

A new synonymy in Japanese *Heterlimnius* HINTON, 1935 (Coleoptera: Elmidae)

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Abstract

Heterlimnius rugulosus (NOMURA, 1958) (Coleoptera: Elmidae) is synonymized with *H. nitidus* (NOMURA, 1958). This species is redescribed, and a morphological diagnosis of the larva is provided. Numerous locality data and a distribution map, based on material examined by the author, are provided.

Key words: Coleoptera, Elmidae, *Heterlimnius rugulosus*, *Heterlimnius nitidus*, adults, larvae, taxonomy, distribution, faunistics.

Introduction

KAMITE (2009, 2011, 2012, 2013, 2015, 2016) provided a global revision of the Holarctic elmids genera *Heterlimnius* HINTON, 1935 and *Optioservus* SANDERSON, 1953. Eventually, KOBAYASHI et al. (2021) synonymized *Optioservus* with *Heterlimnius*; in addition, the Japanese endemic *H. nitidus* (NOMURA, 1958) and *H. rugulosus* (NOMURA, 1958) were placed in the *H. quadrimaculatus* species group.

The genus *Heterlimnius* currently comprises 42 species (25 Palearctic, 17 Nearctic), which are divided into seven species groups. In the present paper, one of these species, *H. rugulosus*, is synonymized with *H. nitidus*.

Material and methods

This study is based on the examination of 1,667 adults and 79 larvae. The material examined is deposited in the following collections:

CHM	collection of Naoyuki Hikida, Mito, Japan
CKN	collection of Yuuki Kamite, Nagoya, Japan
CMS	collection of Hirofumi Moriya, Sagamihara, Japan
EMEC	Essig Museum of Entomology, Berkeley, California, USA
EUMJ	Ehime University Museum, Matsuyama, Japan
NMW	Naturhistorisches Museum Wien, Vienna, Austria
NSMT	National Museum of Nature and Science, Tsukuba, Japan

The methods, as well as the abbreviations used in the redescription are the same as in KAMITE (2013), but scanning electron micrographs (SEM) were taken with a HITACHI TM3030Plus, and the specimens were sputter coated with gold.

Heterlimnius nitidus (NOMURA, 1958)

Optioservus (s.str.) *nitidus* NOMURA 1958: 53 (type locality: Shiromizu-gawa, Yamagata Pref., Honshû, Japan; type material: NSMT); SATÔ 1977: 4; SATÔ 1985: 438, pl. 80, fig. 18; SATÔ 1992: 180, fig. 38; MORIYA 1997: 3, photo 6; YOSHITOMI et al. 1999: 103–104, photo 3; AKIYAMA 2005: 209, pl. 2, fig. 6; HAYASHI & SHIMADA 2006: 133, fig. 6; ARAI 2007: 10; HAYASHI 2007: 94; HAYASHI & KADOWAKI 2007: 164, fig. 2; NARUKAWA 2007: 75; YOSHIOKA 2007: 246, fig. 18; AKIYAMA 2008: 115; HAYASHI 2008: 75; HAYASHI & KADOWAKI 2008a: 283; HAYASHI & KADOWAKI 2008b: 301; SHIYAKE & Beetle team of Yamatogawa River research

group 2008: 50 ff., fig. 3; YAMAJI 2008: 8; YOSHIOKA 2008: 230; FUJIWARA 2009: 53; FUJIWARA & NUMATA 2009: 266, 268; HAYASHI 2009: 241; HAYASHI & KADOWAKI 2010: 178; HAYASHI & SOTA 2010: 418 ff, fig. 12; HAYASHI 2011a: 105; HAYASHI 2011b: 82; HAYASHI & KADOWAKI 2011: 124; HAYASHI et al. 2011: 36; HAYASHI & KADOWAKI 2012: 47; HAYASHI et al. 2012: 75; TOMINAGA et al. 2012: 25; HAYASHI & KADOWAKI 2013: 70, pl. VIII; HAYASHI et al. 2013: 22; SAKAMOTO 2014: 346; CHACHIN 2015: 242, fig. 3; HAYASHI et al. 2015: 192; MIYAKE & TSUTSUMIUCHI 2015: 14, fig. 3; HAYASHI 2016: 74; HAYASHI & KADOWAKI 2016: 42; INAHATA 2016: 8; JÄCH & KODADA 2016: 597; JÄCH et al. 2016: 152; HAYASHI & KADOWAKI 2017: 162, 163; OHMOMO 2017: 32; HAYASHI & KADOWAKI 2018: 13; KAMITE et al. 2018: 10; WATANABE 2018: 35; HAYASHI & KADOWAKI 2019: 32; MIYAKE 2019: 25; HAYASHI 2020: 46, fig. 59; NAKAJIMA et al. 2020: 196; NAKANISHI et al. 2020: 52.

Heterlimnius nitidus: KOBAYASHI et al. 2021: 884.

Optioservus (s.str.) *rugulosus* NOMURA 1958: 53 (type locality: Furuyu, Saga Pref., Kyūshū, Japan; type material: NSMT); NOMURA & BABA 1961: 31, fig. 17; SATŌ 1977: 4; OGATA & NAKAJIMA 2006: 233, fig. 2; MIYAKE & TSUTSUMIUCHI 2015: 14, fig. 3; JÄCH & KODADA 2016: 597; JÄCH et al. 2016: 152; KAMITE et al. 2018: 10; MIYAKE 2019: 25; **syn.n.**

Heterlimnius rugulosus: KOBAYASHI et al. 2021: 886.

TYPE MATERIAL: *Optioservus nitidus*: **Holotype** ♀, examined (NSMT): “Shiromizu-gawa, 16.5:1942, (K. S.)”. No paratypes have been designated in the original description.

Optioservus rugulosus: **Holotype** ♂, examined (NSMT): “Furuyu [erroneously spelled as ‘Furuya’ in original description], Kyushu, 22.VIII.1953, T Shirozu”. According to the original description, there are 13 paratypes from various localities in the Saga, Fukuoka, and Nagano prefectures, deposited in the collection of S. Nomura; these paratypes have not been studied by the author of the present paper.

ADDITIONAL MATERIAL EXAMINED:

Adults. JAPAN: [HONSHŪ] AOMORI Pref.: 2 exs. (CKN): “HOSOGATAI, FUKAYAMACHI, AJIGASAWA-MACHI, 22.IX.1997, N. HIKIDA leg.”; 1 ex. (EUMJ): “Utarube-gawa, Towadako-machi, 1.VIII.1998, H. Yoshitomi leg.”. **IWATE Pref.:** 1 ex. (EUMJ): “Kawame, Morioka-shi, 13.VIII.1986, S. Nakamura leg.”. **AKITA Pref.:** 3 exs. (CKN): “R-Mizusawagawa, Menagawa, Minehama-mura, Yamamoto-gun, 21.IX.1997, N. Hikida leg.”; 36 exs. (EUMJ): “Fukai, Ononogawa-machi, 7.VI.1978, Col. K. Baba & N. Kato”. **YAMAGATA Pref.:** 2 exs. (CKN): “Shiromizugawa-dam-jiyōryū, Higashine-shi, 15.IX.2007, Y. Kamite leg.”; 8 exs. (CKN): “Kumano-gawa, Sugisawa, Yuza-machi, 14.VIII.2008, T. Ikeda leg.”; 2 exs. (CMS): “Kurasawa, Asahi-mura, 23.IX.2004, H. Moriya leg.”; 3 exs. (CMS): “Shimohouzawa, Yamagata-shi, 26.IX.2004, H. Moriya leg.”. **MIYAGI Pref.:** 1 ex. (EUMJ): “Yakurai-onsen, 21.VIII.1978, M. Satō leg.”; 12 exs. (CMS): “Mogazawa, Shichikasyuku-machi, 1998.6.29, H. Moriya leg.”; 1 ex. (CMS): “Misumi, Shiroishi-shi, 1998.6.30, H. Moriya leg.”. **FUKUSHIMA Pref.:** 18 exs. (CKN, EUMJ): “KAMISINDEN, YUYAGISAWA, YANAIZU-MACHI, KAWANUMA-GUN, 1997.8.31, N. HIKIDA leg.”. **TOCHIGI Pref.:** 1 ex. (EUMJ): “Nishinasuno, 18.VII.1985, K. Takahashi leg.”; 2 exs. (CKN): Urami-daki, Nikkō-shi, 28.IX.2009, Y. Kamite leg.”; 5 exs. (EUMJ): “Kamikuroo-gawa, Nasu-machi, 25.VII.1994, H. Yoshitomi leg.”; 2 exs. (EUMJ): “Itabashi, Funiyū, Shioyama-machi, 11.XI.1993, K. Satoh leg.”. **GUNMA Pref.:** 6 exs. (CKN): “Ōsawa-gawa, Matsunosawa, Misato-machi, Takasaki-shi, 2.I.2008, M. Hayashi leg.”; 4 exs. (CKN): ditto but: “6.IX.2008, M. Hayashi leg.”; 3 exs. (CKN): “Kuruma-gawa-genryū, Haruna-san, Misato-machi, Takasaki-shi, 8.IX.2008, M. Hayashi leg.”; 86 exs. (CKN): “Harunashira-kawa, Misatomachinishiakiya, Takasaki-shi, 3.I.2008, M. Hayashi leg.”; 19 exs. (CMS): “Niiharumura, 1997.7.8, H. Moriya leg.”. **NIIGATA Pref.:** 1 ex. (EUMJ): “Momogawa-tōge, 9.VIII.1961, M. Satō leg.”; 5 exs. (CMS): “Kamiterauchi, 3.Jun.1997, H. Moriya leg.”; 13 exs. (CMS): “Omata, Sanpoku-machi, 21.IX.2004, H. Moriya leg.”; 1 ex. (CMS): “Tossakayama, Nakajyō-shi, 1999.11.22, H. Moriya leg.”; 9 exs. (EUMJ): “Budo-toge, N-Echigo, 27.VI.1964, Col. K. Baba”; 1 ex. (EUMJ): “Kashiwao, 8.VIII.1961, K. Baba leg.”. **TOKYO:** 1 ex. (CKN): “Kitaasa-kawa, Kamiogata-chō, Hachioji-shi, 2.IX.2007, Y. Kamite leg.”; 8 exs. (CKN): “Nippara-keikoku, Okutama-machi, 2.IX.2007, Y. Kamite leg.”; 11 exs. (CKN): “Hirai-gawa, Hinode-machi, 1.IX.2007, Y. Kamite leg.”; 1 ex. (CMS): “Youzawa, Itsukaichi-machi, 1994.12.21, H. Moriya leg.”. **KANAGAWA Pref.:** 8 exs. (CKN): “Taraigoya-sawa Cr., Hudakake, Kiyokawa-mura, (N 35°27.60', E 139°12.62'), 8.VII.2006, Yusuke MINOSHIMA leg.”; 20 exs. (CKN): “Sukumo-gawa, Hakone-machi, 27.V.2006, M. Kishi leg.”; 4 exs. (CMS): “Yagurazawa, Minamiashigara, Yagura-zawa, 19.Mar.1994, H. Moriya leg.”; 20 exs. (CMS): “Karasawa, Minamiashigara, Kari-kawa, 23.Oct.1989, T. Nozaki leg.”; 4 exs. (CMS): “Sengokuhara, Hakone-machi, (small stream), 1995.8.5, H. Moriya leg.”; 6 exs. (CMS): “Tsunago, Fujinoma-machi, 7.I.1996, H. Moriya leg.”; 3 exs. (CMS): “Hacchō, Yamakita-machi, 26.V.2003, H. Moriya leg.”; 50 exs. (CMS): “Toya, Tsukui-chō, 3.VI.1996, H. Moriya leg.”; 9 exs. (EUMJ): “Nishitanzawa, 20.VIII.1984, Y. Notsu leg.”; 11 exs. (CKN): “Makuyama-kōen, Yugawara-machi, 9.X.2011, Y. Kamite leg.”. **YAMANASHI Pref.:** 2 exs. (CKN): “Hara, Sudama-chō, 15.XII.2003, T. Ogata leg.”; 2 exs. (CKN): “Ōsawa-gawa, Shishidome, Tsuru-gun, 14.X.2004, M. Kishi leg.”; 1 ex. (CKN): “Shiokawa, Hishi, Hokuto-shi, 3.VIII.2006, ca 800 m alt., (N 35°51.08', E 138°29.84'), Yusuke MINOSHIMA leg.”; 1 ex. (CKN): “Midori-ko Pond, Shiroizawa, Nagasaka-chō, Hokuto-

shi, 4.VIII.2006, 860 m alt., (N 35°51.46', E 138°21.84'), Yusuke MINOSHIMA leg.". **SHIZUOKA Pref.:** 4 exs. (CKN): "Inokashira-yusui, Inokashira, Fujinomiya-shi, 26.VI.2005, Y. Kamite leg."; 2 exs. (EUMJ): "Shuzenji, 26.VII.1984, K. Satake"; 1 ex. (CKN): "Misakubo-gawa, Misakubo, Hamamatsu-shi, 29.VIII.2006, Y. Kamite leg."; 8 exs. (CKN): "Shirakura-gawa, Misakubo, Hamamatsu-shi, 29.VIII.2006, Y. Kamite leg."; 5 exs. (CMS): "Kawanechōsasamakami, Shimada-shi, 28.III.2010, H. Moriya leg."; 1 ex. (CMS): "Ashikubookugumi, Aoi-ku, Shizuoka-shi, 29.IV.2008, H. Moriya leg.". **NAGANO Pref.:** 3 exs. (CKN): "Tobira, Matsumoto-shi, 4.V.2010, Y. Kamite leg."; 3 exs. (CKN): "Ichinosawa-gawa, Minowa-machi, 3.V.2010, Y. Kamite leg."; 24 exs. (CKN): "Fujimi-machi, Suwa-gun, 14.VIII.2006, J. Kantoh leg."; 5 exs. (CKN, CHM): "URIKI-TOHGE, NEBA-MURA, SHIMOINA-GUN, 1998.8.1, N. HIKIDA leg."; 5 exs. (CKN, CHM): "R-ASAMAGAWA, ASAMA, NEBA-MURA, SHIMOINA-YOSI, 1998.8.1, N. HIKIDA leg."; 4 exs. (EUMJ): "Nebagawa, 24-IX[IX?]-1958, M. Satō leg."; 2 exs. (CKN): "Karasawa-no-taki, Kiso-machi, 29.VII.2007, Y. Kamite leg."; 2 exs. (CKN): "Ôdaira, Iida-shi, 15.V.2010, Y. Kamite leg."; 4 exs. (CKN): "Kashimata, Takagi-mura, 3.X.2010, Y. Kamite leg."; 4 exs. (CMS): "Kanisawa, Ina-shi, 7.May.1997, H. Moriya leg."; 1 ex. (CMS): "Kayano, Minowa-machi, 1997.5.6, H. Moriya leg."; 2 exs. (CMS): "Yochi, Ina-shi, 1995.10.6, Col. Hirofumi Moriya"; 4 exs. (EUMJ): "Kaida-kôgen, 16.VIII.1966, M. Satō leg."; 6 exs. (EUMJ): "Todai, S. Alps, 12-14.VIII.1978, M. Satō leg."; 6 exs. (EUMJ): "Ichinose, Neba, 25.VIII.1958, Z. Naruse leg."; 4 exs. (EUMJ): "Kotochi, Neba, 24.VIII.1958, Z. Naruse leg."; 1 ex. (EUMJ): "Kamimura, 25.VIII.1958, M. Satō leg."; 1 ex. (CKN): "Tokiwa, Ômachi-shi, 5.V.2011, Y. Kamite leg.". **AICHI Pref.:** 1 ex. (CKN): "Inahashi, Shitara-chō, 24.V.2003, Y. Kamite leg."; 1 ex. (CKN): ditto but: "29.V.2005, Y. Kamite leg."; 10 exs. (CKN): ditto but: "6.VIII.2006, Y. Kamite leg."; 5 exs. (CKN): ditto but: "5.VIII.2008, Y. Kamite leg."; 16 exs. (CKN): "Tôgaitsu-gawa, Toyokuni, Shitara-chō, 11.VIII.2007, Y. Kamite leg."; 1 ex. (CKN): "Chikaraishi-gawa, Nakagane-chō, Toyota-shi, 7.VII.2007, Y. Kamite leg."; 16 exs. (CKN): "Noiri-gawa, Noiri, Toyota-shi, 5.VII.2008, Y. Kamite & T. Ikeda leg."; 12 exs. (CKN, CHM): "R-NOIRI, NOIRI, INABU-MACHI, KITASHITARA-GUN, 1998.8.1, N. HIKIDA leg."; 5 exs. (CKN): "Yahagi-gawa, Kamigō, Toyota-shi, 5.VII.2008, Y. Kamite leg."; 4 exs. (CMS): "Nakatō, Inabu-chō, 1997.10.10, H. Moriya leg."; 9 exs. (EUMJ): "Higashi-oomi, Asuke-chō, 12.IX.1994, H. Yoshitomi leg."; 3 exs. (EUMJ): "Akazuya-gawa, Seto-shi, 6.II.1994, H. Yoshitomi leg."; 11 exs. (EUMJ): ditto but: "14.II.1994, H. Yoshitomi leg."; 1 ex. (EUMJ): "2.VI.1998, Tsubosaki Riv., Tsubosaki, Asahi-cho, A. Shiragane leg."; 1 ex. (EUMJ): "Hongu-san, 19.IX.1978, M. Satō leg."; 6 exs. (EUMJ): "Mt. Chausu-yama, Toyone, 9.VII.1974, Y. Hori leg."; 1 ex. (EUMJ): "Otogawa, 24.VII.1978, M. Satō leg."; 2 exs. (EUMJ): "Inabu, 20.VII.1968, M. Satō leg."; 3 exs. (EUMJ): "Tomoe-gawa, Asuke, 20.VII.1978, M. Satō leg."; 3 exs. (EUMJ): "Asuke-chō, 14.IV.1963, Z. Naruse leg."; 2 exs. (EUMJ): "Kurijima-gawa, Kurijima, Shitara-chō, 18.IV.1993, M. Hasegawa leg.". **GIFU Pref.:** 21 exs. (CKN): "Hirano, Motosu-shi, 23.X.2004, Y. Kamite leg."; 8 exs. (CKN): "Okuya, Motosu-shi, 26.II.2005, Y. Kamite leg."; 6 exs. (CKN): ditto but: "21.III.2005, Y. Kamite leg."; 19 exs. (CKN): "Neomidori, Motosu-shi, 21.XI.2004, Y. Kamite leg."; 19 exs. (CKN): ditto but: "12.VI.2021, Y. & N. Kamite leg."; 4 exs. (CKN): "Kire, Motosu-shi, 21.III.2005, Y. Kamite leg."; 2 exs. (CKN): "Enami, Motosu-shi, 23.X.2004, Y. Kamite leg."; 10 exs. (CKN): "Nukumi-dani, Motosu-shi, 19.VI.2005, Y. Kamite leg."; 20 exs. (CKN): "Nôgō-dani, Neônôgō, Motosu-shi, 3.VI.2005, Y. Kamite leg."; 18 exs. (CKN): "Yatani, Motosu-shi, 17.VI.2007, Y. Kamite leg."; 17 exs. (CKN): "Midoriyokokura-rindō, Motosu-shi, 19.X.2008, Y. Kamite leg."; 15 exs. (CKN): "Hirose, Ibigawa-chō, 12.VI.2005, Y. Kamite leg."; 29 exs. (CKN): "Tsukio-dani, Ibigawa-chō, 18.VIII.2007, Y. Kamite leg."; 15 exs. (CKN): ditto but: "19.IV.2009, Y. Kamite leg."; 9 exs. (CKN): "Kôchi-dani, Ibigawa-chō, 18.VIII.2007, Y. Kamite leg."; 7 exs. (CKN): "Ôtani-gawa, Sakauchihirose, Ibigawa-chō, 22.VIII.2009, Y. Kamite leg."; 14 exs. (CKN): "Sakauchikawakami, Ibigawa-chō, 8.VIII.2009, Y. Kamite leg."; 3 exs. (CKN): "Ôtani-gawa-shiryû, Ibigawa-chō, 18.VIII.2007, Y. Kamite leg."; 6 exs. (CKN): "Ôtani, Nakatsugawa-shi, 4.V.2006, Y. Kamite leg."; 2 exs. (CKN): "Kaore, Nakatsugawa-shi, 27.VII.2008, Y. Kamite leg."; 8 exs. (CKN): "Otome-keikoku, Nakatsugawa-shi, 22.IX.2009, Y. Kamite leg."; 8 exs. (CKN): "Hachiman-chō, Nakatsugawa-shi, 6.IX.2009, Y. Kamite leg."; 1 ex. (CKN): "Kômi, Seki-shi, 15.VIII.2004, Y. Kamite leg."; 8 exs. (CKN): "Syôro, Seki-shi, 15.VIII.2004, Y. Kamite leg."; 26 exs. (CKN, EMEC, NMW): "Taraga-dani, Seki-shi, 30.VIII.2009, Y. Kamite leg."; 25 exs. (CKN): "Shimonoho, Seki-shi, 16.X.2021, Y. & N. Kamite leg."; 1 ex. (CKN): "Yamanomura, Kamioka-chō, Hida-shi, 30.IV.2005, Y. Kamite leg."; 3 exs. (CKN): "Sasagahora, Furukawa-chō, Hida-shi, 2.X.2021, Y. Kamite leg."; 1 ex. (CKN): "Sandani, Shōkawa-chō, Takayama-shi, 31.VII.2005, Y. Kamite leg."; 11 exs. (CKN): ditto but: "28.VIII.2005, Y. Kamite leg."; 5 exs. (CKN): ditto but: "19.IX.2009, Y. Kamite leg."; 1 ex. (CKN): "Nishiure-tôge, Kiyomi-chō, Takayama-shi, 15.XI.2008, Y. Kamite leg."; 6 exs. (CKN): "Isshiki, Syōkawa-chō, Takayama-shi, 28.VIII.2005, Y. Kamite leg."; 4 exs. (CKN): "Utsue, Kokufu, Takayama-shi, 13.VIII.2006, Y. Kamite leg."; 3 exs. (CKN): "Oppara, Kiyomi-chō, Takayama-shi, 30.IV.2007, Y. Kamite leg."; 13 exs. (CKN): "Meihō-kôgen, Meihō, Gujyō-shi, 30.IV.2007, Y. Kamite leg."; 3 exs. (CKN): "Washimi, Gujyō-shi, 14.XI.2004, Y. Kamite leg."; 5 exs. (CKN): "Arisaka, Gujyō-shi, 14.XI.2004, Y. Kamite leg."; 5 exs. (CKN): "Komami, Gujyō-shi, 14.XI.2004, Y. Kamite leg."; 12 exs. (CKN): "Onami, Gujyō-shi, 21.III.2005, Y. Kamite leg."; 3 exs. (CKN): "Kamizaisho, Gujyō-shi, 3.IX.2009, Y. Kamite leg."; 8 exs. (CKN): "Katakari, Yamagata-shi, 28.XI.2004, Y. Kamite leg."; 4 exs. (CKN):

“Terabora, Hichisô-chô, 7.XI.2004, Y. Kamite leg.”; 2 exs. (CKN): ditto but: “26.II.2005, Y. Kamite leg.”; 2 exs. (CKN): “Kabuchi, Hichisô-chô, 7.XI.2004, Y. Kamite leg.”; 1 ex. (CKN): “Nakao, Okuhidaonsengô, Takayama-shi, 30.IV.2005, Y. Kamite leg.”; 9 exs. (CKN): “Umetani, Tarui-chô, 19.IV.2008, Y. Kamite leg.”; 1 ex. (CKN): “Kamiishiduchômakida, Ôgaki-shi, 27.VI.2009, Y. Kamite leg.”; 4 exs. (CKN): “Shiratoriaburasaka, Gujyô-shi, 9-IX-2006, 700 m, Masato MORI Leg.”; 2 exs. (CMS): “Sasahara, Kamiyahagi-chô, 1998.10.10, H. Moriya leg.”; 2 exs. (CMS): “Noi, Ena-shi, 1995.10.8, Col. Hirofumi Moriya”; 10 exs. (CMS): “Nakagiri, Akechi-chô, 1999.10.2, H. Moriya leg.”; 2 exs. (EUMJ): “Hokunô, Gujyô-shi, 31.V.1959, K. Kamiya leg.”; 2 exs. (EUMJ): “Hiwada, Takane-chô, Takayama-shi, 16.VIII.1966, M. Satô leg.”; 10 exs. (EUMJ): “Yamanashi-kôgen, 20.XI.1966, M. Satô leg.”; 5 exs. (EUMJ): “Akgami, Takayama-shi, 4.VIII.1966, M. Satô leg.”; 2 exs. (NMW): “Takasu, Gujyô-shi, ca. 38 km SSW Takayama, Erimi-gawa (river), 35°56'22.07"N, 136°54'2.57"E, 760 m a.s.l., 18.IX.2013, leg. M.A. Jäch (4)”; 1 ex. (NMW): “Okuhidaonsengôkansaka, Takayama-shi, ca. 30 km NE Takayama, Gameda (river), 36°15'59.43"N, 137°33'53.12"E, 985 m a.s.l., 20.IX.2013, leg. M.A. Jäch (13)”; 5 exs. (NMW): “Okuhidaonsengôkansaka, Takayama-shi, ca. 27 km NE Takayama, Gameda (river), 36°13'18.50"N, 137°32'31.98"E, 1060 m a.s.l., 20.IX.2013, leg. M.A. Jäch (14)”. **ISHIKAWA Pref.:** 3 exs. (CKN): “R-MORIMOTOGAWA, KITAKATA-MACHI, KANAZAWA-SHI, 1998.9.14, N. HIKIDA leg.”. **TOYAMA Pref.:** 3 exs. (CKN): “Tokonijino-taki, Toyama-shi, 20.IX.2009, Y. Kamite leg.”. **FUKUI Pref.:** 9 exs. (CKN): “Jyôhoji, Eiheiji-chô, 17.VI.2003, Y. Kamite leg.”; 1 ex. (CKN): “Higashiichinuno, Ôno-shi, 2.XI.2008, Y. Kamite leg.”; 5 exs. (CKN): “Nagano, Ôno-shi, 2.XI.2008, Y. Kamite leg.”; 10 exs. (CKN): “Aburasaka-tôge, Ôno-shi, 2.XI.2008, Y. Kamite leg.”; 1 ex. (CKN): “Ogo-gawa, Ogo, Tsuruga-shi, 6.III.2011, Y. Kamite leg.”; 6 exs. (EUMJ): “Kawakami, Maruoka-chô, 15.VIII.1981, H. Sasaji leg.”. **MIÉ Pref.:** 3 exs. (CKN): “Asake, Komono-chô, 24.IX.2005, Y. Kamite leg.”; 3 exs. (CKN): “Yahara-gawa, Kameyama-shi, 31.VII.2010, alt. ca. 270 m, H. Yokoi leg.”; 6 exs. (CKN): “Funato, Matsuzaka-shi, 23.IX.2005, Y. Kamite leg.”; 1 ex. (CKN): “Kôraibiro, Ise-shi, 24.IX.2005, Y. Kamite leg.”; 2 exs. (CKN): “Yokowa, Ise-shi, 24.IX.2005, Y. Kamite leg.”. **SHIGA Pref.:** 24 exs. (CKN): “Shimotanami, Maibara-shi, 22.IX.2005, Y. Kamite leg.”; 7 exs. (CKN): “Magatani, Maibara-shi, 22.IX.2005, Y. Kamite leg.”; 4 exs. (CKN): “Kouduhara, Maibara-shi, 22.IX.2005, Y. Kamite leg.”; 9 exs. (CKN): “Koizumi, Maibara-shi, 22.IX.2005, Y. Kamite leg.”; 4 exs. (CKN): “Yataka, Maibara-shi, 19.IV.2008, Y. Kamite leg.”; 25 exs. (CKN): “Jyôheiji, Maibara-shi, 21.III.2009, Y. Kamite leg.”; 10 exs. (CKN): “Kurakake-tôge, Taga-chô, 13.IX.2009, Y. Kamite leg.”; 1 ex. (CKN): “Mandokoro-chô, Higashiômi-shi, 28.IV.2013, Y. Kamite leg.”; 2 exs. (EUMJ): “Yamaaoi V., Yasu-gawa, 26.IX.1962, Z. N. leg.”. **KYOTO Pref.:** 6 exs. (CKN): “Yasakachôsugawa, Kyôtango-shi, 25.VII.2010, Y. Kamite leg.”; 1 ex. (EUMJ): “Kibune, 26.IV.1959, M. Gotô leg.”; 2 exs. (EUMJ): ditto but: “6.VIII.1980, M. & A. Sakai leg.”. **NARA Pref.:** 1 ex. (CKN): “Wasabi-dani, Kawakami-mura, 23.IX.2005, Y. Kamite leg.”; 15 exs. (CMS): “Izuo, Higashiyoshino-mura, 1997.9.3, H. Moriya leg.”; 3 exs. (CMS): “Kitsu-gawa, Higashiyoshino-mura, 1994.5.15, Col. Hirofumi Moriya”; 1 ex. (CMS): “Serii, Sakurai-shi, 1997.9.2, H. Moriya leg.”; 3 exs. (CMS): “Midu, Yoshino-chô, 1997.9.3, H. Moriya leg.”; 2 exs. (CMS): “Simotako, Kawakami-mura, 17.V.1994, H. Moriya leg.”; 2 exs. (CMS): ditto but: “1997.9.3, H. Moriya leg.”; 42 exs. (CMS): “Nakato, Kurotaki-mura, 1995.9.24, Col. Hirofumi Moriya”; 38 exs. (CMS): “Makio, Kurotaki-mura, 1994.5.16, Col. Hirofumi Moriya”; 13 exs. 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(CKN): “Hosomi-gawa-jyôryû, Furusatono-mori, Yazu-chô, 6-IX-2007, 750 m, Masato MORI Leg.”. **OKAYAMA Pref.:** 13 exs. (CKN): “Myôren-gawa, Hiruzen, Maniwa-shi, 18.IX.2006, Y. Kamite leg.”; 7 exs. (CKN): “Hiruzen, Maniwa-shi, 28.VIII.2010, H. Fujimoto leg.”. **YAMAGUCHI Pref.:** 5 exs. (EUMJ): “Shimonoseki, 10.VIII.1966, Y. Arita leg.”. **[OKI ISLS.] SHIMANE Pref.:** 1 ex. (CKN): “Oki isles, Dôgo is, Fuse-mura, Nakadani, 30-VII-2004, (65m alt.), LT, T. Shimada leg.”; 20 exs. (CKN): “Oki isles, Dôgo is, Gokamura, Nagôda-gawa, 19.VIII.2005, (0-5m alt.), T. Shimada leg.”. **[SHIKOKU] EHIME Pref.:** 1 ex. (EUMJ): “Ishite-gawa, 1.VIII.1956, K. Kuwada”; 2 exs. (EUMJ): “Komenono, 29.IV.1974, M. Sakai”; 1 ex. (CKN): ditto but: “20.IX.2008, Y. Kamite leg.”; 20 exs. (CKN): “Kiji, Imabari-shi, 20.IX.2008, Y. Kamite leg.”; 12 exs. (EUMJ): “Uchiko-chô, 20.VII.1975, M. Sakai leg.”; 2 exs. (EUMJ): “Yamanouchi, Shigenobu-chô, 26.VI.1988, M. Sakai leg.”; 1 ex. (EUMJ): “West ravine of Mt. Shiratsue, Matsuyama-shi, 26.VI.1966, S. Hisamatsu leg.”; 7 exs. (EUMJ): “Rokurodani, Odamiyama, 22.VII.1994, E. Yamamoto leg.”; 1 ex. (EUMJ): “Odamiyama, 1.VI.1986, E. Yamamoto leg.”; 3 exs. (EUMJ): ditto but: “15.VIII.1986, E. Yamamoto leg.”. **KÔCHI Pref.:** 1 ex.

(CKN): “Shidehara, Kubokawa-chô, 6.XI.1999, S. Ohmomo leg.”; 8 exs. (CKN): “Chikaraishi, Tsuno-chô, 18.VIII.2010, Y. Kamite leg.”; 6 exs. (CMS): “Yamaoku, Sakawa-chô, 7.Nov.2000, H. Moriya leg.”. [KYÛSHÛ] **FUKUOKA Pref.:** 2 exs. (CKN): “Kuwanagari, Chikuhô-machi, 6.IV.2003, T. Ogata leg.”. **ÔITA Pref.:** 1 ex. (CKN): “1996. 7.13–14, Taisen-rindo, Kuju, S. OHMOMO lgt.”; 3 exs. (CKN): ditto but: “1997.6.13–15, S. Ohmomo lgt.”; 10 exs. (CKN): “Yufuin-onsen, Yufuin-machi, 18.VII.2009, Y. Kamite leg.”; 10 exs. (CKN): ditto but: “19.VII.2009, Y. Kamite leg.”; 3 exs. (CKN): “Kouzuharu, Shônaichôasono, Yufu-shi, 9.X.2014, T. Miyake leg.”; 2 exs. (EUMJ): “Asono-gawa, Shônai-chô, 3.XI.1997, H. Yoshitomi leg.”. **KUMAMOTO Pref.:** 2 exs. (EUMJ): “Midorikawa Dam, 8.VIII.1980, H. Yamada leg.”.

Larvae. JAPAN: [HONSHÛ] SHIZUOKA Pref.: 11 mature larvae (CKN): “Inogashira-yusui, Inogashira, Fujinomiya-shi, 26.VI.2005, Y. Kamite leg.”. **AICHI Pref.:** 1 mature larva (CKN): “Inahashi, Shitara-chô, 29.V.2005, Y. Kamite leg.”; 1 mature larva (CKN): ditto but: “6.VIII.2006, Y. Kamite leg.”. **GIFU Pref.:** 17 mature larvae and 6 immature larvae (CKN): “Nôgô-dani, Neonôgô, Motosu-shi, 3.VI.2005, Y. Kamite leg.”; 24 mature larvae and 9 immature larvae (CKN): “Yatani, Motosu-shi, 17.VI.2007, Y. Kamite leg.”; 7 mature larvae (CKN): “Neomidori, Motosu-shi, 12.VI.2021, Y. & N. Kamite leg.”. [KYÛSHÛ] **FUKUOKA Pref.:** 3 mature larvae (CKN): “Ichino, Kano-machi, 19.V.1993, T. Ogata leg.”.



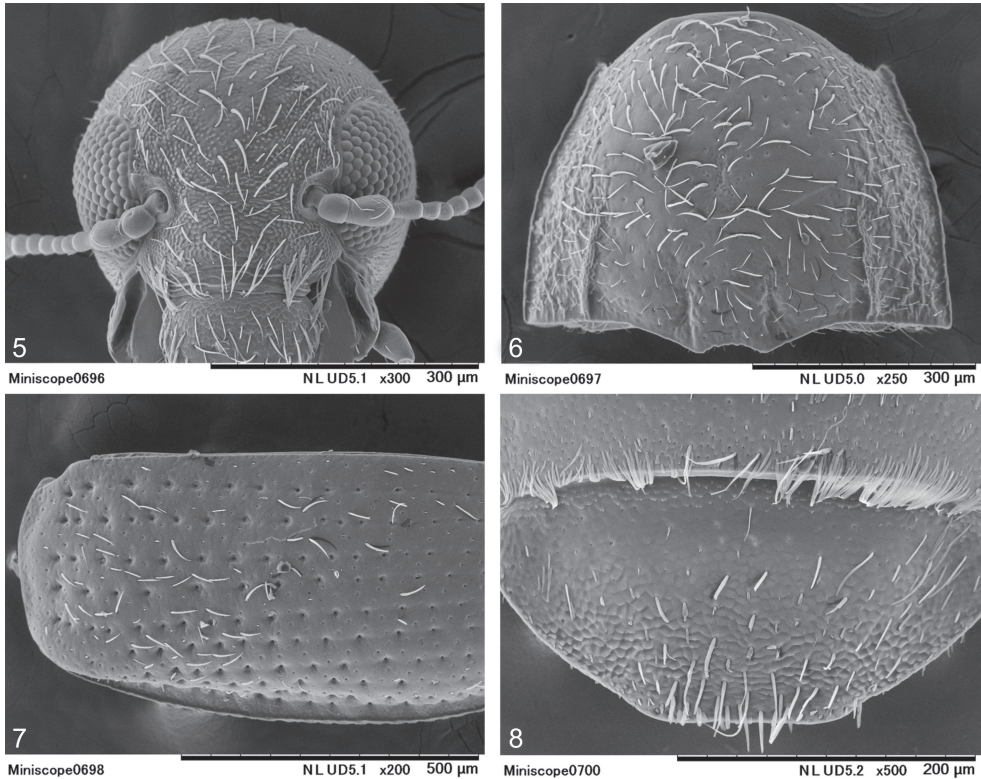
Figs. 1–4: Habitus of *Heterlimnius nitidus*; 1) adult, dorsal view; 2) same, lateral view; 3) larva, dorsal view; 4) same, lateral view.

REDESCRIPTION: Adult. TL/EW 1.76–2.12 (2.04). Dorsal surface black, but elytra dark brown to black, with yellowish patches at humeral and apical areas (Fig. 1). Humeral yellowish patches extending from about second elytral stria to lateral margin, comprising basal 1/3–1/5 of elytral length. Ventral surface, antennae, mouth parts and legs reddish brown to blackish brown, but antennomeres 1–8 and tarsi paler.

Head almost flat on dorsal surface, densely granulate and pubescent (Fig. 5). Eyes rather small; distance between eyes about 1.35 times as long as the maximum diameter of an eye. Antennae with dense setae at antero-lateral corners of antennomeres 9 and 10 and apical part of antennomere 11; approximate ratio of each antennomere: 2.1 : 1.9 : 1.6 : 1.0 : 1.0 : 1.0 : 1.1 : 1.0 : 1.5 : 1.5 : 3.0. Clypeus transverse, about 2.69 times as wide as long. Labrum transverse, about 1.88 times as wide as long.

Pronotum transverse (Fig. 6), slightly convex (Fig. 2); lateral areas moderately granulate; without median longitudinal impression; prescutellar pits present; antero-lateral corners

moderately produced anteriad. PW/PL 1.26–1.39 (1.33); sublateral carinae 0.29–0.34 ($n = 10$, 0.31) times as long as PL.



Figs. 5–8: *Heterlimnius nitidus*; 5) head; 6) pronotum; 7) left elytron; 8) abdominal ventrite 5.

Elytra elongate oval; moderately convex (Fig. 2); lateral margin weakly serrate; intervals not distinctly rugose, slightly convex; punctate striae shallow or vague; strial punctures moderately large and deep; basal part of 3rd interval wider than that of 4th (Fig. 7); EL/EW 1.23–1.56 (1.48); EL/PL 2.33–2.86 (2.63); EW/PW 1.29–1.40 (1.34).

Prosternal process narrowing posteriorly, rounded at apex. Anterior part of mesoventral groove relatively narrow. Abdominal ventrite 5 weakly granulate; apex evenly rounded or somewhat truncate, with long hairs (Fig. 8).

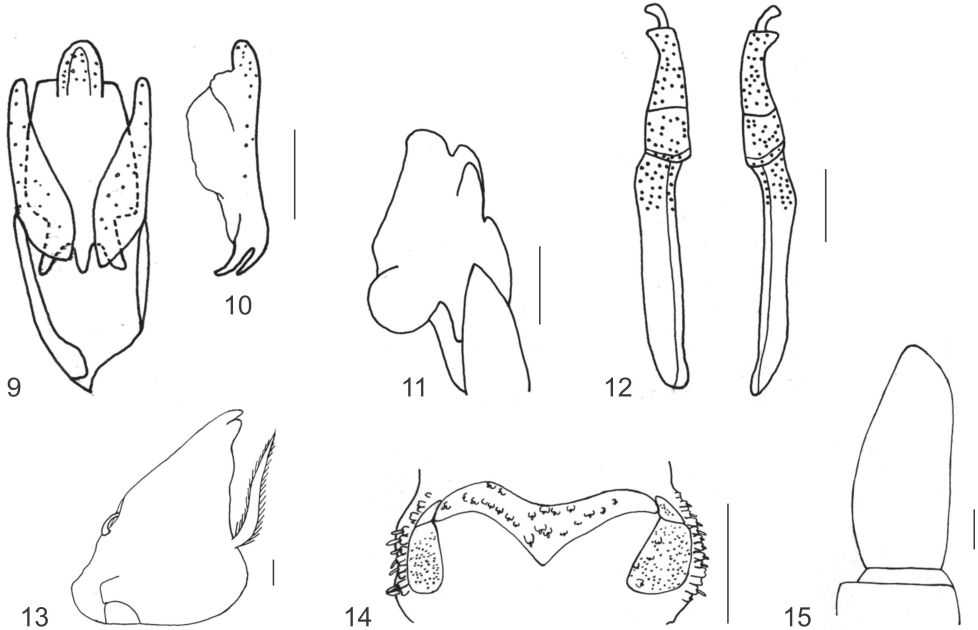
Aedeagus as in Figs. 9–11; phallobase smooth at lateral and ventral surface; penis about 1.29 times as long as phallobase; apical part rounded, slightly curved ventrad in lateral view (Fig. 10); parameres slender, about 0.79 times as long as penis; lateral view of endophallus as in Fig. 11.

Ovipositor as in Fig. 12; coxite about 5.48 times as long as stylus; valvifer about 9.90 times as long as stylus.

MEASUREMENTS ($n = 10$): TL 1.53–1.81 (1.68) mm; PL 0.44–0.50 (0.46) mm; PW 0.58–0.66 (0.62) mm; EL 1.07–1.31 (1.22) mm; EW 0.79–0.87 (0.83) mm.

Larva. Body (Figs. 3–4) cylindrical; TL/TW 7.07–7.22 (7.15). Color brown, head, pronotum and abdominal segment 9 dark brown. Head about 1.19 times as wide as long; setiferous tubercles in mesal part and along suture; each tubercle relatively large. Mandibles (Fig. 13)

subtriangular, 1.30 times as long as wide. Labrum about 1.93 times as wide as long. Pronotum slightly wider than long; PW/PL 1.38–1.53 (1.43), not humped in middle. Meso- and metathorax with five ventral sclerites; antero-lateral sclerites triangular, small (Fig. 14). Abdominal segments 1–8 distinctly humped, segment 9 not humped dorsally; abdominal segment 9 without lateral keel (Fig. 15).



Figs. 9–15: *Heterlimnius nitidus*; 9) aedeagus in dorsal view; 10) penis in lateral view; 11) endophallus in lateral view; 12) ovipositor; 13) mandible (larva); 14) mesothorax, ventral view (larva); 15) abdominal segment 9, lateral view (larva). Scales: 9–12, 14–15: 100 μ m; 13: 10 μ m.

MEASUREMENTS (n = 3): TL 4.10–4.22 (4.17) mm; HW 0.29–0.30 (0.30) mm; PL 0.38–0.39 (0.39) mm; PW 0.54–0.58 (0.55) mm; TW 0.58–0.59 (0.58) mm.

DISTRIBUTION (Fig. 16): Japan (Honshū, Oki Islands, Shikoku, Kyūshū).

BIOLOGICAL NOTES: *Heterlimnius nitidus* is the most common species of *Heterlimnius* in Japan. Specimens are usually found in middle courses of rivers, where they prefer sandy substrates.

COMMENTS: Both nominal species (*O. rugulosus* and *O. nitidus*) were described in the same publication, even on the same page. The distinguishing characters listed by NOMURA (1958) are all based on generally variable characters: e.g., frontoclypeal suture feeble/distinct, middle of disc of pronotum with/without very feeble small elongate-oval impression; elytral intervals feebly/distinctly rugulose (the elytral intervals of the holotype of *O. rugulosus* are somewhat opaque, which can be often observed in older specimens). Since I was unable to detect any significant external or aedeagal distinguishing characters, *O. rugulosus* is here officially synonymized with *O. nitidus*. SATŌ (1992) already proposed this synonymy in his unpublished PhD thesis.

Heterlimnius nitidus is here chosen as the senior synonym, because in the literature it has been used much more often than the name *H. rugulosus* (see above).

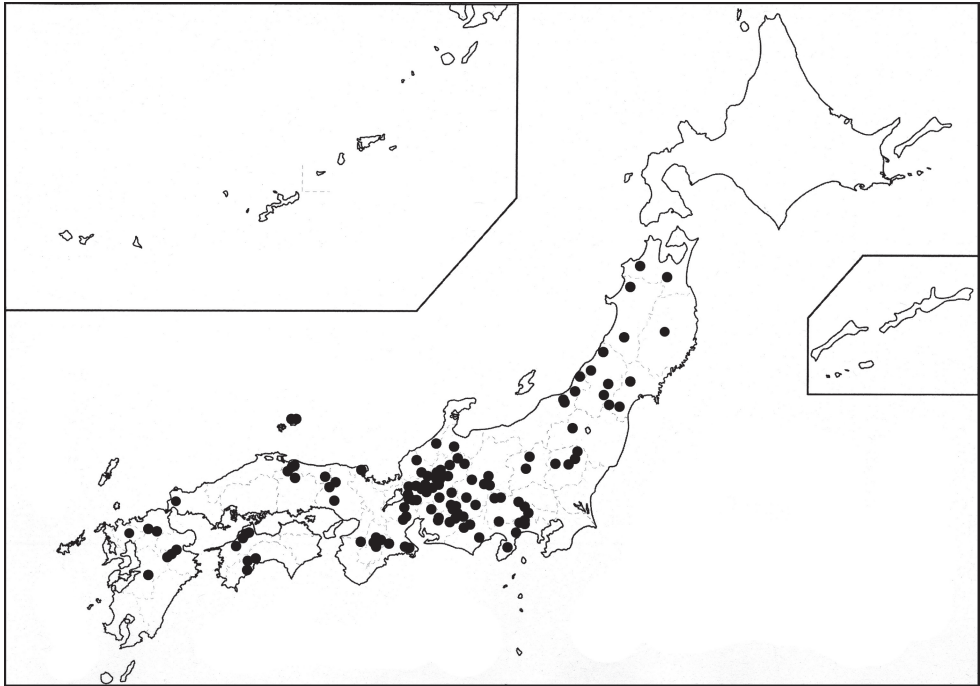


Fig. 16: Geographical distribution of *Heterlimnius nitidus* based on the material examined by the author.

DIFFERENTIAL DIAGNOSIS: In adult features, this species somewhat resembles *H. sakaii* (KAMITE, 2015) in general appearance, but is easily distinguishable from the latter by the following characteristics: body small; pronotum with prescutellar pits (Fig. 6); intervals of elytra less rugose (Fig. 7); apical part of penis rounded (Fig. 9); lateral view of endophallus as in Fig. 11.

The larva of this species somewhat resembles that of *H. hagai* (NOMURA, 1958) in general appearance, but is easily distinguishable from the latter by the following characteristics: body small; meso- and metathorax each with five ventral sclerites (Fig. 14); abdominal segment 9 without lateral keel (Fig. 15).

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