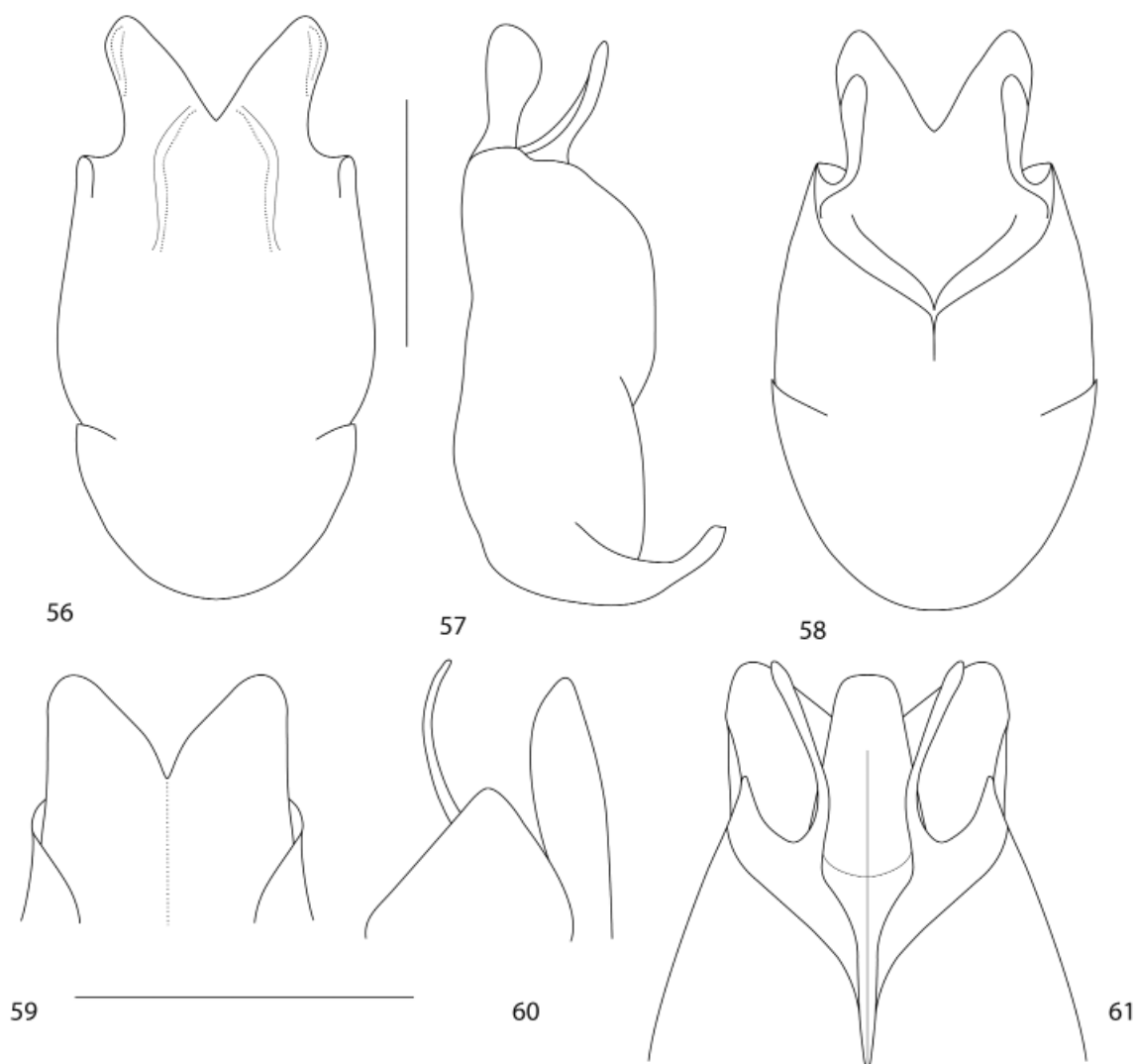
17. Dorsal plate of aedeagus shallowly excised, excision not exceeding 1/4 its length (Figs 65–70)..... 18
 – Dorsal plate of aedeagus deeper excised, excision exceeding 1/4 its length (Figs 74–134) 19
18. Dorsal plate of aedeagus widened towards base (Figs 68–70) (Transbaikalia, Kamchatka, Amurskaya, Chita, Magadan Oblast, Primorskij Krai, Kuril Islands – Japan, Mongolia) *Rh. (s.str.) geniculata* Gebler
 – Dorsal plate of aedeagus not widened towards base (Figs 71–73) (Primorskij Krai – Korea)
 *Rh. (s.str.) asiatica* Wittmer
19. Inner sides of dorsal plate blades almost parallel, or the angle between them less than 30°; distance between the blades in the middle of the excision less than maximum width of the blade (Figs 74–100) 20
 – Inner sides of dorsal plate blades diverging at more than 45°; distance between the blades in the middle of the excision exceeding maximum width of the blade (Figs 101–134) 29
20. Excision reaching dorsal plate base; in case excision does not quite reach the base, it is rounded proximally (Figs 74–83) 21



Figs 51–55. Aedeagus of *Rhagonycha*: 51, 52 — *Rh. selemdzhana*; 53–55 — *Rh. kurbatovi*; 51, 53 — dorsal view; 52, 54 — lateral view; 55 — ventral view. Scale: 0.5 mm (51, 52 — after Kazantsev, 2008; 53–55 — after Kazantsev, 1994).

Рис. 51–55. Эдеагус *Rhagonycha*: 51, 52 — *Rh. selemdzhana*; 53–55 — *Rh. kurbatovi*; 51, 53 — сверху; 52, 54 — сбоку; 55 — снизу. Масштабная линейка: 0,5 мм (51, 52 — по: Kazantsev, 2008; 53–55 — по: Kazantsev, 1994).

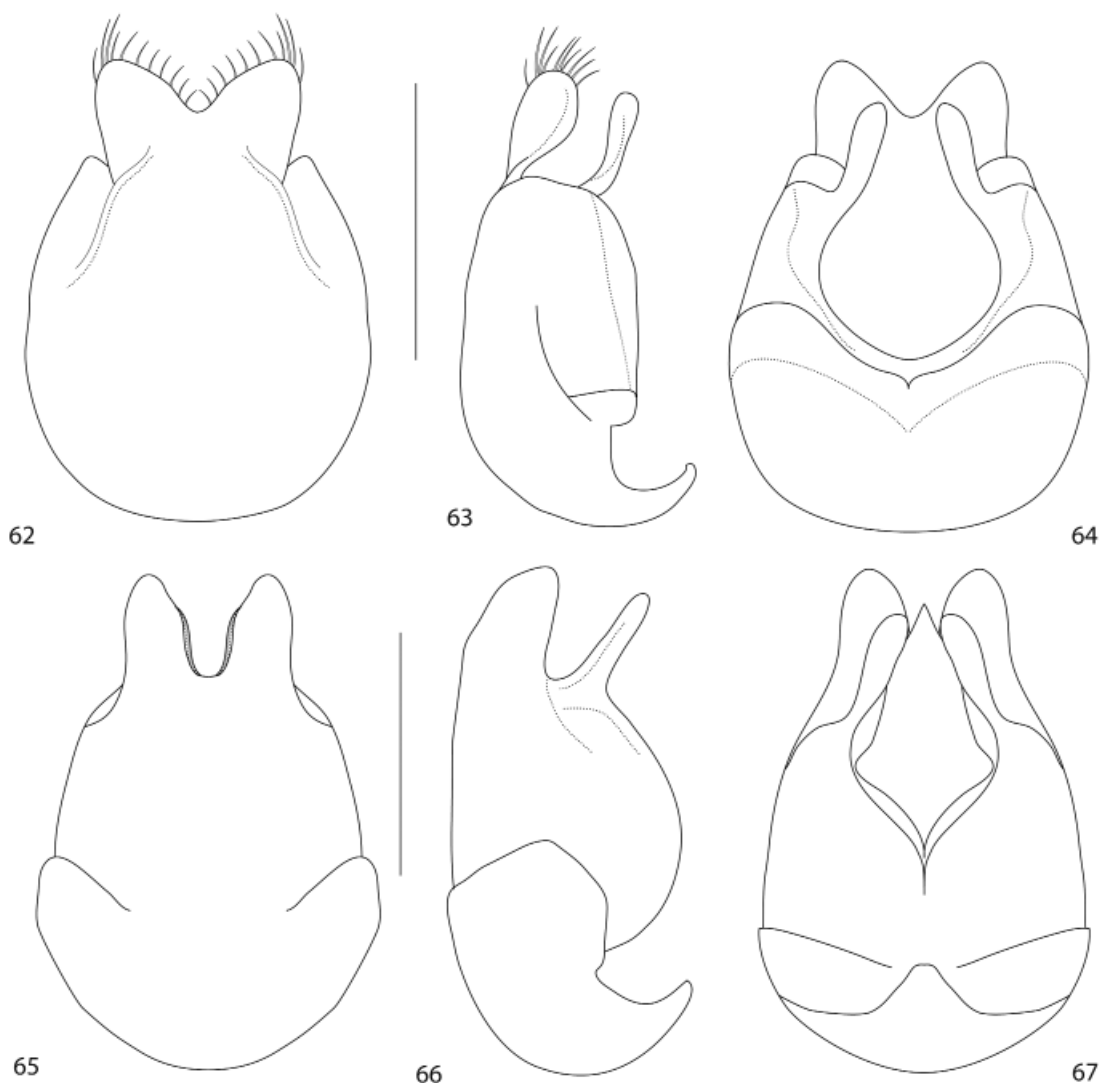
- Excision hardly reaching dorsal plate middle; in case excision reaches a little over the middle, it is acute proximally (Figs 84–101) 24
21. Parameres narrow and sub-cylindrical (Figs 74–76) (Primorskij Krai – Japan, Korea) *Rh. (s.str.) coreana* Pic
– Parameres conspicuously flattened (Figs 77–83) 22
22. Parameres broad, parallel-sided (Figs 77, 78) ('East Siberia', 'Amur', Khabarovsk Krai – North Korea)
..... *Rh. (s.str.) lederi* Pic
- Parameres not parallel-sided (Figs 79–83) 23
23. Parameres slightly widened in the middle (Figs 79, 80). Pronotal sides rounded; legs mostly testaceous (Fig. 7) (Khanty-Mansi A.O. – centre and north of European part of Russia, Urals, Western and Central Europe)
..... *Rh. (s.str.) atra* Linnaeus
- Parameres gradually tapering from base to apex (Figs 81–83) (Primorskij Krai, Sakhalin, Kuril Islands – Japan)
..... *Rh. (s.str.) pacifica* Kazantsev
24. Dorsal plate blades angular at apex; parameres narrow, slightly bent towards dorsal plate, trihedral at base, in ventral view slightly diverging (Figs 84–86). Antennae uniformly dark brown; pronotum trapezoidal, with pronounced angles (Fig. 8) (Irkutsk Oblast, ?Sakhalin)
..... *Rh. (s.str.) dolini* Švihla
- Dorsal plate blades rounded or appearing obtuse at apex (Figs 87–101) 25
25. Dorsal plate blades distally obtuse or broadly rounded; parameres widened in the middle (Figs 87–94) 26
- Dorsal plate blades rounded, but narrowing at apex; parameres not widened in the middle (Figs 95–100) 28



Figs 56–61. Figs 56–61. Aedeagus of *Rhagonycha*: 56–58 — *Rh. planicollis*; 59–61 — *Rh. amaguensis*; 56, 59 — dorsal view; 57, 60 — lateral view; 58, 61 — ventral view. Scale: 0.5 mm (56–58 — after Kazantsev, 1994; 59–61 — after Švihla, 1995).

Рис. 56–61. Эдеагус *Rhagonycha*: 56–58 — *Rh. planicollis*; 59–61 — *Rh. amaguensis*; 56, 59 — сверху; 57, 60 — сбоку; 58, 61 — снизу. Масштабная линейка: 0,5 мм (56–58 — по: Kazantsev, 1994; 59–61 — по: Švihla, 1995).

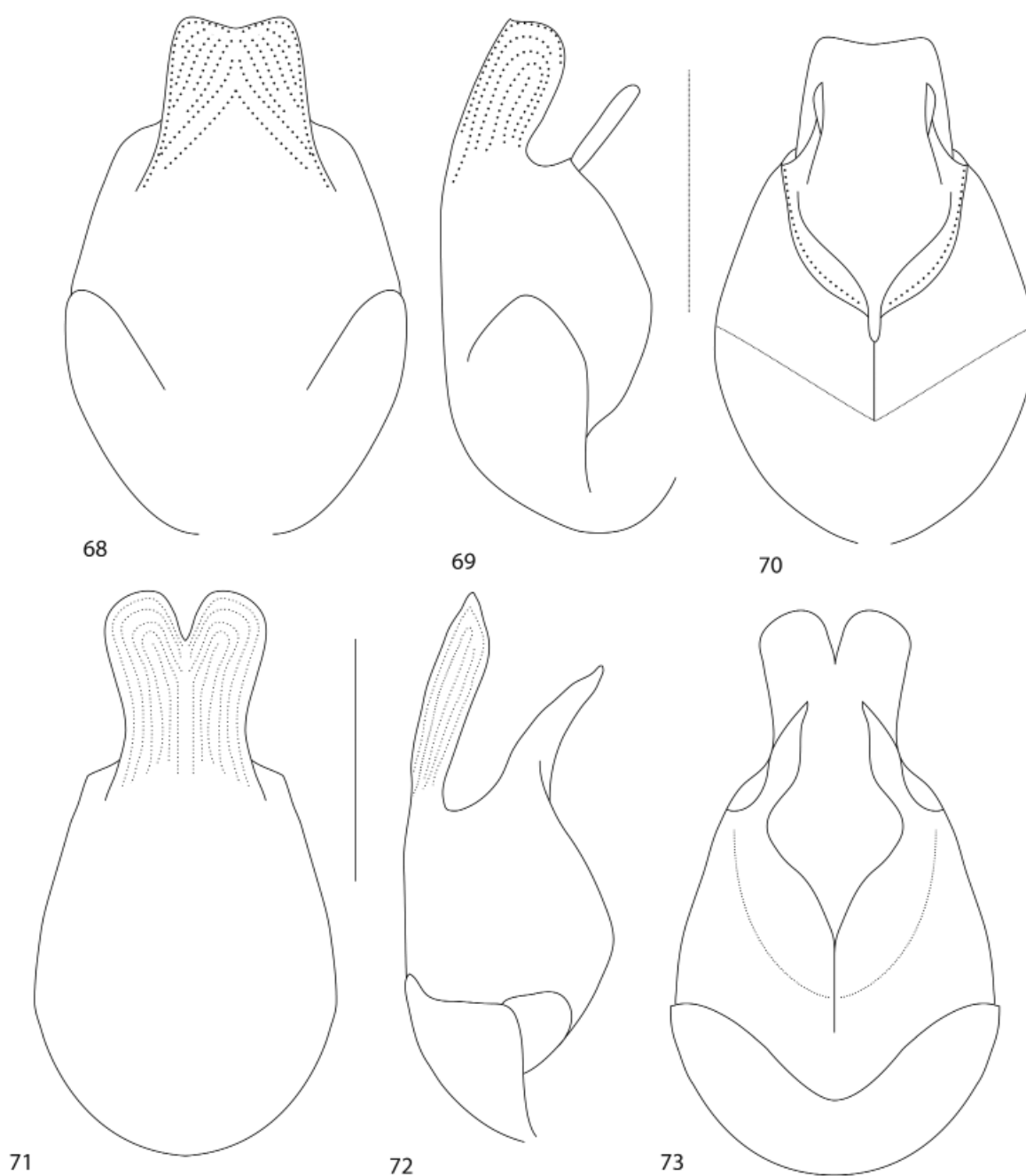
26. Dorsal plate transverse, with distally obtuse blades (Figs 87–89) Small, 6–7 mm long (Amurskaya Oblast)
 *Rh. (s.str.) mimica* Medvedev et Ryvkin
 – Dorsal plate elongate, with distally broadly rounded blades (Figs 90–94)27
 27. Cheeks, two basal antennomeres and knees light brownish. Ultimate sternite abruptly constricted near apex (Fig. 22); parameres strongly widened in the middle (Figs 90, 91). Smaller, 7 mm long (Tuva – Mongolia)
 *Rh. (s.str.) mongolica* Wittmer
 – Cheeks, two basal antennomeres and knees dark brown to black, as the rest of the body (Fig. 9). Ultimate sternite gradually narrowed at apex (Fig. 21); parameres only slightly widened in the middle (Figs 92–94). Larger, 8–9 mm long (Primorskij Krai, Sakhalin)
 *Rh. (s.str.) ussurica* **sp.n.**
28. Parameres relatively wide and abruptly narrowed near apex (in lateral view) (Figs 95–97) (Transbaikalia, Primorskij Krai, Kamchatka, Magadan, Amurskaya Oblasts – Mongolia, Korea)
 *Rh. (s.str.) indistincta* Medvedev et Ryvkin
 – Parameres narrow and rounded at apex (in lateral view) (Figs 98–100) (Kuril Islands) .. *Rh. (s.str.) kabakovi* Kazantsev
 29. Dorsal plate incision semicircular (Figs 101–108)30
 – Dorsal plate incision of a different shape (Figs 109–134)32
 30. Dorsal plate blades bluntly cut at apex and slightly bent inward (Figs 101–103) (East Siberia, Far East – Mongolia, Korea) *Rh. (s.str.) cembricola* Eschscholtz
 – Dorsal plate blades sharpened apically (Figs 104–108)31
 31. Parameres sharpened apically (in ventral view) (Figs 104–106) (Kuril Islands – Japan)
 *Rh. (s.str.) nopporensis* Wittmer



Figs 62–67. Aedeagus of *Rhagonycha*: 62–64 — *Rh. flavotibialis*; 65–67 — *Rh. angulosa*; 62, 65 — dorsal view; 63, 66 — lateral view; 64, 67 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

Рис. 62–67. Эдеагус *Rhagonycha*: 62–64 — *Rh. flavotibialis*; 65–67 — *Rh. angulosa*; 62, 65 — сверху; 63, 66 — сбоку; 64, 67 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

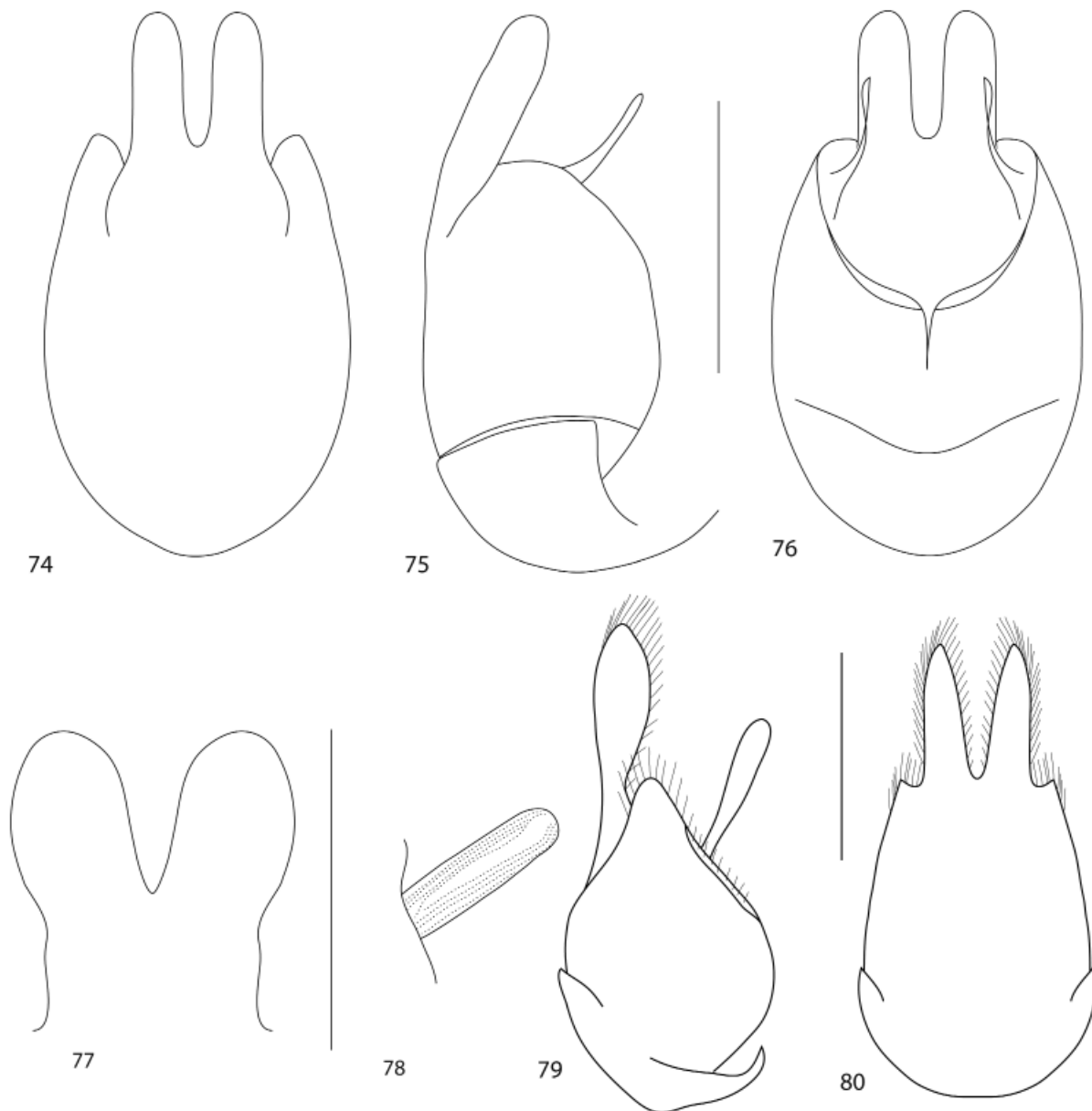
- Parameres rounded apically (in ventral view) (Figs 107, 108) (Sakhalin – Japan) *Rh. (s.str.) basarukini* Kazantsev
32. Parameres widened in the middle and tapering toward apex (in lateral view) (Figs 109–126) 33
- Parameres not widened in the middle (in lateral view) (Figs 127–134) 38
33. Parameres relatively wide, gradually bent inward and infuscated (Figs 109–111) (Chita Oblast, Krasnoyarsk Krai, Kamchatka, Magadan Oblast) *Rh. (s.str.) mandibularis siberiana* Kazantsev
- Parameres of a different shape and colour (Figs 112–126) 34
34. Parameres only slightly longer than wide (Figs 112–114) (Kuril Islands – Northeastern China, Japan) *Rh. (s.str.) kurilica* Wittmer
- Parameres considerably longer than wide (Figs 115–126) 35



Figs 68–73. Aedeagus of *Rhagonycha*: 68–70 — *Rh. geniculata*; 71–73 — *Rh. asiatica*; 68, 71 — dorsal view; 69, 72 — lateral view; 70, 73 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

Рис. 68–73. Эдеагус *Rhagonycha*: 68–70 — *Rh. geniculata*; 71–73 — *Rh. asiatica*; 68, 71 — сверху; 69, 72 — сбоку; 70, 73 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

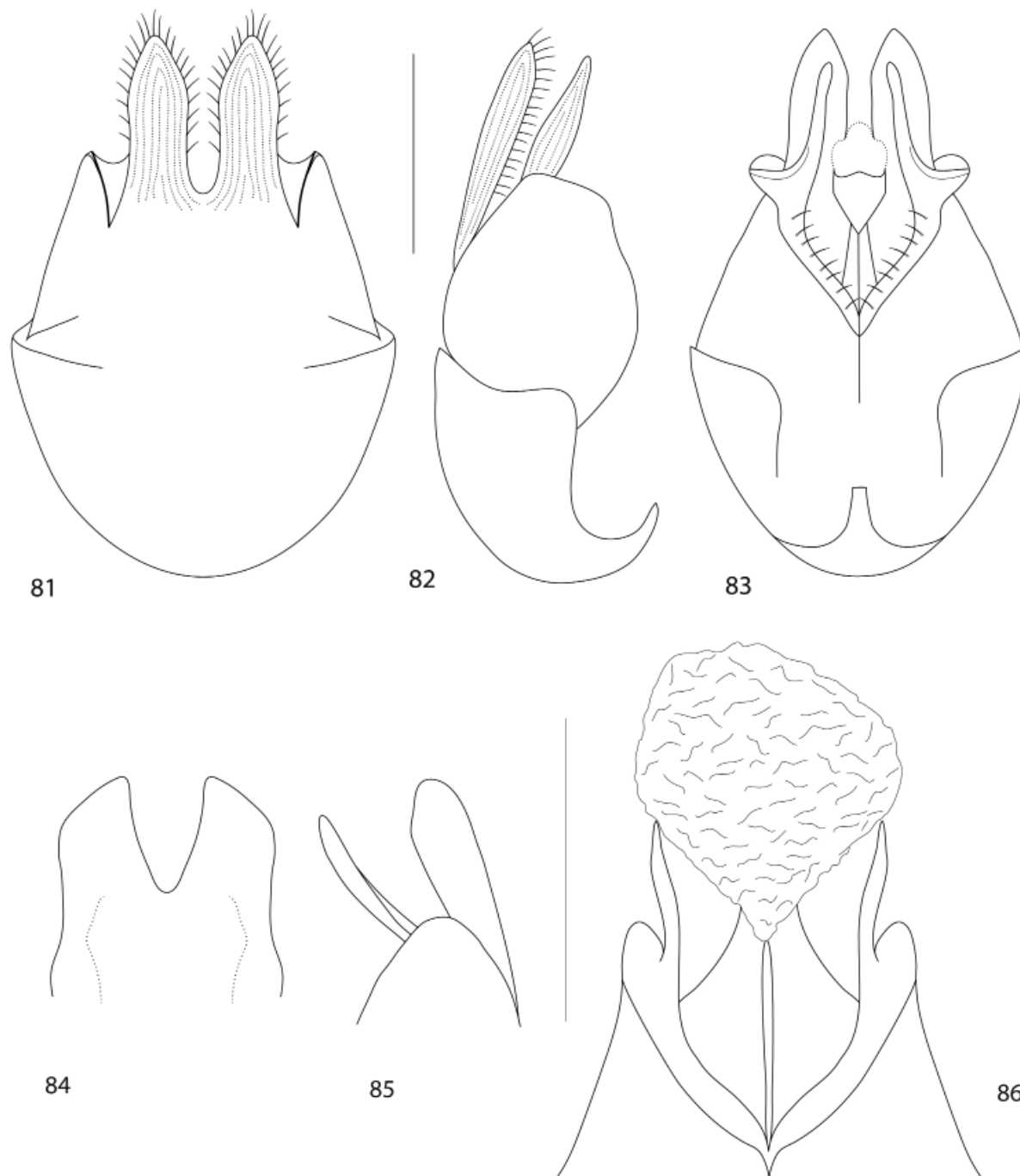
35. Parameres proximally bent inward, then near apex bent outward (in lateral view) (Figs 115–117) (Altai, Tuva, Transbaikalia, Primorskij Krai – Kazakhstan, Mongolia) *Rh. (s.str.) atrovarya* Wittmer
 – Parameres straight (in lateral view) (Figs 118–126) 36
 36. Parameres longer than dorsal plate (Figs 118–120) (Magadan Oblast, Yakutia – Mongolia)
 *Rh. (s.str.) hyperborea* Kazantsev
 – Parameres shorter than dorsal plate (Figs 121–126) 37
 37. Pronotum more than 1.4 times wider than long, its angles rounded. Parameres (in lateral view) more distant from dorsal plate and flattened throughout (Figs 121–123) (Yakutia, Chita, Magadan Oblast) *Rh. (s.str.) matisi* Kazantsev
 – Pronotum not more than 1.3 times wider than long, its angles distinct. Parameres (in lateral view) closer to dorsal plate, trihedral at base (Figs 124–126) (Buryatia, Primorskij Krai, ‘Amur’ – Japan, Korea)
 *Rh. (s.str.) transita* Wittmer



Figs 74–80. Aedeagus of *Rhagonycha*: 74–76 — *Rh. coreana*; 77, 78 — *Rh. lederi*; 79, 80 — *Rh. atra*; 80 — paramere; 74, 77, 80 — dorsal view; 75, 78, 79 — lateral view; 76 — ventral view. Scale: 0.5 mm (74–76 — after Kazantsev, 1994; 77, 78 — after Wittmer, 1971; 79, 80 — after Kuska, 1995).

Рис. 74–80. Эдеагус *Rhagonycha*: 74–76 — *Rh. coreana*; 77, 78 — *Rh. lederi*; 79, 80 — *Rh. atra*; 80 — парамера; 74, 77, 80 — сверху; 75, 78, 79 — сбоку; 76 — снизу. Масштабная линейка: 0,5 мм (74–76 — по: Kazantsev, 1994; 77, 78 — по: Wittmer, 1971; 79, 80 — по: Kuska, 1995).

38. Parameres widened apically in lateral view (Figs 127, 128). Male pronotum elongate (Fig. 10) (Khanty-Mansi A.O., Altai, Transbaikalia – centre and north of European part of Russia, Urals, Western and Central Europe) *Rh. (s.str.) elongata* Fallen
 – Parameres not widened apically in lateral view (Figs 129–134) 39
39. Male eyes relatively small, eye width ~3.3 times less than interocular distance. Dorsal plate blades relatively wide, usually bent inward apically; parameres flattened throughout (Figs 129–131) (West and East Siberia, Far East – Japan, Mongolia) *Rh. (s.str.) latiuscula* Sahlberg
 – Male eyes relatively large, eye width ~2.3 times less than interocular distance. Dorsal plate blades relatively narrow,



Figs 81–86. Aedeagus of *Rhagonycha*: 81–83 — *Rh. pacifica*; 84–86 — *Rh. dolini*; 81, 84 — dorsal view; 82, 85 — lateral view; 83, 86 — ventral view. Scale: 0.5 mm (81–83 — after Kazantsev, 1994; 84–86 — after Švihla, 1995).

Рис. 81–86. Эдеагус *Rhagonycha*: 81–83 — *Rh. pacifica*; 84–86 — *Rh. dolini*; 81, 84 — сверху; 82, 85 — сбоку; 83, 86 — снизу. Масштабная линейка: 0,5 мм (81–83 — по: Kazantsev, 1994; 84–86 — по: Švihla, 1995).

not bent inward apically; parameres trihedral in proximal half (Figs 132–134) (Evenkia, Yakutia, Magadan, Amurskaya Oblast, Kamchatka, Sakhalin, Kuril Islands)
 *Rh. (s.str.) fonticola* Kazantsev

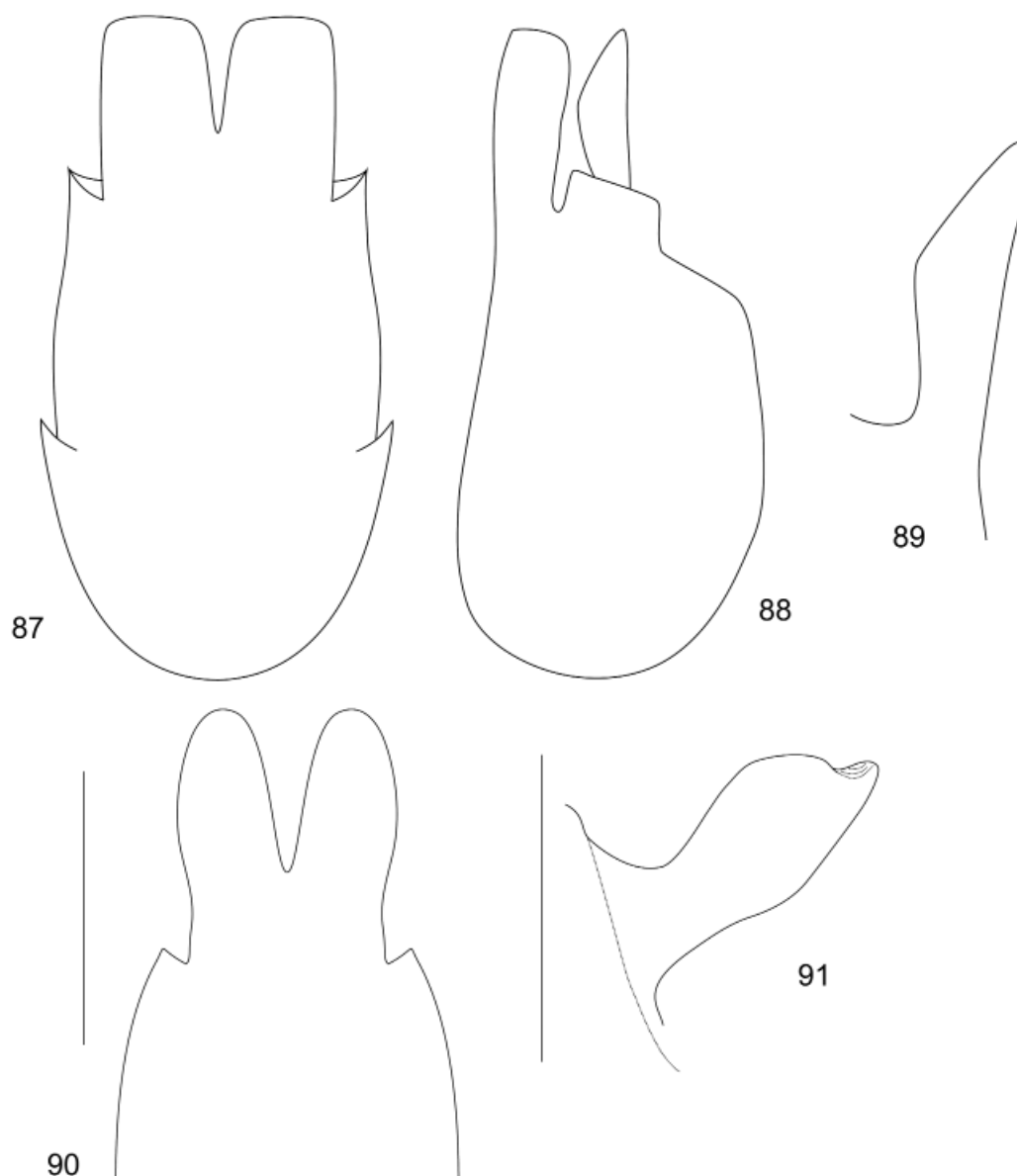
An annotated checklist of *Rhagonycha* of Siberia and the Russian Far East

Rhagonycha Eschscholtz, 1830

Rhagonycha Eschscholtz, 1830: 64.

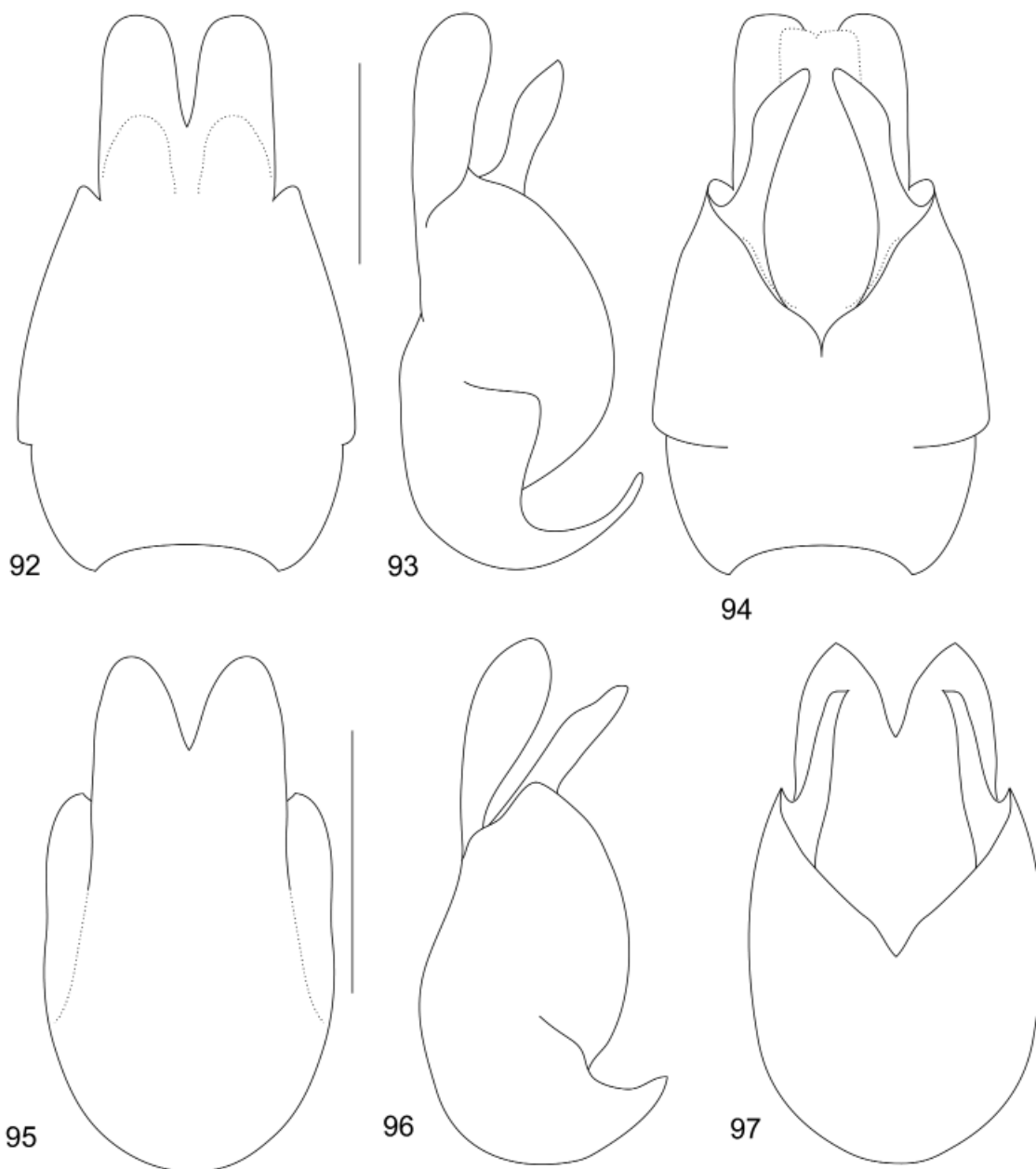
type species: *Cantharis fulva* Scopoli, 1763 (designated by Delkeskamp, 1977)

DISTRIBUTION. The genus *Rhagonycha* includes not less than 200 Palearctic species [Delkeskamp, 1977; Kazantsev, Brancucci, 2007]; at the same time the exact number of its Nearctic members is not easily definable as *Rhagonycha* species were traditionally not separated from *Cantharis* Linnaeus, 1758 by North American authors (e.g., Green [1941]; Ramsdale [2002]), but apparently is over forty [Fender, 1971, 1972]. Also forty species of the genus are registered in Siberia and the Far East of Russia, most of which confined to the east of the region, with 39 taxa in the subgenus *Rhagonycha* sensu stricto and one in the subgenus *Ussurycha* Kazantsev, 1995.



Figs 87–91. Aedeagus of *Rhagonycha*: 87–89 — *Rh. mimica*; 90, 91 — *Rh. mongolica*; 89, 91 — paramere; 87, 90 — dorsal view; 88, 89, 91 — lateral view. Scale: 0.5 mm (87–89 — after Medvedev and Ryvkin, 1989; 90, 91 — after Wittmer, 1971).

Рис. 87–91. Эдеагус *Rhagonycha*: 87–89 — *Rh. mimica*; 90, 91 — *Rh. mongolica*; 89, 91 — параметра; 87, 90 — сверху; 88, 89, 91 — сбоку. Масштабная линейка: 0,5 мм (87–89 — по: Medvedev и Ryvkin, 1989; 90, 91 — по: Wittmer, 1971).

Subgenus *Rhagonycha* Eschscholtz, 1830*Rhagonycha* Eschscholtz, 1830: 64.type species: *Cantharis fulva* Scopoli, 1763 (designated by Delkeskamp, 1977)= *Nastonycha* Motschulsky, 1853: 77 type species *Nastonycha brachyptera* Motschulsky, 1853= *Pseudocratosilis* Moscardini et Sassi, 1970: 192 type species *Pygidia**graeca* Pic, 1901 (= *Rhagonycha corcyrea* Pic, 1901)= *Spartiolepta* Bedel et Bourgeois, 1901: 177 type species *Telephorus**geniculatus* Lucas, 1846 (= *Rhagonycha lucasi* Jacobson, 1911)*alpicola* Barovskij, 1928: 98. West and East Siberia (Altai, Tuva, Transbaikalia) – Middle Asia, Mongolia.= *kiritshenkoi* Barovskij, 1929: 267= *shavrovi* Barovskij, 1928: 99

Figs 92–97. Aedeagus of *Rhagonycha*: 92–94 — *Rh. ussurica* **sp.n.**; 95–97 — *Rh. indistincta*; 92, 95 — dorsal view; 93, 96 — lateral view; 94, 97 — ventral view. Scale: 0.5 mm (95–97 — after Kazantsev, 1994).

Рис. 92–97. Эдеагус *Rhagonycha*: 92–94 — *Rh. ussurica* **sp.n.**; 95–97 — *Rh. indistincta*; 92, 95 — сверху; 93, 96 — сбоку; 94, 97 — снизу. Масштабная линейка: 0,5 мм (95–97 — по: Kazantsev, 1994).

amaguensis Švihla, 1995: 74. East Siberia (Irkutsk Oblast).
angulosa Kazantsev, 1994: 77. East Siberia (Yakutia, Transbaikalia).

asiatica Wittmer, 1971: 195. Far East (south of Primorskij Krai) – Korea.

atra Linnaeus, 1767: 649 (*Cantharis*). Northwestern Siberia (Khanty-Mansi A.O.) – centre and north of European part of Russia, Urals, Central Europe.

= *fauconetti* Pic, 1914: 52

= *glacialis* Bourgeois, 1909: 391

= *plumbea* P. Rossi, 1792: 56

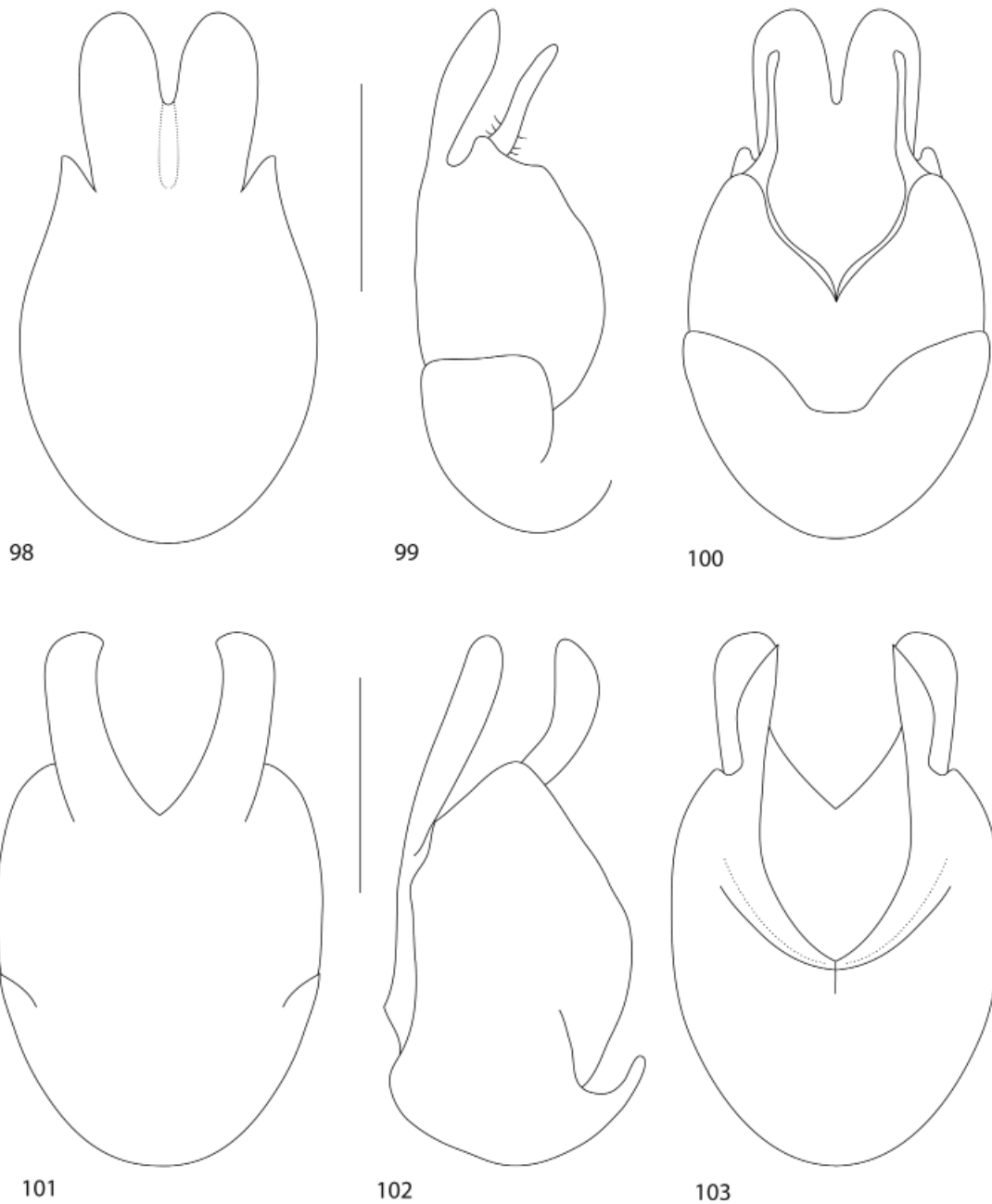
= *rhaetica* Stierlin, 1862: 37

= *sabauda* Pic, 1914: 52

= *subrobusta* Pic, 1923: 1

atrovaria atrovaria Wittmer, 1971: 196. West and East Siberia (Altai, Tuva, Transbaikalia), Far East (Primorskij Krai) – Kazakhstan, Mongolia. The only other subspecies is registered in southern Urals (Mount Iremel)

basarukini Kazantsev, 1994: 94. Far East (Sakhalin) – Japan (Hokkaido).



Figs 98–103. Aedeagus of *Rhagonycha*: 98–100 — *Rh. kabakovi*; 101–103 — *Rh. cembricola*; 98, 101 — dorsal view; 99, 102 — lateral view; 100, 103 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

Рис. 98–103. Эдеагус *Rhagonycha*: 98–100 — *Rh. kabakovi*; 101–103 — *Rh. cembricola*; 98, 101 — сверху; 99, 102 — сбоку; 100, 103 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

cembricola Eschscholtz, 1822: 62 (*Cantharis*). East Siberia (Irkutsk, Chita Oblasts, Krasnoyarsk Krai, Yakutia), Far East (Kamchatka, Magadan Oblast, Khabarovsk and Primorskiy Krais, Kuril Islands) – Mongolia, Korea.

= *sjoestedti* Pic, 1926: 2

coreana Pic, 1921: 28. Far East (Primorskiy Krai) – Japan, Korea

dolini Švihla, 1995: 78. East Siberia (Irkutsk Oblast), Far East (Sakhalin).

elongata Fallén, 1807: 11 (*Cantharis*). West and East Si-

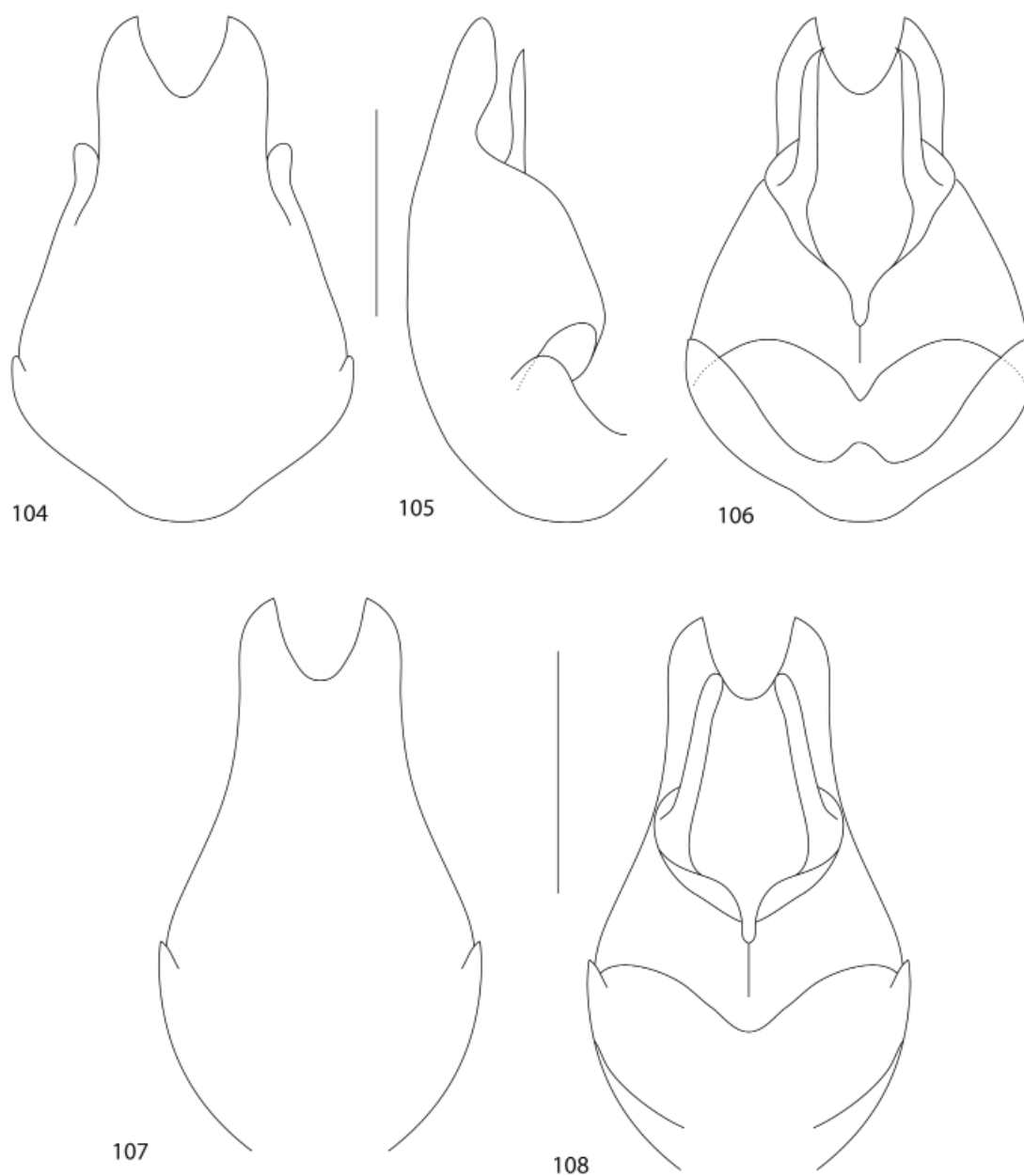
beria (Khanty-Mansi A.O., Altai, Transbaikalia) – centre and north of European part of Russia, Urals, Western and Central Europe.

= *atra* Paykull, 1798: 266 (*Cantharis*) [homonym]

= *paludosa* L. Redtenbacher, 1847: 325 (*Cantharis*) [homonym]

flavotibialis Medvedev et Ryvkin, 1989: 138. Far East (Amurskaya Oblast) – Mongolia.

fonticola Kazantsev, 1994: 83. East Siberia (Evenkia, Yakutia), Far East (Magadan Oblast, Kamchatka, Amurskaya Oblast, Sakhalin, Kuril Islands).



Figs 104–108. Aedeagus of *Rhagonycha*: 104–106 — *Rh. nopporensis*; 107, 108 — *Rh. basarukini*; 104, 107 — dorsal view; 105 — lateral view; 106, 108 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

Рис. 104–108. Эдеагус *Rhagonycha*: 104–106 — *Rh. nopporensis*; 107, 108 — *Rh. basarukini*; 104, 107 — сверху; 105 — сбоку; 106, 108 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

geniculata Gebler, 1832: 46. East Siberia (Chita Oblast), Far East (Kamchatka, Magadan, Amurskaya Oblasts, Primorskiy Krai, Kuril Islands) – Japan (Hokkaido), Mongolia.

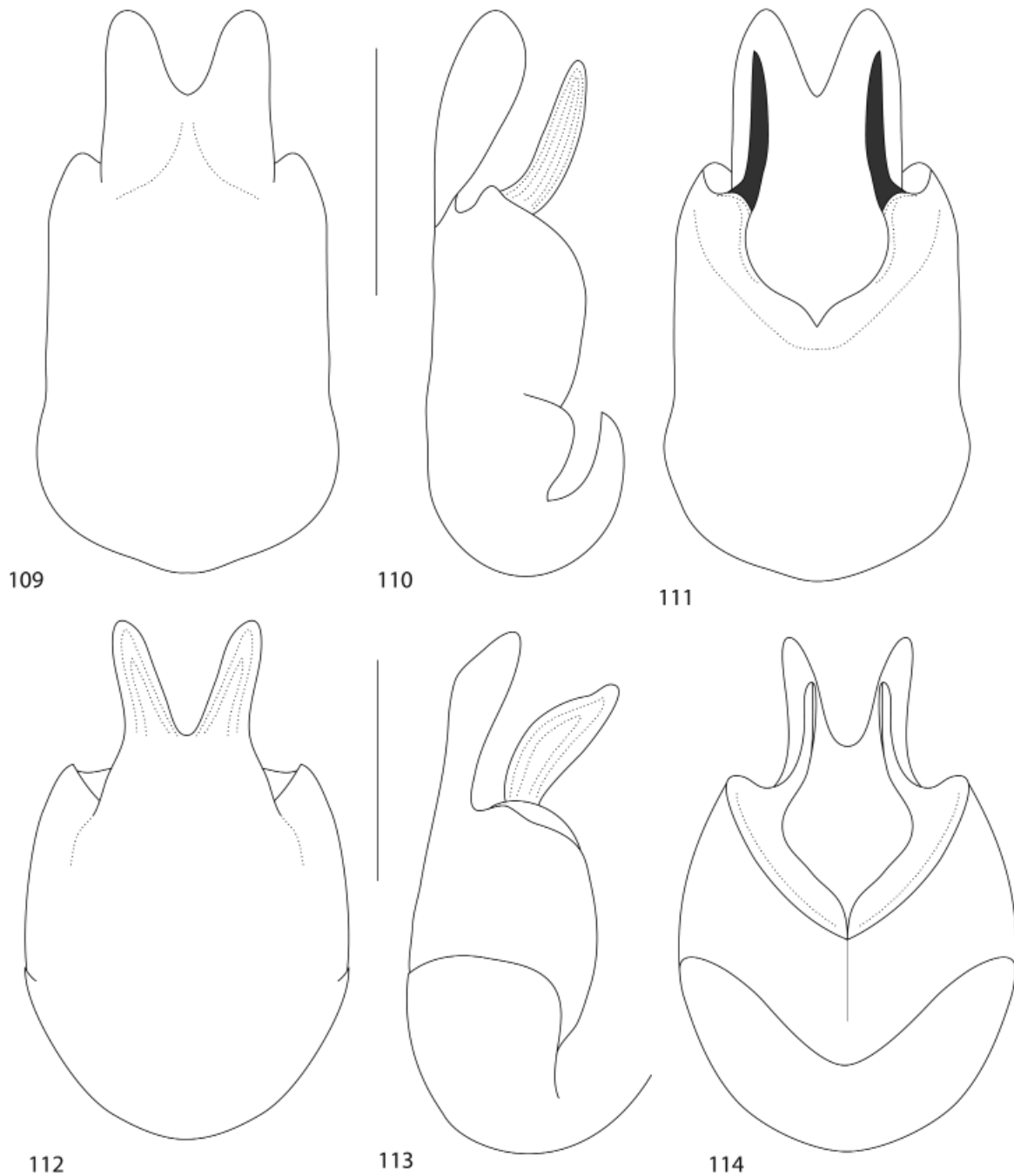
= *amurensis* Pic, 1902: 25

hyperborea Kazantsev, 1994: 84. Far East (Magadan Oblast, Yakutia – Mongolia).

indistincta Medvedev et Ryvkin, 1989: 140. East Siberia (Irkutsk, Chita Oblasts), Far East (Kamchatka, Magadan, Amurskaya Oblasts, Primorskiy Krai) – Mongolia, Korea.

kabakovi Kazantsev, 1994: 81. Far East (Kuril Islands).

kurbatovi Kazantsev, 1994: 73. Far East (south of Primorskiy Krai).



Figs 109–114. Aedeagus of *Rhagonycha*: 109–111 — *Rh. mandibularis siberiana*; 112–114 — *Rh. kurilica*; 109, 112 — dorsal view; 110, 113 — lateral view; 111, 114 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

Рис. 109–114. Эдеагус *Rhagonycha*: 109–111 — *Rh. mandibularis siberiana*; 112–114 — *Rh. kurilica*; 109, 112 — сверху; 110, 113 — сбоку; 111, 114 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

kurilica Wittmer, 1971: 197. Far East (Kuril Islands) – Northeastern China, Japan (Hokkaido).

latiuscula J.R. Sahlberg, 1887: 32. West and East Siberia (Altai, Kemerovo, Chita Oblasts, Krasnoyarsk Krai, Buryatia), Far East (Magadan Oblast, Primorskij Krai, Sakhalin) – Japan, Mongolia.

= *caroli* Pic, 1905: 121

= *distinctipes* Pic, 1905: 121

= *mlikovskyi* Švihla, 1995: 74, **syn.n.**

lederi Pic, 1909: 177. Far East ('Amur', Khabarovsk Krai) – North Korea.

mandibularis siberiana Kazantsev, 1994: 93. East Siberia (Chita Oblast, Krasnoyarsk Krai), Far East (Kamchatka,

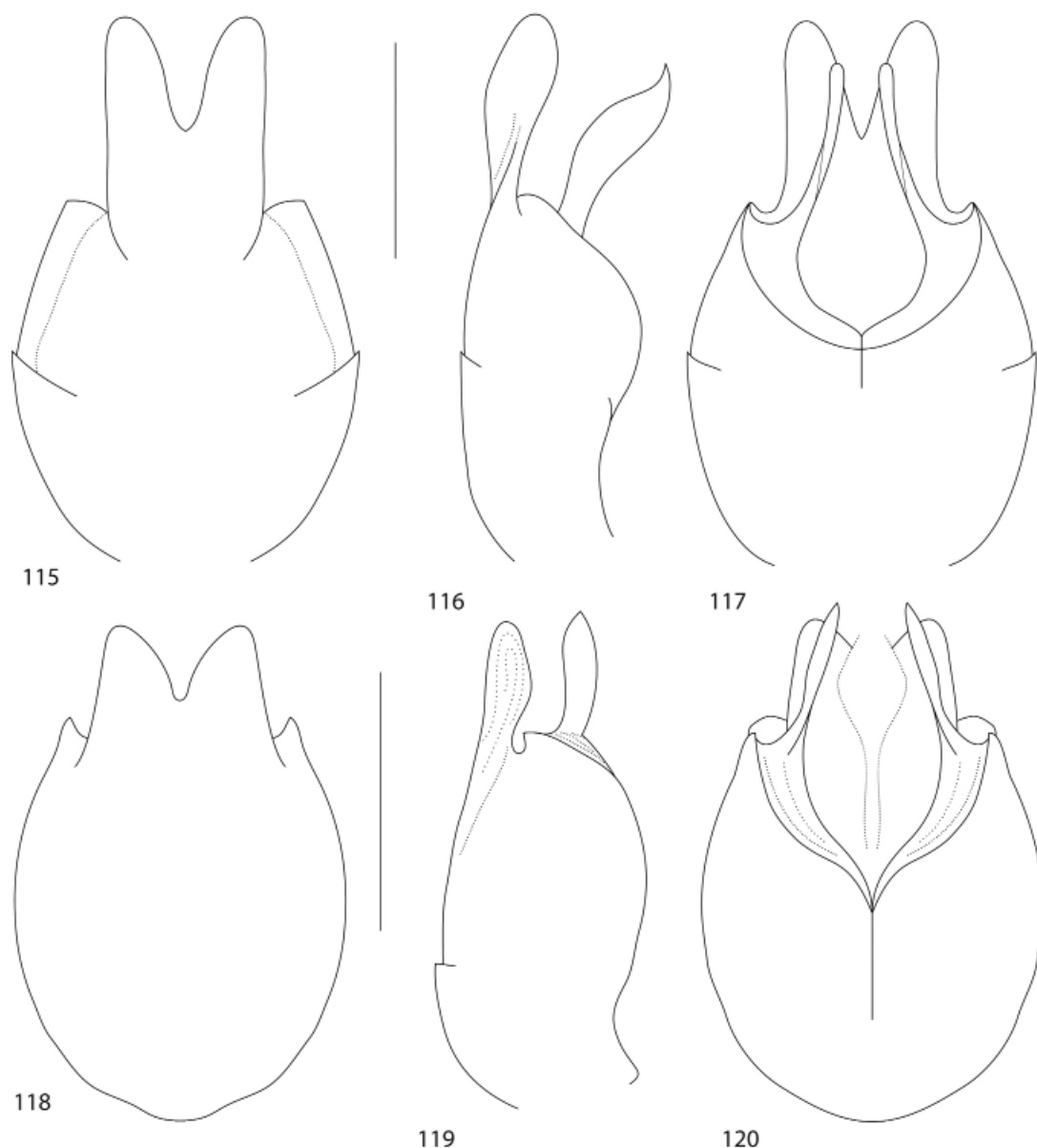
Magadan Oblast). The nominative subspecies, *Rh. m. mandibularis* (Kirby, 1837), is distributed in North America, from Alaska and British Columbia to Newfoundland [Delkeskamp, 1977; Kazantsev, 1994].

matysi Kazantsev, 1994: 85. East Siberia (Chita Oblast, Yakutia), Far East (Magadan Oblast).

mimica Medvedev et Ryvkin, 1989: 140. Far East (Amurskaya Oblast).

mongolica Wittmer, 1971: 197. East Siberia (Tuva) – Mongolia.

nigriventris Motschulsky, 1860: 117. West and East Siberia (Khanty-Mansi A.O., Tyumen Oblast, Taimyr, north of



Figs 115–120. Aedeagus of *Rhagonycha*: 115–117 — *Rh. atrovarya*; 118–120 — *Rh. hyperborea*; 115, 118 — dorsal view; 116, 119 — lateral view; 116, 119 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

Рис. 115–120. Эдеагус *Rhagonycha*: 115–117 — *Rh. atrovarya*; 118–120 — *Rh. hyperborea*; 115, 118 — сверху; 116, 119 — сбоку; 116, 119 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

Krasnoyarsk Krai, Buryatia, Yakutia), Far East (Kamchatka, Magadan Oblast) – centre, north and south of European part of Russia, northwestern Caucasus, Urals, Middle Asia, Western and Central Europe, Mongolia.

= *femorata* Rey, 1891: 115

= *innotatithorax* Pic, 1902: 54

= *limbata* C.G. Thomson, 1864: 191

= *nigrofemorata* Schilsky, 1890: 178

= *signicollis* Rey, 1891: 115

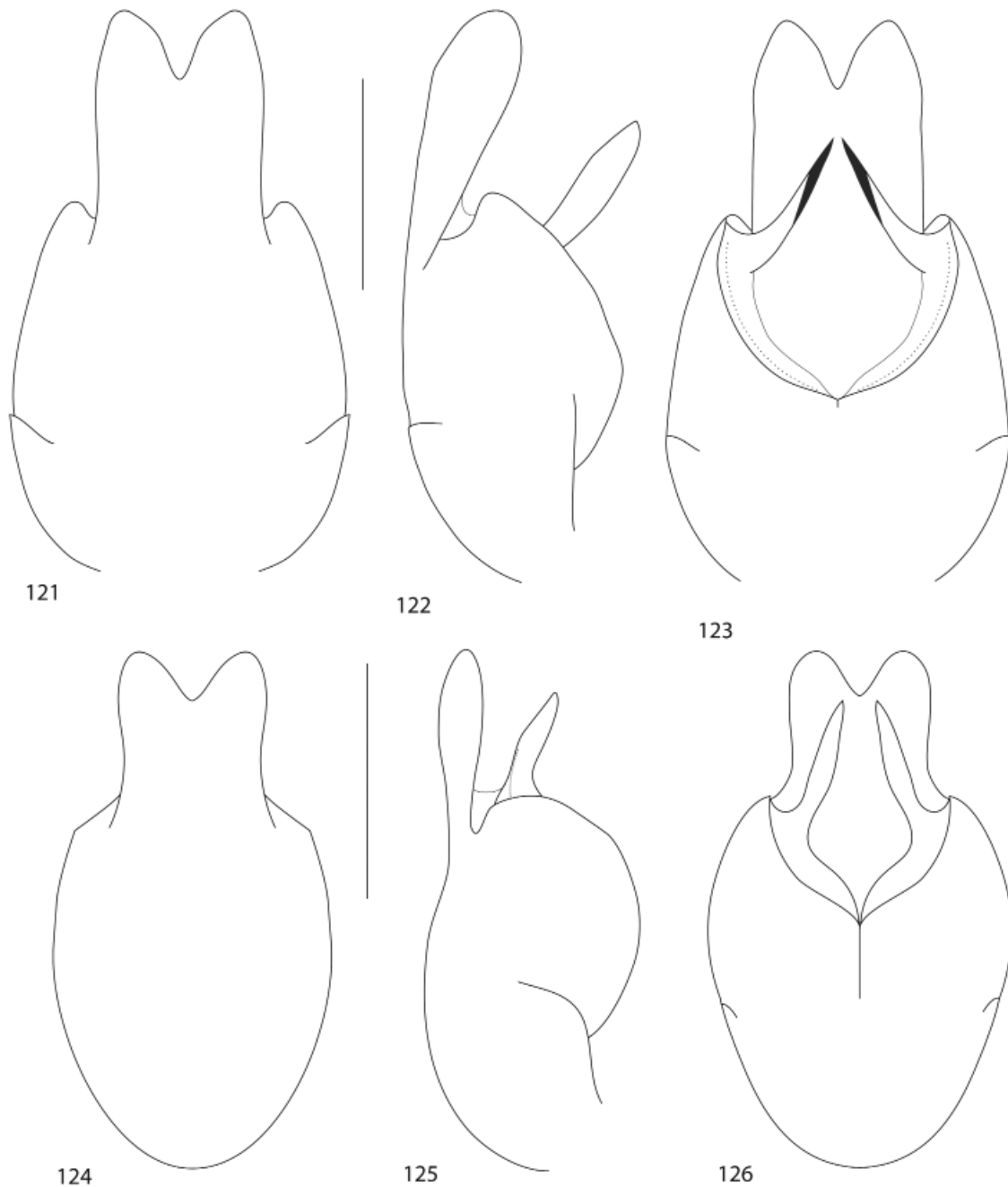
= *testacea* Gyllenhal, 1808: 355

nopporensis Wittmer, 1971c: 199. Far East (Kuril Islands) – Japan (Hokkaido).

pacifica Kazantsev, 1994: 80. Far East (Sakhalin, Kuril Islands) – Japan (Hokkaido).

oboensis Kazantsev, 1994b: 72. East Siberia (Bolshie Koty, Irkutsk Oblast) – Mongolia.

planicollis Kazantsev, 1994: 76. East Siberia (Chita Oblast, Buryatia), Far East (Magadan Oblast, Kuril Islands).



Figs 121–126. Aedeagus of *Rhagonycha*: 121–123 — *Rh. matisi*; 124–126 — *Rh. transita*; 121, 124 — dorsal view; 122, 125 — lateral view; 123, 126 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

Рис. 121–126. Эдеагус *Rhagonycha*: 121–123 — *Rh. matisi*; 124–126 — *Rh. transita*; 121, 124 — сверху; 122, 125 — сбоку; 123, 126 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

selemdzhana Kazantsev, 2008: 337. East Siberia (Amurskaya Oblast).

sibirica Wittmer, 1971c: 198. Far East (Primorskij Krai, Magadan Oblast) – Japan (Hokkaido).

sihotana Kazantsev, 1994: 75. Far East (Primorskij Krai).

stusaki Švihla, 1992: 286. East and West Siberia (Tyumen Oblast, Tuva, Buryatia, Yakutia) – northern Caucasus, Mongolia.

testacea Linnaeus, 1758: 403 (*Cantharis*). West and East Siberia (Khanty-Mansi A.O., Tomsk, Tyumen Oblasts, Krasnoyarsk Krai, Transbaikalia) – centre, north and south of European part of Russia, Urals, Western and Central Europe.

= *florida* Schiötte, 1872: 8

= *obscurithorax* Pic, 1902: 54

= *ochropa* Stephens, 1830: 296 (*Telephorus*)

= *pellucida* Brahm, 1790: 110 (*Cantharis*)

= *taurinensis* Pic, 1905: 105

transbaikalia Pic, 1906: 89. West and East Siberia (Altai, Tuva, Yakutia, Transbaikalia) – Kazakhstan, Mongolia.

= *jakovlevi* Barovskij, 1908: 293

= *smirnovi* Barovskij, 1908: 294

transita Wittmer, 1971: 195. East Siberia (Buryatia), Far East (Primorskij Krai, 'Amur') – Japan, Korea.

ulaensis Kazantsev, 1994: 78. East Siberia (Chita Oblast) – Japan (Hokkaido), Mongolia.

uralensis Dahlgren, 1972: 131. East Siberia (Tuva).

ussurica **sp.n.** Far East (Primorskij Krai, Sakhalin).

Subgenus *Ussurycha* Kazantsev, 1995

Rhagonycha (*Ussurycha*) Kazantsev, 1995: 91.

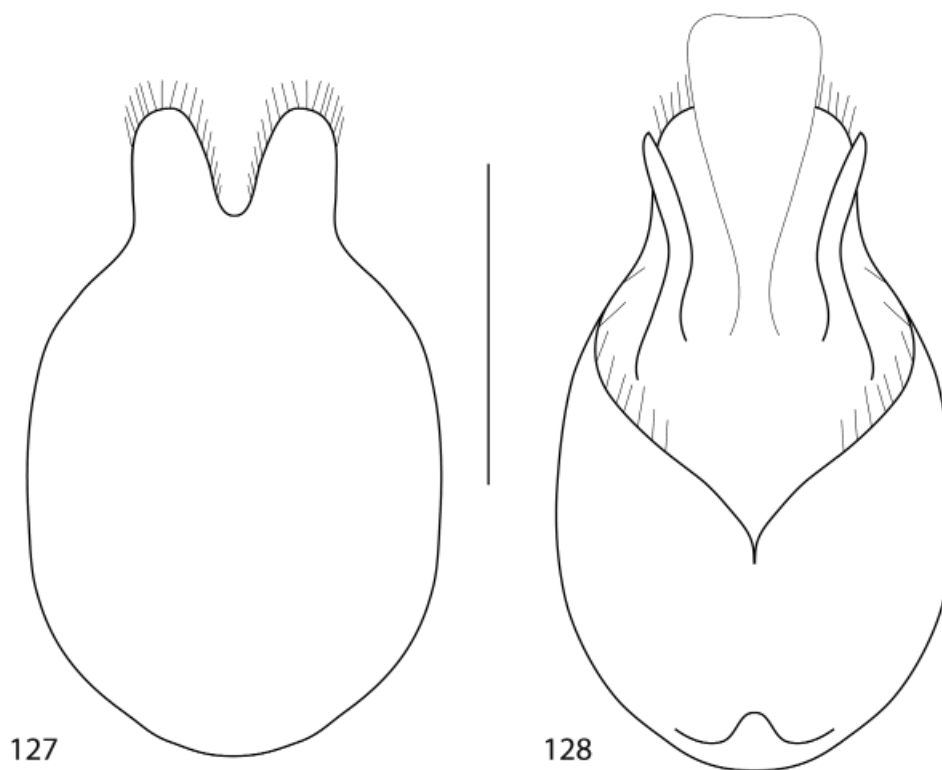
type species: *Rhagonycha lederi* sensu Kazantsev, 1994 (= *Rhagonycha kazantsevi* Švihla, 1995) (by original designation).

kazantsevi Švihla, 1995: 76. Far East (Primorskij Krai).

Discussion

The usually uniformly dark brown to black and monotonously similar in appearance *Rhagonycha* species of Siberia most commonly are differentiated by the structure of their aedeagi [Wittmer, 1971; Kazantsev, 1994; Švihla, 1995; etc.], which requires preparation of the male genitalia. Another character is the structure of tarsal claws of the males, which proved to be an additional useful character separating, for example, the subgenus *Ussurycha* from the nominative one, or the *Rh. sibirica* group of species [Kazantsev, 1994, 1995]; however, reliance just on these two characters leaves most of the female specimens undetermined. The shape of the clypeal apex that could also be used for taxonomic purposes, as indicated already by Green in his paper on this group of soldier beetles of the United States and Canada [Green, 1941], and is shared both by males and females, has not been adequately studied in the Siberian *Rhagonycha*.

Morphological characters of taxonomic value to distinguish between *Rhagonycha* species also include the structure of claws



Figs 127–128. Aedeagus of *Rhagonycha elongata*; 127 — dorsal view; 128 — ventral view. Scale: 0.5 mm (after Kuska, 1995).

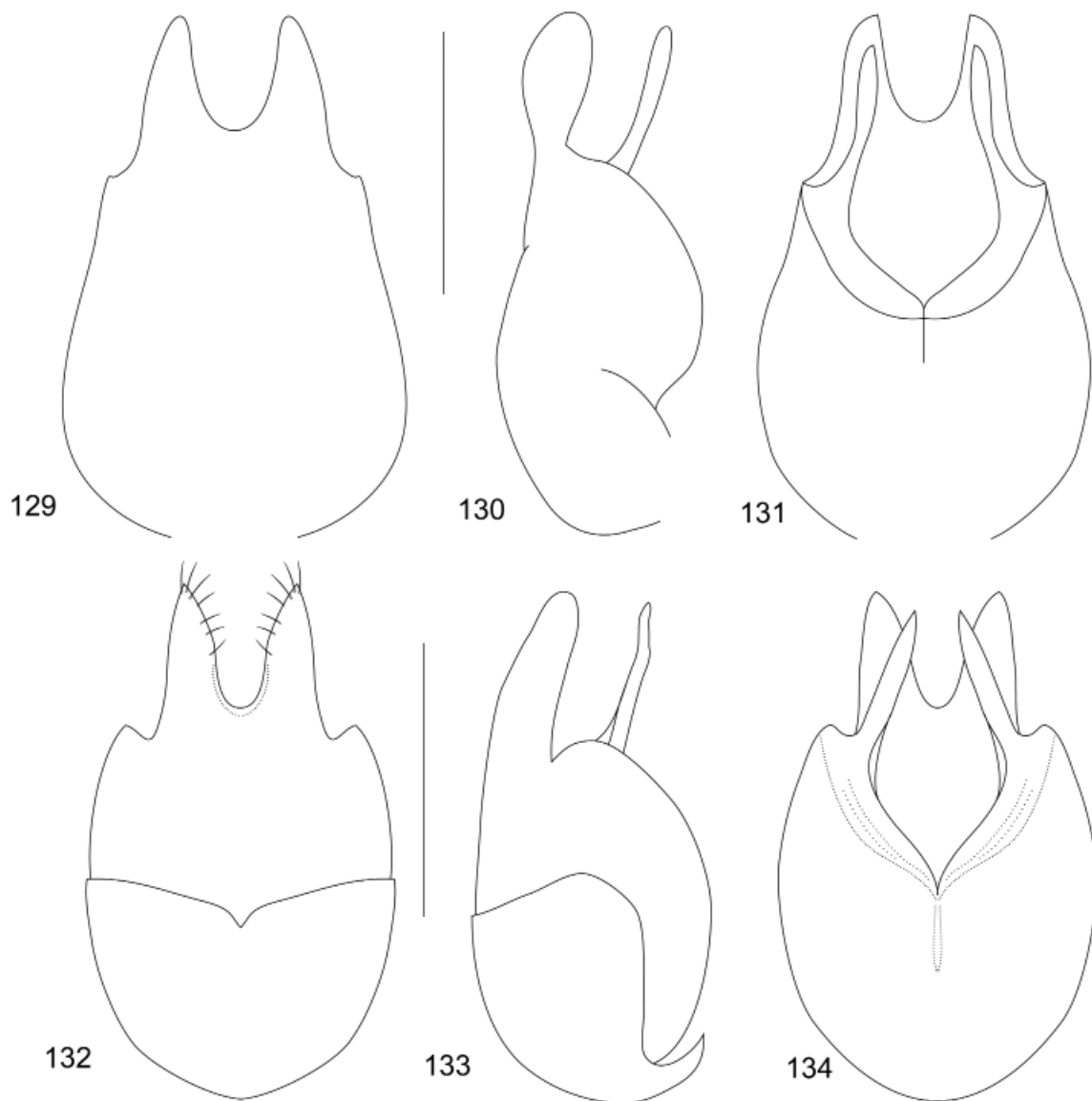
Рис. 127–128. Эдеагус *Rhagonycha elongata*; 127 — сверху; 128 — снизу. Масштабная линейка: 0,5 мм (по: Kuska, 1995).

in the female [Green, 1941] and the shape of the female ultimate sternite (e.g., Takahashi [2021]). However, as the association of externally very similar females with males is not always possible, and as in many cases the type series include only males, it does not seem appropriate to use this character in identification keys to Siberian species, at least at the current level of knowledge of the genus. A detailed morphological study of females, wherever it is possible, is still highly advisable, to obtain material for further comprehensive analyses.

It also seems possible to separate *Rhagonycha* species by the shape and structure of the everted internal sac of their aedeagi, with diversely shaped and differently located setiferous patches [e.g., McKey-Fender, 1950; Dahlgren, 1985; Figs

28–30; 34]. However, application of this character is hindered by the difficulty of affecting the full eversion of the internal sac in dry cabinet, especially alcohol fixed, specimens. Unfortunately, the bulk of the collection material is usually represented by this type of specimens.

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Figs 129–134. Aedeagus of *Rhagonycha*: 129–131 — *Rh. latiuscula*; 132–134 — *Rh. fonticola*; 129, 132 — dorsal view; 130, 133 — lateral view; 131, 134 — ventral view. Scale: 0.5 mm (after Kazantsev, 1994).

Рис. 129–134. Эдеагус *Rhagonycha*: 129–131 — *Rh. latiuscula*; 132–134 — *Rh. fonticola*; 129, 132 — сверху; 130, 133 — сбоку; 131, 134 — снизу. Масштабная линейка: 0,5 мм (по: Kazantsev, 1994).

References

- Dahlgren G. 1985. Beiträge zur Kenntnis der Gattung *Rhagonycha* (Col. Cantharidae) III // Entomologische Blätter. Bd.81. H.1–2. S.85–90.
- Delkeskamp K. 1977. Coleopterorum Catalogus Supplementa. Pars 165, fasc. 1. Editio secunda. Cantharidae. The Hague: W. Junk Publishers. 485 pp.
- Eschscholtz J.F. von. 1822. Descriptions d'insectes nouveaux // Entomographien. Bd.1. Berlin: G. Reimer. 128 pp., 2 pls.
- Fender K.M. 1971. The genus *Rhagonycha* Eschscholtz in North America // The Coleopterists' Bulletin. Vol.25. No.3. P.86–87.
- Fender K.M. 1972. A New Species of *Rhagonycha* from Alaska (Coleoptera: Cantharidae) // The Pan-Pacific Entomologist. Vol.48. No.4. P.242–243.
- Green J.W. 1941. Taxonomic studies in *Cantharis* (Coleoptera: Cantharidae) // Entomologica Americana. Vol.20 (n.s.). No.4 (1940). P.159–214.
- Kang T.-H., Kim J.-I. 2000. Taxonomic Study of Korean Cantharidae (Coleoptera). IV. Subfamily Cantharinae: Genus *Rhagonycha* // Korean Journal Entomology. Vol.30. No.3. P.157–162.
- Kazantsev S.V. 1994. A review of *Rhagonycha* species (Coleoptera, Cantharidae) of the Asian part of Russia // Zoologicheskij Zhurnal. Vol.73. Nos.7–8. P.71–100 [in Russian with English summary]. [Translated into English in 1996 Entomological Review 75(3): 121–153].
- Kazantsev S.V. 1995. A key to *Rhagonycha* (Coleoptera, Cantharidae) east of the Ural Mountains with the description of a new subgenus // Entomologica Basiliensia. Vol.18. P.91–98.
- Kazantsev S.V. 2008. [New soldier beetles (Coleoptera, Cantharidae) from Amurskaya Oblast and Tuva] // Eurasian Entomological Journal. Vol.7. No.4. P.337–338 [in Russian with English summary].
- Kazantsev S.V. 2011. An annotated checklist of Cantharoidea (Coleoptera) of Russia and adjacent territories // Russian Entomological Journal. Vol.20. No.4. P.387–410.
- Kazantsev S.V. 2022. [Identification key to soldier beetles (Coleoptera, Cantharidae) of the European part of Russia and the Northern Caucasus] // [Digital identification keys to beetles of the European part of Russia Series]. Issue 2. Livny: Muhametov G.B. 110 pp. [In Russian]
- Kazantsev S.V., Brancucci M. 2007. Cantharidae // Löbl I., Smetana A. (eds.). Catalogue of Palaearctic Coleoptera. Vol.4. Stenstrup: Apollo Books. P.234–298.
- Kuska A. 1995. Omomilki (Coleoptera, Cantharidae): Cantharinae i Silinae Polski. Krakow: Wydawnictwa Instytutu Systematyki i Evolucii Zwierząt Polskiej Akademii Nauk 201 pp.
- McKey-Fender D. 1950. Notes on *Cantharis* III (Coleoptera: Cantharidae) // The Pan-Pacific Entomologist. Vol.26. No.1. P.25–79.
- Medvedev L.N., Ryvkin A.B. 1989. [New species of *Rhagonycha* (Coleoptera, Cantharidae) from Siberia and Far East] // Zoologicheskij Zhurnal. Vol.68. No.10. P.138–141 [in Russian with English summary].
- Medvedev L.N., Ryvkin A.B. 1992. [46. Cantharidae] // Lehr P.A. (ed.). Opredelitel' nasekomykh Dal'nego Vostoka SSSR. Vol.3. Part 2. St. Petersburg: Nauka Publ. P.29–40 [in Russian].
- Ramsdale A.S. 2002. Family 64. Cantharidae Imhoff 1856 // Arnett R.H. Jr., Thomas M.C., Skelley P.E., Frank J.H. (eds.). American Beetles. Vol.2. Polyphaga through Curculionoidea. Boca Raton, FL: CRC Press. P.202–218.
- Švihla V. 1995. Contribution to the knowledge of the genus *Rhagonycha* Eschscholtz (Coleoptera: Cantharidae) II // Entomologica Basiliensia. Vol.18. P.71–90.
- Švihla V. 2006. A contribution to the knowledge of the genus *Rhagonycha* Eschscholtz, 1830 (Coleoptera, Cantharidae) // Entomologica Basiliensia et Collectionis Frey. Vol.28. P.83–95.
- Takahashi K. 2021. Two New Species of the Genus *Rhagonycha* (Coleoptera, Cantharidae) from Southwestern Hokkaido, Japan // Elytra, Tokyo, New Series. Vol.11. No.1. P.59–65.
- Wittmer W. 1971. Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. Cantharidae der V. et VI. Expeditionen. (49. Beitrag zur Kenntnis der palaearktischen Cantharidae) // Annales Historico-Naturales Musei Nationalis Hungarici (Pars Zoologica). Vol.63. S.189–203.