

Species of the Subgenus *Baudia* of the Genus *Badister* (Coleoptera, Carabidae) from the Southern Sikhote-Alin Mountains

Yu. N. Sundukov

Lazo State Nature Reserve, Lazo, Primorskii Territory, 692980 Russia
e-mail: lazovzap@mail.primorye.ru

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Abstract—Data on two species of the subgenus *Baudia* Ragusa, 1884, *B. ishigakiensis* Habu, 1975 and *B. marginellus* Bates, 1873 new to the fauna of the southern Sikhote-Alin Mountains, are presented. A key to species of this subgenus is provided. Holotypes of *B. nigriceps* A. Morawitz, 1863 and *B. ussuriensis* Jedlička, 1937 are designated. New data on the distribution of the species in Eastern Asia are given.

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The subgenus *Baudia* Ragusa, 1884, genus *Badister* Clairville, 1806, includes 11 species in the Palearctic and 6 in Eastern Asia (Baehr, 2003). Despite a rather small number of the species included in the subgenus, their distribution and biology are poorly studied, primarily because of considerable difficulty of identification of most of them. Only two taxonomic studies cover this group in the territory of the Russian Far East (Lafer, 1989; Komarov, 1991).

The necessity of the present study arose when a beetle species unknown to the author but belonging to the subgenus *Baudia* was found in the southern Sikhote-Alin Mts. Examination of the species has shown that, in addition to the known *Badister* (*Baudia*) *ussuriensis* Jedlička, 1937, two unknown species also occur in the southern Sikhote-Alin Mts.

The following designations are used in descriptions: PL, maximum length of the pronotum; EL, length of the elytra measured from the humeri to the apices; M, the average.

The following abbreviations are used in the text: ZIN, Zoological Institute, Russian Academy of Sciences, St. Petersburg; MSPU, Moscow State Pedagogical University; ISEA, Institute of Systematics and Ecology of Animals, Novosibirsk; NMP, National Museum, Prague; cYuS, Yu.N. Sundukov's collection, Lazo.

The most important characters of the species of the subgenus *Baudia* include the structure of the aedeagus and fore tarsus of males, structure of the elytra, colora-

tion of the body, and microsculpture of the dorsal side of the head. The structure of the pronotum can be used to a lesser extent.

A Key to the Species of the Subgenus Baudia of the Southern Sikhote-Alin Mts.

- 1 (2). Aedeagus with large hook at apex (Fig. 1, 1, 2). 1st–3rd segments of fore tarsus of male weakly widened (Fig. 2, 3). Basal foveae of pronotum wide and deep, posterior angles of pronotum rather strongly upcurved. All elytral intervals convex, striae moderately deep. Humeri rather strongly protruding. Elytra oval, with sides usually convex along entire length. Dorsum entirely dark brown; head black; clypeus, labrum, and mandibles yellowish brown. Length 4.45–4.70 mm *B. ishigakiensis* Habu.
- 2 (1). Aedeagus without hook at apex (Fig. 3, 1, 3). 1st–3rd segments of fore tarsus of male strongly widened (Fig. 2, 1, 2). Basal foveae of pronotum stroke-shaped or wide; posterior angles of pronotum usually not upcurved, lying in one plane with base, sometimes weakly or moderately upcurved. Outer or all elytral intervals flattened, striae shallow. Humeri straight or weakly protruding. Elytra oval or oblong.
- 3 (4). Body entirely dark brown dorsally or with pale brown pronotum; head entirely dark; clypeus, labrum, and mandibles colored as dorsum of head. Antenna with only 1st segment dark brown. Eyes large, strongly convex. Elytra oblong

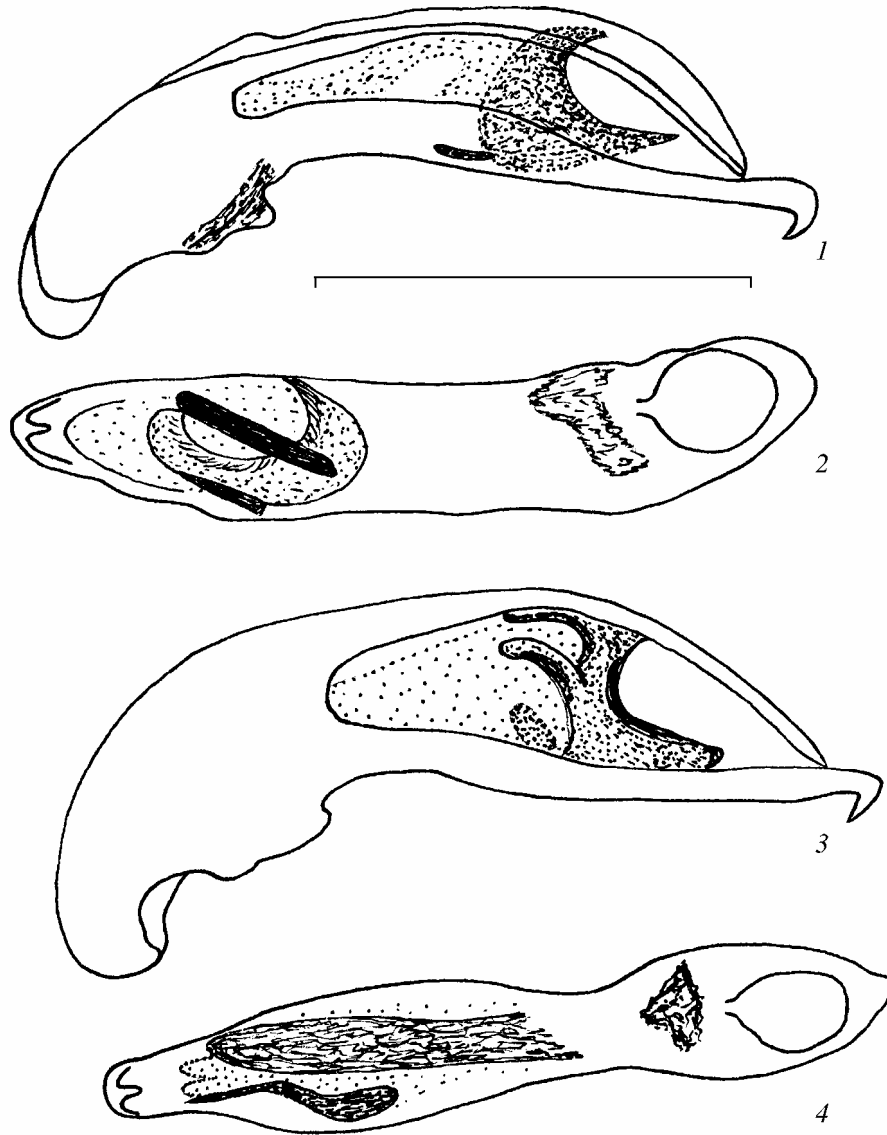


Fig. 1. Structure of aedeagus: (1, 2) *Badister (Baudia) ishigakiensis* Habu; (3, 4) *B. (B.) peltatus* (Panzer) [(1, 3) penis, view from right side; (2, 4) penis, ventral view]. Scale = 0.5 mm.

[EL = 3.00–3.32 (M 3.11); EL/PL = 3.00–3.30 (M 3.14)], their sides rectilinear along basal 2/3. Apical part of aedeagus wide (Fig. 3, 4). Body larger, length 4.80–5.45 mm
 *B. ussuriensis* Jedl.

smaller, length 4.25–4.83 mm
 *B. marginellus* Bat.

***Badister (Baudia) ishigakiensis* Habu**

Badister (Baudia) ishigakiensis Habu, 1975 : 81.

Type locality: Ishigaki Island, the Sakishima Islands in the southern part of the Ryukyu Islands, Japan.

Ussuriisk Distr.: 1 spm., Ussuri Nature Reserve, Komarovo-Zapovednoe, 26–28.V.1999, Yu. Sundukov (cYuS); 71 spms., same locality, 22–28.VII.1999, Yu. Sundukov (cYuS); Chuguevskii Distr.: 1 spm., Pavlovka River floodland near Uborka Vill.,

4 (3). Pronotum reddish yellow; elytra brown to nearly black; head black; clypeus, labrum, and mandibles yellowish red or red. Antennae with 2 basal segments yellow or red. Eyes smaller, frequently slightly flattened. Elytra oval [EL = 2.55–3.00 (M 2.77); EL/PL = 2.62–3.20 (M 2.84)], with sides convex along entire length. Apical part of aedeagus narrow (Fig. 3, 2). Body

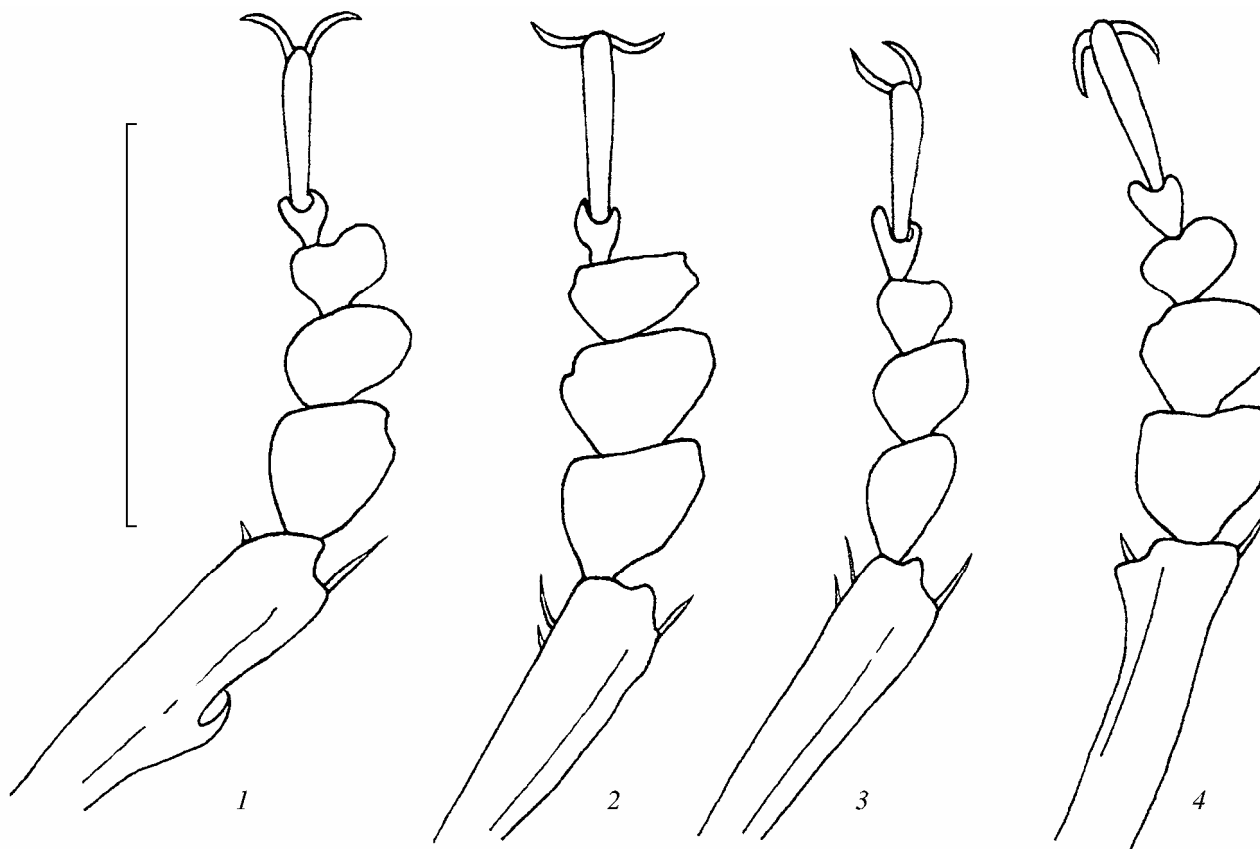


Fig. 2. Right fore tarsus of male: (1) *Badister (Baudia) marginellus* Bates, (2) *B. (B.) ussuriensis* Jedlička, (3) *B. (B.) ishigakiensis* Habu, (4) *B. (B.) peltatus* (Panzer). Scale = 0.5 mm.

29.VII.2004, Yu. and L. Sundukovs (cYuS). A total of 73 spms. were collected.

Distribution. Russia: Primorskii Territory, Japan: Ishigaki Island.

Ecology. The beetles occur in litter in strongly boggy biotopes under the forest canopy or along forest edges.

Notes. Komarov (1991) regarded *B. ishigakiensis* as a synonym of *B. peltatus* (Panzer, 1796) widely distributed in Europe, Asia Minor, and Western Siberia. I have examined collections of *B. peltatus* from northern Italy (1 ♂, 1 ♀), European part of Russia (3 ♂, 2 ♀), and Tyumen Province [1 ♂, 25 km S of Tyumen, 14.VII.1989, D. Lomakin (ISEA)]. Comparison of these specimens with my material of *B. ishigakiensis* has shown that they belong to two different species. Morphological characters for identification of the species are listed below:

1 (2). Microsculpture on dorsum of head distinct, isodiametrical. 1st–3rd segments of fore tarsus of male weakly widened (Fig. 2, 3). Aedeagus as in Fig. 1, 1, 2 *B. ishigakiensis* Habu.

2 (1). Microsculpture on dorsum of head fine, consisting of meshes transverse on neck and longitudinal on occiput and vertex. 1st–3rd segments of fore tarsus of male strongly widened (Fig. 2, 4). Aedeagus as in Fig. 1, 3, 4 *B. peltatus* Panz.

The taxonomic status of *B. ishigakiensis* is not indisputable, when the species is compared with *B. fukiensis* Jedlička, 1955 described from Shanghai (Eastern China). Judging by the original description of *B. fukiensis* (Jedlička, 1955) and the subsequent re-description of its holotype (Morita, 1994), this species is very closely related to *B. ishigakiensis* and may be its senior synonym.

***Badister (Baudia) marginellus* Bates**

Badister marginellus Bates, 1873 : 258.

Type locality: Nagasaki, Kyushu Island, Japan.

Shkotovskii Distr.: 1 spm., Nikolaevskaya Pad', 10 km NE of Mnogoudobnoe Vill., 21.VIII.1994, Yu. Sundukov (cYuS); Anuchinskii Distr.: 2 spms., Grodekovo Vill. on Muraveika River, 13–15.VIII.

1994, Yu. Sundukov (cYuS); Lazo Distr.: 20 spms., Lazo Nature Reserve, middle Sokolovka River, 16–20.IV.1997, Yu. Sundukov (cYuS); 3 spms., same locality, 16–20.IV.1998, Yu. Sundukov (cYuS); 1 spm., same area, Amerika locality, 20.IV.1997, Yu. Sundukov (cYuS); 3 spms., same locality, 21–24.V.2000, Yu. Sundukov (cYuS); 14 spms., same area, Proselochnaya Bay, 6.V.1996, Yu. Sundukov (cYuS); 1 spm., same locality, 11–12.V.2000, Yu. Sundukov (cYuS); 1 spm., same locality, 18.X.2000, Yu. Sundukov (cYuS); 1 spm., same area, Sukhoi Stream, 18.VI.2002, Yu. and L. Sundukovs (cYuS); 1 spm., Lazo Vill., 5.VI.1997, Yu. Sundukov (cYuS); 1 spm., same locality, 23.VI.2004, Yu. Sundukov (cYuS); 1 spm., same locality, 18–20.VIII.2005, V. Shokhrin (cYuS); 2 spms., same locality, 7–13.VIII.2006, Yu. Sundukov, V. Shokhrin (cYuS); 1 spm., same locality, 20–23.VIII.2006, V. Shokhrin (cYuS); 2 spms., Veselyi Stream in Pasechnaya River basin, 22–24.VI.1995, Yu. Sundukov (cYuS); 1 spm., Kievka River 3 km downstream of Lazo Vill., 9.V.1995, Yu. Sundukov (cYuS); 1 spm., Kamen'-Brat Mt. (ridge of Sestra Mt.), 1300–1540 m, 28.VIII.1995, Yu. Sundukov (cYuS); Chuguevskii Distr.: 2 spms., Ussuri River valley near Bulyga-Fadeyev Vill., 8–9.VI.1999, Yu. Sundukov (cYuS); 1 spm., Vostochnyi Sinii Mt. Range., Elovyi Pass, 400 m, 25.VII.2004, Yu. and L. Sundukovs (cYuS); 1 spm., Chuguevka Vill., Chuguevka River valley, 15–26.V.1997, S. Mukhanov (MSPU); Olginskii Distr.: 4 specimens, upper Milogradovka River, Chertov Most locality, 16–18.VIII.2004, Yu. Sundukov (cYuS); Dal'negorskii Distr.: 4 spms., Sedaya Mt., 3 km S of Krasnorechenskii Vill., 1100 m, 22.VII.2004, Yu. Sundukov (cYuS); Terneiskii Distr.: 4 spms., Sikhote-Alin Nature Reserve, Yasnyi Cordon on Zabolochennaya River, 26.VI–05.VII.1998, Yu. Sundukov (cYuS); 1 spm., same area, pass from Kabanii Cordon to upper Sporny Stream, 650–850 m, 8–13.VII.1998, Yu. Sundukov (cYuS); 1 spm., same area, Ust-Serebryanyi Cordon near Serebryanyi Stream, 15–22.VII.1998, Yu. Sundukov (cYuS); 1 spm., upper Zapadnaya Kema River, 600–800 m, 14.VII.1999, Yu. Sundukov (cYuS). A total of 76 spms. were collected.

Distribution. Russia: Primorskii Terr., Furugelm Island, Southern Sakhalin, Moneron Island, Kunashir Island, Iturup Island. Japan.

Ecology. The species occurs under the canopy of deciduous and mixed, valley and mountain forests, reaches mountain tundras. The beetles inhabit forest

litter in humidified but not wet places, hibernate forming large congestions in underground hollows of rocky soils, fly to light.

Notes. In the continental part of the Far East the species was first recorded by Lafer (1977) from the Khekhtsir Mt. Range under the name *B. nigriceps* A. Morawitz, 1863. Later (Lafer, 1989; Komarov, 1991; Kryzhanovskij et al., 1995; Lobl and Smetana, 2003), it was indicated as an exclusively island species inhabiting Japan, Sakhalin, and Kunashir. The material examined by me has shown that, in addition to the territories listed, *B. marginellus* also occurs on the following islands: Iturup [♀, Iturup Isl., Medvezhyi Peninsula, Slavnaya river, 600 m, up stream of mouth, 20.VIII.1994, K. Eskov (MSPU)], Moneron [1 ♂, 1 ♀, Moneron Isl., SSE shore, Usovo Ck., 46 13.956N 141 13.731E, h 100 m, litter with fern under *Picea* and *Betula*, 24.VIII.2001, G. Azarkina (ISEA)] and Furugelm [1 ♀, Far East, Furugelm Island, 27.VII.1975, Velizhanin (ISEA)].

The taxon was mentioned under the name *B. nigriceps* for the territory of Russia until 1995. *B. nigriceps* was described by Morawitz (1863 : 36) from one female collected in the environs of Hakodate (south of Hokkaido Island, Japan). Having examined a type specimen of *B. nigriceps* from the ZIN collection, Kataev (Kataev in Kryzhanovskij et al., 1995 : 160, footnote 337) has revealed that the species distributed in the territory of Russia is not *B. nigriceps* but *B. marginellus* similar to the latter. The results of my examination of Morawitz's type [♀ with labels: "Hakodate 85–1." (yellow rectangle); "85. *nigriceps*. Mor." (white rectangle); and "Holotypus" (red rectangle)] confirm Kataev's conclusion. As *B. nigriceps* was described from a single female, this specimen is designated here as holotype.

These species can be identified according to the following characters:

- 1 (2). Elytra brown to nearly black, with narrow transparent margins. Basal foveae of pronotum larger, stroke-shaped or rounded, reaching posterior margin of pronotum. Humeri straight or protruding slightly forward. Microsculpture on head isodiametrical, consisting of larger meshes, and therefore, appearing coarse and shagreened. 1st–2nd antennal segments red or yellow
..... *B. marginellus* Bat.
- 2 (1). Elytra entirely yellow. Basal foveae of pronotum small, stroke-shaped, deep anteriorly and shallow posteriorly.

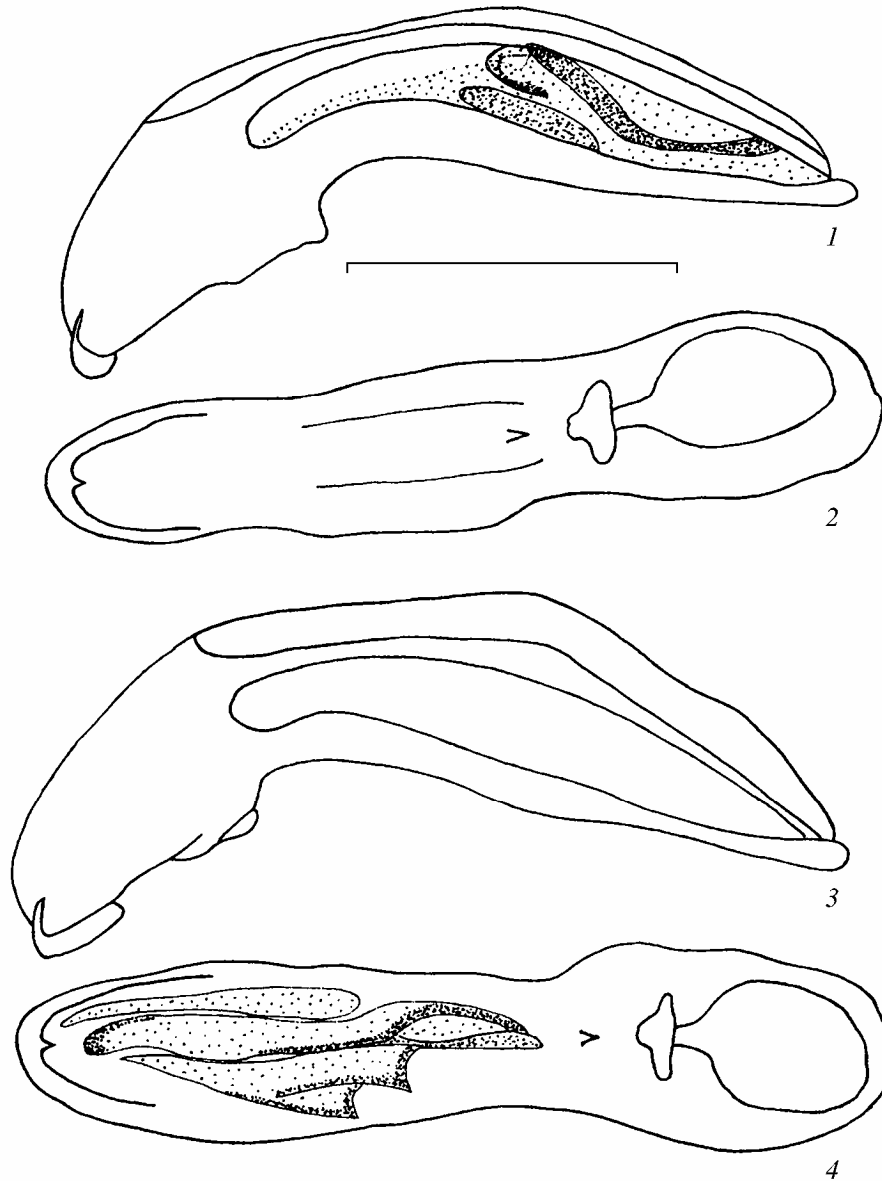


Fig. 3. Structure of aedeagus: (1, 2) *Badister (Baudia) marginellus* Bates, (3, 4) *B. (B.) ussuriensis* Jedlička [(1, 3) penis, view from right side; (2, 4) penis, ventral view]. Scale = 0.5 mm.

low posteriorly, which making them nearly isolated from posterior margin of pronotum. Humeri strongly protruding forward. Microsculpture on head isodiametrical, meshes small. Only 1st antennal segment yellow
 *B. nigriceps* Mor.

The taxonomic status of *B. nakayamai* (Morita, 1992) described from the environs of Tokyo (Japan) requires verification. This species almost does not differ from *B. marginellus* in the main characters of the morphology, shape of the aedeagus, and internal armament of the endophallus. Morita (1992) indicates

the following main differences of the new species: smaller body, another coloration, more convex dorsal side of the body, and shorter antennae.

***Badister (Baudia) ussuriensis* Jedlička**

Badister (Baudia) ussuriensis Jedlicka, 1937 : 83.

Type locality: Ussuriisk, Primorskii Terr., Russia.

Ussuriisk Distr.: Holotype (designated here), 1 ♀, "Nikolsk Ussurijsk Ussurigeb. Mandl" (pale green rectangle); "TYPE" (dark red rectangle); "Mus. Nat. Pragae Inv., 66591 Mus. Nat. Pragae" (orange rectan-

gle); "*ussuriensis* sp. n. DET. ING. JEDLIČKA" (red rectangle); "*Badister (Baudia) ussuriensis* Jedlička Det. S. Morita, 1993" (yellowish green rectangle) (NMP); 1 spm., Ussuri Nature Reserve, Komarovo-Zapovednoe, 22–28.VII.1999, Yu. Sundukov (cYuS); 2 spms., Kamenushka Vill., 10–20.VII.1993, S. Khvylya (MSPU); Mikhailovskii Distr.: 1 spm., Otradnoe Vill., upper Ilistaya River, 31.VII.2003, Yu. Sundukov (cYuS); Yakovlevskii Distr.: 2 spms., Yakovlevka Vill., 26.VII.2004, Yu. and L. Sundukovs (cYuS); Lazo Distr.: 1 spm., Lazo Nature Reserve, Petrov Bay, 10 km SW of Preobrazhenie Vill., 9–12.VI.1995, Yu. Sundukov (cYuS); 2 spms., same locality, 22–24.VIII.1997, Yu. Sundukov (cYuS); 1 spm., same locality, 17.IX.2000, Yu. Sundukov (cYuS); 6 spms., same locality, 2–4.X.2000, Yu. Sundukov (cYuS); 12 spms., same area, Lake Chekhunenka in Kievka Bay, 11–13.VIII.2005, Yu. Sundukov, V. Shokhrin (cYuS); 1 spm., middle Sokolovka River, 16–20.IV.1997, Yu. Sundukov (cYuS); Olginskii Distr.: 14 spms., Avvakumovka River mouth near Olga Vill., 30–31.VII.2004, Yu. and L. Sundukovs (cYuS). A total of 44 spms. were collected.

Distribution. Russia: Primorskii and Khabarovsk Territories, Furugelm Island, Amur Province. Northern Korea: Savoron (possibly Sariwon, Hvanhedo Prov.) (Jedlička, 1960). Japan (Morita, 1994).

Ecology. This is a sharply hygrophilous species. The beetles occur in litter over strongly boggy meadows and forest glades along valleys of large rivers and at a sea coast, fly to light.

Notes. In Russia, the species was previously recorded in the southern Far East from Khabarovsk to Vladivostok (Komarov, 1991). I have examined specimens from Amur Prov. [2 ♀, environs of Blagoveshchensk, VI.1998, A. Streltsov (ISEA)] and Furugelm Island [♀, Far East, Furugelm Island, 27.VII.1975, Velizhanin (ISEA)].

B. ussuriensis is very closely related to *B. marginellus* in its external morphology, structure of the aedeagus, and armament of the endophallus, but clearly differs in its ecology. According to my observation, *B. ussuriensis* is a distinctly hygrophilous species inhabiting only strongly boggy meadows, while *B. marginellus* occurs under the forest canopy and is not associated with water.

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