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A REVIEW OF THE GENUS *ODACANTHA* (COLEOPTERA, CARABIDAE) OF THE RUSSIAN FAR EAST

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Summary. Data on the species of the genus *Odacantha* Paykull, 1790 from Russia are given. *Odacantha* (*Odacantha*) *puziloi aino* Makarov et Sundukov, **subsp. n.** is described from Kunashir Island. New subspecies distinguished from nominotypical in relatively wide elytra with coarser sculpture and punctation, and the less strongly developed punctation of the prothorax. The first record *O. hagai* Nemoto, 1989 in Russia is provided. A key to the taxa of the genus *Odacantha* from the Russian Far East is compiled.

Key words: Coleoptera, Carabidae, *Odacantha*, fauna, new subspecies, new record, key, Russian Far East.

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Резюме. Приведены данные о видах рода *Odacantha* Paykull, 1790 из России. С острова Кунашир описан новый подвид *O.* (*Odacantha*) *puziloi aino* Makarov et Sundukov, **subsp. n.**, отличающийся от номинативного подвида относительно широкими надкрыльями с более грубой скульптурой и пунктировкой и слабее развитой пунктировкой переднегруди. Впервые для фауны России указывается *O. hagai* Nemoto, 1989. Составлена определительная таблица видов и подвидов рода *Odacantha*, известных с Дальнего Востока России.

INTRODUCTION

Odacantha Paykull, 1790 is a small genus comprising 15 species from the Palaearctic, Afro-tropical Region and the northeast of the Oriental Region (Liebke, 1938; Lorenz, 2005). The subgeneric structure of the genus still remains insufficiently clear. Some authors divide it into three subgenera: the Palaearctic *Odacantha* Paykull, 1790, the African *Neocolliuris* Liebke, 1931, and the East Asian *Heliocasnonia* Liebke, 1938 (Liebke, 1938; Lorenz, 2005, *et al*.). Some others recognize only two subgenera, considering *Neocolliuris* as a junior synonym of *Odacantha* (Basilewsky, 1956; Bousquet, Ito, 2003; Bousquet, 2017, *et al*.). In addition, in describing his *Odacantha hagai* Nemoto, 1989, Nemoto (1989) suggested to consider *Heliocasnonia* as a junior synonym of *Odacantha*, due to a mosaic combination of characters of those two subgenera observed in this species.

To date, only one species of *Odacantha*, *O. puziloi* Solsky, 1875, has been reported from the Far East of Russia (Lafer, 1989; Bousquet, 2017). In 2018, we collected in Primorsky Krai another species, *O. hagai*, which is new to the fauna of Russia. A comparative study of material from Primorye and Kunashir Island showed that the island populations are distinguished by a stable combination of characters and deserve a subspecific status.

When describing the body size and their proportions, the following abbreviations are used: OCL – the maximum length of the eye from the front to the rear edge; TEL – the length of the temple from the rear edge of the eye to the cervical interception; HEW – the width of the head with eyes; PNW – the maximum pronotum width; PNL – the pronotum length along the midline; ELW – the pronotum maximum width; ELL – the length of the elytra along the seam; EDW – the width of the aedeagus at the basal suture; EDL – the maximum length of the aedeagus; LPW – the maximum width of the left paramere; LPL – the maximum length of the left paramere.

All material recorded in this paper is deposited in the collections of the Center of Biodiversity, Vladivostok (FEB), Moscow State Pedagogical University, Moscow (MPU), Zoological Institute of the Russian Academy of Sciences, St. Petersburg (ZIN), Institute of Animal Systematics and Ecology of the Russian Academy of Sciences, Novosibirsk (ISEA) as well as the private collections of A.S. Tilli, Samara (cAT), I.V. Melnik, Moscow (cIM) and S.N. Ivanov, Vladivostok (cSI).

Family Carabidae

Genus *Odacantha* Paykull, 1790

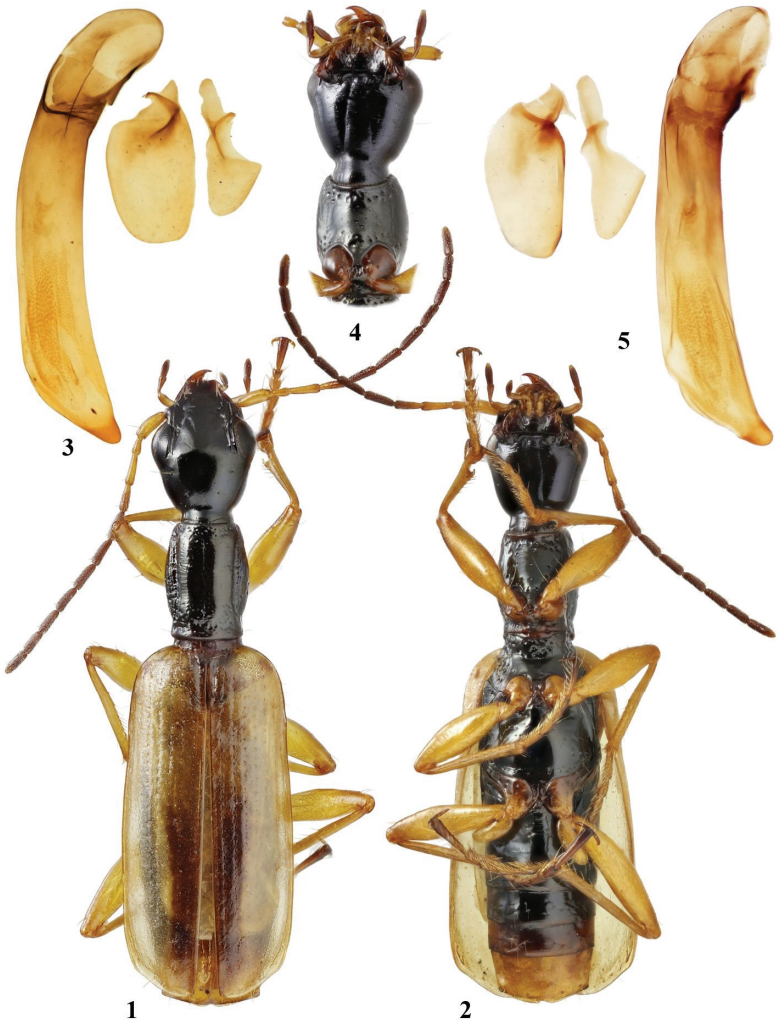
***Odacantha* (*Odacantha*) *puziloi puziloi* Solsky, 1875**
Figs 1–9, 12–14, 20–25, 28–33

Odocantha Puziloi Solsky, 1875: 264–265; type locality: "lac Khanka et dans les environs de Vladivostok", Primorskiy Kray, Russian Far East.

TYPE MATERIAL. **Lectotype** (designated herewith), male, with the following labels: small golden square, yellow square (handwritten) "Lac Khanka Puzilo 13 III 1870"; pink square (handwritten) "*Odacantha puziloi* mihi"; red square (printed) "LECTYPUS *Odacantha puziloi* Solsky, 1875 design. K. Makarov et Yu. Sundukov, 2019" [ZIN]. **Paralectotypes**: 3 males with labels as in the lectotype: small golden square, yellow square (handwritten) "Lac Khanka Puzilo 13 III 1870"; pink square (handwritten) "*Odacantha puziloi* mihi"; red square (printed) "PARALECTYPUS *Odacantha puziloi* Solsky, 1875 K. Makarov et Yu. Sundukov design." [ZIN]; 1 female, yellow square (handwritten) "Wladiwostok 1.IV.1870" and a yellow square (handwritten) "*puziloi*" [ZIN].

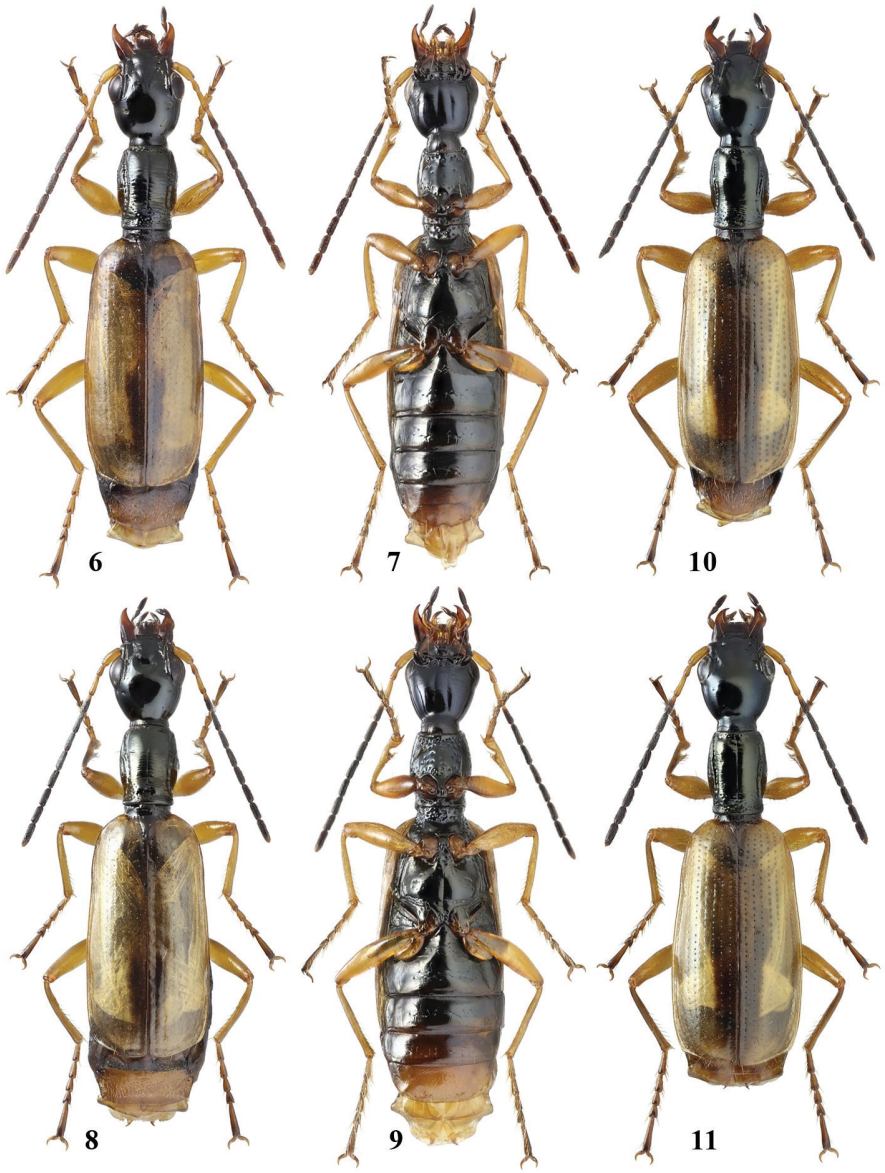
OTHER MATERIAL. **Russia**: *Zabaykalsky krai*: near Duroy, to light, 16–18.VI 2000, I. Melnik leg. [1 ex., cIM]; *Yakutia*: Central Yakutia, Khatyryk, Ensieli valley, lake, 3.VII 2004, A. Averensky leg. [1 ex, ISEA]; *Amurskaya oblast'*: Klimoutsy, Amur Region, 40 km W Svobodnyi, 24.IX 1958, Zinoviev leg. [1 ex., ZIN]; *Primorskiy krai*: Lazovsky Nature Reserve, cordon Petrova, 5.VI 1994, Yu. Sundukov leg. [1 ex., FEB]; Troitskoe, Khanka, 13.VI 1908, Cherskiy leg. [4 ex., ZIN]; Kamen-Rybolov, Khanka, 18.VIII 1908, Cherskiy leg. [1 ex., ZIN]; Astrakhanka, Lake Khanka, 22.V 1908, Dyukin leg. [1 ex., ZIN]; east shore of Lake Khanka, swamp, 19.VIII 1963, Kerzhner leg. [1 ex. ZIN]; Spassky Distr., rice, 14.VII 1971, M. Pinsker leg. [1 ex., ZIN]; Khankaysky Nature Resrve, Mt Luzanova Sopka, 8 km N Sivakovka, 18.VI 2000, V. Medvedev leg. [3 ex., FEB]; 20 km NNW Spassk-Dalniy, Lake Khanka, cordon Vostochnyi, 3–8.VI 2008, A. Napolov leg. [1 ex, MPU]; Chernigovskiy Distr., Dmitrievka,

20.VI 1981, V. Kuznetsov leg. [1 ex, FEB]; Vladivostok, Sputnik Station, 25.VII 1994, A. Nilsson leg. [1 ex., FEB]; Ilistaya River near Chernigovka, at light, 13.VIII 2001, V. Kuznetsov leg. [1 ex., FEB]; Ussuriyskiy Nature Reserve, Kaymanovka, at light, 26.VII 1992, S. Beloborodov leg. [1 ex., MPU]; Vinogradovka, 4.VIII 1929, Kirichenko leg. [1 ex., ZIN]; Nizhne-Mikhailovskoe, 19.VI 1899, G. Suvorov leg. [1 ex., ZIN]; Khasansky Distr., mouth of Kedrovaya River, 25.V 2015, K. Makarov leg. [1 ex., MPU]; ibid, 20–24.VIII 2018, M. Korepanov, K. Makarov, A. Matalin & Yu. Sundukov leg. [32 ex., FEB, MPU]; Khasansky Distr., Mt Golubinyi Utes, 13.VI 2009, S. Ivanov leg. [1 ex., cSI]; Khasansky Distr., 6 km E of Khasan Railway Station, 1–9.VII.1990, A. Tilli leg. [4 ex, cAT].



Figs 1–5. *Odacantha puziloi puziloi*: 1 – male, lectotype, dorsal view; 2 – the same, ventral view; 3 – aedeagus and parameres, lectotype; 4 – head and prothorax, paralectotype, ventral view; 5 – aedeagus and parameres, paralectotype.

TAXONOMIC REMARKS. A detailed description of the structure of *O. puziloi* is given in Habu (1967). In this regard, we present only a brief description of the nominative subspecies.



Figs 6–11. Habitus of *Odacantha puziloi*: 6–9 – *O. puziloi puziloi*; 10–11 – *O. puziloi aino* subsp. n.; 6, 7, 10 – male; 8, 9, 11 – female; 6, 8, 10, 11 – dorsal view; 7, 9 – ventral view.

Head with well-developed temples varying in shape from regularly converging towards neck interception to subparallel, sharply tapering towards neck. Eyes relatively large, length almost equal to that of temples (TEL/OCL ratio, 0.82–1.25, average 1.01).

Head chaetotaxy variable. Lectotype head with only one pair of additional setae, basal to posterior supra-orbital ones. Of 28 specimens studied [1 ex. from the Amurskaya oblast' and 27 from the Primorskiy krai: Khasansky District (9 ex.), Vladivostok (2), Razdolnaya River basin (5), Lake Khanka (7), Ussuri River valley (4)]; 3 specimens showing an additional left seta between anterior and posterior supra-orbital pores, 1 specimen with a 3rd additional posterior seta on left side, 1 specimen lacking a right additional posterior seta.

Figs 12–19. Morphological details of *Odacantha* spp.: 12–14 – *O. puziloi puziloi*; 15, 16 – *O. puziloi aino* subsp. n.; 17–19 – *O. hagai*; 12, 18 – pronotum, ventral view; 13, 15, 17 – left elytra, dorsal view; 14, 16, 19 – 3rd-5th intervals of elytra in basal half of elytra, dorsal view.

Pronotum cylindrical, slightly narrowed towards both anterior and posterior edges, with a well-developed median groove. Its base punctured with large points. Prosternum and proepisterna punctured to varying degrees. Lectotype and paralectotypes with prosternum punctured mainly along edges; only 2–3 points in front of coxae. In individuals from the Khasansky District, punctures much stronger, points occupying almost entire prosternum.

Elytra relatively narrow (ELW/ELL 0.41–0.51, mean 0.49), slightly dilated in posterior half. Striae usually thin and not reaching the apex of elytra (except for near suture); points on them often very small, reduced to thin strokes. Microsculpture consisting of isodiametric or slightly elongated cells, front edge of which slightly scale-shaped.

Discal pores on intervals of elytra varying considerably in number: in interval 3 from 3 to 6 (usually 3–4, lectotype with 3), in interval 5 from 0 to 2 (usually 0, as in lectotype), in interval 7 from 0 to 2 (more often 1, lectotype with 1 on left elytron, 2 on right one).

Figs 20–35. Male genitalia of *Odacantha* spp.: 20–25, 28–33 – *O. puziloi puziloi* (20, 28 – lectotype; 21, 29 – paralectotype); 26, 27, 34, 35 – *O. puziloi aino* subsp. n.; 20–27 – aedeagus, 28–35 – left paramere. Scale bars – 0.5 mm. Figures 27 and 35 show measurements scheme.

Aedeagus slightly bent, barely broadened in preputial field area, relatively narrow (EDW/EDL 0.12–0.15, average 0.14, n=10). Left paramere roundly trapezoidal, elongated (LPW/LPL 0.39–0.49, average 0.43, n=10).

Body length 5.4–6.7 mm (average 6.2 mm, n=28). Measurements used here (n=34): OCL – 0.40–0.50 (average 0.45), TEL – 0.39–0.51 (average 0.46), HEW – 0.95–1.13 (average 1.05), PNW – 0.76–0.90 (average 0.84), PNL – 1.03–1.24 (average 1.16), ELW – 1.53–1.95 (average 1.70), ELL – 3.13–3.83 (average 3.46).

DISTRIBUTION. **Russia**: Zabaykalsky krai (new record), Yakutia (new record), Amurskaya oblast' (new record), Primorskiy krai and south of Khabarovsky krai (Lafer, 1989); North Korea (Bousquet, 2017), South Korea (Park *et al*., 2014), northeastern China (Nakane, 1963). The records from Japan (Hokkaido, Honshu: Habu, 1967, 1982) can apply to this and/or the following subspecies.

BIOLOGY. Lifestyles are similar to those of the Western Palaearctic *Odacantha melanura* (Linnaeus, 1767) (Lindroth, 1986). *O. puziloi* lives along the shores of eutrophied waterbodies with rich vegetation of large graminoids and cattails, adults often being found on partially submerged plants (Figs 44, 45). Flying to light. The last instar larvae were found together with adults on 20–24.VIII 2018. In the laboratory, they pupated, the development time of pupae averaging 7.3 days (n=3).

***Odacantha* (*Odacantha*) *puziloi aino* Makarov et Sundukov, subsp. n.**

http://zoobank.org/NomenclaturalActs/C41F0BA5-9029-43E2-AC7F-C51DB7645F6C

Figs 10, 11, 15, 16, 26, 27, 34, 35

Odacantha (*Odacantha*) *puziloi* Solsky, 1875: Sundukov & Makarov, 2016: 144.

TYPE MATERIAL. **Holotype**, male, with the following labels: white square (printed) "South Kuriles, Kunashir Isl., between Rikorda River and Belozerskaya River, 24–30.V 2016, Yu. Sundukov leg.", red square (printed) "HOLOTYPUS *Odacantha puziloi aino* subsp. n. det. K. Makarov et Yu. Sundukov, 2019" [ZIN]. **Paratypes**, with the following labels: South Kuriles, Kunashir Isl., Veslovskii Peninsula, 1.5 km north of Cape Veslo, 21.VII 2008, K. Makarov leg. [1 ex., MPU]; between Rikorda River and Belozerskaya River, 24–30.V 2016, Yu. Sundukov leg. [89 ex., ZIN, MPU, FEB]; ibid, 19.VIII 2017, Yu. Sundukov leg. [1 ex., FEB].

DESCRIPTION. Head with rounded temples, usually regularly tapering towards neck. Eyes slightly smaller than temples (TEL/OCL ratio, 0.92–1.38, average 1.11).

Pronotum as in the nominative subspecies. Punctures on prosternum and proepisterna usually less strongly developed, the surface in front of coxae usually being smooth, less than 10% of individuals showing punctures there.

Elytra wider (ELW/ELL 0.50–0.56, average 0.52), markedly broadened in posterior part. Their striae usually well-developed and reaching apices. Punctation variable, points often being quite large. Microsculpture similar to that of the nominative subspecies, but upper edge of cells more convex.

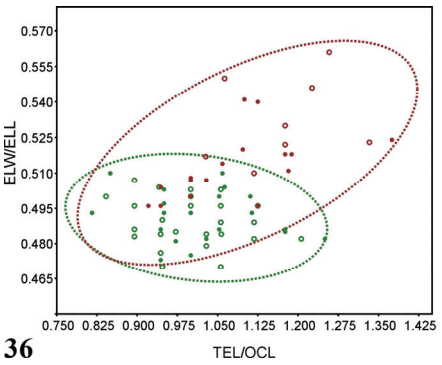
Aedeagus almost straight, in preputial field area markedly broadened, wider than in the nominative subspecies (EDW/EDL 0.14–0.17, average 0.16, n=11). Left paramere rounded trapezoidal, ca. 2 times as long as wide (LPW/LPL 0.41–0.52, average 0.49, n=11).

Body length 5.6–6.8 mm (average 6.2 mm, n=20). Measurements used here (n=27): OCL – 0.38–0.48 (average 0.42); TEL – 0.40–0.55 (average 0.46); HEW – 0.95–1.10 (average 1.03); PNW – 0.75-0.93 (average 0.83); PNL – 1.03–1.23 (average 1.14); ELW – 1.58–1.89 (average 1.75; ELL – 3.05–3.63 (average 3.38).

DIAGNOSIS. Differs from the nominative subspecies by its relatively wide elytra, the weak punctures on the prosternum, the coarser punctures on the striae, and the more distinct microsculpture of the elytra. In addition, the aedeagus in *O. puziloi aino* subsp. n. is larger and thicker, while the left paramere is significantly wider (Figs 26, 27, 34, 35).

DISTRIBUTION. **Russia**: South Kuriles (Kunashir Isl.). Not found on the islands of the Lesser Kuriles (field studies of Yu. Sundukov on the islands of Shikotan, Yuri, Polonsky, Tanfilyeva in 2012, 2016, 2017). The records from Japan (Habu, 1967, 1982) can refer to both nominative and new subspecies.

BIOLOGY. On the island of Kunashir, this form has only been found in the extreme south, along the shores of coastal wetlands and marshes (Figs 46, 47).



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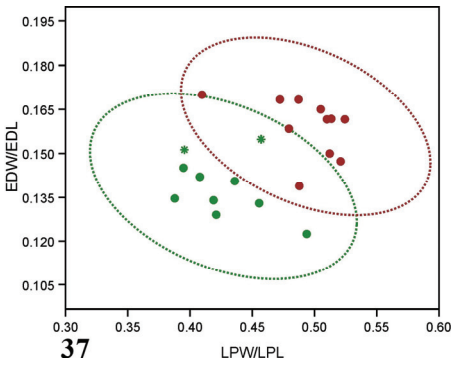

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Fig. 36. Variations in eye size (TEL/OCL) and relative elytral width (EDW/EDL).

Fig. 37. Variations in the width of the left paramere (LPW/LPL) and aedeagus (EDW/EDL).

Green – *O. puziloi puziloi*, red – *O. puziloi aino* subsp. n.; spots – female, circles – male; the asterisk denotes the lectotype and paralectotype. The differences between subspecies (t-test) are significant: p = 0.00041017 for TEL/OCL, p = $8.6047E^{-12}$ for ELW/ELL, p = 0.00021324 for LPW/LPL and p = 0.00014941 for EDW/EDL.

***Odacantha* (*Odacantha*) *hagai* Nemoto, 1989**

Figs 17–19, 38–43

Odacantha hagai Nemoto, 1989: 101–102; type locality: "Lake Kasumigaura, Ibaraki Pref.", Honshu, Japan.

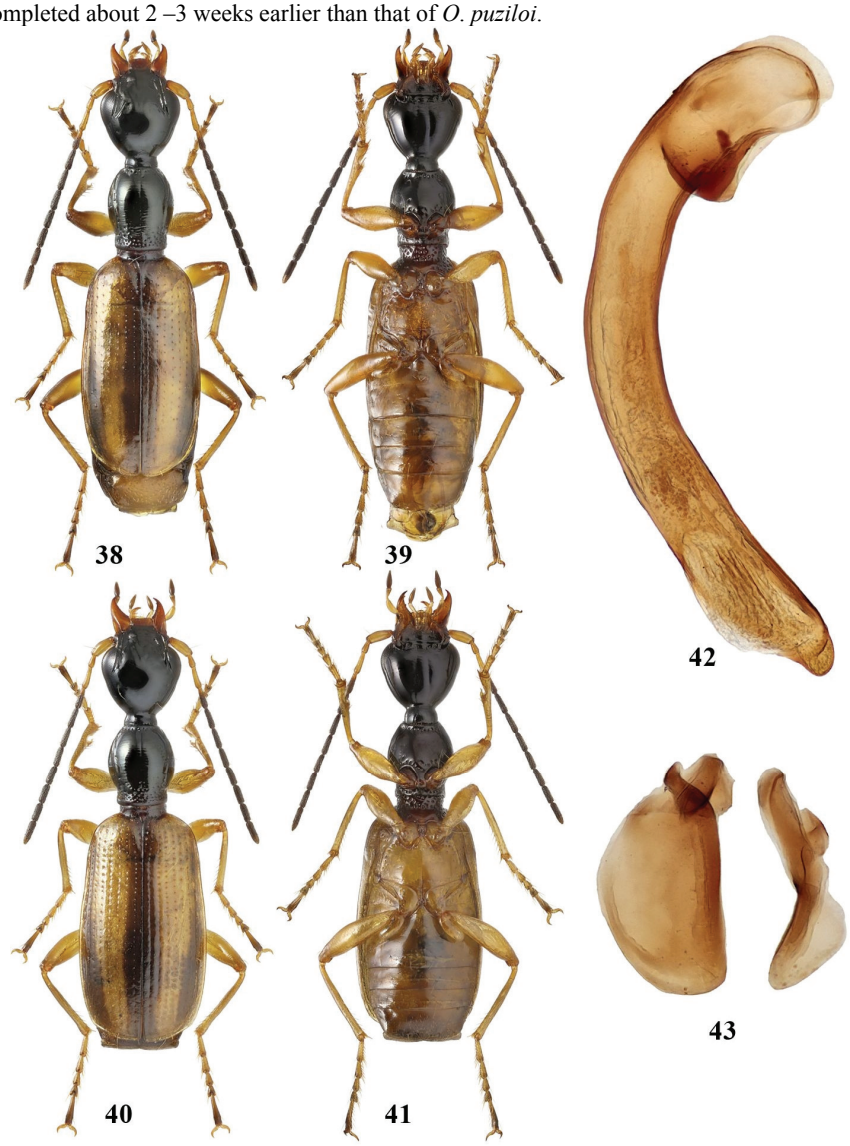
MATERIAL. **Russia**: *Primorskiy krai*: Khasansky Distr., mouth of Kedrovaya River, 22–24.VIII 2018, M. Korepanov, K. Makarov, A. Matalin & Yu. Sundukov leg. [18 ex., ZIN, MPU, FEB]; Khasansky Distr., 6 km E of Khasan Railway Station, 1–9.VII 1990, A. Tilli leg. [8 ex, cAT]; Khasansky Distr., Ryazanovka, 5.IX 1985, Kabakov leg. [1 ex., ZIN]; Anuchinsky Distr., Chernyshevka environs, food meadow, 14.VII 1995, R. Dudko leg. [1 ex., ISEA[; Chernigovsky Distr., 10 km SSW of Sibircevo, Ilistaya River, 44,107°N, 132,397°E, 29-30.V 2015, R. Dudko leg. [1 ex., ISEA].

TAXONOMIC REMARKS. Like the previous species, *O. hagai* shows a variable chaetotaxy on the head and elytra. For example, of 18 specimens studied, 1 individual has only 1 left additional seta on the head, 2 beetles each with only 1 right additional seta, 1 specimen shows an additional posterior right seta, 2 specimens have no additional posterior left seta, in 1 specimen additional posterior setae are absent, but 1 has 2 pairs of additional posterior setae. The number of discal pores on the elytra varies: in the 3rd interval from 1 to 5 (usually 3–4), in the 5th interval from 0 to 2 (more often 1), in the 7th from 0 to 3 (usually 1–2).

The length of the body is 4.7–5.7 mm (average 5.3 mm, n=17).

DISTRIBUTION. **Russia**: Primorskiy krai (new record); Japan (Hokkaido, Honshu) (Nemoto, 1989; Kasahara, 1992).

BIOLOGY. According the literature record (Nemoto, 1989; Kasahara, 1992) and our collections, the lifestyle is similar to that of *O. puziloi* (Figs 44, 45). However, at the end of August, when the larvae of the latter species were not uncommon, *O. hagai* was represented by young, often weakly sclerotized adults. This suggests that the development in *O. hagai* is completed about 2 –3 weeks earlier than that of *O. puziloi*.



Figs 38–43. *Odacantha hagai*: 38 – male, dorsal view; 39 – male, ventral view; 40 – female, dorsal view; 41 – female, ventral view; 42 – aedeagus; 43 – parameres.

Figs 44–47. Habitats: 44, 45 – both *Odacantha puziloi puziloi* and *O. hagai* (44 – Khasansky Distr., 6 km east of Khasan Railway Station, photo by A. Tilli; 45 – Khasansky Distr., mouth of Kedrovaya River, photo by A. Matalin); 46, 47 – *O. puziloi aino* subsp. n. (46 – Veslovskii Peninsula, 1.5 km north of Cape Veslo, photo by K. Makarov; 47 – swamp between Rikorda River and Belozerskaya River, photo by Yu. Sundukov).

KEY TO THE SPECIES OR SUBSPECIES OF THE GENUS *ODACANTHA* OCCURRING IN THE RUSSIAN FAR EAST

1 Smaller, length 4.7–5.7 mm (average 5.25 mm). Pronotum shorter (1.25 times as long as wide), with rounded sides and arcuate grooves (Figs 38, 40). Prothorax from below in front of coxae smooth, without punctation (with the exception of a number of points along front edge) (Fig. 18); proepisterna with only a few points in basal part and near lateral grooves (Fig. 18). Elytra without microsculpture, glossy (Fig. 19). Head and pronotum black, without metallic tint; labrum brown; head and prothorax below black, mesothorax, metathorax and abdomen are entirely red (Figs 39, 41). Aedeagus rather clearly curved, relatively slender and long (Fig. 42) ..... ***O. hagai*** **Nemoto, 1989**

– Larger, length 5.6–6.8 mm (average 6.26 mm). Pronotum elongated (about 1.4 times as long as wide), cylindrical, its lateral grooves almost parallel (Figs 6, 8, 10, 11). Prothorax from below and proepisterna with large coarse points (Figs 9, 12). Elytra with distinct microsculpture (Figs 14, 16). Head and pronotum black, with weak brass tint; labrum black; underside completely black, only last visible sternite red-brown (Figs 7, 9). Aedeagus straight, relatively stout and short (Figs 20–27) ..... ***O. puziloi*** **Solsky, 1875**

2 Elytral striae weak, finely punctured, not reaching the apex (Fig. 13); left paramere narrow (Figs 28–33) ..... ***O. puziloi puziloi*** **Solsky, 1875**

– Elytral striae strongly developed, usually reaching the apex; left paramere wider (Figs 34, 35) ..... *O.* ***puziloi aino*** **Makarov et Sundukov, subsp. n.**

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