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The genus *Eobrachycentrus* Wiggins (Trichoptera, Brachycentridae) in Japan

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Abstract

Japanese species of the genus *Eobrachycentrus* are revised, and only 2 species are recognized: *E. vernalis* (Banks 1906) and *E. niigatai* (Kobayashi 1968). *Eobrachycentrus oharensis* (Iwata 1927) and *E. propinquus* Wiggins *et al*. 1985 are synonymized with *E. vernalis* and *E. niigatai*, respectively. Adults and immature stages of these 2 species are described or redescribed. Information on the larval habitat and biology is provided.

Key words: Trichoptera, Brachycentridae, *Eobrachycentrus*, Japan, taxonomy, biology

Introduction

The genus *Eobrachycentrus* Wiggins is a small genus composed of only 5 named species from Japan and North America (Morse 2009). In Japan, although 4 *Eobrachycentrus* species have been recorded from Hokkaido, Honshu and Kyushu, adults of *E. oharensis* (Iwata 1927) are not yet known (Nozaki 2009). Furthermore, Wiggins *et al*. (1985) pointed out the necessity of critical study to confirm the specific status of *E. niigatai* (Kobayashi 1968).

To solve these taxonomic problems, I examined extensive material of *Eobrachycentrus* and recognized only 2 species in the Japanese fauna. In this paper, I describe or redescribe adults, larvae and pupae of these 2 species. Information on the larval habitat and biology is also provided.

Material and methods

Male and female genitalia and some larval characters were figured after being cleared in a 10% solution of KOH. Larval characters described are based on final instar larvae. Morphological terms mainly follow Schmid (1998) for the adults and Wiggins (2004) for the larvae and pupae. Depositories of the specimens are abbreviated as follows: Natural History Museum and Institute, Chiba (CBM); the Kyoto University Museum, Kyoto (KUM); N. Kuhara, Chitose (KN). For the specimens deposited in the author's own collection, the name is omitted in the list.

Eobrachycentrus vernalis (Banks 1906)

Figs 1, 3, 5

Brachycentrus vernalis Banks 1906, 108, male.
Micrasema oharensis Iwata 1927, 391–392, larva, case. **Syn. nov.**

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Brachycentrus sp. BB: Akagi 1959, 43, larva; Akagi 1962, 43, larva; Kim 1974, 68, 70, male, pupa.

Eobrachycentrus vernalis: Wiggins *et al*. 1985, 61–64, male, female, pupa, larva; Tanida 1985, 192, larva, case; Nozaki 2005, 501, male.

Adult (Fig. 1). Length of forewing 7–9.5 mm in male, 9–11 mm in female. General morphology and genitalic structures of both male and female were described in detail by Wiggins *et al*. (1985). Geographical variations are found in the male genitalia. Morphology of genitalia of males collected from Kyushu and Shikoku are in accord with that of the holotype male (Wiggins *et al*. 1985, Fig. 1), and are slightly different from males collected from Honshu in the shape of segment X and its appendages (Wiggins *et al*. 1985, Fig. 2). Female genitalia mostly agree with those described by Wiggins *et al*. (1985, Fig. 3), but most specimens lack a short median lobe on segments IX+X. Illustrations provided here are based on materials collected from the type locality.

Larva (Fig. 3). Length up to 12 mm. Head mostly dark brown to black, round in dorsal view, dorsum depressed mesally; setae 1, 4, 5, 6, 11, 13, 18 transparent; setae 5, 6 short, both about 1/5 of seta 14; seta 14 longest, seta 17 slightly shorter than seta 14; seta 18 tiny. Ventral apotome trapezoid, slightly longer than wide. Labrum hairy along anterior margin, mandibles each with 3 apical teeth, pair of submental sclerites long triangular. Prosternal horn very short. Pronotal sclerites dark reddish brown in anterior half, yellowish brown in posterior half; with many long stout setae along anterior margin; each sclerite with 2 long stout setae and 2 short transparent setae on transverse ridge dorsally. Mesonotal sclerites mostly yellowish brown; each sclerite subdivided longitudinally, with long stout setae along anterior, posterior and lateral margins. Metanotal *sa*1 with single short seta, *sa*2 and *sa*3 sclerites long oval, with long stout setae. Forelegs short, mid- and hind legs slender; each femur with 2 stout transparent setae ventrally. Abdominal segments without gills and lateral fringes, with pair of dorsal setae on segment I to VIII, and with forked lamellae on segment III to VII. Abdominal segment VIII with pair of protuberances dorsolaterally. Dorsal sclerite of segment IX semicircular, with about 50 long stout setae posteriorly. Lateral sclerite of anal prolegs with 4 long stout setae posteromesally, anal claw with 1 accessory hook.

Pupa (Fig. 5). Length about 10 mm. Antennae same length as body. Head with numerous minute spines on frons mesally, central area depressed; 3 pairs of setae on frons, with mesal setae short and transparent. Labrum with 4 long stout setae at base, each branched at apical half; pair of short transparent setae basolaterally, and 6 pairs of setae apicolaterally, apical 3 pairs transparent. Tarsi of midlegs with dense fringe of setae on dorsal margin. Abdominal segments bearing pair of spined ridges; anterior hook plates on segments III to VII oval; posterior hook plates on segment V long oval. Lateral fringe on segments VI to VIII. Anal processes slender, with thick bristles at each apex.

Case (Fig. 5). Case of final instar larva up to 14 mm, 4-sided, tapered, slightly curved ventrally; constructed of plant materials, mostly moss, with moss pieces often projecting outside; both anterior and posterior ends usually overhung dorsally; posterior opening large, marginal silken points protruding mesally. In pupal case, anterior opening closed by silken membrane with central hole; posterior opening closed by silken membrane with many perforations.

Specimens examined. Type series of *Micrasema oharensis*: 20 larvae, Otonashi-daki, Ohara, Sakyo-ku, Kyoto-shi, Kyoto, 3.X.1926, Ueno & Iwata (KUM). **Saitama:** 1 larva, Wasabi-zawa, ca. 1,200 m a.s.l., Tochimoto, Otaki, Chichibu-shi, 24.XI.1999, T. Nozaki. **Tokyo**: 2 larvae, Birikubo, 460 m a.s.l., Youzawa, Akiruno-shi, 18.VII.1990, T. Nozaki. **Ishikawa**: 7 larvae, tributary of Jadani, Chugu, Hakusan-shi, 9.X.1986, T. Nozaki. **Fukui**: 7 larvae, Kuzuryu-gawa, 370 m a.s.l., Ono-shi, 25.IX.2003, T. Hattori. **Yamanashi**: 5 larvae, seepage of Yanagisawa-gawa, 1,000 m a.s.l., Ichinose-takahashi, Koshu-shi, 20.VII.1990, T. Nozaki; 1 male, ibid., larva collected on 17.IX.1990, adult emerged on 21.III.1991, T. Nozaki; 1 larva, Sakubadaira, 1,310 m a.s.l., Enzan-kamiogiwara, Koshu-

shi, 21.XI.2004, D. Tsuruda. **Nagano**: 2 males, near Nomugi-toge, 1,600 m a.s.l., Nagawa, Matsumoto-shi, 1.VI.1993, N. Kuhara (NK); 2 larvae, small tributary of Azusa-gawa, Nagawado, Azumi, Matsumoto-shi, 2.XI.2004, T. Nozaki; 4 males, 1 female, ibid., larvae collected on 2.XI.2004, adults emerged on 16–24.II.2005, T. Nozaki; 1 larva, Oizumi-gawa, 1 040 m a.s.l., Minami-minowa-mura, 17.XI.1999, T. Tsuruishi. **Shizuoka**: 5 larvae, Abe-toge, ca. 1 400 m a.s.l., Umegashima, Aoi-ku, Shizuoka-shi, 11.X.1998, T. Hattori; 1 male, Yokosawa, ca. 550 m a.s.l., Aoi-ku, Shizuoka-shi, 21.III.2004, T. Hattori. **Shiga**: 1 male, Ojigahata, Taga-cho, 3.V.2008, H. Morita; 1 male, 1 female, Shiratani, 250 m a.s.l., Sugino, Kinomoto-cho, 12.IV.2004, T. Hattori. **Kyoto**: 1 larva, Otonashi-daki, 370 m a.s.l., Ohara, Sakyo-ku, Kyoto-shi, 10.X.2008, T. Nozaki; 1 male, ibid, larva collected on 10.X.2008, adult emerged on 2.III.2009 T. Nozaki; 1 male, 1 pupa, Hanase, 700 m a.s.l., Kyoto-shi, 13.IV.2004, T. Hattori. **Mie**: 1 male, Tashida, Fujiwara-cho, Inabe-shi, 20.IV.2008, H. Morita. **Hyogo**: 3 larvae, Hyono-sen, ca. 900 m a.s.l., Sekimiya, Yabu-shi, 14.X.1969, N. Nishimura; 9 males, small stream near a house of Kobe Univ., Hyono-sen, Sekimiya, Yabu-shi, 15.V.1993, N. Kuhara (NK); 1 male, Uwano, Muraoka-ku, Kami-shi, 2.III.2003, K. Inazu; 6 larvae, ibid., 12.IX.2006, T. Nozaki. **Nara**: 3 larvae, small waterfall, Sannoko-gawa, Kawakami-mura, 12.XI.2005, T. Nozaki; 1 pupa, ibid., larvae collected on 12.XI.2005, pupa fixed on 27.II.2006, T. Nozaki; 2 males, 2 females, ibid., larvae collected on 12.XI.2005, adults emerged on 25–27.II.2006, T. Nozaki. **Tokushima**: 3 larvae, Fujikawa-dani, Yoshino-gawa, Yamashiro-cho, Miyoshi-shi, 13.X.1982, T. Nozaki. **Ehime**: 1 male, Koya-yama, Oda, Uchiko-cho, 18.V.2000 (Malaise trap), E. Yamamoto & M. Doi; 8 males, 2 females, small stream, 800 m a.s.l., Namakusa-dani, Odami-yama, Uchiko-cho, 11–21.IV.2001 (Malaise trap), E. Yamamoto; 17 males, 1 pupa, waterfall, Kanmon, Omogo, Kumakogen-cho, 23.IV.2000, T. Ito & A. Ohkawa. **Kochi**: 1 larva, Kitagawa-gawa, headwater of Shimanto-gawa, Yahazu, Tsuno-cho, 10.X.1988, T. Nozaki; 1 female, Shiragadani-gawa, Befu-kyo, Kami-shi, 12.IV.2004, K. Nio. **Fukuoka**: 1 male, 1 female, small stream, 650 m a.s.l., Hiko-san, Soeda-machi, larvae collected on 14.XI.1989, adults emerged on 31.III.1990, T. Nozaki; 2 larvae, ibid., 3.XI.1993, T. Nozaki.

Distribution. Japan (Honshu, Shikoku, Kyushu).

Remarks. Wiggins *et al*. (1985) briefly described the larval stage of this species and provided some diagnostic characters for distinguishing larvae of this species from that of *E. niigatai* (Kobayashi 1968) (as *E. propinquus* Wiggins *et al*. 1985). Through the course of this study, I recognized that larvae of 2 Japanese species are easily distinguished from each other by following characters: head with very short, thin, transparent no. 5 seta in *E. vernalis*, but with long, stout, pigmented no. 5 seta in *E. niigatai*; abdominal segment VIII with a pair of protuberances dorsolateraly and with a pair of setae dorsally in *E. vernalis*, but without protuberances and with more than 10 dorsal setae in *E. niigatai*.

Iwata (1927) described *Micrasema oharensis* based on larval material. Wiggins *et al*. (1985) transferred this species to the genus *Eobrachycentrus*, but did not compare it at the species level. I examined the type series specimens deposited in the Kyoto University Museum, and confirmed that all Iwata's larvae are identical to the larvae of *E. vernalis* described above. Furthermore, a male reared from a larva collected from the type locality of *E. oharensis* is identified as *E. vernalis*.

A larva described as *Brachycentrus* sp. BB by Akagi (1959) also agrees with the larval stage of *E. vernalis* because the head is depressed mesally and the no. 5 seta on the head are invisible in her illustrations. The male genitalia in pupal skin described as *Brachycentrus* sp. BB by Kim (1974) can be identified as *E. vernalis* from the shape of intermediate appendages of segment X.

***Eobrachycentrus niigatai* (Kobayashi 1968)**
Figs 2, 4, 6

Brachycentrus niigatai Kobayashi 1968, 7, pl. 3, male.
Eobrachycentrus niigatai: Wiggins *et al*. 1985, 66, male.
Eobrachycentrus propinquus Wiggins *et al*. 1985, 64–65, male, larva; Ito *et al*. 1997, 5, male; Morita 2000, 61, male; Nozaki 2005, 109, male. **Syn. nov.**

Adult (Fig. 2). Length of forewing 6–8 mm in male, 7–8.5 mm in female. General morphology and male genitalia mostly agree with those described as *E. propinquus* (Wiggins *et al*. 1985, Fig. 6), but the shape of the intermediate appendages of segment X in lateral aspect and the size and arrangement of spines or setae on the intermediate appendages are variable (Figs 2 b1–2 b5). Illustrations of genitalia of the holotype male are provided. Female genitalia are very similar to those of *E. vernalis*, but segment IX is sclerotized ventrally.

Larva (Fig. 4). Length up to 10 mm. Head reddish brown, round in dorsal view; dorsum slightly depressed mesally, but rather flattened than that of *E. vernalis*; setae 1, 4, 6, 11, 18 transparent; seta 5 about 1/2 of seta 14; length of seta 6 variable, about 1/3 to 4/5 of seta 5; seta 14 longest, seta 17 slightly shorter than seta 14, seta 18 tiny. Ventral apotome, labrum, mandibles and submental sclerites similar to those of *E. vernalis*. Prosternal horn very short. Pronotal sclerites reddish brown in anterior half, paler in posterior half, with many long setae along anterior margin; long stout seta present on anterolateral margin; each sclerite with 2 long stout setae and 2 short transparent setae on transverse ridge dorsally. Mesonotal sclerites yellowish brown, each sclerite subdivided longitudinally; each lateral sclerite with many setae, 1 long stout seta anteriorly; each mesal sclerite with many setae on anterior half and near posterior margin; 1 long stout seta anteromesally and posterolaterally. Metanotal *sa*1 with single short seta; *sa*2 and *sa*3 sclerites long oval, each with long stout seta and many shorter setae. Legs similar to those of *E. vernalis*. Abdominal gills and lateral fringes absent, forked lamellae present on segment III to VII. Abdominal segment VIII with 10–25 hair-like setae posterodorsally, without pair of protuberances; abdominal segment VII usually with 5–12 hair-like setae dorsally. Dorsal sclerite of segment IX semicircular, with about 100 long setae posteriorly. Lateral sclerite of anal prolegs with 4 long stout setae posteromesally; anal claw with 1 accessory hook.

Pupa (Fig. 6). Length about 8 mm. Antennae same length as body. Head similar to that of *E. vernalis*, but 5 pairs of setae present on frons, mesal 3 pairs short and transparent. Labrum similar to that of *E. vernalis*, but apices of 4 stout setae brush-shaped. Tarsi of midlegs without hair. Abdominal segments similar to those of *E. vernalis*, but lateral fringe of segment VI restricted only to posterior end.

Case (Fig. 6). Case of final instar larva up to 12 mm, 4-sided, straight, tapered, constructed of plant materials, mostly moss; often moss pieces projecting outside; posterior opening large, marginal silken points protruding mesally. In pupal case, anterior opening closed by silken membrane with central hole; posterior opening closed by silken membrane with many perforations.

Specimens examined. Holotype male of *Brachycentrus niigatai* Kobayashi 1968, M1768, Kurokawa-mura, Kitakanbara-gun, Niigata, 7.V.1961 (CBM). **Hokkaido**: 5 males, 9 females, brooklet near Noborikawa tunnel, Yubari-shi, 19.V–15.VI.2007 (Malaise trap), N. Kuhara (NK); 23 males, 65 females, brooklet beside Kuobetsu-gawa, Yuni-cho, 30.IV–6.VI.2007 (Malaise trap), N. Kuhara (NK); 7 males, 5 females, ibid., 12–19.V.2007 (Malaise trap), N. Kuhara; 1 male, brooklet beside Niikappu Dam, Niikappu-cho, 23.V.2007, N. Kuhara (NK); 3 larvae, Onko-zawa, 270 m a.s.l., Furano-shi, 9.X.2008, T. Ito; 1 male, 4 females, Kannon-zawa, Misumai, Sapporo-shi, 24–

30.V.1992 (Malaise trap), N. Kuhara (NK); 1 male, small spring, Sakuraba, Rumoi-shi, 22.V.1982, T. Ito ; 1 male, 3 females, Okusawa-suigenchi, Otaru-shi, 14.VI.1996 (Malaise trap), M. Ohara & Y. Sasaki (NK); 2 males, 1 female, ibid., 21.VI.1996, M. Ohara & Y. Sasaki (NK); 4 larvae, Nakano-sawa, Amano-gawa, Kaminokuni-cho, 13.X.1987, T. Nozaki; 2 larvae, headwater of Amano-gawa, Kaminokuni-cho, 13.X.1987, T. Nozaki. **Ibaraki**: 1 female, Ogawa, Kitaibaraki-shi, 21.IV–6.V.2003 (Malaise trap), T. Inoue; 1 male, 2 females, ibid., 6–20.V.2003 (Malaise trap), T. Inoue. **Saitama**: 2 males, small stream near Wasabi-zawa, Tochimoto, Otaki, Chichibu-shi, 1.V.1999, T. Ito. **Tokyo**: 3 larvae, Birikubo, 460 m a.s.l., Youzawa, Akiruno-shi, 4.X.1989, T. Nozaki; 3 males, 6 females, seepage of Minami-aki-kawa, 350 m a.s.l., Dehata, Hinohara-mura, larvae collected on 24.X.1989, adults emerged on 2–29.III.1990, T. Nozaki; 1 male, Nakazato, 290 m a.s.l., Hinohara-mura, 18.IV.1991, T. Nozaki. **Kanagawa**: 2 females, seepage of Morito-gawa, 70 m a.s.l., Sakurayama, Zushi-shi, larvae collected on 24.X.1988, adults emerged on 17–28.III.1989, T. Nozaki; 5 larvae, ibid. 15.VII.1997, T. Nozaki; 2 males, Shiraishi-zawa, Nakagawa, Yamakita-machi, 24.IV.1997, T. Nozaki. **Yamanashi**: 10 larvae, spring stream, Hachiemon-deguchi, Oizumi-cho, Hokuto-shi, 10.X.1998, T. Nozaki; 1 larva, spring stream from Daiyusen, 1,060 m a.s.l., Oizumi-cho, Hokuto-shi, 10.X.1998, T. Nozaki. **Gifu**: 14 males, 1 female, madicolous habitat, Hin-dani, 400 m a.s.l., Ibigawa, Ibigawa-cho, 4.V.1996, T. Hattori. **Shizuoka**: 1 male, Takeno-sawa, ca. 400 m a.s.l., Kamiochiai, Aoi-ku, Shizuoka-shi, 29.IV.1996, T. Hattori; 1 male, 1 female, Hirano, 350 m a.s.l., Aoi-ku, Shizuoka-shi, 14.IV.1996, T. Hattori; 4 males, ibid., 17.IV.2003, T. Hattori; 1 male, madicolous habitat, Hirayama, Aoi-ku, Shizuoka-shi, 1 male, 3.V.1980, T. Hattori. **Aichi**: 1 larva, Danto-gawa, 300 m a.s.l., Asahi-cho, 3.XI.2002, T. Nozaki. **Mie**: 1 male, 1 female, Gozaisho-yama, Komono-cho, 3.V.2008, H. Morita; 4 males, Myojindaira, Iitaka-cho, 8.V.1999, H. Morita. **Shiga**: 20 males, 1 female, Ojigahata, Taga-cho, 27.IV.2008, H. Morita; 2 males, ibid., 3.V.2008, H. Morita. **Hyogo**: 3 males, small stream near pass in forest, Hyono-sen, Sekimiya, Yabu-shi, 15.V.1993, N. Kuhara (NK). **Okayama**: 2 larvae, Shiraga-gawa, Tominishi-dani, Kagamino-cho, 23.IX.2003, T. Nozaki. **Tokushima**: 11 larvae, 1 prepupa, Konose-kyo, Naka-cho, 27.XI.2008, M. Takai & T. Ito. **Ehime**: 8 males, 1 female, small stream, Nanogawa-goe, Saijo-shi, 25.V.1999, A. Ohkawa & T. Ito; 16 males, madicolous habitat near Yosakoi-toge, Saijo-shi, 20.V.2008, M. Takai & T. Ito; 1 male, 3 females, Koya-yama, Oda, Uchiko-cho, 18.V.2000 (Malaise trap), E. Yamamoto & M. Doi; 1 pupa, small stream, 800 m a.s.l., Namakusa-dani, Odami-yama, Uchiko-cho, 20.IV.2000; 1 male, ibid., 13–18.V.2004 (Malaise trap), E. Yamamoto. **Kochi**: 1 male, small waterfall, Befu-kyo, Kami-shi, 25.IV.2004, T. Hattori. **Fukuoka**: 1 male, small stream in Hikosan Biological Lab. of Kyushu Univ., Soeda-machi, 26–28.IV.1993, T. Ito (NK); 1 larva, ibid., 11.IX.1996, T. Nozaki; 3 larvae, seepage on great rock wall near Kita-dake, Hiko-san, 980 m a.s.l., Soeda-machi, 4.X.1997, T. Nozaki. **Miyazaki**: 1 female, Osuzu-yama, 750 m a.s.l., Tsuno-cho, 22.IV.2004, T. Hattori.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu)

Remarks. Wiggins *et al*. (1985) provided new figures of the holotype male of *E. niigatai* illustrated by Mr. Kobayashi. They pointed out that *E. niigatai* resembles *E. propinquus* in the shape of the male inferior appendages and the size of the preanal appendages, but is more similar to *E. vernalis* in the structure of the intermediate appendages of segment X. After comparative study of the holotype of *E. niigatai* with specimens collected widely from Japanese islands, I recognized that *E. niigatai* is the same species as *E. propinquus*, although the shape of the intermediate appendages of segment X in lateral aspect and the size and arrangement of their spines or setae are variable (Fig. 2 b; Ito *et al*. 1997, Fig. 5).

Biological note

Collections for this study suggest that both species have a univoltine life cycle with a spring flight period. Larvae of *E. vernalis* were found mainly on moss-covered boulders in mountain streams or mossy rock surface of waterfalls, and their habitats are usually splashed with water. On the other side, typical larval habitats of *E. niigatai* are mossy seeps on vertical rock surfaces, often isolated from mountain streams. Larvae of the latter were sometimes collected from small waterfalls or spring brooks, but water flows there rather more gently than habitats of *E. vernalis*. The pupal midlegs of *E. niigatai* do not form "swimming legs," and this feature is probably connected with their microhabitats.

In laboratory rearing, larvae of *E. vernalis* fed on several kinds of mosses, such as *Platyhypnidium riparioides* (Hedw.) Dis. (Platytrip), *Brachythecium rivulare* W.P. Schimper, and *Plagiomnium vesicata* (Besch.) T.J. Kop., which grow in the larval habitats. Larvae of *E. niigatai* fed on at least *P. vesicata* in the laboratory. Pre-final instar larvae of both species, collected in autumn and provided only Java Moss, *Taxiphyllum barbieri* (Karta. & Coppey) Iwatsuki, for food in the laboratory, developed to adult stage in early spring.

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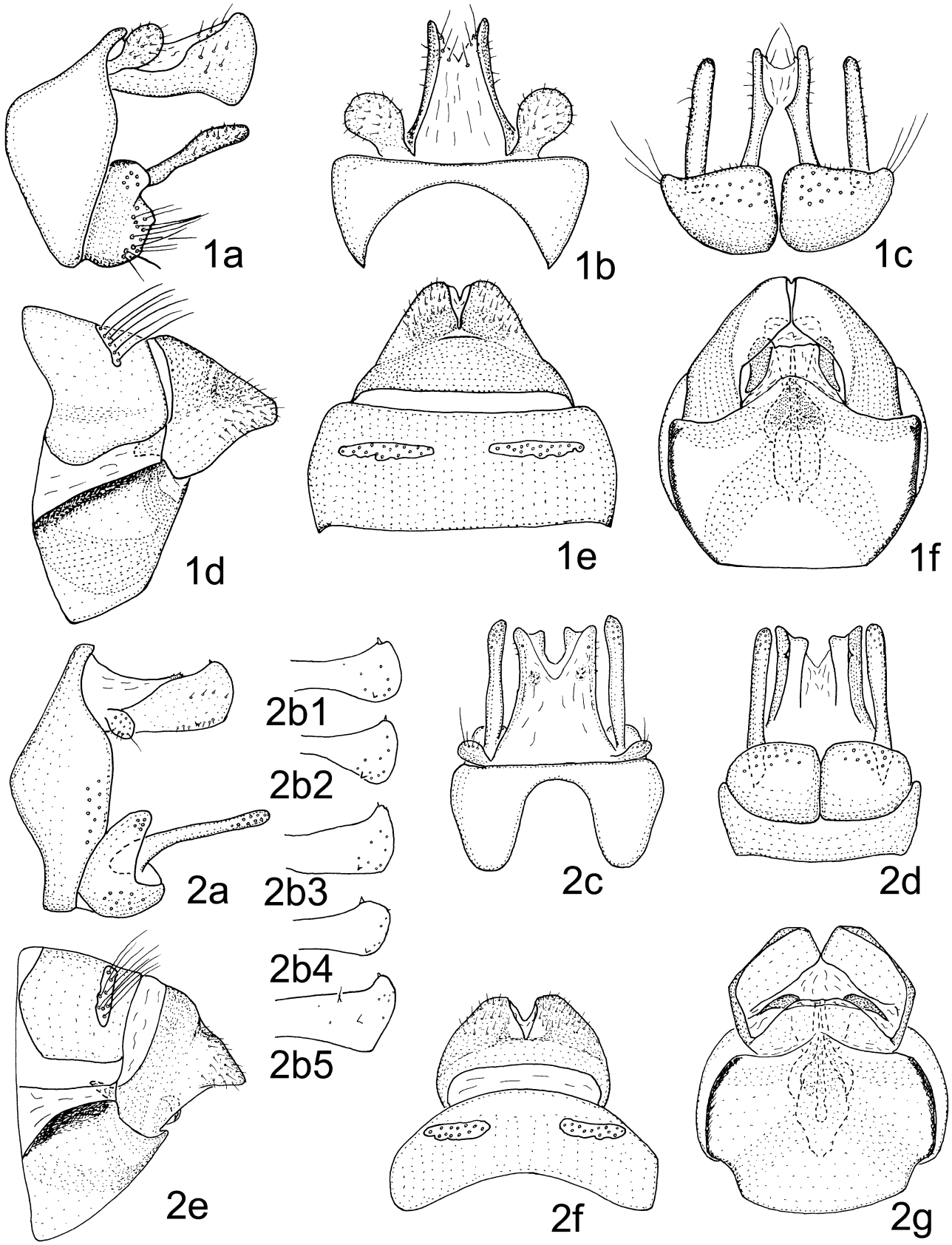
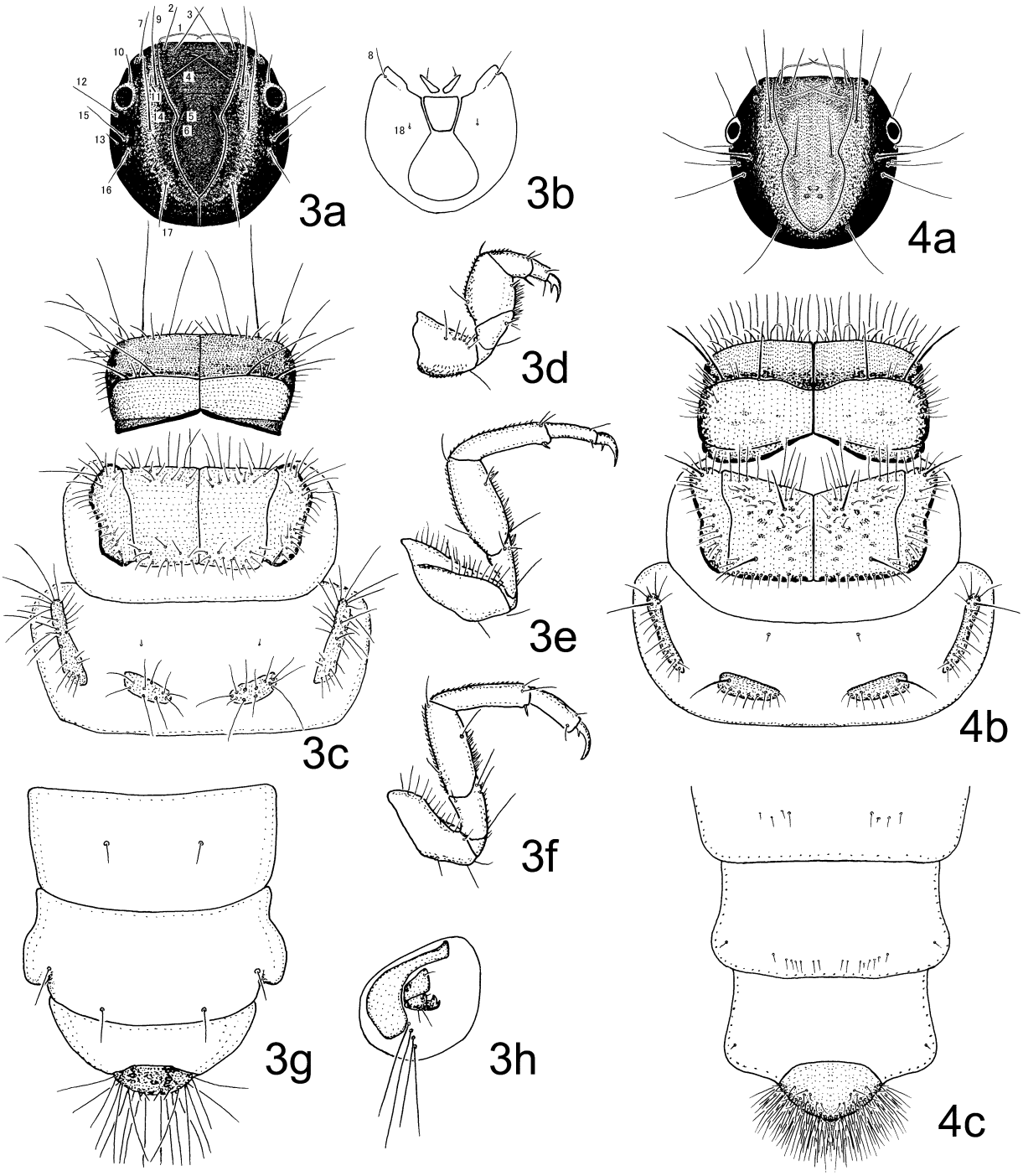
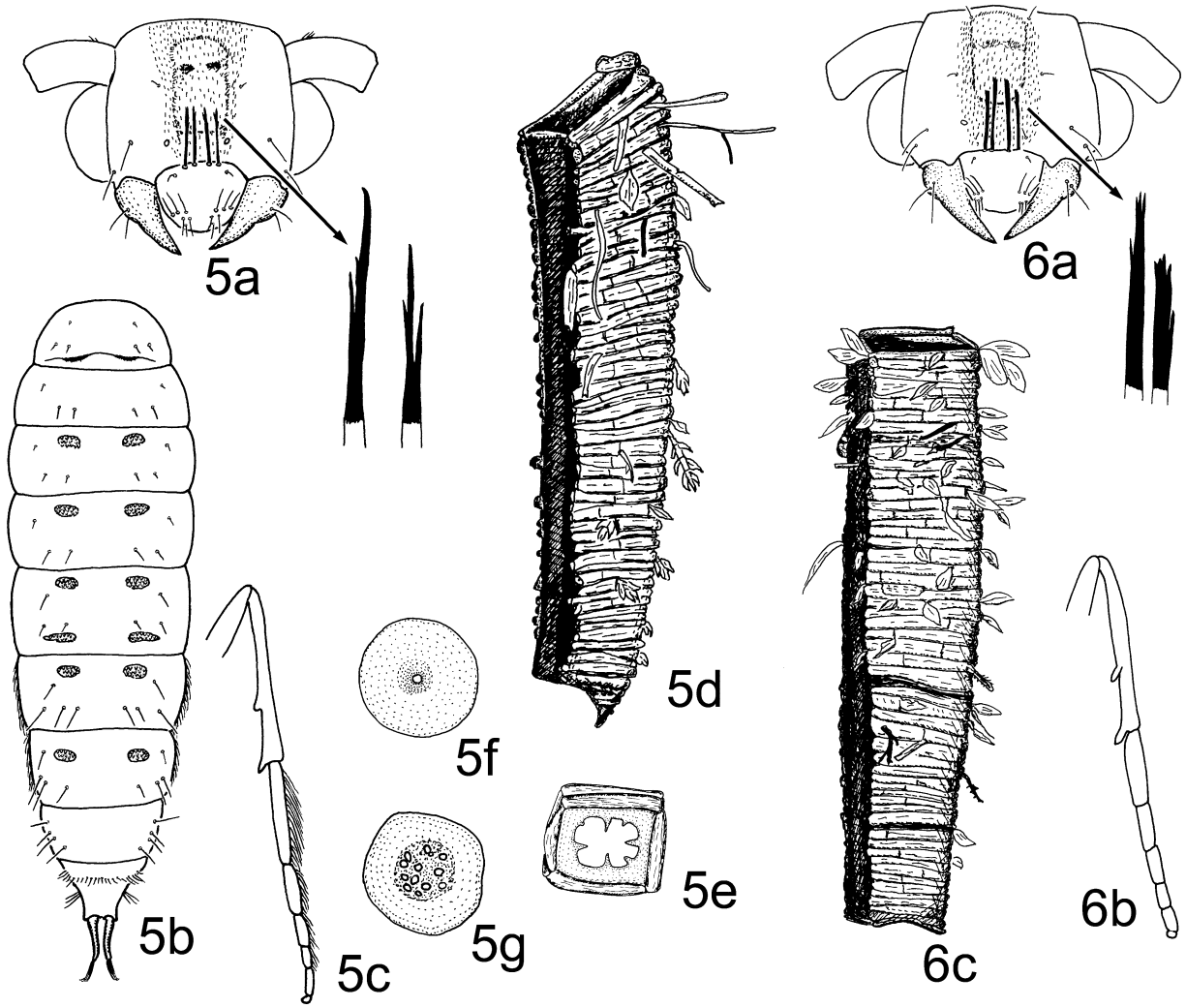


FIGURES 1–2. 1—*Eobrachycentrus vernalis*, Hiko-san, Kyushu. Male genitalia: a—left lateral; b—dorsal; c—ventral. Female genitalia: d—left lateral; e—dorsal; f—ventral. 2—*Eobrachycentrus niigatai*. Male genitalia, holotype (except for b): a—left lateral; b—left intermediate appendage of segment X, left lateral (b1—Rumoi, Hokkaido; b2—Tokyo, Honshu; b3—Shizuoka, Honshu; b4—Mie, Honshu; b5—Ehime, Shikoku); c—dorsal; d—ventral. Female genitalia: e—left lateral; f—dorsal; g—ventral.



FIGURES 3–4. 3—*Eobrachycentrus vernalis*. Larva: a—head, dorsal, primary setae numbered; b—head, ventral, primary setae numbered; c—thorax, dorsal; d—right foreleg, right lateral; e—right midleg, right lateral; f—right hindleg, right lateral; g—abdominal segments VII–IX, dorsal; h—right anal proleg, right lateral. 4—*Eobrachycentrus niigatai*. Larva: a—head, dorsal; b—thorax, dorsal; c—abdominal segments VII–IX.



FIGURES 5–6. 5—*Eobrachycentrus vernalis*. Pupa: a—head, frontal, brush-shaped setae on labrum enlarged; b—abdomen, dorsal; c—right midleg, right lateral. Case: d—left ventrolateral; e—caudal; f—anterior closure of pupal case; f—posterior closure of pupal case. 6—*Eobrachycentrus niigatai*. Pupa: a—head, frontal, brush-shaped setae on labrum enlarged; b—right midleg, right lateral. Case: c—left ventrolateral.