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A new genus of the subfamily Hybrizontinae (Hymenoptera: Ichneumonidae) from Japan

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Abstract

Neohybrizon **gen. nov.** is described from Japan (type species: *Neohybrizon mutus* **sp. nov.**). This new genus is characterized by much reduced mouth parts, long mesoscutum, absence of epicnemial carina, depressed posterocentral area of mesoscutum, slender stigma, short RS+M of fore wing, entirely straight M of fore wing, slender hind wing, long hind femur which is over 5.5 × as long as trochanter, and using the ant *Myrmica kotokui* Forel, 1911 as its host. A key to genera of Hybrizontinae is also provided.

Key words: *Neohybrizon*, new species, taxonomy

Introduction

Hybrizontinae, a small subfamily of Ichneumonidae, is distributed over the Holarctic region and includes 13 extant species in three genera, *Ghilaromma*, *Hybrizon*, and *Ogkosoma* (Yu *et al*. 2012; Madl 2013). This subfamily had been treated as a member of Braconidae (e. g. Foerster 1862; Capek 1970; van Achterberg 1976) or considered to be a separate family (e. g. Tobias 1988), because of its peculiar characteristics such as wing venation. Currently, this taxon is treated as a subfamily of Ichneumonidae, because the second metasomal tergite is not fused with the third tergite, and vein 1r-m of the hind wing is opposite or apical to the separation of R1 and Rs (e.g. Gauld 1984). In Ichneumonidae, Hybrizontinae is placed in the ophioniformes (Quicke *et al*. 2009; Quicke, 2015; Broad *et al*. 2018).

The biology of Hybrizontinae has been for a long time only known that *Ogkosoma cremieri* (Romand, 1838) attacked larvae of *Lasius fuliginosus* (Latreille, 1798) (Formicidae, Formicinae) when they were carried by workers (Cobelli 1906), and *Hybrizon buccatus* (de Brébisson, 1825) pupae were found in same chamber with ant pupae in the nest of *L. alienus* (Foerster, 1850) (Donisthorpe 1913). Recently, Gómez Durán & van Achterberg (2011) reported the movie of oviposition behavior of *H. buccatus* and Komatsu & Konishi (2010) photographed the behavior of *O. cremieri* and a species which could not be placed in any known genera. In this paper, we describe the species which was reported by Komatsu & Konishi (2010) as Gen. sp. and establish a new genus for the species.

Materials and methods

Materials used in this paper will be deposited in Ehime University Museum, Japan (EUMJ), Kanagawa Prefectural Museum of Natural History, Odawara, Japan (KPMNH), Institute for Agro-Environmental Sciences, NARO, Tsukuba, Japan (NIAES), Osaka Museum of Natural History, Osaka, Japan (OMNH), Laboratory of Systematic Entomology, Hokkaido University, Sapporo, Japan (SEHU), Tochigi Prefectural Museum, Utsunomiya, Japan (TPM), American Entomological Institute, Utah, USA (AEI), Natural History Museum, London, UK (BMNH), Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZI).

Images were taken with a Nikon D90 digital camera attached to a Leica MZ16 stereomicroscope or a Nikon

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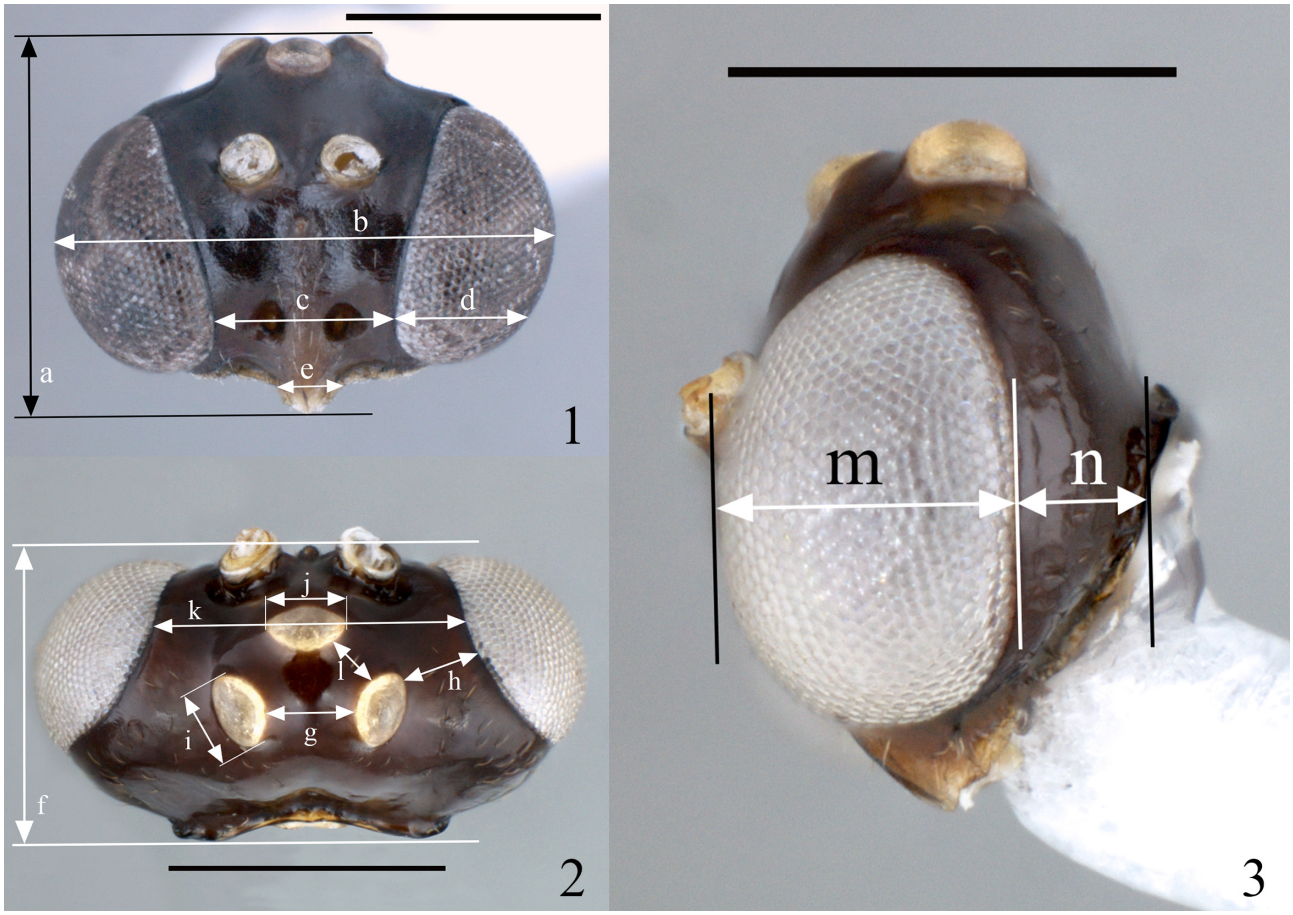
Digital Sight DS-Fil camera attached to a Leica S8APO stereomicroscope, and edited using Adobe Photoshop ® CS6.

Morphological terminology follows Broad *et al*. (2018). Measurements mainly follow those established by Konishi (1985, 2005). Measurements of head were made as Fig. 1 (frontal view), Fig. 2 (dorsal view), and Fig. 3 (lateral view). Width of the head was measured by maximum width of head including compound eye (Fig. 1-b). Clypeal width was measured at a convex area of clypeus (Fig. 1-e). The following abbreviations and indices are used: minimum length of postocellar line (POL) (Fig. 2-g), minimum length of ocello-ocular line (OOL) (Fig. 2-h), maximum length of lateral ocellus diameter (OD) (Fig. 2-i), frontal index of head (FI, Gauld & Mitchell, 1978) = maximum diameter of anterior ocellus (Fig. 2-j) / distance between eyes through maximum diameter of anterior ocellus (Fig. 2-k), lateral ocellar line (LOL, Masner & Huggert, 1989) = shortest distance between inner margins of median and lateral ocelli (Fig. 2-l), segment of flagellomere (F), metasomal tergite (T). Geno-orbital index (GOI, Gauld & Mitchell 1981) = maximum breadth of compound eye in lateral profile (Fig. 3-m)/ maximum breadth of gena in the same line (Fig. 3-n). The following abbreviations are used in material data, Malaise trap (MT).



FIGURES 1–3. Head of *Neohybrizon mutus* **sp. nov.**, female, showing measurements: 1, frontal view; a, head height; b, head width; c, interocular distance; d, compound eye width in the same line; e, clypeal width; 2, dorsal view; f, head length; g, POL; h, OOL; i, OD; j, median ocellus length; k, FI; l, LOL; 3, lateral view; m, maximum breadth of eye in lateral profile; n, breadth of gena in the same line. Scales: 0.5mm.

Taxonomy

Neohybrizon Hisasue & Konishi, gen. nov.

Type species. *Neohybrizon mutus* Hisasue & Konishi, sp. nov.

***Description*.** Head wider than high; face with median longitudinal convexity and with a short longitudinal ridge on dorso-median portion; face smooth except on median longitudinal convexity granulate; occiput and interocular area

polished; occipital carina strong; anterior tentorial pit large and deep; clypeus very narrow, apical portion of clypeus 0.2–0.4 × as wide as minimum interocular distance, with some longitudinal striae, apical margin rounded; apical margins of malar space depressed,with carina; mouth parts much reduced; mandible absent; area of surrounded by hypostomal carina elliptic; maxillary palpus reduced to 1 segment; labial palpus disappeared; antenna with 11 flagellomeres (Fig. 8); scape about as long as pedicel or somewhat shorter, F1 relatively slender.

Mesosoma polished; anterior margin of pronotum with transverse groove, and with ventral margin rounded; mesoscutum longer than wide except marginal rim, highly elevated and narrowed anteriorly; marginal rim of mesoscutum lamellate; posterocentral area of mesoscutum depressed; epicnemial carina absent; mesopleural fovea elongate to median portion of mesopleuron and rugose; sternalus absent; propodeal spiracle elliptic.

Fore wing 3.4–4.7 mm, and entirely covered with dense hairs; stigma slender; M+CU non-tubular except apical area; RS almost straight, apical 4/5 slightly curved; M entirely straight; RS+M very short; 2r&RS short; 1m-cu&M longer than first abscissa of CU; distal abscissa of CU straight, apical 1/4 non-tubular; M+CU present only apical portion. Hind wing slender; veins non-tubular except R.

Legs with weak and dense hairs; femora clavate. Hind coxa 1.9–2.7 × as long as trochanter; femur long; basitarsus shorter than following tarsomeres combined; 2–5 tarsal segments weakly flattened; 4th tarsomere longer than 5th tarsomere; maximum width of 4th tarsomere wider than maximum width of 5th tarsus.

Metasoma slender; T1–T4 depressed, smooth and hairless except apical and lateral marginal areas with sparse hairs; T1 polished, 3.2–4.3 × as long as apical width; T2 longer than T1, and its apical width; T5–T7 compressed, and covered with dense hairs; ovipositor tapering toward apex; ovipositor sheath, lateral and dorsal area with dense hairs.

Etymology. The genus name is from the Greek neo (new) + *hybrizon* (the type genus of the subfamily, Hybrizon), named after the possession of many derived character states.

Neohybrizon mutus Hisasue & Konishi, sp. nov.

Gen. sp. Komatsu & Konishi, 2010: 575.

Material examined. **Holotype**, ♀, Hitsujigaoka (43.00°N/141.24°E), Sapporo, Hokkaido, Japan, 6–13.viii.2003 (K. Konishi), MT, EUMJ.

Paratypes: [Hokkaido] 1♀ (9–22. viii. 2002), 4♀ (6–13. viii. 2003), 14♀ (13–20. viii. 2003), 1♀ (27. viii–3.ix. 2003), 1♀ (19–26. vii. 2007), 3♀ (26. vii–2.viii. 2007), 7♀ (2–9. viii. 2007) & 4♀ (9–16. viii. 2007), 43°00’N/141.24°E, Hitsujigaoka, Sapporo (K. Konishi), MT, EUMJ, ZI; 5♀ (7–14. viii. 2009), 5♀ (14–21. viii. 2009), 3♀ (21–28. viii. 2009), 1♀ (28. viii–4. ix. 2009) & 1♀ (11–18. ix. 2009), 43°00’09”N/141°24’56”E, Hitsujigaoka, Sapporo (K. Konishi), MT, EUMJ; 2♀ (1–8. viii. 2012), 1♀ (15–22. viii. 2012), 2♀ (25. vii–1. viii. 2012), 3♀ (8–15. viii.2012) & 1♀ (22–29. viii. 2012) , 43°00’24”N/141°24’52”E, Hitsujigaoka, Sapporo (K. Konishi), MT, EUMJ; 8♀ (18–26. viii. 1998, K. Mizota *et al*.) & 3♀ (4–18. viii. 2001, 42°58’N/141°12’E, T. Yoshida), Hyakumatsu-zawa, Sapporo, MT, BMNH, SEHU; 6♀ (24. viii–7. ix. 1993, N. Kuhara, EUMJ), 2♀ (1–8. viii. 2000, K. Uesugi, SEHU), 12♀ (1–8. viii. 2000, K. Uesugi, SEHU) & 8♀ (7. viii–13. ix. 2002, stream side, 42°58’N/141°15’E, T. Yoshida, SEHU), MT, Kannon-zawa, Sapporo; 8♀, Misumai (small stream), Sapporo, 27. vii–13. viii. 1994 (N. Kuhara, MT), EUMJ; 1♀ (24–31. viii. 2001, H. Sugaya, FIT) & 1♀ (7. vii. 2002, 42°57’N/141°14’E, T. Yoshida), Mt. Hakken-zan, Sapporo, SEHU; 9♀ (7. viii. 1999), 11♀ (14. viii. 1999), 1♀ (21. viii. 1999) & 1♀ (28. viii. 1999), Mt. Maruyama (50 m), Sapporo (K. Mizota *et al*.), MT, SEHU; 1♀, Mt. Okuteine-yama (43°04’N/141°08’E), Sapporo, 3–17. vii. 2011 (R. Takayanagi, MT), SEHU; 3♀ (27. vii–21. viii. 2007 , Natural forest, 42°54’N/141°16’E), 11♀ (27. vii–21. viii. 2007, Selectively cut forest, 42°54’N/141°16’E) & 3♀ (27. vii–21. viii. 2007, Natural forest, 42°56’N/141°16’E), Mt. Soranuma-dake, Sapporo (A. Ueda), MT, AEI, EUMJ; 1♀, Nakayama-toge, Sapporo, 4. ix. 2003 (T. Yoshida), SEHU; 1♀ (9. viii. 2001, T. Yoshida, SEHU) & 3♀ (18–31. viii. 1993, N. Kuhara, MT, EUMJ), Nopporo, Ebetsu; 8♀ (3–17. viii. 2007, 180 m, 43°00’N/142°04’E), 2♀ (17–31. viii. 2007, 180 m, 43°00’N/142°04’E) & 3♀ (16. vii–6. viii. 2008, 263 m, 43°01’N/142°05’E), Ohyubari (Natural forest), Yubari (A. Ueda), MT, EUMJ; 11♀ (13–21. viii. 2001), 20♀3♂ (21. viii–3. ix. 2001) & 1♀ (3–21. ix. 2001), Moizari River, Eniwa (T. Ohkawara & T. Ito), MT, EUMJ; 10♀, Kusabue-rindo (42.7154°N/141.2143°E), Chitose, 17. viii–1. ix. 2012 (N. Kuhara, MT), BM, EUMJ; 1♀, Lake Shikotsu, Chitose, 28. vii–11. viii.2000 (K. Uesugi, MT), SEHU; 1♀, Oohonai River, Makkari, 18–28. viii. 1998 (M. Nakajima, MT), NIAES; 3♀ (11–29. viii. 2002, 42°29’22”N/141°03’34”E) & 2♀ (29. viii–23. ix. 2002,

42°29'N/141°03'E), Mt. Raiba-dake, Noboribetsu (T. Yoshida), MT, SEHU; 1♀, Ohnuma, Nanae, 24. viii. 1994 (R. Matsumoto), OMNH. [Honshu] Aomori Pref.: 1♀, Kawaratai (40°31'N/140°10'E), Nishimeya, 15–25. vii. 2013 (T. Nakamura, MT), EUMJ. Tochigi Pref.: 5♀ (24. vii–17. viii. 2014) & 9♀ (1-25. viii. 2013), Dodaira, Enna-skyline, Nasushiobara (T. Nakayama), MT, EUMJ; 6♀, Nikko-zawa–Kinunuma, Nikko, 14. viii. 2004 (H. Makihara, MT), EUMJ; 1♀, Sukkan-sawa, Kita-one (1000 m), Nasushiobara, 13–21. viii. 2008 (T. Matsumura, MT), TPM. Gunma Pref.: 1♀, Mt. Hotakasan, 29. viii. 2006 (H. Katahira), KPMNH. Niigata Pref.: 1♂, Sasagamine (1230–1290 m) (36°51'N/138°04'E), Myoko, 17. viii. 2013 (S. Shimizu), Sweeping, EUMJ. Nagano Pref.: 1♀, Utsukushi-matsu (1350 m) (36.135°N/138.234°E), Nagawa, 23. viii. 2012 (S. Fujie), EUMJ; 1♀, Abo-toge, Matsumoto, 5. ix. 2009 (T. Komatsu), EUMJ; 1♂, Mt. Ontake-san–Mt. Hakkai-san (1660–1700 m) (35°51'47"N/137°31'37"E), Ohtaki, 8. viii. 2010 (K. Watanabe), KPMNH. Gifu Pref.: 1♀ (24. vii-3. viii. 2010) & 2♀ (9–16. viii. 2010), Shima (800 m), Shirakawa (R. Sugiura & H. Sumi, MT), OMNH; 1♀, Hidarimata, Kamitakara, 1. ix. 1996 (M. Sueyoshi), OMNH. Osaka Pref.: 1♀ (23. vii–2.viii. 2002), 14♀ (2–10. viii. 2002) & 1♀ (10–20. viii. 2002), Mt. Izumi-Katsuragisan, Kishiwada (R. Matsumoto, MT), OMNH. Nara Pref.: 1♀, Nikaidake–Kinomiyazuka (34.3507°N/136.0661°E), Mt. Azami-dake, Kawakami, 6–23. viii. 2010 (R. Matsumoto, MT), OMNH. [Shikoku] Ehime Pref.: 1♀, Hontani, Odamiyama, 26–30. ix. 2008 (E. Yamamoto, MT), EUMJ; 1♀, Omogokei, Kumakogen, 20. ix. 1958 (K. Kamijo), SEHU.

***Description*.** FEMALE (n=20) (Fig. 4). Body 4.5–5.6 mm long. Fore wing 3.4–4.7 mm long. Head wider than high, 0.6–0.9 × as long as wide in frontal view (Fig. 1); head length 0.4–0.5 × as long as wide (Fig. 2); face with median longitudinal convexity and with a short longitudinal ridge on dorso-median portion; face smooth except on median longitudinal convexity granulate; POL 0.8–1.2 × as OD; OOL 0.7–1.3 × as long as OD; LOL 0.3–1.0 × as long as OD; FI 0.2–0.3; occiput and interocular area polished; minimum interocular distance 1.2–1.9 × as long as compound eye width of same line; inner margins of eyes convergent toward ventrally, not emarginated at antennal socket; gena to vertex along the outer orbit of eye with sparse hairs; GOI 2.4–5.3; occiput higher than wide (Fig. 6); occipital carina strong (Fig. 6); anterior tentorial pit large and deep; clypeus very narrow, apical portion of clypeus 0.2–0.4 × as wide as minimum interocular distance, with some longitudinal striae, apical margin rounded; malar space concaved into a crescentic, apical margins depressed, with carina; mouth parts much reduced; mandible absent; area of surrounded by hypostomal carina elliptic; maxillary palpus reduced to 1 segment; labial palpus disappeared; antenna with 11 flagellomeres (Fig. 8); scape about as long as pedicel or somewhat short, F1 relatively slender, 7.3–11.7 × as long as wide; relative proportion of length of all flagellomeres, F1: F2: F3: F4: F5: F6: F7: F8: F9: F10: F11= 3.3: 2.4: 2.3: 2.3: 2.2: 2.2: 2.1: 2.0: 1.9: 1.7: 2.2.

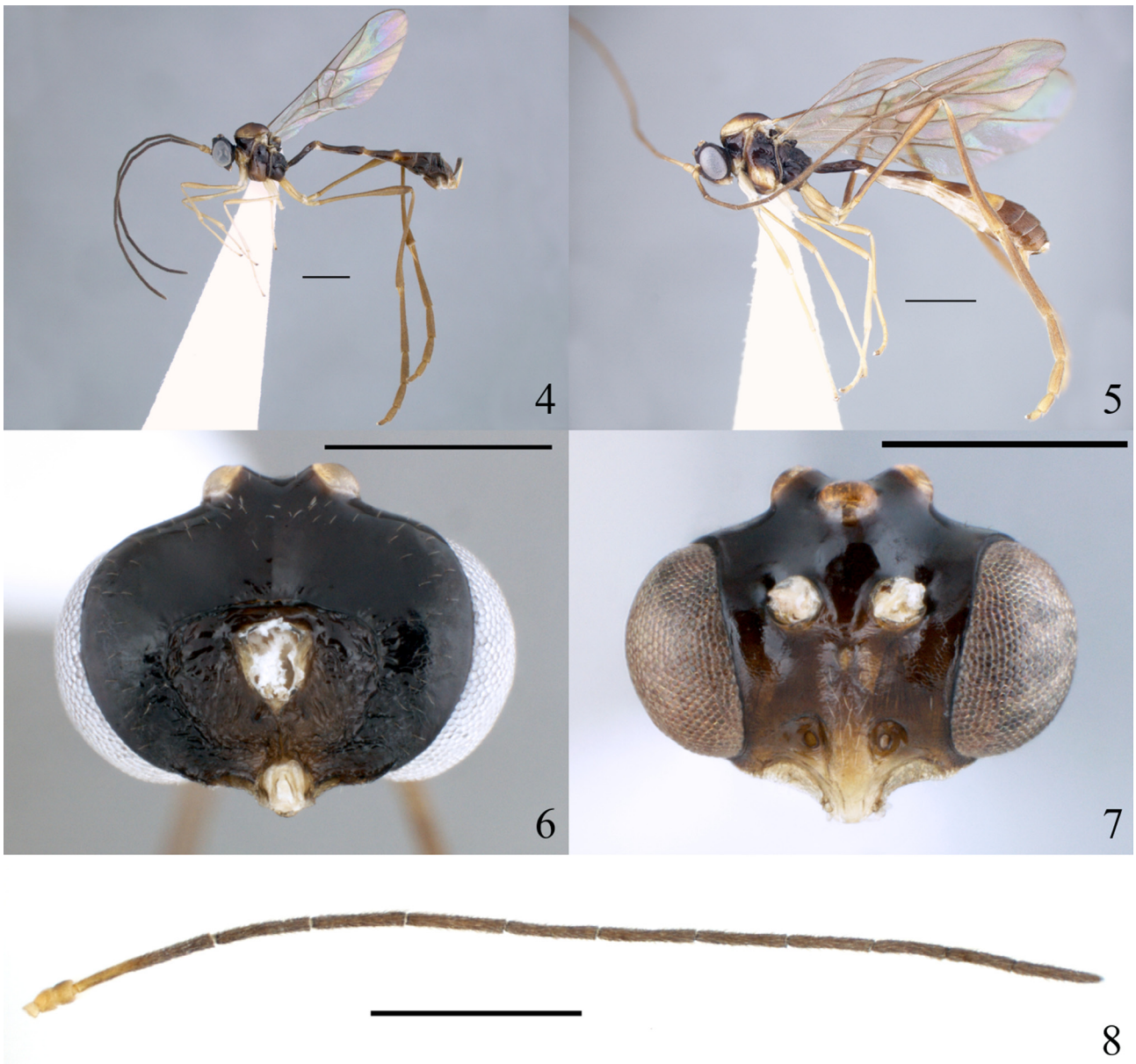
Mesosoma polished (Fig. 10); anterior margin of pronotum with transverse groove, and with ventral margin rounded; pronotal collar short (Fig. 14); mesoscutum 1.1–1.4 × as long as wide except marginal ring, highly elevated and narrowed toward anteriorly; marginal rim of mesoscutum lamellate; anterior half of mesoscutum scattered punctures with hairs except median part; posterocentral area of mesoscutum depressed; scutellum basically impunctate, with lateral carina extending anterior half; post scutellum strongly convex; epicnemial carina absent (Fig. 12); mesopleural fovea elongate to median portion of mesopleuron and rugose; mesopleural suture distinct; anterior portion of mesopleuron rounded, with hairs and fine wrinkles (Fig. 12); sternalus absent; posterocentral portion of metapleuron depressed; pleural carina strongly curved; propodeum with rugose carinae, with sparse hairs; propodeal spiracle elliptic. Legs with weak and dense hairs (Fig. 15); femora clavate. Fore coxa with longitudinal carina. Hind coxa 1.9–2.7 × as long as trochanter; femur 5.5–7.8 × as long as trochanter; tibia curved dorsally at apical 1/3; basitarsus 0.7–0.9 × as long as following tarsomeres combined; 1–3 tarsomeres parallel sided in lateral view; 2–5 tarsal segments weakly flattened; 4th tarsomere 1.3–1.9 × as long as 5th tarsomere; maximum width of 4th tarsomere 1.4–1.8 × as wide as maximum width of 5th tarsomere; apical width of 5th tarsomere as wide as basal width.

Fore wing entirely covered with dense hairs (Fig. 9); stigma slender, over 8.9 × as long as maximum width; M+CU non-tubular except apical area; RS almost straight, apical 1/5 slightly curved; M entirely straight; AA non-tubular except apical portion; 1cu-a opposite M&RS; 2r&RS short, 0.2–0.3 × as long as 1m-cu&M; 1m-cu&M 2.5–3.5 × as long as first abscissa of CU; distal abscissa of CU straight, apical 1/4 non-tubular; 2cu-a present basal half; RS+M very short, sometimes absent; M+CU present only apical portion. Hind wing slender, 4.8–5.9 × as long as wide, and with four hamuli; veins non-tubular except R; RA, RS, M+CU, M and CU colored.

Metasoma slender (Fig. 16); T1–T4 depressed, smooth and hairless except apical and lateral marginal areas with sparse hairs; T1 polished, 3.3–4.3 × as long as apical width, apical width 1.4–1.8 × as wide as basal width,

posterocentral area with longitudinal depression (Fig. 16); T2 1.1–1.5 × as long as T1, 2.9–4.7 × as long as apical width, apical width 1.1–2.1 × as wide as basal width, with some wrinkles laterally, and dorsal contour concave in lateral view; around spiracles of T1 and T 2 triangularly raised (Fig. 16); T3 1.4–3.1 × as long as apical width; dorsal contour of T2 and basal portion of T3 concave in lateral view; T5–T7 compressed, and entirely covered with dense hairs; ovipositor tapering toward apex; ovipositor sheath 0.2–0.4 × as long as hind basitarsus, lateral and dorsal area with dense hairs.

Coloration: Head blackish-brown; clypeus yellowish brown except apical 1/5 whitish yellow, antennal sockets, scapes, basal half of 1st flagellomere yellow-brown; distal half of 1st flagellomere, triangular tubercle, pedicels yellowish-brown; maxilla, labium, maxillary and labial palpi pale-yellow. Mesosoma blackish-brown; propleuron, mesoscutum, scutellum, and lower part of mesopleuron brown; anterior portion of mesoscutum brownish-brown except central part; lower part of pronotum, anterolateral margin of mesonotum, marginal ring of mesoscutum, posterolateral margin of scutellum, posterior margin of propodeum yellowish-brown; anterior margin of mesopleuron and tegula pale-yellow. Fore and middle legs brownish-yellow; fore and middle coxae and trochanters whitish-yellow. Hind leg brown; hind coxa brownish-yellow. Wings hyaline; stigma and veins blackish-brown. Metasoma brown; T1 and sternite blackish-brown; anterior margins of T2–T3, and 4T brownish-yellow; ovipositor brownish-yellow; T2–T4 whitish-yellow.



FIGURES 4–8. *Neohybrizon mutus* **sp. nov.**: 4, lateral habitus of female; 5, ditto male; 6, head of female in posterior view; 7, head of male in frontal view; 8, antenna of female. Scales: 4–5, 8, 1.0 mm; 6–7, 0.5 mm.

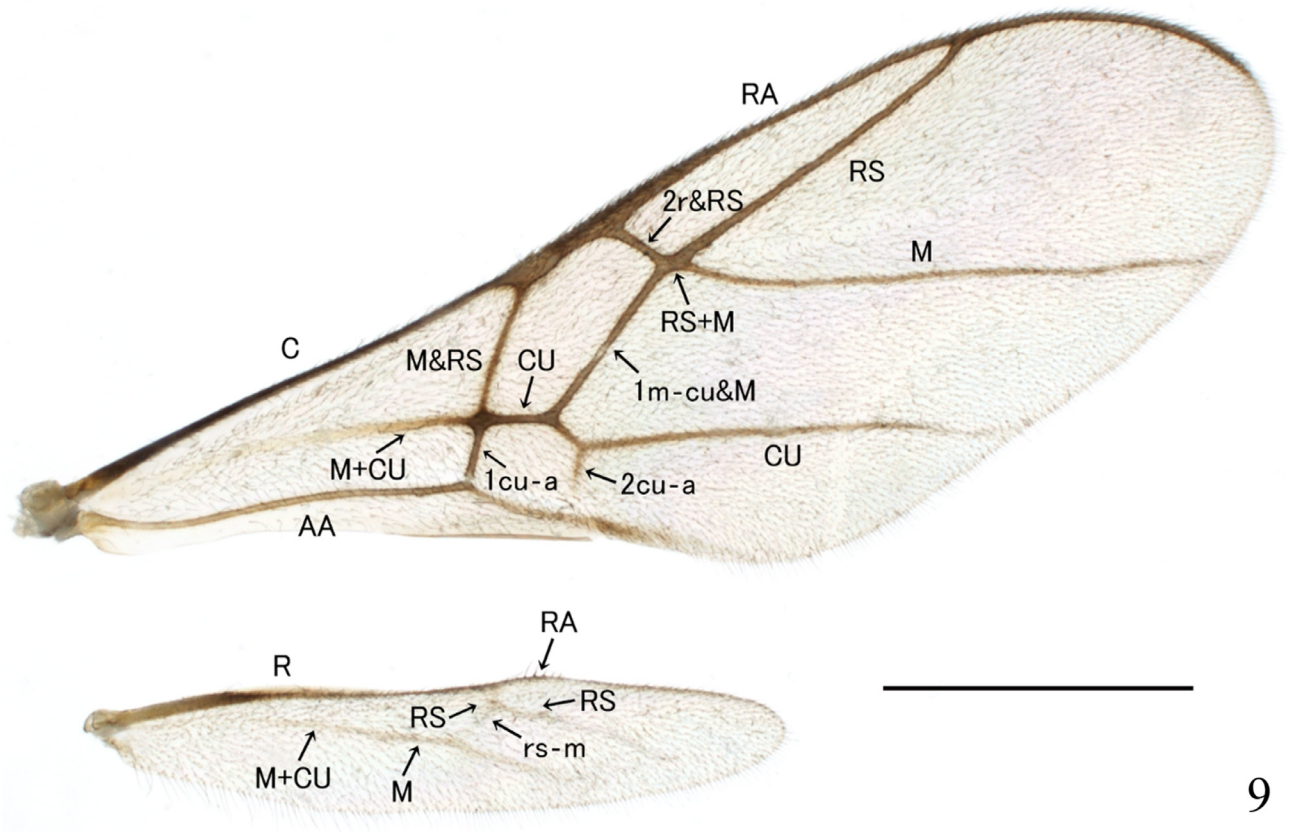


FIGURE 9. Fore and hind wings of *Neohybrizon mutus* **sp. nov.** Scale: 1.0 mm.

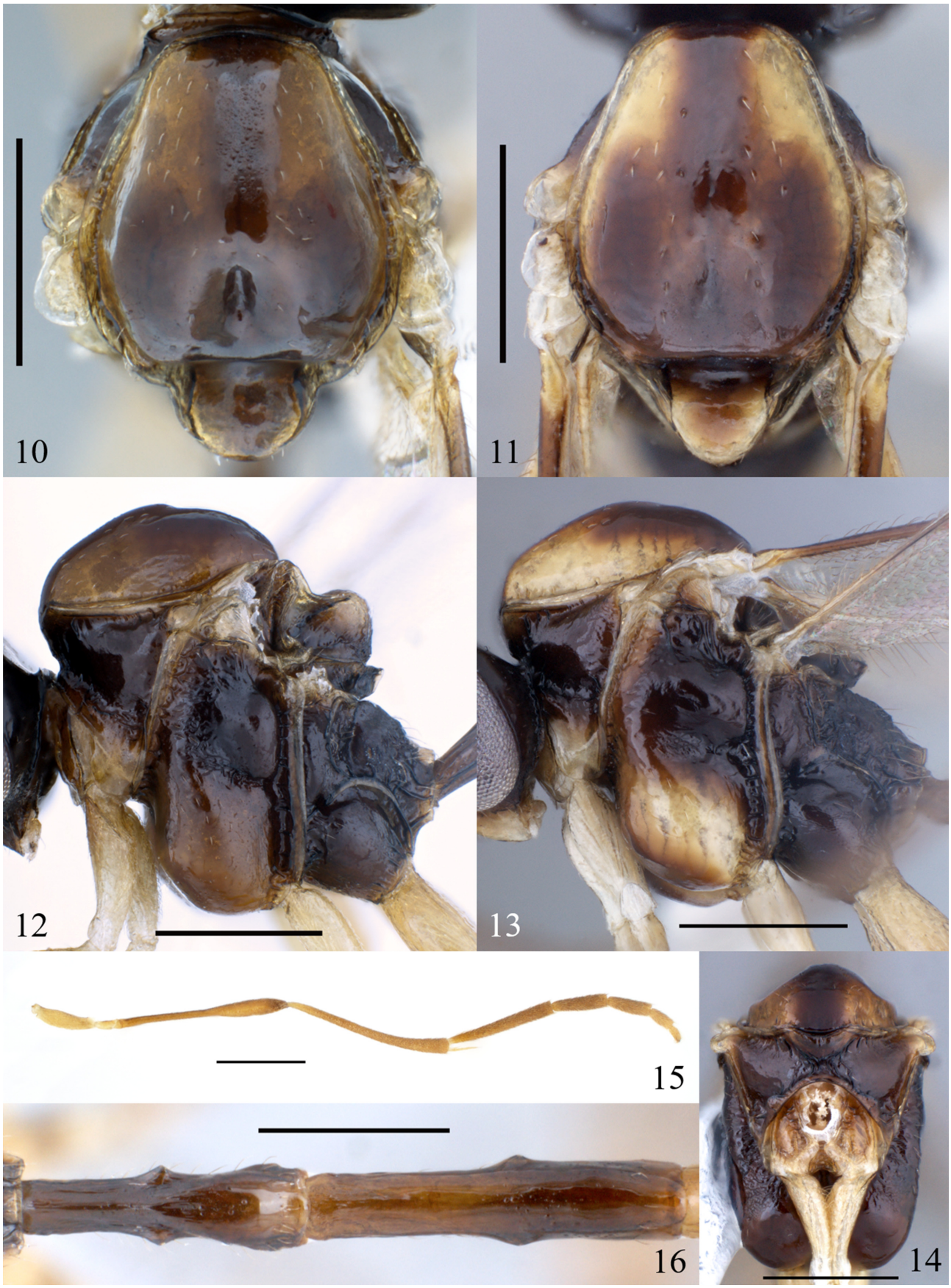
MALE (n=5) (Fig. 5). Body 4.8–5.4 mm long. Fore wing 3.7–4.2 mm long. Similar to females except as follows. Head wider than high, 0.7 × as high as wide in frontal view (Fig. 7); head length 0.5–0.6 × as long as wide; POL 1.1–1.5 × as OD; OOL 1.0–1.2 × as long as OD; LOL 0.7–1.0 × as long as OD; FI 0.2; minimum interocular distance 1.8–2.2 × as long as compound eye width of same line; GOI 2.3–3.8; clypeus very narrow, apical portion of clypeus 0.2–0.3 × as wide as minimum interocular distance; malar space often strongly concaved than female; F1 7.8–13.5 × as long as wide; relative proportion of length of all flagellomeres, F1: F2: F3: F4: F5: F6: F7: F8: F9: F10: F11= 3.0: 2.3: 2.2: 2.3: 2.3: 2.3: 2.2: 2.0: 2.0: 1.9: 2.3. Mesoscutum 1.2–1.3 × as long as wide except marginal rim; scutellum more abruptly narrowed than in female. Hind coxa 1.9–2.5 × as long as trochanter; femur 5.4–7.5 × as long as trochanter; basitarsus 0.8–0.9 × as long as following tarsomeres combined; 4th tarsomere 1.3–1.6 × as long as 5th tarsomere; maximum width of 4th tarsomere 1.2–1.5 × as wide as maximum width of 5th tarsomere. Stigma, over 10 × as long as maximum width; 1m-cu&M 2.1–3.8 × as long as first abscissa of CU. Hind wing 4.9–6.1 × as long as wide. T1 3.2–3.5 × as long as apical width; T2 1.2–1.4 × as long as T1, 2.9–4.1 × as long as apical width, apical width 1.3–1.9 × as wide as basal width; T3 1.3–2.2 × as long as apical width. Subgenital plate transverse and somewhat reduced (Fig. 17); apical margin emarginate medially and with a pair of hairs; basal margin without median apodeme and acute laterally (Fig. 18-c). Apical and antero-ventral margin of paramere with sparse hairs (Fig. 18); apical margin of paramere truncated; apical part of digitus slightly expand. Aedeagus slender, penis valve slightly curved (Fig. 19).

Coloration similar to females except clypeus and mesosoma, clypeus and lower part of mesopleuron whitish yellow (Fig. 13), anterior portion of mesoscutum brownish-yellow except central part (Fig. 11).

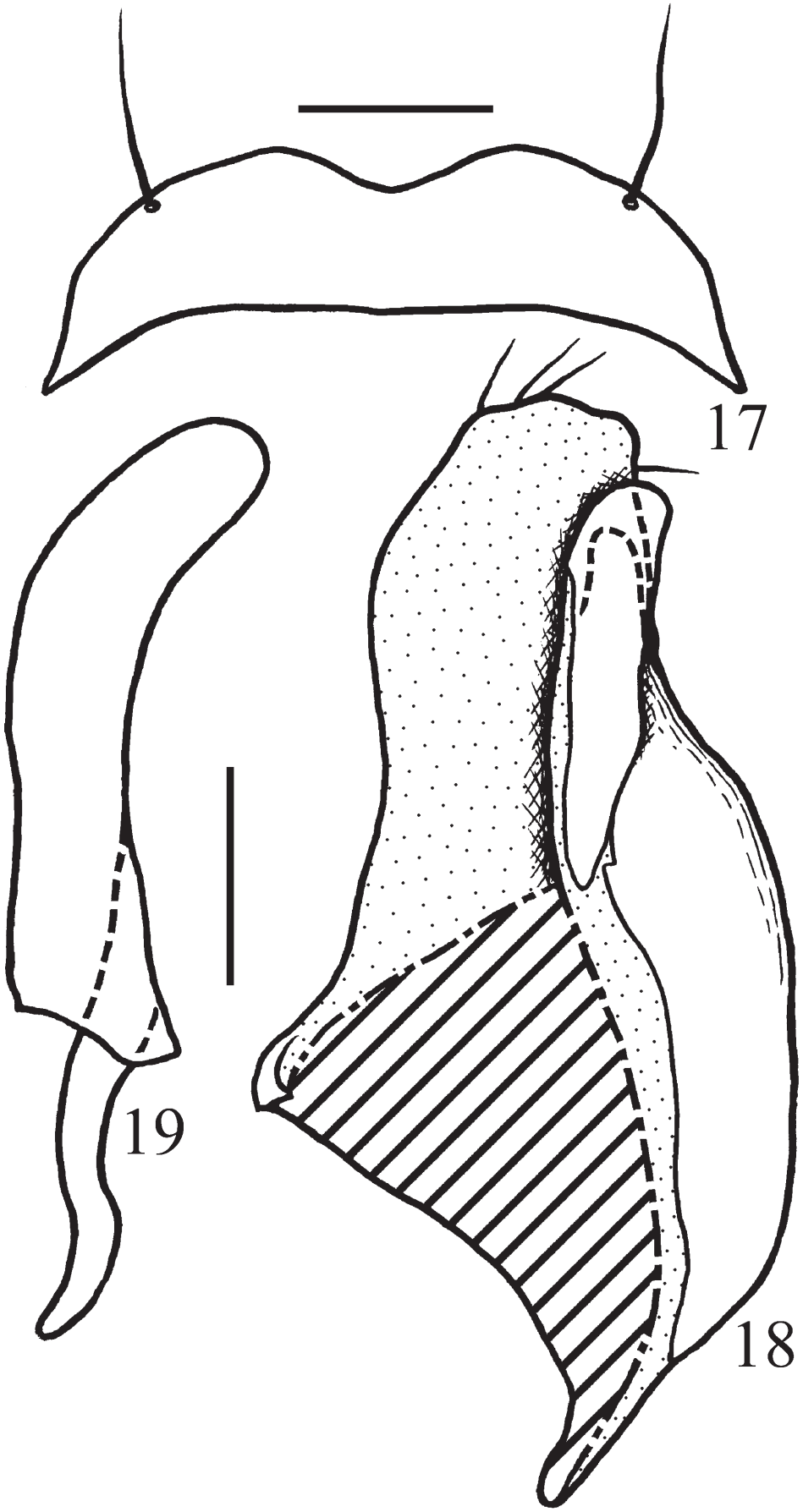
***Distribution*.** Hokkaido, Honshu (Aomori, Tochigi, Gunma, Niigata, Nagano, Gifu, Osaka, Nara), Shikoku (Ehime).

Host. *Myrmica kotokui* Forel, 1911 (Hymenoptera: Formicidae) (Komatsu & Konishi, 2010).

***Etymology*.** Named after the Latin ‘mutus’, meaning quiet, reffering to the much reduced mouth parts.



FIGURES 10–16. *Neohybrizon mutus* **sp. nov.**: 10, 12, 14–16, female; 11, 13, male; 10–11, mesonotum in dorsal view; 12–13, mesosoma in lateral view; 14, mesosoma in anterior view; 15, hind leg in lateral view; 16, T1 & T2 in dorsal view. Scales: 10–14, 16, 0.5 mm; 15, 1.0 mm.



FIGURES 17–19. Male terminalia of *Neohybrizon mutus* **sp. nov.**: 17, subgenital plate in ventral view; 18, paramere in mesal view; 19, aedeagus in lateral view. Scales: 0.1 mm.

Key to genera of the subfamily Hybrizontinae

1. Clypeus very narrow; mandible absent; mesoscutum much longer than wide except marginal rim and narrowed toward anteriorly; posterocentral area of mesoscutum depressed; stigma very slender; RS+M very shorter, sometimes absent; M entirely straight; hind wing much slender; hind femur longer, over 5.5 × as long as trochanter . . . . . *Neohybrizon* **gen. nov.**
- Clypeus moderately wide; mandible reduced and present; mesoscutum equal to length and width or little longer than wide except marginal rim; posterocentral area of mesoscutum not depressed; stigma stouter; RS+M present, modelately longer; basal area of M curved; hind wing stouter; hind femur shorter, less than 5.0 × as long as trochanter 2
2. Larger, body length ≥10 mm; behind eye of head flat; antenna short; RS+M as long as 2r&RS; hind coxa smooth; hind femur and tibia flattened; hind tarsomeres flat, basitarsus strongly widened; T2 smooth . . . . . .*Ogkosoma*
- Smaller, body length 3–7 mm; behind eye of head convex; antenna moderately long; RS+M not as long as 2r&RS; hind femur and tibia subcylindrical; hind tarsomeres subcylindrical or weakly flattened; T2 with striae on anterior half 3
3. Occipital carina absent ventrally; without median longitudinal ridge between antennal sockets; lower face almost smooth; lateral carina of scutellum absent; ventral half of mesopleuron faintly coriaceous with punctures; epicnemial carina absent; RS+M longer than 2r&RS; T1 with striae on anterior half . . . . . *Ghilaromma*
- Occipital carina complete; median longitudinal ridge present between antennal sockets; sculpture of lower face granulate or coriaceous; lateral carina of scutellum present; ventral half of mesopleuron coriaceous or reticulate rugose; epicnemial carina present; RS+M much shorter than 2r&RS, sometimes absent; anterior half of T1 smooth, reticulate rugose or strigose. . . . . .*Hybrizon*

Discussion

Among the genera of Hybrizontinae, it is considered that *Ghilaromma* and *Ogkosoma* are closely related in sharing the following morphological and biological character states: genal carina absent; vertex and gena weakly coriaceous and polished; lower face almost smooth; second segment of maxillary palpus cylindrical; antennal scape longer than pedicel; epicnemial carina absent; mesoscutum faintly coriaceous, almost smooth; metapleuron coriaceous; hind tibia straight; distal 1/2-3/5 of R of fore wing with hairs; 1cu-a of fore wing basad M; 4th tarsomere of hind leg not longer than 5th tarsomere; T1 with dorsolateral carina; parasitoids of ants belonging to the subgenus *Dendrolasius* of the genus *Lasius*. Also, *Neohybrizon* is considered to be closely related to *Ghilaromma* + *Ogkosoma* in having the following character states: vertex and gena weakly coriaceous and polished; epicnemial carina absent.

In bionomics, three previously known genera are known to be associated with the genus *Lasius* (subfamily: Formicinae). Some members of *Hybrizon* were reported as parasitoids of ants belonging to the subgenus *Lasius* (Gómez Durán & van Achterberg 2011), and *Ghilaromma* and *Ogkosoma* are known to use ants belonging to the subgenus *Dendrolasius* as their hosts (Watanabe 1984; Komatsu & Konishi 2010). In the subfamily, one can easily trace an evolutionary sequence from parasitoids of *Lasius* (*Lasius*) ant, to parasitoids of *Lasius* (*Dendrolasius*) ant, because *Lasius* (*Dendrolasius*) ants are known to socially parasitize on *Lasius* (*Lasius*) ants (Yamauchi & Hayashida 1968). On the other hand, *Neohybrizon* has been reported to be associated with genus *Myrmica* (subfamily: Myrmicinae) (Komatsu & Konishi 2010), and *Lasius* and *Myrmica* belong to different subfamilies which are not closely related each other (Ward *et al*., 2015), so host shifting in the same habitat is assumed. According to data of the specimens used in this study, adults of the new genus were collected intensively in August, but it is unknown whether the host has certain life history event in August, such as larval transportation. In order to clarify this mystery, it is necessary to clarify the bionomics of the host ants.

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