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REVISION OF THE GENUS OSMYLUS (NEUROPTERA: OSMYLIDAE: OSMYLINAE) OF JAPAN

By SHIGEYUKI SEKIMOTO and KAZUNORI YOSHIZAWA

Abstract

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Japanese species of the genus *Osmylus* Latreille were revised. The following three species of the subgenus *Osmylus* were recognized: *O.* (*O.*) *pryeri* McLachlan, 1875, *O.* (*O.*) *hyalinatus* McLachlan, 1875 and *O.* (*O.*) *decoratus* Nakahara, 1914. One species of the subgenus *Plesiosmylus* Makarkin, *O.* (*P.*) *tessellatus* McLachlan, 1875 was recognized. All Japanese species of *Osmylus* were redescribed and illustrated but *O. kisoensis* Iwata, 1928, which is known only from a larva to date, was not treated here. A key to the Japanese species of the genus is provided. In Appendix, two new combinations were proposed for two Chinese species, *O. atomatus* (Yang, 1988) and *O. zheanus* (Yang & Liu, 2001) (both originally assigned in the genus *Plethosmylus* Krüger).

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Introduction

Osmylus Latreille, 1802 is the largest genus of the subfamily Osmylinae (Osmylidae). According to Oswald (2007) and Wang & Liu (2010), the genus consists of 25 species: most of them are distributed in the Palaearctic region, with the highest diversity in eastern Asia (20 species). The other five species are described from Turkey (2 species), Tadzhikistan (1), Europe (1) and Africa (1). The species show relic distribution pattern (Makarkin, 1985), so it is considered that the genus was once distributed widely in Eurasia (Makarkin, 1985).

The Japanese fauna of the genus was first studied by McLachlan (1875), who described three new species, *O. tessellatus*, *O. pryeri*, and *O. hyalinatus*. Later, Nakahara (1914) and Iwata (1928) each described one new species, *O. decoratus* and *O. kisoensis*, respectively. However, the latter species was described from a single larval specimen. Kuwayama (1953) described *O. shikokuensis* from Shikoku, on the basis of differences in head and forewing markings. However, the species was later synonymized with *O. pryeri* by himself without mentioning the reason for this treatment (Kuwayama, 1962). Moreover, *O. shikokuensis* has not been compared with the specimens of *O. pryeri* from Shikoku.

Classification of Japanese species above the species level has also been complicated. Krüger (1913a) erected the genus *Plethosmylus*, which was characterized by having the forewing costal cross veins linked by short transverse veins, with *O. hyalinatus* as the type species. After that, Krüger (1915) transferred *O. decoratus* to *Plethosmylus*. Nakahara (1914) suggested the synonymy of *Plethosmylus* with *Osmylus*, but *Plethosmylus* was accepted by Kuwayama (1953, 1962). Later, Makarkin (1985) officially synonymized *Plethosmylus* with *Osmylus* on the basis of morphological characters including genitalic morphology. In that paper, Makarkin (1985) also established a new subgenus, *Plesiosmylus*, with *O. tessellatus* as the type species, although he pointed out that the characters defining *Plesiosmylus* seem to be plesiomorphic.

As in the case for many other insect groups, male and female terminal characters are most important for taxonomy and phylogenetics of *Osmylus*. However, these characters of Japanese species have been studied only poorly so far (Makarkin, 1985; Hayashi, 2005). Therefore, the purposes of the present paper are to test the previous taxonomic treatments based on more detailed morphological examination, including male and female terminal characters, and to provide redescriptions and illustrations of the Japanese species of *Osmylus*.

Materials and Methods

The specimens used in the present study were mostly dried and some specimens were fixed with 80% or 99.5% ethanol. For detailed observation of terminalia, the terminal segments of the abdomen were removed and placed in a 10% solution of KOH at room temperature for approximately 12–24 h. Then soaked parts were washed with distilled water and stained with aceto-fuchsin. Dissection and illustration was made in distilled water under a binocular stereoscopic microscope.

Descriptions of coloration and measurement of body length are based on dried specimens. Terminology mostly followed New (1989) and Wang & Liu (2010). The

following abbreviations were used: B, body length; A, antenna length; FW, forewing length; HW, hindwing length; Ta1–Ta5, first to fifth tarsomeres. All measurements are given in millimeters. Trichobothria of callus cerci are omitted in illustrations.

All specimens are deposited in the Laboratory of Systematic Entomology, Hokkaido University, Sapporo, Japan (SEHU). Collector's names appearing commonly in text are abbreviated as follows: AO (A. Ohkawa); KM (K. Mizota); KU (K. Uesugi); SS (S. Sekimoto); ST (S. Takagi); TA (T. Kanbe); TU (T. Kumata); TY (T. Yoshida).

Key to Subgenera and Species of the Genus Osmylus in Japan

1. Female fore coxa with pronounced prominence on anterior surface; male tergite IX sometimes with dorsal projection (Figs 3, 6, 8); scent-glands composed of a pair of lobes (Fig. 2AB) .... (subgenus *Osmylus*) 2
–. Female fore coxa without prominence; male tergite IX unmodified (Fig. 10); scent-glands composed of single tube bifurcated distally (Fig. 2CD) .... (subgenus *Plesiosmylus*) *O.* (*P.*) *tessellatus*
2. Male tergite IX with dorsal conical projection in lateral view (Figs 6AB, 8AB); gonarcus without process along dorsal margin, both pairs of prominences of gonarcus almost same size in lateral view (Figs 6C, 8C); female sternite VIII not membranous (Figs 7B, 9B) 3
–. Male tergite IX with dorsal tapered process in lateral view (Fig. 3AB); gonarcus with process along dorsal margin, upper triangular pair of prominences of gonarcus larger than lower one in lateral view (Fig. 3C); female sternite VIII membranous, except for median sclerotized concave (Fig. 4B) ..... *O.* (*O.*) *pryeri*
3. Frons bright yellow without marking; fore and mid tibiae without marking; posteroventral surface of female sternite VII with concavity medially in ventral view, which sometimes extended into sternite VIII (Fig. 7B) ..... *O.* (*O.*) *hyalinatus*
–. Frons dorsally brown to dark brown, with dark brown X-shaped marking at middle, ventrally yellow; fore and mid tibiae with dark line on dorsal surface; female sternite VII with preapical small prominence posteroventrally in ventral view (Fig. 9B) ..... *O.* (*O.*) *decoratus*

Systematics

Genus *Osmylus* Latreille

Osmylus Latreille, 1802: 289. Type species: *Hemerobius maculatus* Fabricius, 1787: 247 (by monotypy).

Hyposmylus McLachlan, 1870: 200. Type species: *Osmylus punctipennis* Walker, 1860: 183, monotypy. Synonymized by Banks, 1913: 215.

Dictyosmylus Navás, 1910: 189. Type species: *Dictyosmylus lunatus* Navás, 1910: 189, monotypy. Synonymized by Banks, 1913: 215.

Plethosmylus Krüger, 1913a: 43. Type species: *Osmylus hyalinatus* McLachlan, 1875: 181, original designation. Synonymized by Makarkin, 1985: 36.

Diagnosis. Medium to large-sized osmylids, forewing length approximately 20–30 mm; wings elongate, broad, sometimes slightly falcate; forewing costal crossveins furcated, except for basal simple ones, sometimes several ones linked by short transverse veins; single Sc-R1 crossvein near base of forewing; usually two gradate veins; forewing vein MP forked near base of wing, slightly beyond or almost opposite Rs fork; forewing

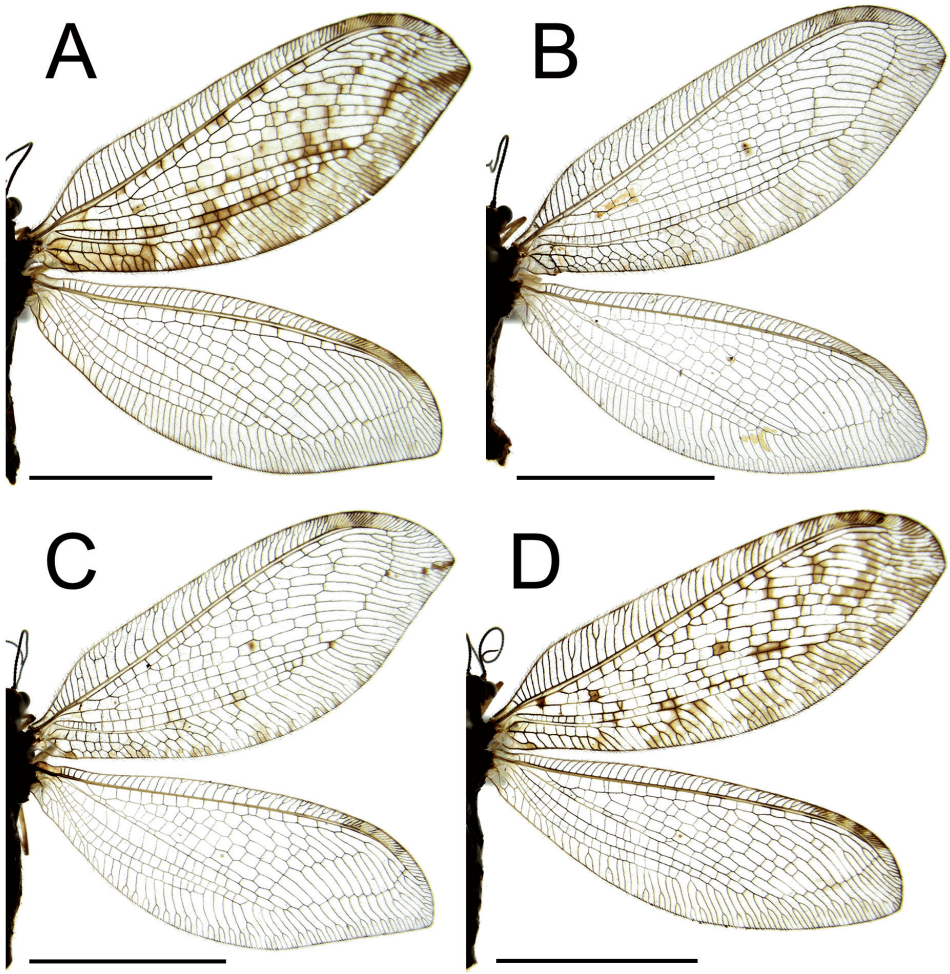

Fig. 1. Wings of Japanese species of *Osmylus*. A. *O.* (*O.*) *pryeri*. B. *O.* (*O.*) *hyalinatus*. C. *O.* (*O.*) *decoratus*. D. *O.* (*Plesiosmylus*) *tessellatus*. [Scale: 1cm.]

vein 1A rather short, approximately one-third to one-forth length of wing; forewing vein 2A ending slightly beyond or almost opposite Rs fork; female fore coxa usually with pronounced prominence on anterior surface; male with scent-glands; tergite IX with dorsal projection; gonarcus well developed and sclerotized posteriorly, with two pairs of posterior prominences; baculum present; parameres fused by membrane dorsally, curved medially, anterior end strongly recurved and forming hook-like process, posterior end surrounded by hyaline membrane; pair of slender rods present on outside of each parameres; hypandrium internum present; female without subgenital plate; gonapophysis lateralis boat-shaped; spermatheca usually oval or cylindrical.

Remarks. The genus *Plethosmylus* was synonymized with *Osmylus* by Nakahara (1914) and Makarkin (1985) without mentioning the basis of this taxonomic treatment.

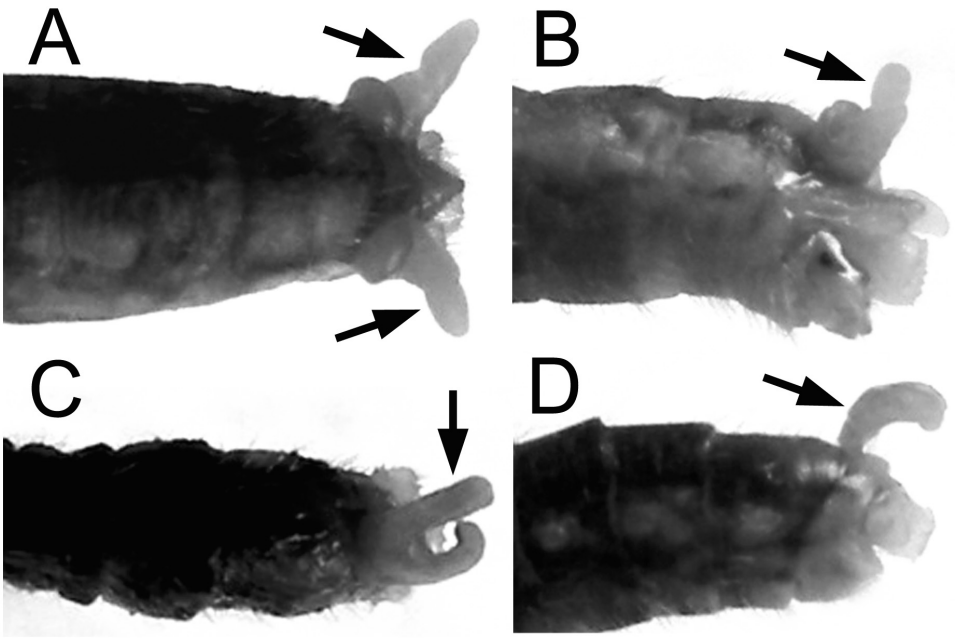

Fig. 2. Scent-glands of *Osmylus* spp. indicated by arrows. A. *O.* (*O.*) *hyalinatus*, dorsal view. B. Ditto, lateral view. C. *O.* (*Plesiosmylus*) *tessellatus*, dorsal view. D. Ditto, lateral view.

Plethosmylus is characterized by the following two character states in the forewing venation: costal crossveins linked by short transverse veins; only two crossveins between stem of Rs and M before basal nygma. However, these character states are also observed in Japanese species of *Osmylus* for example sometimes, *O. pryeri* and *O. tessellatus*. Thus, the characters used to define *Plethosmylus* are insufficient for distinguishing it from *Osmylus*. Therefore we accept the synonymy of *Plethomylus* proposed by Nakahara (1914) and Makarkin (1985).

Subgenus *Osmylus* Latreille

Diagnosis. Male tergite IX sometimes with dorsal projection (Figs 3AB, 6AB, 8AB); scent-glands composed of pair of white eversible membranous lobes (Fig. 2AB); gonarcus moderately covered with hairs posteriorly (Figs 3CD, 6CD, 8CD); female fore coxa with pronounced prominence on anterior surface; sternite VIII modified (Figs 4AB, 7AB, 9B).

Osmylus (*Osmylus*) *pryeri* McLachlan
(Figs 1A, 3–5)

Osmylus pryeri McLachlan, 1875: 180; Kuwayama, 1962: 342; Makarkin, 1985: 41, figs. 11, 15, 23; 1990: 37; 1995: 44–45, figs. 5, 9.

Osmylus pryeri?: Nakahara, 1913: 626.

Osmylus? *pryeri*: Krüger, 1913b: 204.

Osmylus shikokuensis Kuwayama, 1953: 178. Synonymized by Kuwayama, 1962: 342.

Redscription. Male. Head. Vertex yellow to pale brownish-yellow, pale dark brown posterolaterally, sometimes dark brown to blackish-brown overall, moderately raised; occiput dark brown, rarely blackish-brown; ocelli whitish-yellow, ocellar field brown to dark brown, with several pale hairs; frons yellow, margin of antennal socket broadly brown to blackish-brown, except for yellow ventrolateral margin, linked with pair of blackish-brown spots under antenna; gena yellow; clypeus yellow, whitish-yellow along ventral margin, sparsely covered with pale hairs. Antenna dark brown to blackish-brown, densely covered with short pale hairs; scape and pedicel blackish-brown; flagellum comprising approximately 50 segments. Mouthparts yellow; labrum pale brown, with several pale hairs ventrally.

Thorax. Pronotum yellow, rarely almost blackish-brown, with blackish-brown lateral margins, broad, slightly broadened posteriorly, with brown hairs. Mesonotum dark brown to blackish-brown, with dark hairs; mesoprescutum often yellowish-brown to brown. Metanotum dark brown to blackish-brown, with yellow hairs. Mesopleuron and metapleuron brown to dark brown on dorsal half, yellowish-brown to dark brown on ventral half, with yellow hairs.

Legs. Pale yellow, densely covered with pale yellow and pale brown hairs; tibiae approximately as long as femora in fore- and midlegs, longer than femur in hindleg; spurs reddish-brown, short; tarsi much shorter than tibiae, pale yellow to pale brown, Ta5 sometimes dark distally; claws reddish-brown, strongly curved, with row of small teeth on outer edge.

Wings (Figs 1A, 5). Acute at apex, posterodistal margin often slightly falcate, elongate, narrow. Veins mostly dark to dark brown, densely covered with brown hairs. Forewing with grayish-brown longitudinal linear marking from apex to distal gradate veins, which sometimes linked with grayish-brown distal gradate veins. Sc and R irregularly alternating pale yellow and dark brown, some small grayish-brown spots along posterior margin of R. Posterior margin broadly clouded with grayish-brown, with a series of irregularly spaced small pale patches. Pterostigma pale yellow, with dark patches. Few costal crossveins linked by short transverse veins. Hindwing almost without markings, except for pale yellow pterostigma with dark patches.

Abdomen. Dark brown to blackish-brown, yellow distally, densely covered with yellow hairs.

Terminalia (Fig. 3): tergite IX (Fig. 3AB) with dorsal tapered process directed posterodorsally in lateral view, rather broad with rounded distal margin in dorsal view, both anterior and posterior surface with concave medially; ectoproct triangular in lateral view. Genitalia (Fig. 3CD): gonarcus with two pairs of prominences posteriorly, upper triangular pair larger than lower one, and with process along dorsal margin in lateral view.

Length: B, 13–14; A, 7–8; FW, 23–26; HW, 21–22.

Female. Coloration and general morphology, except terminalia, almost as in male. Terminalia (Fig. 4): posteroventral portion of sternite VII swelled ventrally in lateral view; tergite VIII broad, deep and trapezoidal, anterovental angle protruding ventrally and articulating with posterodorsal margin of sternite VII in lateral view; sternite VIII membranous, except for median sclerotized concave, which bearing some hairs on each lateral membrane in ventral view (Fig. 4B); tergite IX narrow, constricted adjacent to callus cerci, tapered and articulated with gonapophysis lateralis ventrally, anteroventral

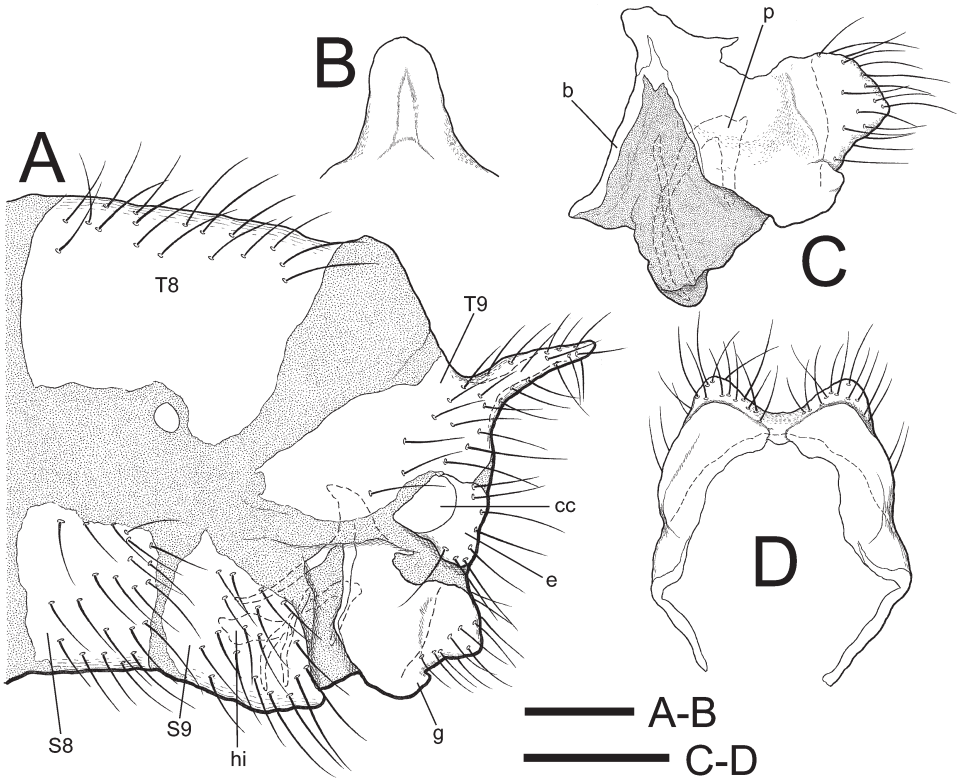

Fig. 3. Male terminalia of *Osmylus* (*Osmylus*) *pryeri*. A. Terminalia, lateral view. B. Dorsal process of tergite IX, dorsal view. C. Genitalia, lateral view. D. Ditto, ventral view (parameres omitted). Abbreviations: b; baculum: cc; callus cerci: e; ectoproct: g; gonarcus: hi; hypandrium internum: p; parameres: S8; sternite VIII: S9; sternite IX: T8; tergite VIII: T9; tergite IX. [Scale: 1 mm.]

margin with process in lateral view; ectoproct triangular in lateral view; gonapophysis lateralis tapered anteriorly in lateral view; spermatheca (Fig. 4C) oval.

Length: B, 13–15; A, 7–8; FW, 26–28; HW, 23–25.

Type locality: Japan: "Yokohama".

Specimens examined (dried). Holotype male of *Osmylus shikokuensis* (Fig. 5). Verbatim label data: "Joju, Mt. Ishizuchi / Prov. Iyo / 26-vii-1952 / T. ISHIHARA / T. EDASHIGE" [script, light brown rectangle]; "*Osmylus* / *shikokuensis* / n. sp. (1953) / Det. Satoru Kuwayama / [HOLOTYPE]" [Kuwayama script, red rectangle]; "*Osmylus* / *pryeri* / M'LACHLAN / det S. Kuwayama / 1964" [Kuwayama script, blue-lined white notebook paper, rectangle]; "EUM TYPE / NO. 1190" [printed, pale light blue rectangle with black border]. Other specimens. [Hokkaido] 1 male 2 females, Mirutoichino-sawa, Kurisawa, 15. viii. 2003, SS; 3 males 1 female, same locality, 21. viii. 2003, SS; 1 female, Heiwanotaki, Kotonihassamu-gawa Riv., Sapporo, 2. vii. 2003, SS; 1 male, Mt. Muine-yama, Sapporo, 8. viii. 1972, TU; 1 male, Usubetsu, Sapporo, 9. ix. 1970, TU. [Honshu] 1 female, Umegashima Spa, Shizuoka, 1. x. 1996, T. Nakamura. [Shikoku] 1 male, Okuyarido, Kizawa, Tokushima, 7. viii. 1996, T. Beppu.

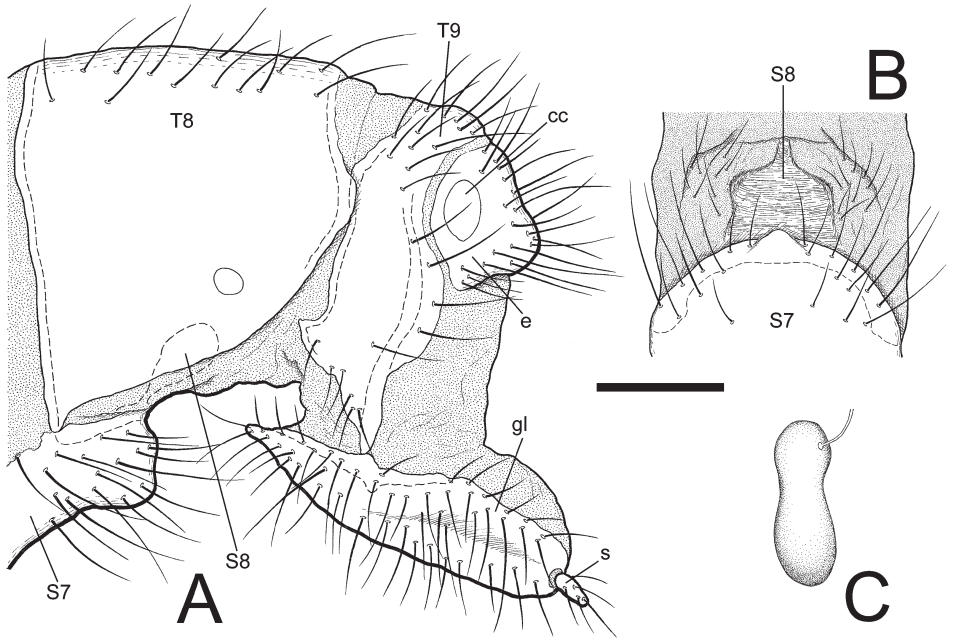

Fig. 4. Female terminalia of *Osmylus* (*Osmylus*) *pryeri*. A. Terminalia, lateral view. B. Sternite VII and VIII, ventral view. C. Spermatheca. Abbreviations: cc; callus cerci: e; ectoproct: gl; gonapophysis lateralis: s; stylus: S7; sternite VII: S8; sternite VIII: T8; tergite VIII: T9; tergite IX. [Scale: 1 mm.]

Specimens examined (ethanol). [Hokkaido] 1 female, Yutomuraushi Riv., (alt. 700m), Shintoku, 12–17. vii. 1999 (MT), K. Endo; 1 female, Onkozawa-gawa Riv., Furano, 5–13. vii. 2005 (MT), AO; 1 male 1 female, same locality, 11. viii. 2004 (MT), AO; 2 females, Maruyama-zawa, Furano, 11–22. viii. 2004 (MT), AO; 1 female, Mirutoichino-sawa, Kurisawa, 21. viii. 2003, SS; 1 male, Kannon-zawa, Sapporo, 27. vi. 2000 (MT), KU; 1 female, Hyakumatsu-zawa, Sapporo, 30. vi–7. vii. 1998 (MT), KM et al.; 1 male 2 females, same locality, 14. vii. 1998 (MT), KM et al.; 5 females, same locality, 21–29. vii. 1998 (MT), KM et al.; 1 female, same locality, 11. vii. 2000 (MT), KU; 1 male, Mt. Raiba-dake, Noboribetsu, 30. vi–15. vii. 2002 (MT), TY; 1 male 1 female, same locality, 14–28. vii. 2002 (MT), TY; 1 male 4 females, same locality, 28. vii–11. viii. 2002 (MT), TY; 2 males, same locality, 11–29. viii. 2002 (MT), TY; 1 male, Mt. Washibetsu-dake, Muroran, 28. vii. 2002 (MT), TY; 1 male, same locality, 28. vii–11. viii. 2002 (MT), TY.

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

Remarks. In having the dorsal tapered process of male tergite IX (Fig. 3AB), this species is similar to *Osmylus atomatus* (Yang, 1988) n. comb. from Xizang, China, *Osmylus biangulus* Wang & Liu, 2010 from Xizang, China, and *Osmylus bipapillatus* Wang & Liu, 2010 from Henan, China, but is different from them in the shape of gonarcus (Fig. 3CD).

Osmylus shikokuensis (Fig. 5) was described by Kuwayama (1953) based on three specimens collected from Shikoku, Japan. Kuwayama (1962) synonymized *O. shikokuensis* with *O. pryeri*, but he did not provide any comments about this taxonomic

Fig. 5. Holotype of *Osmylus shikokuensis*. A. Habitus. B. Labels. [Scale: 1 cm.]

treatment.

In the present study, we examined the holotype of *O. shikokuensis*. According to Kuwayama (1953), *O. shikokuensis* is distinguished from *O. pryeri* by the markings of the head and forewing. However, the external features of the holotype of *O. shikokuensis* is in good agreement with *O. pryeri* examined in this study, except for blackish-brown thorax. We also examined one male specimen of *O. pryeri* collected in Shikoku, the type locality of *O. shikokuensis*, which is in exact agreement with the original description of *O. pryeri*. Moreover, we found a female specimen collected in Hokkaido which is similar to the holotype of *O. shikokuensis* in blackened coloration. However, the specimen from Hokkaido also is in exact agreement with the original description of *O. pryeri*. Therefore, we concluded that the holotype of *O. shikokuensis* is a blackened form of *O. pryeri*, and synonymy between *O. shikokuensis* and *O. pryeri* as proposed by Kuwayama (1962) is reconfirmed.

Osmylus (*Osmylus*) *hyalinatus* McLachlan
(Figs 1B, 2AB, 6, 7)

Osmylus hyalinatus McLachlan, 1875: 181; Makarkin, 1985: 39, figs. 8, 17, 25; 1990: 37; 1995: 44, 45, figs. 6, 10.

Plethosmylus (*Osmylus*) *hyalinatus*: Matsumura, 1931: 1169.

Plethosmylus hyalinatus: Krüger, 1913b: 205; Kuwayama, 1962: 343; 1967: 65.

Pletosmylus [sic] *hyalinatus*: Navás, 1928: 90.

Plethosmylus decoratus: Matsumura, 1933: 5(8), pl. 2, fig. 2 [not *Plethosmylus decoratus* (Nakahara, 1914)].

Osmylus tessellatus: Kato, 1933: pl. 47, fig. 5 (not *Osmylus tessellatus* McLachlan, 1875).

Redescription. Male. Head. Vertex bright yellow, moderately raised; occiput, frons and gena bright yellow; ocelli white, ocellar field bright yellow, with several pale hairs; clypeus yellow, whitish-yellow along ventral margin, sparsely covered with pale hairs. Antenna dark brown to black, densely covered with short pale hairs; flagellum comprising approximately 50 segments. Mouthparts yellow; labrum pale brown, with

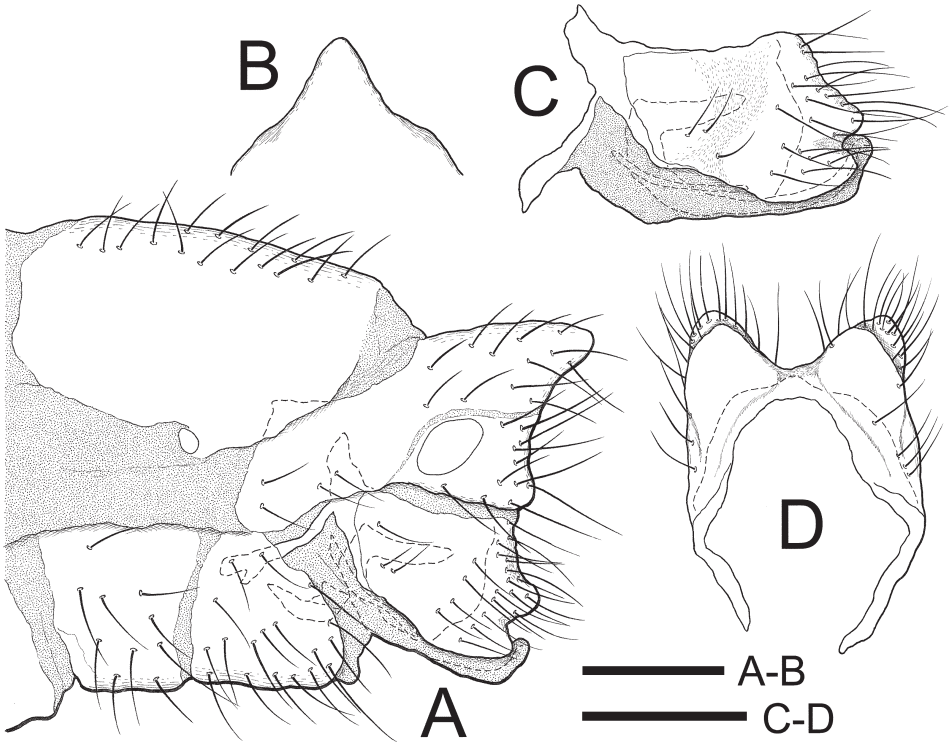

Fig. 6. Male terminalia of *Osmylus* (*Osmylus*) *hyalinatus*. A. Terminalia, lateral view. B. Dorsal projection of tergite IX, dorsal view. C. Genitalia, lateral view. D. Ditto, ventral view. (parameres omitted) [Scale: 1 mm.]

several pale hairs ventrally.

Thorax. Cervix with dark brown spot at middle. Pronotum blackish-brown, broad, slightly broadened posteriorly, with broad median yellow longitudinal band, which irregularly variegated with blackish-brown medially. Mesonotum and metanotum variable in color, brown to dark brown, sometimes paler posteriorly. Mesopleuron and metapleuron brown to dark brown. Hairs on nota pale.

Legs. Pale yellow, densely covered with pale yellow and pale brown hairs; mid and hind coxae pale yellow to pale brown; tibiae approximately as long as femora in fore- and midlegs, longer than femur in hindleg; spurs reddish-brown, short; tarsi much shorter than tibiae, pale yellow to pale brown, Ta5 dark distally; claws reddish-brown, strongly curved, with row of small teeth on outer edge.

Wings (Fig. 1B). Subacute at apex, posterodistal margin sometimes slightly falcate, broad. Veins pale and dark, densely covered with brown hairs. Forewing with some faint gray tinges along posterior margin, often grayish-brown longitudinal linear marking developed from middle of distal gradate veins to apex. Sc and R pale yellow. Some costal crossveins often linked by short transverse veins. Pterostigma rather indistinct, with gray patches. Hindwing without markings, except for pale white pterostigma, with pale dark patches.

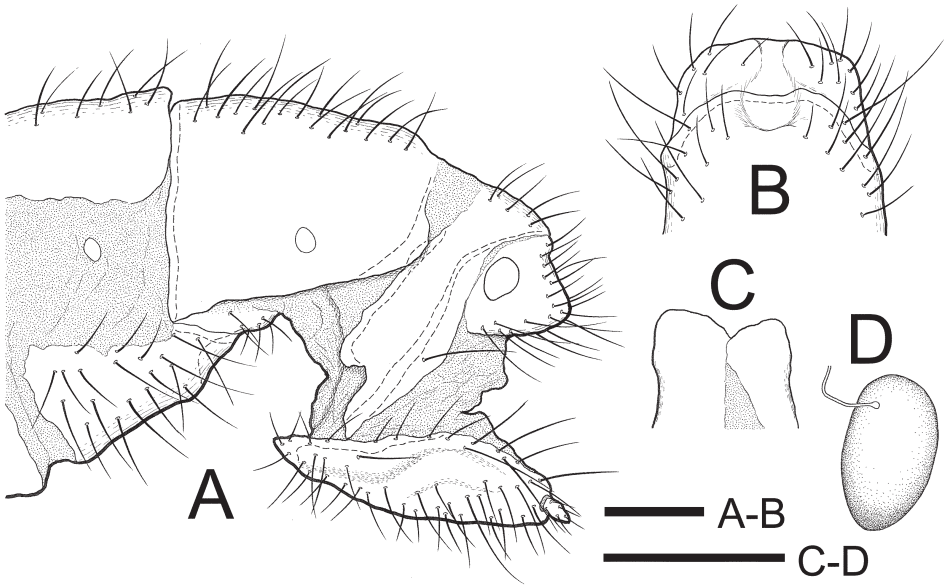

Fig. 7. Female terminalia of *Osmylus* (*Osmylus*) *hyalinatus*. A. Terminalia, lateral view. B. Sternite VII and VIII, ventral view. C. Anterior apex of gonapophysis lateralis, ventral view. D. Spermatheca. [Scale: 1 mm.]

Abdomen. Dark brown to blackish-brown, yellow distally, densely covered with yellow hairs.

Terminalia (Fig. 6): tergite IX (Fig. 6AB) constricted medially, with dorsal conical projection directed dorsally to posterodorsally in lateral view; ectoproct triangular in lateral view. Genitalia (Fig. 6CD): gonarcus with two pairs of prominences posteriorly, both pairs of prominences almost same size in lateral view.

Length: B, 10–13; A, 7–8; FW, 20–27; HW, 18–24.

Female. Coloration and general morphology, except terminalia, almost as in male. Terminalia (Fig. 7): posteroventral surface of sternite VII with central concave in ventral view, which sometimes extended into sternite VIII, and posterior margin overlapped with anterior margin of sternite VIII (Fig. 7B); tergite VIII broad, trapezoidal, anterovental angle articulating with posterodorsal portion of sternite VII in lateral view; sternite VIII small, triangular in lateral view; tergite IX narrow, constricted adjacent to callus cerci, ventrally tapered and articulated with gonapophysis lateralis, anteroventral margin with process in lateral view; ectoproct triangular in lateral view; gonapophysis lateralis expanded medially, tapered anteriorly in lateral view; spermatheca (Fig. 7D) oval.

Length: B, 11–14; A, 7–8; FW, 21–26; HW, 19–23.

Type locality: Japan: “Yokohama” and “Kobé”.

Specimens examined (dried). [Hokkaido] 1 female, Toikanbetsu, 12. viii. 1965, TU et al.; 1 male, Siretoko, 10–17. vii. 1965, TU et al.; 1 male, Iwaobetsu-gawa Riv., 9. vii. 2003, SS; 1 female, Mt. Chubetsu-dake, 28. vii–3. viii. 1975, M. Suwa et al.; 1 male, Nukabira, 19. viii. 1974, T. Hattori; 1 female, Bikuni, Shakotan, 16. vii. 2005, TA; 1 female, Satsunaigawa-enchi, Nakasatsunai, 30. vii. 2004 (on light), G. Ito; 1 female, Mirutoichino-sawa, Kurisawa, 15. viii.

2003, SS; 3 males, same locality, 21. viii. 2003, SS; 1 male 1 female, Zenibako, Otaru, 30. vi. 1976, A. Sakai; 1 female, Mt. Teine-yama, Sapporo, 12. viii. 2003, TA; 1 female, Heiwanotaki, Kotonihassamu-gawa Riv., Sapporo, 18. vi. 2003, SS; 1 male, same locality, 2. vii. 2003, SS; 1 female, Mt. Maru-yama, Sapporo, 13. vii. 2004, SS; 1 male, Hyakumatsuzawa, Sapporo, 20. viii. 2001, TY; 4 males 2 females, Jozankei, Sapporo, 9. ix. 1970, TU; 1 male 1 female, same locality, 13. viii. 1974, T. Hattori; 1 male, Toya, 14. vi. 1967, M. Miyazaki; 1 male 1 female, Gamushi, Assabu, 12. vii. 1958, collector unknown; 1 male, Shiriuchi, 21. vi. 1976, TU et al.; 3 females, Mt. Sengen-dake, 4–6. ix. 1970, ST; 1 male, same locality, 6. ix. 1970, M. Suwa. [Honshu] 1 female, Sarusawa, Asahi, Niigata, 14. ix. 2003, SS; 2 males, Gosha Riv., Tagami, Niigata, 12. ix. 2003, SS; 1 male, Okura Riv., Tagami, Niigata, 12. ix. 2003, SS; 3 males 2 females, Nakabusa Spa, Nagano, 30. vii. 1973, ST; 1 ex, Kozagawa, Wakayama, 14–20. v. 1964, TU. [Kyushu] 1 male, Mt. Hiko-san, Fukuoka, 21. vi. 1965, TU; 1 ex, Kusugi-dani, Yakushima Is., 7–10. vi. 1965, TU.

Specimens examined (ethanol). [Hokkaido] 1 male 1 female, Mikaeridai park, Rishiri Is., 16–18. vii. 2001 (MT), KU et al.; 1 male 2 females, Nukamappu-gawa Riv., 30. vi–13. vii. 2001 (MT), KU; 7 males, same locality, 13. vii–17. x. 2001 (MT), KU; 7 males 7 females, Shunkunbetsu-gawa Riv., Shari, 13. vii–17. x. 2001 (MT), KU; 1 female, Onkozawa-gawa Riv., Furano, 13–20. vii. 2004 (MT), AO; 2 males 1 female, same locality, 4. viii. 2004 (MT), AO; 2 males 1 female, same locality, 11–22. viii. 2004 (MT), AO; 1 male 1 female, Maruyama-zawa, Furano, 13–20. vii. 2004 (MT), AO; 1 male 1 female, same locality, 11. viii. 2004 (MT), AO; 1 male, same locality, 11–22. viii. 2004 (MT), AO; 1 male, Modori-zawa, Furano, 5–13. vii. 2005 (MT), AO; 1 male 1 female, same locality, 13–20. vii. 2005 (MT), AO; 1 female, same locality, 26–31. viii. 2005 (MT), AO; 1 female, Iwanazawa-gawa Riv., Furano, 27. vii. 2004 (MT), AO; 1 female, same locality, 13–20. vii. 2004 (MT), AO; 2 males 2 females, Yutomuraushi Riv., (alt. 700m), Shintoku, 20–23. vii. 1999 (MT), K. Endo; 1 male, Takkobu-numa, Kushiro, 3–28. viii. 2005, T. Ito; 2 females, same locality, 7. viii–13. ix. 2002 (MT), TY; 5 males 5 females, Miyanomori, Sapporo, 27. vi. 2000 (MT), KU; 1 male 2 females, same locality, 11. vii. 2000 (MT), KU; 4 males 7 females, same locality, 18. vii. 2000 (MT), KU; 2 males 2 females, same locality, 25. vii. 2000 (MT), KU; 1 male 3 females, same locality, 1. viii. 2000 (MT), KU; 2 males, same locality, 8. viii. 2000 (MT), KU; 2 males 3 females, Kannon-zawa, Sapporo, 27. vi. 2000 (MT), KU; 2 males 3 females, same locality, 4. vii. 2000 (MT), KU; 1 male 2 females, same locality, 11. vii. 2000 (MT), KU; 1 male 4 females, same locality, 18. vii. 2000 (MT), KU; 1 female, same locality, 25. vii. 2000 (MT), KU; 1 female, same locality, 3. ix. 2000 (MT), KU; 1 male, same locality, 3–22. vii. 2002 (MT), TY; 1 female, same locality, 22. vii–7. viii. 2002 (MT), TY; 1 male, Hyakumatsu-zawa, Sapporo, 16–23. vi. 1998 (MT), KM et al.; 2 males, same locality, 18–26. vi. 1998 (MT), KM et al.; 3 males 2 females, same locality, 30. vi–7. vii. 1998 (MT), KM et al.; 2 males 3 females, same locality, 14. vii. 1998 (MT), KM et al.; 3 males 1 female, same locality, 21–29. vii. 1998 (MT), KM et al.; 1 female, same locality, 18–26. viii. 1998 (MT), KM et al.; 2 males 3 females, same locality, 27. vi. 2000 (MT), KU; 3 females, same locality, 4. vii. 2000 (MT), KU; 2 males 3 females, same locality, 11. vii. 2000 (MT), KU; 5 males 1 female, same locality, 18. vii. 2000 (MT), KU; 1 male 1 female, same locality, 1. viii. 2000 (MT), KU; 1 male, same locality, 21. viii. 2000 (MT), KU; 3 males 1 female, same locality, 30. vi–7. vii. 2001 (MT), TY; 3 males 1 female, same locality, 7–12. vii. 2001 (MT), TY; 3 males 1 female, same locality, 12–28. vii. 2001 (MT), TY; 3 males 1 female, same locality, 4–18. viii. 2001 (MT), TY; 1 male, same locality, 18–24. viii. 2001 (MT), TY; 1 male 4 females, same locality, 5. vii–28. viii. 2002 (MT), KU; 1 male 1 female, Bankei-sawa, Sapporo, 2. vii. 2004, SS; 1 male 9 females, Nopporo, Ebetsu, 4. vii. 2000 (MT), KU; 3 males 6 females, same locality, 11. vii. 2000 (MT), KU; 5 males 1 female, same locality, 18. vii. 2000 (MT), KU; 2 females, same locality, 25. vii. 2000 (MT), KU; 2 females, same locality, 1. viii. 2000 (MT), KU; 1 male, same locality, 11. viii. 2000 (MT),

KU; 3 males 1 female, N. F. P. Shinnopporo-sen, Ebetsu, 22. vi. 2003, D. Sumikawa; 2 females, same locality, 28. vi. 2003, D. Sumikawa; 1 female, same locality, 11. vii. 2003, D. Sumikawa; 1 female, same locality, 17. viii. 2003, D. Sumikawa; 1 male, same locality, 31. viii. 2003, D. Sumikawa; 1 female, Lake Shikotsu-ko, Chitose, 28. vii. 2000 (MT), KU; 1 male 1 female, same locality, 11. viii. 2000 (MT), KU; 1 male 2 females, same locality, 28. viii. 2000 (MT), KU; 1 female, Mt. Raiba-dake, Noboribetsu, 23–30. vi. 2002 (MT), TY; 4 males 9 females, same locality, 30. vi–15. vii. 2002 (MT), TY; 2 males 5 females, same locality, 28. vii–11. viii. 2002 (MT), TY; 1 male, Kozan-cho, Noboribetsu, 30. vi–15. vii. 2002 (MT), TY; 3 males 1 female, same locality, 14–28. vii. 2002 (MT), TY; 1 female, Mt. Washibetsu-dake, Muroran, 16–22. vi. 2002 (MT), TY; 1 male 2 females, same locality, 30. vi–15. vii. 2002 (MT), TY; 1 male 6 females, same locality, 28. vii. 2002 (MT), TY; 1 female, same locality, 28. vii–11. viii. 2002 (MT), TY. [Honshu] 1 female, Musa-zawa, Taiwa, Miyagi, 24. viii. 2003, I. Ohshima; 1 female, Kawauchi, Sendai, Miyagi, 7. vi. 2003, I. Ohshima; 1 female, Kiyokawa, Izumi, Sendai, Miyagi, 18. vi. 2003, I. Ohshima.

Distribution. Japan (Hokkaido, Rishiri Is., Kunashiri Is., Honshu, Shikoku, Kyushu, Yakushima Is.); Russian Far East (Sakhalin).

Remarks. This species is similar to *Osmylus zheanus* (Yang & Liu, 2001) n. comb. from Zhejiang, China but is different from it by the shape of the female sternite VII (Fig. 7AB: posteroventral surface with median concavity in *O. hyalinatus*, but with sclerotized prominences in *O. zheanus*).

Osmylus (*Osmylus*) *decoratus* Nakahara
(Figs 1C, 8, 9)

Osmylus decoratus Nakahara, 1914: 626; Makarkin, 1985: 41, figs. 2, 12, 13, 26; 1990: 37; 1995: 44, 45, figs. 2, 3, 7, 11.

Osmylus decoratus: Matsumura, 1907: 172 (not *Osmylus hyalinatus* McLachlan, 1875).

Plethosmylus (*Osmylus*) *hyalinatus*: Matsumura, 1933: 5(8), pl. 2, fig. 1 [not *Plethosmylus* (*Osmylus*) *hyalinatus* (McLachlan, 1875)].

Plethosmylus hyalinatus: Krüger, 1915: 76; Kuwayama, 1962: 343 [not *Plethosmylus hyalinatus* (McLachlan, 1875)].

Redescription. Male. Head. Vertex yellow, moderately raised; occiput yellow; ocelli whitish-yellow to yellow, ocellar field dark brown, with several pale hairs; frons dorsally brown to dark brown, with dark brown X-shaped marking at middle, ventrally yellow; gena yellow; clypeus yellow, whitish-yellow along ventral margin, sparsely covered with pale hairs. Antenna black, densely covered with short pale hairs; flagellum comprising approximately 50 segments. Mouthparts yellow; labrum pale brown, with several pale hairs ventrally.

Thorax. Pronotum blackish-brown, broad, slightly broadened posteriorly, with median yellow longitudinal band. Mesonotum blackish-brown, paler posteriorly; mesoscutum with yellow portion centrally. Metanotum blackish-brown; metascutellum paler. Mesopleuron and metapleuron brown to dark brown. Hairs on nota pale.

Legs. Pale yellow, densely covered with pale yellow and pale brown hairs; mid and hind coxae pale yellow to brown; tibiae approximately as long as femora in fore- and midlegs, longer than femur in hindleg, fore and mid tibiae with dark line on dorsal surface, sometimes faint; spurs reddish-brown, short; tarsi much shorter than tibiae, Ta5 dark distally; claws reddish-brown, strongly curved, with row of small teeth on outer

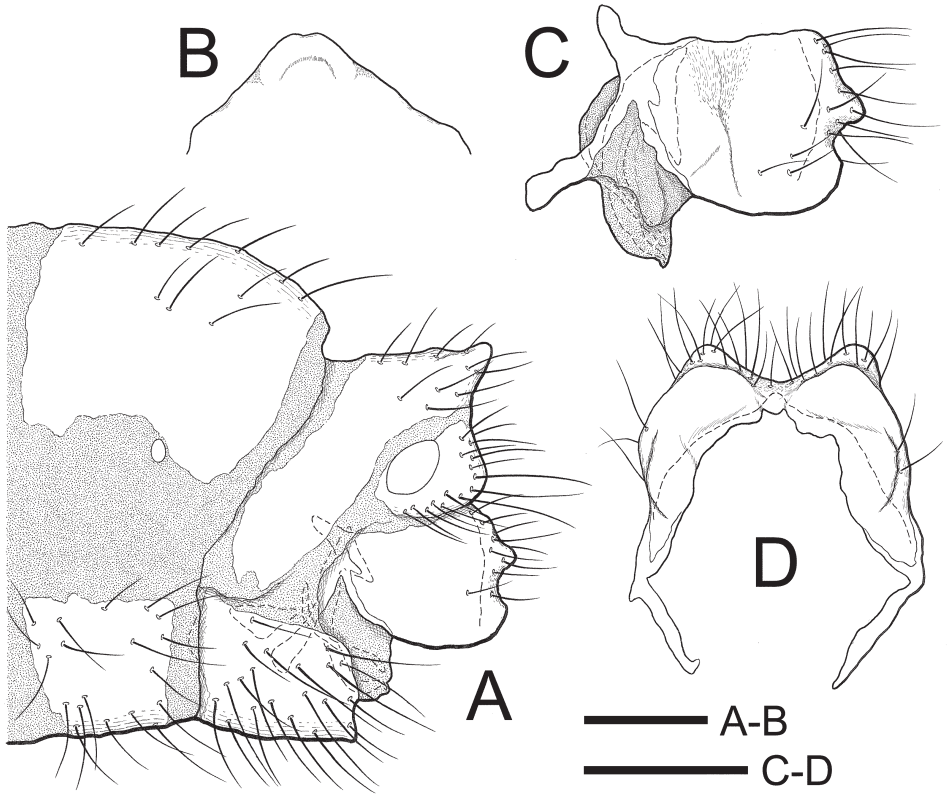

Fig. 8. Male terminalia of *Osmylus* (*Osmylus*) *decoratus*. A. Terminalia, lateral view. B. Dorsal projection of tergite IX, dorsal view. C. Genitalia, lateral view. D. Ditto, ventral view. (parameres omitted) [Scale: 1 mm.]

edge.

Wings (Fig. 1C). Subacute at apex, posterodistal margin sometimes slightly falcate, broad. Veins pale and dark, Sc and R pale yellow, sometimes with several dark parts distally, densely covered with brown hairs. Forewing with small grayish-brown patch at apex. Posterior margin irregularly clouded with gray. Distal nygma dark. Some costal crossveins often linked by short transverse veins. Pterostigma pale yellow, with dark patches. Hindwing without markings, except for pale yellow pterostigma with dark patches.

Abdomen. Dark brown to blackish-brown, yellow distally, densely covered with yellow hairs.

Terminalia (Fig. 8): tergite IX (Fig. 8AB) constricted adjacent to callus cerci, with posterodorsal projection directed dorsally in lateral view, anterior surface with small shallow concave near apex in dorsal view; ectoproct triangular in lateral view. Genitalia (Fig. 8CD): gonarcus with two pairs of prominences posteriorly, both pairs of prominences almost same size in lateral view.

Length: B, 12–15; A, 7–8; FW, 23–25; HW, 20–23.

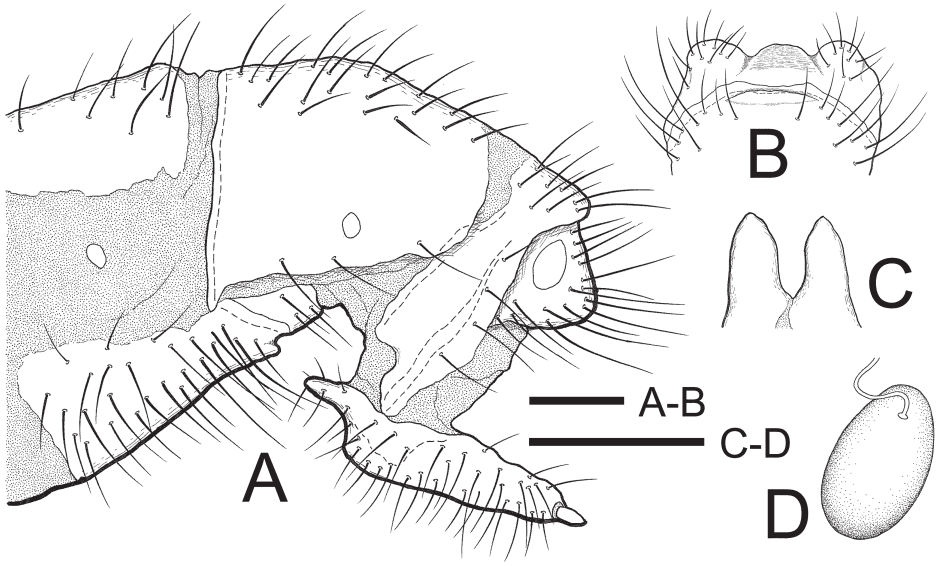

Fig. 9. Female terminalia of *Osmylus* (*Osmylus*) *decoratus*. A. Terminalia, lateral view. B. Sternite VII and VIII, ventral view. C. Anterior apex of gonapophysis lateralis, ventral view. D. Spermatheca. [Scale: 1 mm.]

Female. Coloration and general morphology, except terminalia, almost as in male. Terminalia (Fig. 9): sternite VII (Fig. 9AB) with preapical small prominence posteroventrally, posterior margin overlapped with anterior margin of sternite VIII; tergite VIII broad, anteroventral angle protruding ventrally and articulating with posterodorsal portion of sternite VII in lateral view; sternite VIII (Fig. 9AB) small, triangular in lateral view, posteriorly with pair of lateral hairy prominences and median semicircular portion in ventral view; tergite IX narrow, constricted adjacent to callus cerci, ventrally tapered and articulated with gonapophysis lateralis, anteroventral margin with process in lateral view; ectoproct triangular in lateral view; gonapophysis lateralis tapered anteriorly in lateral view, pair of anterior projections cone-shaped in ventral view (Fig. 9C); spermatheca (Fig. 9D) oval.

Length: B, 13–15; A, 7–8; FW, 23–25; HW, 21–22.

Type locality: Japan: ”Kusakimura, Prov. Harima”, “Prov. Wakasa” and “Prov. Chikugo, Kiushiu”.

Specimens examined (dried). [Hokkaido] 1 male, Bikuni, Shakotan, 16. vii. 2005, TA; 1 female, Asari-dam, Otaru, 14. vii. 2005, SS; 1 female, Mt. Maru-yama, Sapporo, 16. vi. 2003, TA; 1 female, Ashiribetsu, Sapporo, 13. vi. 1970, ST; 5 males 23 females, Satsunaigawa-enchi, Nakasatsunai, 30. vii. 2004 (on light), G. Ito.

Specimens examined (ethanol). [Hokkaido] 1 male, Shunkunbetsu-gawa Riv., Shari, 13. vii–17. x. 2001 (MT), KU; 1 female, Onko-zawa, Furano, 5–13. vii. 2005 (MT), AO; 1 male, same locality, 13–20. vii. 2005 (MT), AO; 1 male 1 female, same locality, 27. vii. 2005 (MT), AO; 1 female, Maruyama-zawa, Furano, 28. vi–5. vii. 2005 (MT), AO; 1 female, same locality, 13–20. vii. 2005 (MT), AO; 1 female, same locality, 20–27. vii. 2005 (MT), AO; 1 male, same locality, 11. viii. 2005 (MT), AO; 2 males, Modori-zawa, Furano, 5–13. vii. 2005 (MT), AO; 1 male, same

locality, 13–20. vii. 2005 (MT), AO; 5 males 2 females, same locality, 27. vii. 2005 (MT), AO; 3 males 1 female, Yutomuraushi-gawa Riv., (alt. 700m), Shintoku, 20–23. vii. 1999 (MT), K. Endo; 1 female, Takkobu-numa, Kushiro, 3–28. viii. 2005, T. Ito; 1 male, Miyanomori, Sapporo, 11. vii. 2000 (MT), KU; 1 female, same locality, 18. vii. 2000 (MT), KU; 1 female, same locality, 1. viii. 2000 (MT), KU; 2 males, N. F. P. Shinnopporo-sen, Ebetsu, 28. vi. 2003, D. Sumikawa; 1 female, Aioi bridge, Uzura-gawa Riv., Assabu, 22. vi. 2003 (LT), AO.

Distribution. Japan (Hokkaido, Kunashiri Is., Honshu); Russian Far East.

Remarks. This species is similar to *Osmylus zheanus* (Yang & Liu, 2001) from Zhejiang, China but is different from it by the small grayish-brown patch at apex of forewing (Fig. 1C).

Subgenus *Plesiosmylus* Makarkin

Plesiosmylus Makarkin, 1985: 41. Type species: *Osmylus tessellatus* McLachaln, 1875: 180, original designation.

Diagnosis. Male tergite IX unmodified (Fig. 10A); scent-glands composed of dark slender eversible tube, which dichotomous distally (Fig. 2CD); gonarcus sparsely covered with hairs posteriorly (Fig. 10BC); female fore coxa without prominence; female sternite VIII unmodified (Fig. 11AB).

Remarks. The subgenus *Plesiosmylus* was erected under the genus *Osmylus* by Makarkin (1985), which is characterized by the following character states: unmodified male tergite IX; female fore coxa without prominence; unmodified female sternite VIII. Makarkin (1985) pointed out that the character states defining *Plesiosmylus* are all plesiomorphic, which is also confirmed in the present examinations. The genus is now represented only by a single species but, *Plesiosmylus* may become a paraphyletic taxon in the future.

Osmylus (*Plesiosmylus*) *tessellatus* McLachlan
(Figs 1D, 2CD, 10, 11)

Osmylus tessellatus McLachlan, 1875: 180; Kuwayama, 1962: 342; 1967: 65.

Osmylus? tessellatus: Krüger, 1913b: 204.

Osmylus (*Plesiosmylus*) *tessellatus*: Makarkin, 1985: 41, figs. 7, 16, 28; 1990: 37; 1995: 44, 45, figs. 4, 8.

Redscription. Male. Head. Vertex shiny blackish-brown, except for narrow whitish-yellow to yellow band along dorsal eye margin, usually with central yellow portion, moderately raised; occiput yellow, dorsally blackish-brown; occipital suture bordered with narrow yellow band; ocelli white to whitish-yellow, ocellar field blackish-brown, with several pale hairs; frons whitish-yellow, with downward furcated blackish-brown marking at middle; gena whitish-yellow; clypeus whitish-yellow, sparsely covered with pale hairs. Antenna black, densely covered with short pale hairs; scape, pedicel and first flagellum sometimes with yellow portion on outer surface; flagellum comprising approximately 50 segments. Mouthparts yellow; labrum pale brown, with several pale hairs ventrally; maxillary and labial palpi dark brown.

Thorax. Pronotum black, medially with rather slender yellow marking on anterior

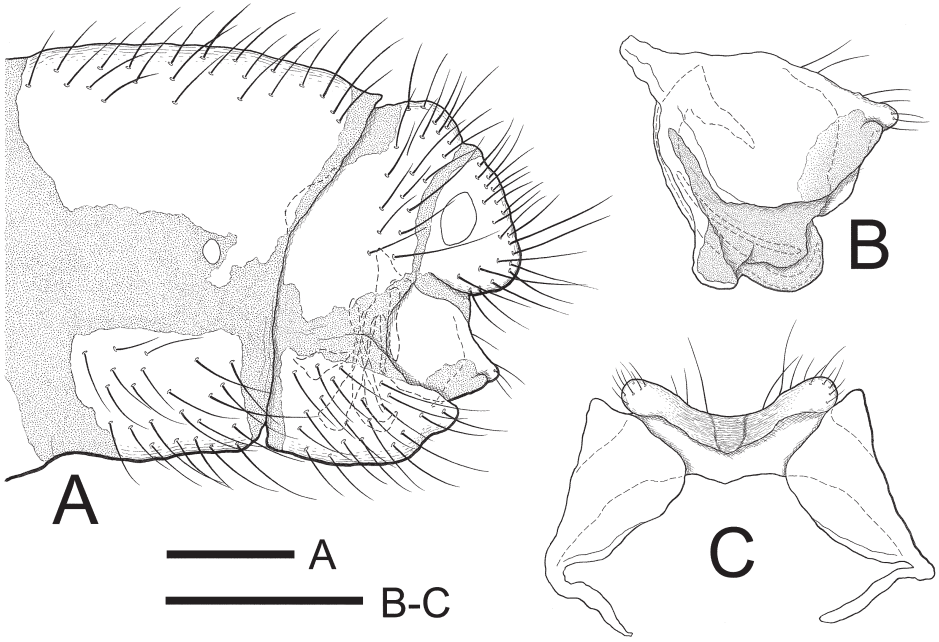

Fig. 10. Male terminalia of *Osmylus* (*Plesiosmylus*) *tessellatus*. A. Terminalia, lateral view. B. Genitalia, lateral view. C. Ditto, ventral view. (parameres omitted) [Scale: 1 mm.]

half and yellow spot over posterior margin and following membrane, sometimes with posterolateral pair of brown spots, slender, slightly broadened posteriorly, with dark hairs. Mesonotum blackish-brown to black, with dark hairs. Metanotum blackish-brown to black, with yellow hairs. Mesopleuron and metapleuron dark brown on dorsal half, pale brown to brown on ventral half, with yellow hairs.

Legs. Pale yellow, densely covered with pale yellow and pale brown hairs; tibiae approximately as long as femora in fore- and midlegs, longer than femur on hindleg, faintly dark brown at apex, with small dark spot on dorsal surface medially; spurs reddish-brown, short; tarsi much shorter than tibiae, pale yellow to pale brown, Ta5 dark; claws reddish-brown, strongly curved, with row of small teeth on outer edge.

Wings (Fig. 1D). Subacute at apex, posteroapical margin smoothly rounded. Veins densely covered with brown hairs. Forewing veins mostly dark brown to blackish-brown, dotted with some whitish-yellow parts, broadly margined with grayish-brown, membrane irregularly clouded with grayish-brown, giving checkered appearance. Sc and R irregularly alternating pale yellow and dark brown, small dark brown spot under single Sc-R1 crossvein. Nygmata both grayish-brown. Pterostigma pale yellow, with dark patches. Few costal crossveins linked by short transverse veins. Hindwing veins mostly dark brown, with some small pale spots, almost without markings, except for pale yellow pterostigma with dark patches.

Abdomen. Dark brown to black, densely covered with yellow hairs, with a longitudinal row of yellow spots on abdominal membrane laterally.

Terminalia (Fig. 10): tergite IX (Fig. 10A) constricted adjacent to callus cerci, with

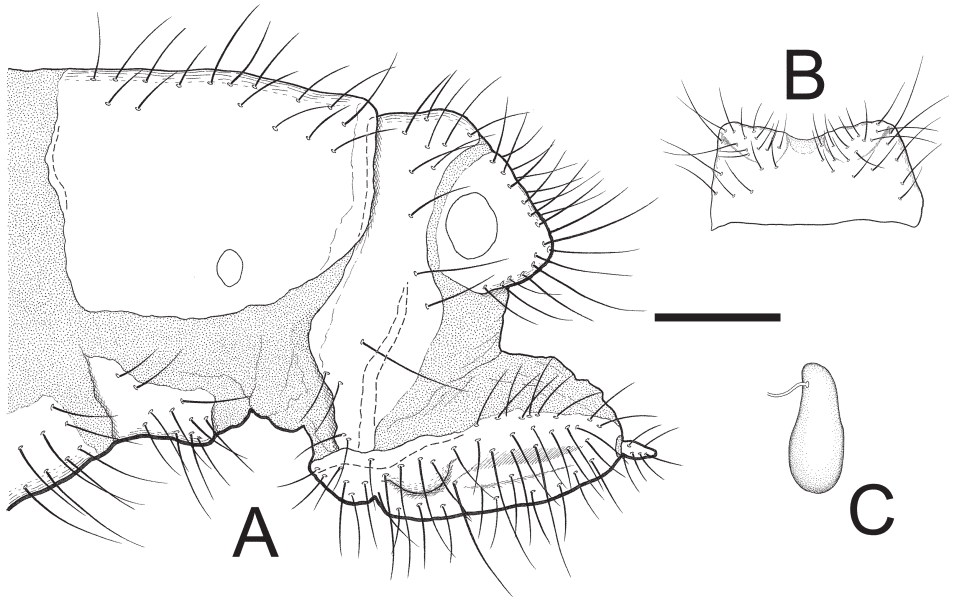

Fig. 11. Female terminalia of *Osmylus* (*Plesiosmylus*) *tessellatus*. A. Terminalia, lateral view. B. Sternite VIII, ventral view. C. Spermatheca. [Scale: 1 mm.]

slightly rounded to almost straight dorsal margin in lateral view; ectoproct with rounded posteroventral margin in lateral view. Genitalia (Fig. 10BC): gonarcus with two pairs of prominences posteriorly, upper rounded one bearing hairs, and with membranous region posteroventrally including lower prominence in lateral view, posteromedian portion lobed ventrally.

Length: B, 10–16; A, 6–8; FW, 20–23; HW, 18–20.

Female. Coloration and general morphology, except terminalia, almost as in male. Terminalia (Fig. 11): tergite VIII broad, trapezoidal in lateral view; sternite VIII (Fig. 11AB) almost quadrate in lateral view; tergite IX narrow, constricted adjacent to callus cerci, ventrally articulated with gonapophysis lateralis in lateral view; ectoproct with round posterior margin in lateral view; gonapophysis lateralis with lateral nodes near articulation with tergite IX in lateral view; spermatheca (Fig. 11C) cylindrical, slightly constricted near spermathecal duct.

Length: B, 13–18; A, 7–9; FW, 22–25; HW, 19–23.

Type locality: Japan: “Yokohama”.

Specimens examined (dried). [Hokkaido] 1 male, Iwaobetsu-gawa Riv., Shari, 9. vii. 2003, SS; 3 males, same locality, 10. vii. 2003, SS; 1 male, Rubeshibe, 29. vii. 1974, TU; 1 female, Mt. Minamishokanbetsu-dake, (alt. 550m), Shokanbetsu park, 20. vii. 1984, TU; 4 males 3 females, Honhoronai-gawa Riv., Mikasa, 15. viii. 2003, SS; 3 males 2 females, Shikoro-zawa, Kurisawa, 21. viii. 2003, SS; 6 males 3 females, Mirutoichino-sawa, Kurisawa, 6. viii. 2003, SS; 1 male, same locality, 15. viii. 2003, SS; 3 females, same locality, 21. viii. 2003, SS; 7 males 1 female, Hariusu-gawa Riv., Otaru, 16. viii. 2003, SS; 3 males, Zenibako-gawa Riv., Otaru, 16. viii. 2003, SS; 1 female, Sapporo, 6. vii. 1971, A. Kubota; 1 female, Heiwanotaki, Kotonihassamu-gawa Riv., Sapporo, 18. vi. 2003, SS; 8 males 3 females 1ex, same locality, 2. vii. 2003, SS; 1 male 1ex, same

locality, 7. vii. 2004, SS; 5 males 3 females, same locality, 18. vii. 2003, SS; 1 male, Kannon-zawa, Sapporo, 14. vi. 2003, SS; 8 males 6 females 1ex, Kannon-zawa, Sapporo, 24. vi. 2003, SS; 10 males 8 females, same locality, 27. vi. 2003, SS; 9 males 3 females, same locality, 1. viii. 2003, SS; 3 males 3 females, Hidarimata-zawa, Sapporo, 1. viii. 2003, SS; 1 female, Otarunai-gawa Riv., Sapporo, 26. vii. 1976, M. Furukawa; 3 females, same locality, 29. vi. 1976, TU; 1 female, Takino, Sapporo, 24. vi. 1972, T. Hattori; 1 female, Ashiribetsu, Sapporo, 30. vi. 1962, ST; 7 males 4 females, Bankei-zawa, Sapporo, 29. vii. 2003, SS; 1 male 1 female, Oyachi, Kyowa, 1. vii. 1995, M. Ohara et al.; 2 females, Satsunaigawa-enchi, Nakasatsunai, 30. vii. 2004 (on light), G. Ito; 1 male, Mt. Poroshiri-dake, (alt. 500m), 24. vii. 1967, TU; 2 females, Mt. Sengen-dake, 4-6. ix. 1970, ST. [Honshu] 1 male, Sanai-zawa, Ajigasawa, Aomori, 10. vi, year and collector unknown; 1 male, Sarusawa, Asashi, Niigata, 14. ix. 2003, SS; 1 male, Gosha-gawa Riv., Tagami, Niigata, 12. ix. 2003, SS; 4 males 6 females, Kazegoshi-gawa Riv., Gosen, Niigata, 12. ix. 2003, SS; 2 males 1 female, Okura-gawa Riv., Gosen, Niigata, 12. ix. 2003, SS; 1 female, Nakabusa Spa, Nagano, 30. vii. 1973, ST. [Shikoku] 1 male, Okuyarido, Kizawa, Tokushima, 7. viii. 1996, T. Beppu.

Specimens examined (ethanol). [Hokkaido] 1 male 1 female, Nukamappu-gawa Riv., Shari, 30. vi–13. vii. 2001 (MT), KU; 1 male, same locality, 13. vii–17. x. 2001 (MT), KU; 1 male 2 females, Shunkunbetsu-gawa Riv., Shari, 13. vii–17. x. 2001 (MT), KU; 5 females, Yutomuraushi Riv., (alt. 700m), Shintoku, 20–23. vii. 1999 (MT), K. Endo; 2 males, Onkozawa-gawa Riv., Furano, 28. vi–5. vii. 2004 (MT), AO; 1 female, same locality, 5–13. vii. 2005 (MT), AO; 1 male 1 female, same locality, 13–20. vii. 2005 (MT), AO; 1 female, same locality, 27. vii. 2005 (MT), AO; 1 male, same locality, 4. viii. 2005 (MT), AO; 1 male, Maruyama-zawa, Furano, 11. viii. 2005 (MT), AO; 1 female, Mirutoichino-sawa, Kurisawa, 21. viii. 2003, SS; 2 males 2 females, Shikoro-zawa, Kurisawa, 21. viii. 2003, SS; 3 males 1 female, Hariusu-gawa Riv., Otaru, 16. viii. 2003, SS; 1 male 1 female, Zenibako-gawa Riv., Otaru, 16. viii. 2003, SS; 1 female, Kannon-zawa, Sapporo, 9–26. vi. 2002 (MT), TY; 1 male 1 female, same locality, 27. vi. 2003; 1 male 1 female, Hyakumatsu-zawa, Sapporo, 16–23. vi. 1998 (MT), KM et al.; 1 female, same locality, 23–28. vi. 1998 (MT), KM et al.; 4 males 3 females, same locality, 30. vi–7. vii. 1998 (MT), KM et al.; 3 males 5 females, same locality, 14. vii. 1998 (MT), KM et al.; 2 males 3 females, same locality, 21–29. vii. 1998 (MT), KM et al.; 1 male, same locality, 18–26. viii. 1998 (MT), KM et al.; 1 male, Mt. Washibetsu-dake, Muroran, 28. vii. 2002 (MT), TY; 1 male, Aioi-suigenchi, Assabu, 22. vi. 2003, T. Ito et al.; 1 male, Hekirichigoe bridge, Ono-gawa Riv., Ono, 23. vi. 2003, AO. [Honshu] 1 male 2 females, Kiyokawa, Izumi, Sendai, Miyagi, 18. vi. 2003, I. Ohshima; 1 male 2 females, Masuzawa, Sendai, Miyagi, 20. viii. 2003, I. Ohshima; 2 males 2 females, Kazegoshi-gawa Riv., Gosen, Niigata, 12. ix. 2003, SS.

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

Remarks. This species is similar to *Osmylus xizangensis* Yang, 1988 from Xizang, China, but is different from it in the absence of distal brown portion of femora. In having the lateral nodes of female gonapophysis lateralis (Fig. 11A), this species is similar to *Osmylus fuberosus* Yang, 1997 from Hubei, China, but is different from it in the shape of ectoproct and anterior portion of female gonapophysis lateralis (Fig. 11A).

Unplaced species

Osmylus kisoensis Iwata

Osmylus kisoensis Iwata, 1928: 216.

Type locality: Japan: “Narai river, Sogamura, Nagano-ken”.

Remarks. This species was described based on a single larval specimen. Because no adult stage of this species is known, the species is here treated as *incertae sedis*.

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References

Banks, N. 1913. Synopses and descriptions of exotic Neuroptera. Transactions of the American Entomological Society 39: 201–242.

Fabricius, J. C. 1787. Mantissa Insectorvm sistens eorvm species nvper detectas adjectis characteribvs genericis, differentiis specificis, emendationibvs, observationibvs. Hafniae. Tome 1.

Hayashi, F. 2005. Neuroptera. In Kawai, T., Tanida, K. (eds.). Aquatic Insects of Japan: manual with keys and illustrations. Tokai University Press, Kanagawa, Japan, Pp. 387–392. (In Japanese.)

Iwata, M. 1928. A new hemerobiid larva (Neuroptera), *Osmylus kisoensis*, n. sp. Kontyû 2: 215–220. (In Japanese with English summary.)

Kato, M. 1933. Three colour illustrated insects of Japan. 5. Koseikaku Co., Tokyo. (In Japanese.)

Krüger, L. 1913a. Osmylidae. Beiträge zu einer Monographie der Neuropteren-Familie der Osmyliden. II. Charakteristik der Familie, Unterfamilien und Gattungen auf Grund des Geäders. Stettiner Entomologische Zeitung 74: 3–123.

Krüger, L. 1913b. Osmylidae. Beiträge zu einer Monographie der Neuropteren-Familie der Osmyliden. III. Literatur und Katalog. Stettiner Entomologische Zeitung 74: 193–224.

Krüger, L. 1915. Osmylidae. Beiträge zu einer Monographie der Neuropteren-Familie der Osmyliden. VIII. Anhang II. Stettiner Entomologische Zeitung 76: 60–87.

Kuwayama, S. 1953. Insect fauna of Mt. Ishizuchi and Omogo Valley, Iyo, Japan: the Neuroptera. Transactions of the Shikoku Entomological Society 3: 177–180.

Kuwayama, S. 1962. A revisional synopsis of the Neuroptera in Japan. Pacific Insects 4: 325–412.

Kuwayama, S. 1967. Insect fauna of the southern Kurile islands. Hokunokai, Sapporo. (In Japanese.)

Latreille, P. A. 1802. Histoire naturelle, générale et particulière des Crustacés et des Insectes. Vol. 3. Dufart, Paris.

Makarkin, V. N. 1985. Review of the family Osmylidae (Neuroptera) of the fauna of the USSR. In Lehr, P. A., Storozhenko, S. Y. (eds.) Taxonomy and ecology of arthropods from the Far East. Collected scientific papers. Far Eastern Scientific Centre, Vladivostok, Pp. 35–47, 129. (In Russian.)

Makarkin, V. N. 1990. A check-list of the Neuroptera-Planipennia of the USSR Far East, with some taxonomic remarks. Acta Zoologica Hungarica 36: 37–45.

Makarkin, V. N. 1995. Order Neuroptera. In Lehr, P. A. (ed.) Key to the insects of Far East Russia in six volumes. Vol. 4 (Neuropteroidea, Mecoptera, Hymenoptera). Part 1. "Nauka", St. Petersbug, Pp. 37–68. (In Russian.)

Matsumura, S. 1907. Systematic Entomology. Vol. 1. Keiseisha Co., Tokyo. (In Japanese.)
Matsumura, S. 1931. 6000 illustrated insects of Japan-Empire. Tokoshoin Co., Tokyo. (In Japanese.)
Matsumura, S. 1933. Illustrated common insects of Japan. Vol. 5. (Neuroptera, Orthoptera, Odonata). Shunyudo Co., Tokyo. (In English and Japanese.)
McLachlan, R. 1870. New species, & c., of Hemerobiina – second series (*Osmylus*). Entomologist's Monthly Magazine 6: 195–201.
McLachlan, R. 1875. A sketch of our present knowledge of the neuropterous fauna of Japan (excluding Odonata and Trichoptera). Transactions of the Entomological Society of London 23: 167–190.
Nakahara, W. 1913. Scientific name of the Osmylidae referred to in the Japanese literature. Zoological Magazine 25: 625–626. (In Japanese.)
Nakahara, W. 1914. On the Osmylinae of Japan. Annotationes Zoologicae Japonenses 8: 489–518.
Navás, L. 1910. Osmylides exotiques (insectes névroptères) nouveaux. Annales de la Société Scientifique de Bruxelles 34(pt. 1): 188–195.
Navás, L. 1928. Insectos del Museo de Hamburgo. Primera serie. Bolet ín de la Sociedad Entomologica de España 11: 59–67, 90-100, 121-138.
New, T. R. 1989. The genus *Oedosmylus* Krüger (Insecta: Neuroptera: Osmylidae). Invertebrate Taxonomy 3: 135–148.
Oswald, J. D. 2007. A catalogue of the species-group names of the extant and fossil neuropterida (Insecta: Neuroptera, Megaloptera and Raphidioptera) of the world. Version 2.00 (posted 31 October 2007). http://lacewing. tamu. edu/Species-Catalogue/
Walker, F. 1860. Characters of undescribed Neuroptera in the collection of W. W. Saunders. Transactions of the Entomological Society of London 10 [= (N. S.) 5]: 176–199.
Wang, Y. J. & Liu, Z. Q. 2010. New species of *Osmylus* Latreille from Henan, China (Neuroptera: Osmylidae). Zootaxa 2363: 60–68.
Yang, C. K. 1988. Neuroptera: Osmylidae, Dilaridae, Hemerobiidae, Chrysopidae, Mantispidae, Myrmeleontidae, Ascalaphidae, Corydalidae. In Huang, F. S. et al. (eds.). Insects of Mt. Namjagbarwa region of Xizang. Science Press, Beijing, Pp. 193–216. (In Chinese with English summary.)
Yang, C. K. 1997. Neuroptera: Osmylidae. In Yang, X. K. (ed.). Insects of the Three Gorge Reservoir area of Yangtze river. Vol. 1. Chongqing Publishing House, Chongqing, China, Pp. 580–583. (In Chinese with English summary.)
Yang, C. K. and Liu, Z. Q. 2001. Neuroptera: Hemerobiidae and Osmylidae. In Wu, H. (ed.). Insects of Tianmushan National Nature Reserve. Science Press, Beijing, Pp. 296–305. (In Chinese with English summary.)

Appendix. Proposals of new combinations for Chinese species.

As discussed in the Remarks under the genus *Osmylus*, the synonymy between *Plethosmylus* and *Osmylus*, originally proposed by Nakahara (1914), is reconfirmed here. Yang (1988) and Yang & Liu (2001) did not accept this synonymy, and the following two Chinese species were described under the genus *Plethosmylus*. For these species, no official nomenclatural act has been proposed to date, except for an unofficial nomenclatural proposal made only on the website. These Chinese species are considered to have close affinity with Japanese species so that, taking this opportunity, we propose new generic combinations for these species as follow.

Osmylus atomatus (Yang, 1988) n. comb.

Plethosmylus atomatus Yang, 1988: 194.

Osmylus atomatus: Oswald, 2007 (unofficial nomenclatural proposal made in the online database only).

Osmylus zheanus (Yang & Liu, 2001) n. comb.

Plethosmylus zheanus Yang & Liu, 2001: 302.