Original Article

Revision of the Genus *Deuteroxorides* Viereck, 1914 (Hymenoptera, Ichneumonidae, Poemeniinae), from Japan

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Abstract. Japanese species of the genus *Deuterixorides* Viereck, 1914, are reviewed. A new species of this genus, *D. breviterebratus* sp. nov., is described. This species resembles *D. orientalis* (Uchida, 1928) in having the black hind coxa and femur, but can easily be distinguished from *D. orientalis* in different morphological characters such as colouration of coxae and tegula and lendth of oviposition. *D. atratus* Kasparyan, 1976, is newly synonymized under *D. orientalis* (syn. nov.). Therefore, only two species of *Deuteroxorides* are recognized from Japan. A key to world species of this genus is provided.

Key words: Far East Asia, new species, new synonym, parasitoid, taxonomy

Introduction

The genus *Deuteroxorides* Cameron, 1901, is a small-sized genus in the subfamily Poemeniinae, containing five described species (Yu *et al*., 2012). This genus is defined by two autapomorphies, the tarsal claws of fore and mid legs of female with apically truncate teeth and the first metasomal tergite with distinct lateral longitudinal carina, and is classified into the more plesiomorphic genera (Wahl & Gauld, 1998). This genus is distributed in the Palearctic (three species) and Oriental (two species) regions. In the former region, one species, *D. elevator* (Panzer, 1799), is distributed in Europe, and two species, *D. orientalis* (Uchida, 1928) and *D. atratus* Kasparyan, 1976, are distributed Far East Asia (Kasparyan & Khalaim, 2007). In the latter region, two species, *D. brumhus* Gupta, 1980 and *D. indicus* Gupta, 1980, are recorded from Myanmar and India, respectively (Gupta, 1980). Their host is mainly several kinds of Cerambicid or Curculionid beetles and the host record is relatively abundant in Poemeniinae. Although host utilization of this genus is unknown, other members of Poemeniinae are exclusively idiobiont ectoparasitoid (Wahl, 1993).

In Japan, two species of *Deuteroxorides*, *D. orientalis* (Uchida, 1928) and *D. atratus* Kasparyan, 1976, has been recorded (Uchida, 1928; Kasparyan & Khalaim, 2007). Recently, I found an undescribed species of *Deuteroxorides* from Honshu and Shikoku. In this study, I reviewed the Japanese species of this genus and describe this new species. Key to Palearctic species of this genus is also provided.

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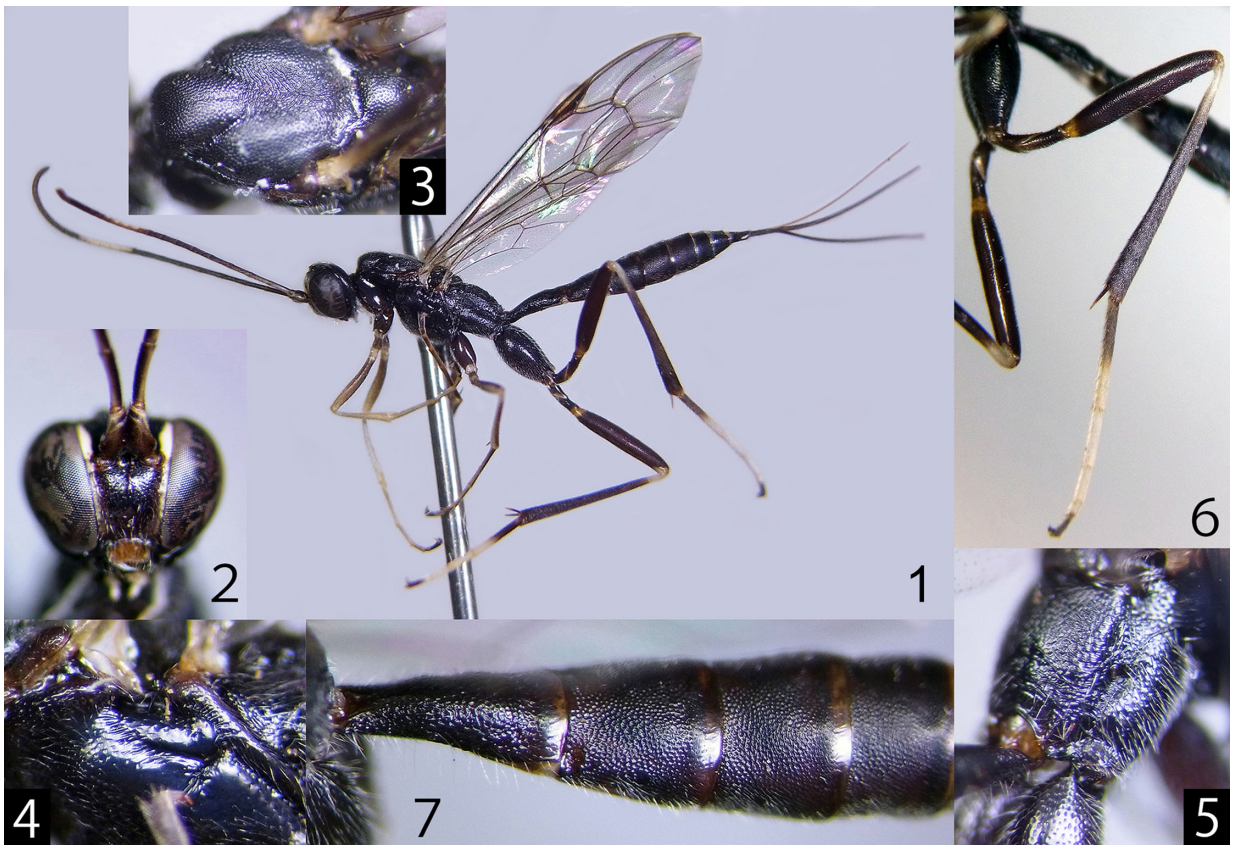
Materials and methods

Materials used were from the collections of Kanagawa Prefectural Museum of Natural History, Odawara, Japan (KPMNH), Laboratory of Entomology, Meijo University, Nagoya, Japan (MU), National Institute of Agro-Environmental Sciences, Tsukuba, Japan (NIAES), Laboratory of Systematic Entomology, Hokkaido University, Sapporo, Japan (SEHU) and Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (ZISP).

A stereomicroscope (Nikon SMZ800) was used for observation. Photographs were taken by RICOH CX-6 digital camera joined with the stereo microscope. Digital images were edited using Adobe Photoshop® CS6.

Morphological terminology mainly follows that established by Gauld (1991) and Gauld et al. (2002). Eady (1968) is referred for microsculpture description. The following abbreviations are used in descriptions: ocello-ocular line (OOL), postocellar line (POL), segment of flagellum (F), tarsal segment (TS), metasomal tergite (T), metasomal sternite (S), and holotype (HT). The following abbreviations are used in material data: female (F), male



Figs. 1–7. *Deuteroxorides breviterebratus* sp. nov., female (holotype: KPM-NK 5006273). — 1, lateral habitus; 2, head, frontal view; 3, mesoscutum and scutellum, dorsal view; 4, mesopleuron, lateral view; propodeum, dorsolateral view; 6, anterior aspect of left hind leg, lateral view; 7, T1-T4, dorsolateral view.

(M) and Malaise trap (MsT).

Results and discussion

Subfamily Poemeniinae Smith & Shenefelt, 1955
Genus ***Deuteroxorides*** Viereck, 1914

Deuteroxorides Viereck, 1914: 43. Type species: *Xorides albitarsus* Gravenhorst, 1829 (= *Ichneumon elevator* Panzer, 1799), by original designation.

Diagnosis. This genus can be distinguished from other genera of Poemeniinae by the following combination of characters; dorsal part of gena finely and weakly rugose to finely denticulate; clypeus small, flat, and subrectangular (Figs. 2, 9); apex of mandible with a single broad, chisel-like tooth; epomia sharply defined above pronotal collar; epicnemial carina absent; tarsal claws of fore and middle legs of female with apically truncate teeth; T1 and S1 clearly separated; T1 with distinct lateral longitudinal carinae (Wahl & Gauld, 1998).

Distribution. Palearctic and Oriental regions.

Remarks. The mesoscutum of Palearctic species is usually partly covered with short transverse rugae (Fig 3), which resemble the character state of the genus *Pseudorhyssa* Merrill, 1915. However, they can be easily distinguished from *Pseudorhyssa* by the character state of mandible, i.e., a single (*Deuteroxorides*) tooth or double teeth (*Pseudorhyssa*).

***Deuteroxorides breviterebratus* sp. nov.**
[New Japanese name: Motoguro-hime-kuchiki-himebachi]
(Figs. 1–7)

Type series. [Holotype] F, JAPAN, Tochigi Pref., Nikko City, Dorobe, 28. VIII. 2010, H. Sawada leg., em. from Amperopsis sp. (KPMNH: KPM-NK 5006273). [Paratypes] JAPAN: 2 F, Japan, Tochigi Pref., Nasushiobara City, Shiobara, Oonuma, 6-15. VI. 2008, T. Matsumura leg. (MsT) (KPMNH: KPM-NK 5006274, 5006275); 1 F, Japan, Tochigi Pref., Nasushiobara City, Ohkawa-rindo, 25. VIII – 13. IX. 2010, T. Nakayama leg. (MsT) (KPMNH: KPM-NK 5006276); 1 F, same locality and collector, 15. V – 13. VI. 2011 (MsT) (KPMNH: KPM-NK 5006277); 1 F, Japan, Gunma Pref., Katashina Vil., Marunuma, Yuzawa, 2. VII. 2008, K. Watanabe leg. (KPMNH: KPM-NK 5006278); 2F, Japan, Gunma Pref., Katashina Vil., Mt. Hotaka-san, 2. X. 1990, K. Esaki leg. (KPMNH: KPM-NK 5006279, 5006280); 1 F, Japan, Saitama Pref., Ootaki Vil., Ootaki, 29. IX. 1999, T. Nambu

Figs. 8–11. *Deuteroxorides orientalis* (Uchida, 1928), female (KPM-NK 5006272). — 8, lateral habitus; 9, head, frontal view; 10, anterior aspect of right hind leg, lateral view; 11, hind coxae, posterior view.

leg. (NIAES); 1 F, Japan, Kochi Pref., Tengu-kogen, 4. VI. 1989, I. Yamashita leg. (NIAES).

Description. Female (n=10). Body length 7.9–9.7 (HT: 9.7) mm.

Head 0.7 times as long as wide in dorsal view. Clypeus 0.6 times as long as wide. Face 0.8–0.9 (HT: 0.9) times as long as wide, punctate. Frons sparsely punctate. Malar space 0.1 times as long as basal width of mandible. POL 0.8 times as long as OOL. Antenna with 26-28 (HT: 28) flagellomeres.

Mesosoma. Pronotum largely smooth except for posterior margin. Scutellum flat, densely punctate (Fig. 3). Mesoscutum densely punctate, with fine, short transverse striae medially (Fig. 3). Mesopleuron with longitudinal striae before smooth speculum (Fig. 4). Propodeum covered with fine transverse striae anteriorly, with rather coarse striae posteriorly, without carinae except for pleural carina and part of posterior transverse carina (Fig. 5). Pleural carina distinctly concave at area near spiracle (Fig. 5). Fore wing 6.3–8.0 (HT: 8.0) mm. Vein cu-a of fore wing slightly reclivous to slightly inclivous, its anterior end opposite to (Fig. 1) or slightly based from posterior end of vein Rs+M. Vein Rs+2r of fore wing more or less sinuate (Fig. 1). Vein 1-cu of hind wing longer than vein cu-a of hind wing (Fig. 1). Inner aspect of fore tibia with 4–6 distinct large setae. Hind femur 5.5–6.2 (HT: 6.0) times as long as maximum depth in lateral view.

Metasoma. T1 2.0–2.6 times as long as maximum width, densely punctate (Fig. 7), slightly transversely striated medially. T2 and anterior 0.3 of T3 densely punctate (Fig. 7). Posterior 0.7 of T3, T4-T7 finely sculptured (Fig. 7). Ovipositor sheath 0.6 times as long as fore wing and 1.2–1.3

(HT: 1.2) times as long as hind tibia.

Colouration (Figs. 1–7). Head black to blackish-brown, except for: inner orbit, outer surface of base of antenna, dorsal surface of F9 to base of F14, and palpi white; clypeus reddish-brown. Mesosoma black to blackish-brown, except for: anterior margin of pronotum usually tinged with reddish-brown. Wings hyaline, with blackish-brown veins. Legs black to blackish-brown except for: fore trochantellus, base of hind tibia, apical 0.1–0.5 (HT: 0.5) of hind TS1 and TS2-TS4 white; fore and mid tibiae, femora, tarsi more or less tinged with whitish-brown; base and apex of hind femur narrowly tinged with yellowish-brown. Metasoma black to blackish-brown, except for: posterior margin of T1-T4 narrowly tinged with reddish-brown to yellowish-brown; membranous part of sternites white; ovipositor yellowish-brown to reddish-brown.

Male. Unknown.

Distribution. Japan (Honshu and Shikoku).

Etymology. The specific name is from the short ovipositor.

Remarks. This species resembles *D. orientalis* in having the black hind coxa and femur, but can easily be distinguished from them by the black fore and mid coxae and the short ovipositor (see the following key).

Deuteroxorides orientalis (Uchida, 1928)
[Japanese name: Hime-kuchiki-himebachi]
(Figs. 8–11)

Xorides orientalis Uchida, 1928: 24.
Deuteroxorides albitarsus f. *orientalis*: Uchida, 1936: 50.
Deuteroxorides atratus Kasparyan, 1976: 85. **Syn. nov.**

Materials examined. JAPAN: 1 F (lectotype of *Xorides orientalis*), Hokkaido, Sapporo City, Mt. Maruyama, "Oct 18 '22", Tamanuki leg. (SEHU); 1 F (*D. orientalis*, det. K. Kusigemati), Hokkaido, Mt. Soranuma, 29. VIII. 1965, K. Kusigemati leg. (SEHU); 1 F (holotype of *D. atratus*), Kunashiri Is., Alekhine, 27. VII. 1973, D. Kasparyan leg. (ZISP); 1 F (*D. atratus*, det. D. Kasparyan), same locality, 31. VII. 1981, S. Belokobylskij leg. (ZISP); 1 F, Hokkaido, Kumaishi, Kenichi-gawa, Iwafuchi-zawa, 5-10. VI. 1995, Y. Ito & T. Ito leg. (MsT) (NIAES); 1 F, same locality and collector, 21-29. IX. 1995 (MsT) (NIAES); 1 F, Hokkaido, Sapporo City, Mt. Soranuma-dake, 14. VI – 4. VII. 2007, A. Ueda leg. (MsT) (KPMNH: KPM-NK 5006272); 1 F, Fukushima Pref., Showa, Mt. Hakase, 29. VI – 26. VII. 1998, T. Muroi leg. (MsT) (MU).

Description. Female (n=8). Body length 8.8–11.5 mm.

Head 0.7 times as long as wide in dorsal view. Clypeus 0.6 times as long as wide. Face 0.8–0.9 times as long as wide, punctate. Frons sparsely punctate. Malar space 0.1 times as long as basal width of mandible. POL 0.6–0.7 times as long as OOL. Antenna with 29–32 flagellomeres.

Mesosoma. Pronotum largely smooth except for posterior margin. Scutellum flat, densely punctate. Mesoscutum densely punctate, with fine transverse striae medially. Mesopleuron without distinct longitudinal striae before smooth speculum. Propodeum covered with fine transverse striae anteriorly, with rather coarse striae posteriorly, without carinae except for pleural carina and part of posterior transverse carina. Pleural carina distinctly or slightly concave at area near spiracle. Fore wing 7.2–9.6 mm. Vein cu-a of fore wing slightly reclivous to slightly inclivous (Fig. 8), its anterior end opposite to (Fig. 8) or slightly based from posterior end of vein Rs+M. Vein Rs+2r of fore wing more or less sinuate. Vein 1-cu of hind wing longer than vein cu-a of hind wing (Fig. 8). Inner aspect of fore tibia with 4–6 distinct large setae. Hind femur 6.3–6.5 times as long as maximum depth in lateral view.

Metasoma. T1 1.7–2.5 times as long as maximum width, densely punctate, slightly transversely striated medially. T2 and anterior 0.1–0.4 of T3 shallowly punctate. Posterior part of T3, T4–T7, and sometimes apical part of T2 finely sculptured. Ovipositor sheath 0.7–1.0 times as long as fore wing and 1.4–2.2 times as long as hind tibia.

Coloration (Figs. 8–11). Head black to blackish-brown, except for: inner orbit (sometimes indistinct in face), outer surface of base of antenna, dorsal surface of F9 to base of F14 (sometimes reduced basally and apically), and palpi white; clypeus reddish-brown. Mesosoma black to blackish-brown, except for: tegula yellow to whitish-yellow; anterior margin of pronotum more or less tinged with reddish-brown. Wings hyaline, with pale blackish-brown veins. Fore and mid legs red to yellowish-brown, sometimes narrowly tinged with blackish-brown. Hind leg black to blackish-brown except for: trochanters, base and apex of femur, base of tibia, tarsus partly tinged with reddish-brown; coxa sometimes with a reddish-brown area. Metasoma black to blackish-brown, except for: posterior margin of T1-T4 narrowly tinged with reddish-brown to yellowish-brown; membranous part of sternites white; ovipositor yellowish-brown to reddish-brown.

Male. No specimens available.

Distribution. Japan (Kunashiri Is., Hokkaido and Honshu), Russian Far East, Korea and China.

Remarks. This is the first record of this species from Honshu. Kasparyan (1976) and Kasparyan & Khalaim (2007) notes that *D. orientalis* and *D. atratus* are separable by the colouration of hind coxa (*D. atratus*: entirely black; *D. orientalis*: black with reddish-brown area) and tarsus (*D. atratus*: without white band; *D.*

Table 1. Intraspecific variation in the additional specimens of *D. orientalis*. A, absent; P, present; I, more or less inclivous; V, vertical; R, more or less reclivous..

Character \ Specimen	*D_orientalis_1*	*D_orientalis_2*	*D_orientalis_3*	*D_orientalis_4*	*D_orientalis_5*
Red area of hind coxa	A	P	A	P	P
White band of hind tarsus	A	A	A	A	A
Inclination of cu-a of fore wing	I	I	V	R	I
Length of ovipositor sheath/ fore wing	0.8	0.7	1.0	0.8	0.7

Character states of *D. orientalis* Character states of *D. atratus*

orientalis: with a white band), the length of ovipositor (*D. atratus*: longer than 0.75 times as long as fore wing; *D. orientalis*: shorter than 0.75 times as long as fore wing), and the inclination of cu-a of fore wing (*D. atratus*: reclivous; *D. orientalis*: subvertical to slightly inclivous) based on the types of both species, while I recognize rather large intraspecific variation of the characters in the additional materials with overlaps (Table 1). In addition, I checked the holotype and the additional specimens of *D. orientalis* and then found its tarsus without white band. Thus, the description of hind tarsus of *D. orientalis* by Kasparyan & Khalaim (2007) may be not correct.

Key to World species of *Deuteroxorides*

1. Mesopleuron nearly entirely black (Figs. 1, 8), at most with a small indistinct yellow area below subalar prominence. Mesoscutum without conspicuous yellow areas. Palearctic region.

.....2

-. Mesopleuron with conspicuous yellow stripes or spots. Mesoscutum with conspicuous yellow areas. Oriental region.

.....4

2. All coxae and hind femur red. Second to fourth segments of hind tarsus with a conspicuous white band. Ovipositor sheath 0.5–0.7 times as long as fore wing. Distribution: Western Palearctic region.

.....*D. elevator* (Panzer, 1799)

-. At least hind coxa and hind femur largely black to blackish-brown (Figs. 1, 6, 8, 10). Second to fourth segments of hind tarsus entirely black (Figs. 8, 10) or with a conspicuous white band (Figs. 1, 6). Ovipositor sheath 0.6–1.0 times as long as fore wing. Distribution: Eastern Palearctic region.

.....3

3. All coxae black (Fig. 1). Tegula black to blackish-brown (Fig. 4). Ovipositor sheath 0.6 times as long as fore wing and 1.2–1.3 times as long as hind tibia. POL 0.8 times as long as OOL. Hind tibia with a conspicuous white band (Figs. 1, 6). Hind femur 5.5–6.2 times as long as maximum depth in lateral view. Male unknown.

..... *D. breviterebratus* **sp. nov.**

-. Fore and mid coxae red (Fig. 8). Hind coxa black, sometimes with a reddish-brown area. Tegula yellow to whitish-yellow. Ovipositor sheath 0.7–1.0 times as long as fore wing and 1.4–2.2 times as long as hind tibia. POL 0.6–0.7 times as long as OOL. Hind tibia without a conspicuous white band (Figs. 8, 10). Hind femur 6.3–6.5 times as long as maximum depth in lateral view.

..... *D. orientalis* (Uchida, 1928) (= *D. atratus* Kasparyan, 1976 **syn. nov.**)

4. All coxae black with a small yellow spot. Fore and mid femora red. Mesopleuron with three yellow areas. Mesopleuron densely punctate. Male unknown.

.....*D. indicus* Gupta, 1980

-. Fore and mid coxae yellow. Fore and mid femora yellow. Mesopleuron with two yellow areas. Mesopleuron sparsely punctate. Female unknown.

.....*D. brumhus* Gupta, 1980

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References

Eady, R. D., 1968. Some illustrations of microsculpture in the Hymenoptera. *Proceedings of the Royal Entomological Society of London*, **43**: 66–72.

Gauld, I. D., 1991. The Ichneumonidae of Costa Rica, 1. *Memoirs of the American Entomological Institute*, **47**: 1–589.

Gauld, I. D., C. Godoy, J. Ugalde & R. Sithole, 2002. The Ichneumonidae of Costa Rica, 4. *Memoirs of the American Entomological Institute*, **66**: 1–768.

Gupta, V. K., 1980. A revision of the tribe Poeminiini in the Oriental Region (Hymenoptera: Ichneumonidae). *Oriental Insects*, **14**: 73–130.

Kasparyan, D. R., 1976. Review of the Ichneumonids of the tribe Polysphinctini and Poemeniini (Hymenoptera, Ichneumonidae) of the Far East. *Trudy Zoologicheskogo Instituta*, **67**: 68–89. (In Russian).

Kasparyan, D. R. & A. I. Khalaim, 2007. Pimplinae. In Lelej, A. S. (ed.), Key to the insects of Russia Far East. Vol. IV, Neuropteroidea, Mecoptera, Hymenoptera. Pt 5, pp. 279–410. Dalnauka, Vladivostok. (In Russian).

Uchida, T., 1928. Dritter Beitrag zur Ichneumoniden-Fauna Japans. *Journal of the Faculty of Agriculture, Hokkaido University*, **25**: 1–115.

Uchida, T., 1936. Erster Nachtrag zur Ichneumonidenfauna der Kurilen. (Subfam. Cryptinae und Pimplinae). *Insecta Matsumurana*, **11**: 39–55.

Viereck, H. L., 1914. Type species of the genera of Ichneumon flies. *United States National Museum Bulletin*, **83**: 1–186.

Wahl, D. B., 1993. Family Ichneumonidae. In Goulet, H. & J. T. Huber (eds.), Hymenoptera of the World: An identification guide to families, pp.395–509. Agriculture Canada, Ottawa.

Yu, D. S., K. van Achterberg & K. Horstmann, 2012. World Ichneumonoidea 2011. Taxonomy, biology, morphology and distribution. Flash driver computer database program. Taxapad®, Vancouver, Canada.

摘　要

渡辺恭平 , 2017. 日本産ヒメクチキヒメバチ属 *Deuteroxorides*（ハチ目、ヒメバチ科、クチキヒメバチ亜科）の再検討 . 神奈川県立博物館研究報告（自然科学）, (46): 101-106.［Watanabe, K., 2017. Revision of the Genus *Deuteroxorides* Viereck, 1914 (Hymenoptera, Ichneumonidae, Poemeniinae), from Japan. *Bull. Kanagawa prefect. Mus.* (*Nat. Sci.*), (46): 101-106.］

日本産のヒメクチキヒメバチ属を再検討し、本州と四国で得られた標本に基づき新種 *Deuterixorides breviterebratus* を命名、記載した。本種はヒメクチキヒメバチ *D. orientalis* (Uchida, 1928) に似るが、前脚および中脚の基節が黒色である点（ヒメクチキヒメバチでは赤色）、肩板は黒色～黒褐色（ヒメクチキヒメバチでは黄色～黄白色）、産卵鞘は前翅の 0.6 倍の長さ（ヒメクチキヒメバチでは 0.7 ～ 1.0 倍）であることで容易に区別できる。国後島と極東ロシアから知られていたクナシリクチキヒメバチ *D. atratus* Kasparyan, 1976 はヒメクチキヒメバチの種内変異に収まると認め、前者を後者のシノニムとした。結果、日本産のヒメクチキヒメバチ属は 2 種が認められた。*D. breviterebratus* の新標準和名として、全ての基節が黒色である点にちなみモトグロヒメクチキヒメバチを提唱した。

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