

## A Systematic Revision of the Clavigerine Genus Diartiger Sharp from East Asia (Coleoptera, Staphylinidae, Pselaphinae)

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## A Systematic Revision of the Clavigerine Genus *Diartiger* Sharp from East Asia (Coleoptera, Staphylinidae, Pselaphinae)<sup>1)</sup>

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**Abstract.** The Clavigerine genus *Diartiger* containing five species is revised. Two new species, *D. kubotai* from Japan and *D. kunmingensis* from Yunnan, Southwest China are described. *D. fossulatus* Sharp is redescribed and classified into seven subspecies, *izuinsulicola* nov., *ispartae* (Karaman), *morimotoi* nov., *imasakai* nov., *hirashimai* nov., *dentipes* Nomura et Lee and the nominotypical subspecies. Two little-known species, *D. spinipes* Sharp and *D. japonicus* (K. Sawada) are redescribed. Records of the host ants are noted.

Key words: Taxonomy, Coleoptera, Staphylinidae, *Diartiger*, revision. East Asia

### Introduction

The genus *Diartiger* described by Sharp (1883) has been well known as a representative of the myrmecophilous beetles in Japan (Adachi, 1950; Shiraki, 1954). The type species, *D. fossulatus* Sharp is commonly distributed in the mainland of Japan and some host ants of this species have been recorded. Striking geographic variation found in this species was pointed out in a private publication on the Japanese Pselaphidae made by Kubota (1956), though its taxonomical treatment has never been discussed. Modified structure of its mouthparts was observed and noted by Kubota (1956). Kistner (1982) and Ohishi (1992). On the other hand, *D. spinipes* Sharp described at the same time as the former species has not been recorded again since its original description for over one century. Nomura and Lee (1992) recently described *D. dentipes* from Cheju Is., of South Korea, which was also recorded from the Korean Peninsula by Nomura and Lee (1993).

Besuchet (1986) revised the genera *Microdiartiger* K. Sawada and *Coiffaitius* Karaman, synonymized them with *Diartiger*, and corrected the erroneous type locality "Turkey" of the type species of the latter genus, *C. ispartae* Karaman to "Japan".

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In this study, the geographically variable species, *D. fossulatus* is classified into seven subspecies. *D. ispartae* (Karaman) and *D. dentipes* Nomura et Lee are regarded as its subspecies. Two little-known species, *D. japonicus* (K. Sawada) and *D. spinipes* Sharp are redescribed and their new distributional records are added. Two new species are described, namely, *D. kubotai* from Japan and *D. kunmingensis* from Yunnan, China. And records of host ants are reviewed for all the species.

### Genus *Dim-tiger* Sharp

[Japanese name: Yamato-higebuto-arizukamushi Zoku]

*Dim-tiger* Sharp, 1883, Trans. ent. Soc. London, 1883: 329; Raffray, 1890, Revue Ent., 9: 165; Raffray, 1904, Anns. Soc. ent. Fr., 73: 464; Raffray, 1908, Gen. Ins., 64: 437; Raffray, 1911, Coleopt. Cat., (27): 176; Park, 1948, Bull. Chicago Acad. Sci., 8: 218; Jeannel, 1958, Mém. Mus. Hist. nat., Paris, (A), 18: 125; Newton & Chandler, 1989, Fieldiana Zool., (N. S.), (53): 64. Type species: *Dial-tiger fossulatus* Sharp, designated by Lucas, 1920.

*Microdiartiger* K. Sawada, 1964, Ent. Rev. Japan, 17: 12; Besuchet, 1986, Revue suisse Zool., 93: 263 (synonymized); Newton & Chandler, 1989, Fieldiana Zool., (N. S.), (53): 64. Type species: *Microdiartiger japonicus* K. Sawada, by original designation.

*Coiffaitius* Karaman, 1969, Biol. Gallo-Hellenica, 2: 50; Besuchet, 1986, Revue suisse Zool., 93: 263 (synonymized); Newton & Chandler, 1989, Fieldiana Zool., (N. S.), (53): 64. Type species: *Coiffaitius ispartae* Karaman, by monotypy.

Body small- to medium-sized, 1.3-2.3 mm in length, broadened posteriorly, strongly depressed at base of abdomen.

Head longer than wide, nearly subcylindrical, weakly broadened anteriorly. Eyes developed, located near the mid level of head. Mouthparts more or less reduced, almost invisible in dorsal view. Antennae short and thick, thickened distally, 4-segmented. 1st and 2nd segments very short, 3rd large and elongate, 4th the largest.

Pronotum subglobose, with a basi-median and a pair of basi-lateral foveae. Elytra various in structure of dorsal surface, each elytron with a large trichome (elytral trichome) at postero-lateral part. Legs short and robust, trochanters very large and elongate. mid trochanters each with a large spine near apex in male of many species, mid femora thickened near the middle in general, with a large spine on posterior side in male in many species, mid tibiae slender, denticulate on inner side in male.

Abdomen very large, rounded on both lateral and posterior sides, 3rd to 6th tergites completely fused to each other to form a large composite tergum, with a large and deep basi-median concavity and a pair of basi-lateral trichomes, each basi-lateral trichome thick at posterior part, then extending antero-medially to form a transverse fringe in the basi-median concavity in some species, 3rd to 6th paratergites fused like tergites to form composite paraterga, each composite paratergum elongate, narrowed posteriorly. with a basal trichome (paratergal trichome) and an elongate to semilunar depressed part (paratergal disc) just behind the paratergal trichome, 7th to 8th tergites short, sometimes

invisible in dorsal view, 3rd to 4th sternites fused to each other, constricted and concave in basal part, 5th to 8th sternites each well demarcated.

Aedeagus well sclerotized, median lobe divided into basal bulb and apical lobe. basal bulb with a basal nodule containing basal foramen and an ovoid membranous part on dorsal side, apical lobe narrowed distally, with large apical orifice on dorsal side. endophallus weakly sclerotized and very slender in many species.

*Remarks.* This genus is characterized by four-segmented antennae with long third and fourth segments. It is most closely allied to the genus *Micrelytriger* Nomura recently described from the Ryukyus and Taiwan in view of the similarity of antennae and the structures of trichomes on the elytra and the abdomen.

### ***Diartiger fossulatus Sharp***

[Japanese name: Ko-yamato-higebuto-arizukamushi]

*Diartiger fossulatus* Sharp, 1883, Trans. ent. Soc. London, 1883: 330; Waterhouse, 1882-90, Aid Ident. Ins., 2: 146; Raffray, 1904, Anns. Soc. ent. Fr., 73: 464; Raffray, 1908, Gen. Ins., 64: 438; Raffray, 1911, Coleopt. Cat., (27): 176; Sakaguti, 1943, Takarazuka-Konchukan-po, (37): 2; Park, 1948, Bull. Chicago Acad. Sci., 8: 218; Jeannel, 1958, Mém. Mus. Hist. nat., Paris, (A), 18: 126; Nomura, 1989, Check List Jpn. Ins., Fukuoka, 1: 293.

*Male.* Length 1.88-2.24 mm. Width 0.70-0.85 mm.

Body broadened posteriorly, widest at the middle of abdomen.

Head longer than wide, subcylindrical, gently thickened anteriorly, covered with irregular reticulation on dorsal surface; clypeus very short, slightly broadened anteriorly, nearly arcuate on anterior margin, frons strongly convex, triangular in anterior part, vertex slightly convex, with a pair of indistinct dorsal tentorial pits just inside eyes, genae weakly narrowed in front of eyes, postgenae angulate postero-laterally. Eyes small and ovoid, each composed of about 15 facets. Antennae short, reaching anterior margin of pronotum, 0.45-0.54 mm in length, thickened distally, 1st segment very short and invisible in dorsal view, 2nd short, slightly wider than long, subcylindrical, 3rd elongate and thickened distally, 4th the largest, longer than 1st + 2nd + 3rd, subconical. covered with long and suberect hairs on lateral surface, shallowly concave and densely covered with short setae at apex. Mouthparts strongly reduced; labrum very short and transverse. gently bisinuate on anterior margin, with a pair of glandular orifices near the base; mandibles short and thick, obtusely angulate at apex, teeth indistinct, each with a large glandular orifice at lateral part, maxillae reduced and weakly sclerotized, galea and lacinia normally setose at apex, maxillary palpi each reduced to a short and simple sclerite. swollen at apex., labium comprising normal-sized mentum, subtransparent and normal paraglossa and a pair of reduced labial palpi.

Pronotum about as long as head, wider than head, subglobose, as long as wide. covered with irregular reticulation and short and bold hairs on dorsal surface. with a large basi-median and a pair of weak basi-lateral foveae. Metasternum transverse and strongly convex just behind mesocoxae, densely covered with longitudinal linear sculpture on both lateral sides, with a longitudinal trichome along median line. Elytra narrowed anteriorly.

nearly trapezoidal, weakly convex, arcuately emarginate on anterior margin, shallowly emarginate on posterior margin, each elytron with 2 indistinct basal foveae and 2 indistinct longitudinal sulci at basal part, elytral trichome large, sharpened posteriorly. Legs short and thick, trochanters elongate and thickened distally, mid trochanters each with a large spine on postero-apical side; femora thick, each femur with 2 longitudinal carinae on inner side, mid femora gently bent, each with a large denticle on postero-dorsal side in some subspecies, tibiae slender, sparsely covered with suberect hairs, mid tibiae strongly flattened, each with a small denticle near the middle.

Abdomen widest and very large, slightly wider than long, rounded posteriorly. composite tergum deeply concave in basal part, convex in apical part, sparsely covered with long suberect hairs, basi-lateral trichome various in shape, more or less curled internally, with a large transverse fringe in its antero-median part, paratergal trichome large and thick, paratergal disc slightly smaller than paratergal trichome, longer than wide, 7th tergite short and transverse, trapezoidal in posterior view, 8th very small and nearly semicircular in posterior view, 4th sternite largest and transverse. with a shallow and indistinct transverse groove at base, 5th to 7th successively shortened posteriad, each short and transverse, covered with indistinct reticulation on both lateral sides, 8th **small** and semicircular, weakly convex.

Aedeagus large and strongly sclerotized, parameres indistinct, median lobe subparallel-sided and rounded at base, with a large and well projected basal nodule. a large and ovoid membranous part on dorsal side and a large and deep ventral depression, apical lobe very small and trapezoidal in dorsal view, endophallus very slender and thin, invisible in some cases.

*Female.* Length 1.88-2.25 mm. Width 0.71-0.85 mm. Similar to male, but antennae slightly shorter than in male in general, 0.44-0.51 mm in length, mid trochanters without spine, mid femora more slender and nearly straight, without denticle, mid tibiae normally slender, without denticle.

*Distribution of the species.* South Korea and Japan (Hokkaido, Honshu, Shikoku and Kyushu).

Remarks. This species is similar to *D. spinipes* Sharp and *D. kubotai* sp. nov., but clearly differs from them in having very small apical lobe of the aedeagus.

A striking geographical variation is recognized in this species. It is considered not to be a cline but a punctuated variation on the basis of examination of many specimens from all over Japan and South Korea. It is therefore concluded that this species can be classified into seven subspecies as described in this study.

*Host ants for subspecies indetermined:*

*Paratrechina flavipes* Smith: Kusaka, Iwate Pref.(Nakano & Yoshida, 1939); Kyoto City (Sakaguti, 1943); localities unknown (Tanokuchi, 1979b).

*Lasius niger* Linnaeus: Asakawa, Tokyo Pref.; Mitake, Tokyo Pref.; Hakone, Kanagawa Pref. (Nakano & Yoshida, 1939); Ryûjin Spa, Wakayama Pref.; Kyoto City (Sakaguti, 1943); Minamizawa, Tsukui-gun, Kanagawa Pref.(Kiryû, 1978); localities unknown (Tanokuchi, 1979b);.

*Lasius umbratus* (Nylander): Shin-gogôme, Mt. Fuji, Shizuoka Pref.(Tanokuchi, 1979a);.

*Formica japonica* Motschulsky: Shin-gogôme, Mt. Fuji, Shizuoka Pref.(Tanokuchi, 1979a);

*Diartiger fossulatus fossulatus* Sharp

**Male.** Length 1.9 **1-2.09** mm. Width 0.75-0.80 mm. Body medium-sized. Antennae relatively short, well broadened distally, 0.45-0.48 mm in length. 0.11-o. 13 mm in width, 4th segment very thick, 2.2-2.3 times as long as wide. Mid trochanters elongate, each with a large and acute spine on postero-apical side, mid femora robust. each with a large and triangular denticle near the middle on posterior side. Basi-lateral trichome of composite tergum very broad at base, straight and scarcely sharpened at apex. paratergal trichome large and elongate, paratergal disc elongate and nearly fusiform.

Female. Length 2.04-2.11 mm. Width 0.76-0.83 mm. Antennae 0.44-0.49 mm in length, 0.13 mm in width, 4th segment 2.0-2.3 times as long as wide.

Specimens **examined.** [Hokkaido] 1 female, Bibi, Chitose C., Ishikari. 20. vi. -4. vii. 1992, S. Hori leg.; 1 male, Kimontou Lake, Taiki-chô, Tokachi, 26. viii. 1993. S. Hori leg.; 1 female, Toyokita-kaigan, Urahoro-chô, Tokachi, 26. vi. -7. vii. 1993. S. Hori leg. [Honshu] 1 male, 1 female, Tappi-misaki, Minmaya-mura, Aomori Pref.. 30. ix. 1992, S. Nomura leg.; 1 female, Yasuno, Hanamaki C., Iwate Pref.. 2. x. 1992. S. Nomura leg.; 1 female, Niisato, Tohno C., Iwate Pref., 1. x. 1992, S. Nomura leg.: 1 female, Ochinome, Sakata C., Yamagata Pref., 3. x. 1992, S. Nomura leg.; 1 female, Akyu, Miyagi Pref., 14. vi. 1986, Y. Hirano leg.; 1 female, Mt. Kotoriyama, Fukushima C., Fukushima Pref., 24. ix. 1987, K. Tazoe leg.; 2 males, 2 females, Natsui, Kurokawa-mura, Niigata Pref., 3. vii. 1985, S. Nomura leg.; 1 female, Tainai-daira, Kurokawa-mura, Niigata Pref., 2. ix. 1991, H. Koike leg.; 1 male, Higashizawa, Otobuzawa, Ueno-mura, Gunma Pref., 5. v. 1979, Y. Nishikawa leg.; 1 male, 1 female, Nikko, Tochigi Pref., 20. v. 1978, Y. Hirano leg.; 1 male, Mt. Yamizosan, Ibaraki Pref., 29. v. 1988, Y. Hirano leg.; 4 males, 2 females, Sunosaki-jinja, Tateyama C., Chiba Pref., 12. v. 1996, S. Nomura leg.; 1 male, 1 female, Kakuyama, Ogawa-machi, Saitama Pref., 30. iii. 1993, T. Nambu leg.; 1 female, same locality, 13. xi. 1993. T. Nambu leg.; 2 females, Higashi-Kadaira, Kannon, Kodama-machi, Saitama Pref.. 17. viii. 1989, T. Nambu leg.; 1 male, Uratako-machi, Hachiôji C., Tokyo Pref.. 2 l. v. 1994, S. Yoshida leg.; 1 female, Mt. Takaosan, Tokyo Pref., 21. iv. 1960, Y. Shibata leg.; 1 female, Mt. Mitakesan, Tokyo Pref., 5. v. 1956, Y. Shibata leg.; 1 male, 1 female, Miwa, Machida C., Tokyo Pref., 10. v. 1980, Kazuhiro Sawada leg.; 1 female, Hisagi, Zushi C., Kanagawa Pref., 12. iv. 1957, K. Ishida leg.; 1 male, Fudakake, Tanzawa, Kanagawa Pref., 16. vi. 1987, Y. Hirano leg.; 1 female, same locality as above, 17. v. 1994, Y. Hirano leg.; 4 males, 4 females, Mt. Ôyama, Tanzawa, Kanagawa Pref., 5. v. 1960, Y. Shibata leg.; 1 female, same locality as above, 3. vii. 1977, Y. Hirano leg.; 2 females, Utsukushigahara, Nagano Pref., 5. v. 1959. K. Mizusawa leg.; 6 males, 2 females, same locality as above, 1. v. 1960, Y. Shibata leg.

**Distribution of the subspecies.** Japan: Hokkaido, Honshu (Tôhoku, Kantô, Chûbu districts and Niigata Pref.).

**Remarks.** The nominotypical subspecies is characterized by the apically broadened antennae with very thick fourth segment, and hardly sharpened basi-lateral trichome of the composite tergum. It is distributed in the large area of the northern and eastern parts of Japan. A problem is on the population of Hakone which is designated as the type locality of this species, as will be noted in the section of *D. fossulatus* subspecies

indetermined under the part of *D. f. ispartae* (Karaman). In spite of this, the characteristics of this nominotypical subspecies are unquestionably described and illustrated by Sharp (1883) and Waterhouse (1882-90).

*Host ants: Lasius (Chthonolasius) sp. (L. umbratus (Nylander) or L. meridionalis (Bondroit)):* Tappi-misaki, Aomori Pref. (present study).

*Diartiger fossulatus izuinsulicola* subsp. nov.

*Male.* Unknown,

*Female.* Length 2.25 mm. Width 0.85 mm. Body large-sized. Antennae slender, 0.5 mm in length, 0.11 mm in width, 4th segment slightly broadened distally, three times as long as wide. Basi-lateral trichome of composite tergum small, strongly sharpened and curled posteriorly, paratergal trichome short, paratergal disc large and elongate, nearly fusiform.

*Holotype, female, Kôzu Is., Izu Isls., Tokyo Pref., 17. vii. 1989, M. Hasegawa leg.*

*Distribution of the subspecies.* Japan: Honshu (Izu Isls.).

*Remarks.* This subspecies differs from the nominotypical subspecies in the slender antennae and the sharpened and curled basi-lateral trichome of the composite tergum.

*Host ants:* Unknown.

*Diartiger fossulatus ispartae* Karaman, stat. nov.

*Coiffaitius ispartae* Karaman, 1969, Biol. Gallo-Hellenica, 2: 50.

*Dim-tiger ispartae:* Besuchet, 1986, Revue suisse Zool., 93: 263; Nomura, 1989, Check List Jpn. Ins., Fukuoka, 1: 293.

*Male.* Length 2.04-2.18 mm. Width 0.78-0.85 mm. Body medium-sized. Antennae elongate and slender, 0.50-0.54 mm in length, 0.11-0.13 mm in width. 4th segment slightly broadened distad, 2.5-3.0 times as long as wide. Mid trochanters elongate, each with a large spine on postero-apical side, mid femora robust, each with two very small denticles near the middle of dorsal carina and at basal 1/8 of ventral carina on posterior side. Trichomes on basi-lateral part of composite tergum similar to those in the nominotypical subspecies.

*Female.* Length 2.04-2.18 mm. Width 0.76-0.85 mm. Antennae shorter than in male, 0.46-0.50 mm in length, 0.11-0.13 mm in width, 4th segment 2.3-2.7 times as long as wide.

*Specimens examined.* [Honshu] 2 males, 1 female, Kurosawaguchi, Mt. Ontakesan, Kiso, Nagano Pref., 20. vii. 1952, S. Uéno leg.; 1 female, Nabetani, Tatsunokuchimachi, Ishikawa Pref., 5. vi. 1994, Y. Sugie leg.; 1 male, Mt. Shiritakayama, Tsurugimachi, Ishikawa Pref., 16. xi. 1991, K. Nakata leg.; 1 male, Tsurugimachi, Ishikawa Pref., 8. v. 1993, I. Togashi leg.; 1 female, Kawakami, Maruoka-machi, Fukui Pref., 25. v. 1984, M. Saitô leg.; 2 males, 2 females, Hananuki Pass, Mt. Odaigahara, Mie Pref., 12. vi. 1952, H. Ishida leg.; 2 males, 1 female, Same, Taga-chô, Shiga Pref., 24. v. 1952, S. Uéno leg.; 1 male, Shimogahara, Taga-chô, Shiga Pref., 24. v. 1952, S.

Uéno leg.; 1 female, Iwakura, Kyoto C., Kyoto Pref., 20. iv. 1981, T. Ogata leg.; 1 female, Kibune, Kyoto C., Kyoto Pref., 29. viii. 1943, K. Sakaguti leg.; 2 males. 1 female, same locality, 6. v. 1952, S. Uéno leg.; 1 female, Sen-yûji, Imakumano. Higashiyama-ku, Kyoto C., Kyoto Pref., 3. v. 1943, K. Sakaguti leg.; 3 males. Mt. Kuramayama, Kyoto C., Kyoto Pref., 26. v. 1979, Y. Hirano leg.; 1 female, Totsukawa, Mizuho-chô, Kyoto Pref., 10. vi. 1986, S. Nomura leg.; 3 males, 6 females, Mt. Mikusayama, Nose-chô, Osaka Pref., 17. xii. 1992, Y. Sawada leg.; 4 males, 5 females, same locality, 23. I. 1993, Y. Sawada leg.; 10 males, 13 females, same locality, 19. iii. 1993, Y. Sawada leg.; 1 male, 2 females, same locality, 20. iv. 1993, Y. Sawada leg.; 1 male, same locality, 20. ix. 1993, Y. Sawada leg.; 1 male. Jûmantsuji, Takarazuka C., Hyôgo Pref., 25. vi. 1989, H. Ohishi leg.; 1 female. Narazaka, Nara C., Nara Pref., 2. vii. 1996, Y. Higashiura leg.; 3 males, 1 female. Kashiwadani, Kii-Ohshima Is., Kushimoto-chô, Wakayama Pref., 5. v. 1994. S. Nomura leg.; 1 female, Mt. Kyûshôzan, Tottori C., Tottori Pref., 21. v. 1989. N. Tsurusaki leg.; 3 males, 3 females, same locality, 20. xii. 1991, N. Tsurusaki leg.

*Distribution of the subspecies.* Japan: Honshu (Chûbu, Hokuriku, Kinki districts and Tottori Pref.).

*Remarks.* This subspecies is easily distinguished in the male from the other subspecies by very small two denticles of the mid femur, though the female cannot be readily separated from the others.

Host *ants*: Unknown.

#### *Diartigerfossulatus* subspecies indetermined

*Specimens examined.* [Honshu] 1 male, Odawara, Kanagawa Pref., 2. i. 1976, Y. Hirano leg.; 1 male, same locality as above, 13. ii. 1977, Y. Hirano leg.; 1 male. 1 female, same locality as above, 16. xii. 1978, Y. Hirano leg.; 1 male, same locality as above, 6. v. 1984, Y. Hirano leg.; 8 males 2 females, Mt. Daiyûzan, Hakone, Kanagawa Pref., 29. iv. 1975, Y. Hirano leg.; 2 males, 2 females, same locality as above, 8. v. 1976, Y. Hirano leg.; 1 male, 3 females, same locality as above. 6. v. 1979, Y. Hirano leg.; 1 male, same locality as above, 9. viii. 1981, Y. Hirano leg.; 1 male, same locality as above, 27. vi. 1982, Y. Hirano leg.; 1 male, same locality as above, 9. iv. 1983, Y. Hirano leg.; 1 male, 1 female, same locality as above, 1. v. 1983, Y. Hirano leg.; 1 male, Mt. Ôhirayama, nr. Yamanakako Lake, Yamanashi Pref., 14. vi. 1986, Y. Hirano leg.; 2 female, Susaki, Izu Peninsula, Shizuoka Pref., 2. i. 1974, Y. Hirano leg.; 1 female, Nihondaira, Shimizu C., Shizuoka Pref., 7. v. 1996, T. Nonaka leg.

*Remarks.* In an area surrounding the Hakone Mts., eastern part of Mt. Fuji and the Izu Peninsula, both forms of the subspecies *ispartae* (Karaman) and the nominotypical subspecies occur in a population. For example, typical forms of the two subspecies and some intermediate forms in various degrees are found on Mt. Daiyûzan, Hakone, which is close to the type locality of this species. Because of the polymorphism, subspecies could not be clearly recognized in this area, even though a few males were identified with one form. This area is shown by open circles in Fig. 13.



*Diartiger fossulatus morimotoi* subsp. nov.

*Male.* Length 2.08-2.15 mm. Width 0.78-0.83 mm. Body medium-sized. Antennae elongate and slender, 0.51-0.54 mm in length, 0.11 mm in width, 4th segment slightly broadened distad, 2.7-2.8 times as long as wide. Mid trochanters elongate, each with a large and obliquely truncate spine on postero-apical side, mid femora weakly swollen apicad, each with a large, acute and apically curved denticle near the middle on posterior side. Basi-lateral trichome of composite tergum broad at base, sharpened toward apex. weakly curled posteriad, paratergal trichome large, various in shape. paratergal disc nearly ovoid.

*Female.* Length 2.09-2.24 mm. Width 0.79-0.84 mm. Antennae shorter than in male, 0.49-0.51 mm in length, 0.11-0.13 mm in width, 4th segment 2.3-2.7 times as long as wide.

Holotype, male, Mt. Kizan, Kiyama-chô, Saga Pref., 12. iv. 1992, S. Nomura leg. Paratopotypes, 2 males, 2 females, same data as holotype; 1 male, 2 females, same locality, 11. iv. 1993, S. Nomura leg. Paratypes, 1 male, 3 females, Nanatsukahara. Shôbara C., Hiroshima Pref., 10. x. 1987, I. Okamoto leg.; 1 male, 1 female. Yawatabara, Geihoku-chô, Hiroshima Pref., 27. vi. 1987, S. Nomura leg.; 9 males, 11 females, Kurose-chô, Kamo-gun, Hiroshima Pref., 2. v. 1988, I. Okamoto leg.; 1 female, same locality, 29. v. 1988, I. Okamoto leg.; 2 males, 1 female, Kurose-gawa. Kure C., Hiroshima Pref., 6. ii. 1988, I. Okamoto leg.; 1 female, Mt. Sanbesan. Ohta C., Shimane Pref., 2. vi. 1989, K. Ogata leg.; 1 female, Ura-hikimi Vall., Hikimi-chô. Shimane Pref., 6. vi. 1988, K. Yahiro leg.; 1 female, Mt. Daimanjisan. Saigô-chô. Oki Is., Shimane Pref., 15. vi. 1988, S. Fukui leg.; 2 males, Akiyoshidô, Yamaguchi Pref., 28. v. 1977, S. Tanaka leg.; 5 males, 5 females, Oku-dougo, Matsuyama C.. Ehime Pref., 21. viii. 1996, I. Okamoto leg.; 1 female, Engyôji, Kôchi C., Kôchi Pref.. 29. iii. 1953, K. Morimoto leg.; 1 female, Hiraodai, Yukuhashi C., Fukuoka Pref., 18. x. 1992, S. Nomura leg.; 1 male, Hirotani, Hiraodai, Kitakyushu C., Fukuoka Pref., 25. iv. 1989, S. Nomura leg.; 1 female, Mt. Mikazukiyama, Fukuoka C., Fukuoka Pref., 22. i. 1993, S. Nomura leg.; 1 male, Minami-kôen, Fukuoka C., Fukuoka Pref.. 19. viii. 1983, H. Harada leg.; 1 male, Kanezaki, Genkai-machi, Fukuoka Pref.. 6. ix. 1983, H. Harada leg.; 2 males, 2 females, Hikosan skiing ground, Soeda-machi, Fukuoka Pref., 7. vi. 1993, S. Nomura leg.; 2 males, 1 female, Ike, Nishitaku-machi. Taku C., Saga Pref., 21. iii. 1989, S. Nomura leg.; 1 female, Mt. Mifuneyama, Takeo C., 27. v. 1984, S. Nomura leg.; 1 male, Kashibaru, Nanayama-mura, Saga Pref.. 9. vi. 1985, S. Nomura leg.; 2 males, 5 females, same locality, 14. v. 1989, S. Nomura leg.; 2 females, Ikebaru, Nanayama-mura, Saga Pref., 10. vi. 1990, S. Nomura leg.: 1 male. Mt. Taradake, Tara-chô, Saga Pref., 14. iv. 1985, S. Nomura leg.; 1 male, Tano-o, Ohmura C., Nagasaki Pref., 15. iii. 1994, S. Imasaka leg.; 1 female, Nanataki, Mifune-chô, Kumamoto Pref., 25. vi. 1994, S. Nomura leg.; 1 male, Naidaijin, Yabe-chô, Kumamoto Pref., 28. vii. 1985, R. Noda leg.; 1 male, Mt. Oidake. Ariake-chô, Amakusa, Kumamoto Pref., 3. vii. 1994, S. Nomura leg.; 1 female. Sasano-o, Amakusa-chô, Amakusa, Kumamoto Pref., 23. xii. 1991, S. Nomura leg.: 3 males, 6 females, Bôgatsuru, Kujû Mts., Ôita Pref., 27. v. 1988, K. Ogata leg.; 1 female: Chôjbaru, Kujû Mts., Ôita Pref., 11. viii. 1992, S. Nomura leg.; 1 male, Mt. Ohkue. Kitagawa-chô, Miyazaki Pref., 8. x. 1984, S. Nomura leg.; 1 male, 2 females.

Takachiho, Miyazaki Pref., 5, vi. 1985, Y. Takai leg.; 1 female, same locality as above. 27. xi. 1979, S. Tanaka leg.

*Distribution of the subspecies.* Japan: Honshu (Chûgoku district excluding Tottori Pref.) including Oki Isls., Shikoku, northern Kyushu excluding the Shimabara Peninsula.

*Remarks.* The new subspecies *morimotoi* is different from the nomynotypical subspecies in the slender antennae, the obliquely truncate spine of the mid trochanter. and the apically sharpened basi-lateral trichome of the composite tergum.

*Etymology.* This subspecies is dedicated to Prof. Emer. Katsura Morimoto of Kyushu University for his great contribution to the Japanese coleopterology and continuous guidance for my study since I was a student of his.

*Host ants:*

*Lasius (Lasius) productus* Wilson: Yawatabara, Hiroshima Pref. (present study).

*Lasius (Lasius) niger* (Linnaeus): Hikosan skiing ground, Fukuoka Pref. (present study).

*Lasius (Lasius) hayashi* Yamauchi et Hayashida: Naidaijin, Kumamoto Pref. (present study).

### ***Diartiger fossulatus imasakai* subsp. nov.**

Male. Length 1.93-2.00 mm. Width 0.73-0.76 mm. Body small-sized. Antennae elongate and slender, 0.50-0.51 mm in length, 0.10-0.13 mm in width, 4th segment very slightly broadened distad, 2.8-3.1 times as long as wide. Mid trochanters elongate. each with a large and truncate spine on postero-apical side, mid femora slightly swollen apicad, each with a large and acute denticle at basal 1/3 on posterior side. Basi-lateral trichome of composite tergum strongly narrowed and sharpened toward apex, strongly curled posteriad, paratergal trichome large at base, paratergal disc small, nearly triangular.

*Female.* Length 1.91-1.96 mm. Width 0.74-0.75 mm. Antennae 0.46-0.48 mm in length, 0.10-0.13 mm in width, 4th segment 2.9-3.1 times as long as wide.

Holotype, male, Token-yama Park, Obama-chô, Nagasaki Pref., 19. ix. 1993, S. Imasaka leg. Paratopotypes, 1 male, same data as holotype; 1 male. same locality. 5. iv. 1994, S. Imasaka leg. Paratypes, 1 male, Shimabara C., Nagasaki Pref.. 25. x. 1985. T. Tanabe leg.; 2 females, Kojigoku, Unzen, Obama-chô, Nagasaki Pref., 17. viii. 1983, H. Harada leg.

*Distribution of the subspecies.* Japan: Northern Kyushu (Shimabara Peninsula).

*Remarks.* This new subspecies is characterized by the small body and the narrowed and strongly curled basi-lateral trichome of the composite tergum in male. However. the female is difficult to be distinguished from the other subspecies, because the character state of the basi-lateral trichome is sometimes indistinct.

*Etymology.* This subspecies name is associated with Mr. Shôichi Imasaka who is an excellent amateur entomologist and is the collector of the holotype.

*Host ants:* Unknown.

*Diartiger fossulatus hirashimai* subsp. nov.

Male. Length 1.89-2.04 mm. Width 0.70-0.79 mm. Body small-sized. Antennae elongate and slender, 0.45-0.53 mm in length, 4th segment very slightly broadened distad, 2.7-3.1 times as long as wide. Mid trochanters elongate, each with a large and obliquely truncate spine on postero-apical side, mid femora less swollen and curved than in subsp. *morimotoi*, each with an acute denticle at basal 3/7 on posterior side. Basi-lateral trichome of composite tergum narrowed and sharpened toward apex, strongly curled posteriad and hook-like at apex, paratergal trichome smaller than in *morimotoi*, paratergal disc elongate and nearly fusiform.

*Female*. Length 1.88-2.13 mm. Width 0.71-0.83 mm. Antennae 0.48-0.51 mm in length, 4th segment 2.3-3.0 times as long as wide.

Holotype, male, Kawanaka, Aya-chô, Miyazaki Pref., 10. v. 1985, S. Nomura leg. Paratopotypes, 2 males, same data as holotype. Paratypes, 1 male. Mt. Ichifusayama, Mizukami-mura, Kumamoto Pref., 12. v. 1985, S. Nomura leg.; 3 females. same locality, 27. x. 1985, T. Tanabe leg.; 1 male, 1 female, same locality. 27. vi. 1993, S. Nomura leg.; 1 male, 2 females, Aoidake, Tano-chô, Miyazaki Pref., 6. ix. 1993, S. Nomura leg.; 2 males, same locality as above, 12. v. 1980, S. Tanaka leg.; 1 female. Kakutô Pass, Ebino C., Miyazaki Pref., 8. ix. 1979, S. Tanaka leg.; 2 males, 5 females, Mt. Wanizukayama, Tano-chô, Miyazaki Pref., 6. ix. 1993, S. Nomura leg.; 1 male. Aoidake, Yamanokuchi-ch8, Miyazaki Pref., 21. xii. 1974, A. Nagai leg.; 7 males, 9 females, Yuzuzono, Suki-son, Miyazaki Pref., 18. v. 1976, A. Nagai leg.; 1 female. Miyanotani, Aya-ch8, Miyazaki Pref., 8. ii. 1994, S. Nomura leg.; 1 female. Ohkawauchi-goshi, Shiiba-son, Miyazaki Pref., 10. vi. 1989, S. Nomura leg.; 1 female. Aya-minami, Aya-chô, Miyazaki Pref., 25. iv. 1993, S. Nomura leg.; 1 male, Mimata. Miyazaki Pref., 15. iii. 1980, S. Tanaka leg.; 2 females, Ishiki-chô, Kagoshima C., Kagoshima Pref., 24. iii. 1985, T. Tanabe leg.; 1 male, Oku-Jusso, Ohkuchi C., Kagoshima Pref., 10. v. 1980, Y. Takai leg.; 2 females, Mt. Shibisan, Miyanojô-chô, Kagoshima Pref., 28. iii. 1985, T. Tanabe leg.; 1 male, Mt. Inaodake, Tashiro-chô, Kagoshima Pref., 7. vii. 1985, T. Tanabe leg.

Distribution of *the subspecies*. Japan: Southern Kyushu.

Remarks. The new subspecies *hirashimai* is very similar to *imasakai* subsp. nov. in the small-sized body and the narrowed and strongly curled basi-lateral trichome of the composite tergum. This subspecies is separable from the latter by the less narrowed and shorter basi-lateral trichome in male. It is, however, difficult to be separated from *imasakai* in the female, because the subspecific character of the basi-lateral trichome is sometimes indistinct.

*Etymology*. This subspecies is dedicated to Prof. Emer. Yoshihiro Hirashima of Kyushu University who greatly contributed to the faunistic study on the Miyazaki Higashimorokata district, in which lies the type locality of this subspecies.

*Host ants*:

*Paratrechina flavipes* (F. Smith): Mt. Ichifusayama, Kumamoto Pref. (present study).

*Lasius (Lasius) niger* (Linnaeus): Mt. Ichifusayama, Kumamoto Pref. (present study).

*Lasius (Lasius) huyashi* Yamauchi et Hayashida: Oku-Jusso, Kagoshima Pref. (present study)

*Diartiger fossulatus dentipes* Nomura et Lee, stat. nov.

*Diartiger dentipes* Nomura et Lee, 1992, Esakia, Fukuoka, (32): 77; Nomura & Lee, 1993, *ibid.*, (33): 44.

*Specimens examined.* 2 males, Kwanglyong Ri, Chejudo Is., South Korea, 22. vii. 1993, T. Ueno leg.

*Distribution of the subspecies.* South Korea including Chejudo Is.

*Remarks.* The reasons why this beetle is ranked down to a subspecies of *fossulatus* are as follows: 1) it closely resembles typical *fossulatus* in many features, especially in the strongly reduced and angulate apical lobe of the aedeagus: 2) there is no autapomorphic character supporting the monophyly of the remaining six subspecies excluding *dentipes*. This subspecies is most similar to subsp. *ispurtue* (Karaman) from western Japan, but differs in the small denticle at basal 1/4 of the mid femur and the apically dilated large spine of the mid trochanter in the male. The female of this species bears a basi-lateral trichome of the composite tergum similar to that in *D. fossulatus hirashimai* subsp. nov., but is separable by the large body.

*Host ants:* *Lusinus alienus* Foerster: Samjeong Ri, Cheonla-buk Do, South Korea (Nomura & Lee, 1993).

*Diartiger kubotai* sp. nov.

[Japanese name: Kubota-yamato-higebuto-arizukamushi]

*Mule.* Length 2.09-2.16mm. Width 0.70-0.75mm.

Body reddish brown, shiny in abdomen, broadened posteriorly.

Head longer than wide, subcylindrical, densely covered with coarse reticulation, sparsely with long and bold hairs on dorsal surface; clypeus short, slightly broadened anteriorly, arcuate on anterior margin, frons convex, strongly narrowed in anterior part. subparallel-sided behind bases of antennae, vertex almost flat, with a pair of round dorsal tentorial pits just behind eyes; postgenae broad, subparallel-sided. Eyes small and ovoid. each composed of about 15 facets. Antennae reaching anterior margin of pronotum, 0.54 mm in length, 0.10-0.13 mm in width, elongate and thickened distally, 1st segment very short, ring-shaped, 2nd short, wider than long, subglobose, 3rd slightly wider than 2nd, about 2.3 times as long as wide, elongate and thickened distally, 4th the largest, 1.8 times as long as 3rd, about 3 times as long as wide, subconical and thickened distally.

Pronotum slightly shorter than head, as long as wide, subglobose, with a deep and glabrous basi-median and a pair of small and weak basi-lateral depressions. **densely** covered with reticulation and long hairs on dorsal surface. Metasternum transverse and broad, covered with shallow and longitudinal linear sculpture on ventral surface. densely with aureous hairs along median line. Elytra wider than long, trapezoidal and narrowed anteriorly, weakly convex, humeri slightly expanded, densely covered with short hairs. each elytron with 3 indistinct basal foveae, 2 longitudinal sulci and a sparse and nearly triangular fringe at postero-median margin, elytral trichome very thick at base, sharpened and internally curved at apex. Legs short and thick, mid trochanters elongate, with a large and robust spine on postero-ventral side, mid femora thickened medially, weakly

concave on posterior side, mid tibiae slender, narrowed at base, with a small denticle at apical 2/5 on inner side.

Abdomen slightly larger than elytra, wider than long, rounded on lateral and posterior sides, strongly convex medially, with a deep and transverse basal concavity, composite tergum very large, with a transverse groove and a pair of short and convergent sulci in the basal concavity, smooth and sparsely covered with very minute hairs on dorsal surface, and with a few long and suberect hairs in posterior part, basi-lateral trichome very thick at base, sharpened and internally curled at apex, with indistinct transverse fringe, paratergal trichome thick and fusiform, paratergal disc semicircular, margined with short fringe, 7th tergite short, transverse and trapezoidal, with 6-7 suberect hairs in posterior part. 8th small and nearly triangular, slightly convex, sparsely with suberect hairs, 4th sternite largest and transverse, 5th to 7th successively shortened posteriad, each short and transverse, 8th small and short, U-shaped.

Aedeagus large and strongly sclerotized, median lobe divided into basal bulb and apical lobe, basal bulb thick and reniform, with a well-projected basal nodule, a pair of longitudinal carinae each running from basal nodule to lateral base of apical lobe, and a large and ovoid membranous part on dorsal side, apical lobe short and broad, narrowed apically, with a broad membranous part on dorsal side, and a lamellar and nearly triangular sclerite at base of the membranous part.

*Female.* Length 2.08-2.19mm. Width 0.80-0.86mm. Very similar to male. but mid trochanters devoid of spine, mid femora more slender than in male. mid tibiae without denticle; abdomen slightly wider than in male.

Holotype, male, Mt. Hikosan, Fukuoka Pref., 27. v. 1938, Esaki. Nomura & Yasumatsu leg. Paratopotypes, 1 male, same data as holotype; 1 female, same locality as above, 2 I. vi. 1971, M. Amano leg.; 2 males, same locality as above, 4. v. 1994, T. Yamauchi leg. Paratypes, 2 males, 1 female, Takao-machi, Hachiôji C., Tokyo Pref., 15. vi. 1994, S. Yoshida leg.; 2 males, Mt. Minobusan, Yamanashi Pref., 2. vi. 1978. Y. Hirano leg.; 1 female, Kawanai, Tago-chô, Shiga Pref., 24. v. 1952, S. Uéno leg.: 1 female, Kibune, Kyoto C., Kyoto Pref., 6. v. 1952, S. Uéno leg.; 1 male, 1 female, Mt. Shirakuchimine, nr. Mt. Gomanodan, Wakayama Pref., 7. v. 1994, S. Nomura leg.: 1 male, Mt. Daisen, Tottori Pref., 30. v. 1983, K. Konishi leg.; 1 female, same locality as above, 23. v. 1985, S. Nomura leg.; 1 male, Mt. Takanawasan, Hôjô C., Ehime Pref., 17. vii. 1996, I. Okamoto leg.

Distribution. Japan: Honshu (Kantô to Chûgoku districts), Shikoku and Kyushu.

*Remarks.* This new species is very similar to *fossulatus* in many features, but is separated by having deeper and more transverse basal concavity of the abdomen in both sexes, and the mid trochanter with an acute spine and the mid femur without denticle in male.

*Etymology.* This species is dedicated to Mr. Masao Kubota who is an entomologist contributed above all to the systematic and ecological study on the ants and ant guests including myrmecophilous pselaphine beetles.

*Host ants: Lasius (Lasius) niger* (Linnaeus): Mt. Shirakuchimine, Wakayama Pref. (present study).

***Diartiger spinipes* Sharp**

[Japanese name: Yamato-higebuto-arizukamushi]

*Diartiger spinipes* Sharp, 1883, Trans. ent. Soc. London, 1883: 33 1; Waterhouse, 1882-90, Aid Ident. Ins., 2: 146; Raffray, 1904, Anns. Soc. ent. Fr., 73: 464; Raffray, 1908, Gen. Ins., 64: 438; Raffray, 1911, Coleopt. Cat., (27): 176; Sakaguti, 1943, Takarazuka-Konchukan-po, (37): 2; Park, 1948, Bull. Chicago Acad. Sci., 8: 218; Kubota, 1956, Not. jap. Psel., 8; Jeannel, 1958, Mém. Mus. Hist. nat., Paris, (A), 18: 126; Nomura, 1989, Check List Jpn. Ins., Fukuoka, 1: 293.

*Male.* Length 2.11-2.14 mm. Width 0.81-0.83 mm. Body reddish brown. broadened in elytra and abdomen.

Head longer than wide, subcylindrical, covered with coarse reticulation and long and suberect hairs on dorsal surface, clypeus short, slightly broadened anteriorly, arcuate on anterior margin, frons strongly convex, narrowed in anterior part, subparallel in posterior part, vertex almost flat, with a pair of indistinct dorsal tentorial pits, postgenae broad, subparallel-sided. Eyes small, each ovoid and composed of about 20 facets. Antennae reaching anterior margin of pronotum, elongate and thickened distally, 0.55mm in length. 0.10-o. 11 mm in width, 1st segment very short, semispherical, 2nd short. wider than long, subcylindrical, 3rd slightly wider than 2nd, twice as long as wide, gently thickened distad, 4th the largest, 2.3 times as long as 3rd, elongate, weakly thickened distad.

Pronotum about as long as head, slightly longer than wide, densely covered with very coarse reticulation and long suberect hairs on dorsal surface, with a large, deep and round basi-median depression at posterior 1/3, and a pair of shallow and indistinct basi-lateral depressions. Metasternum broad and transverse, strongly convex in anterior part. gently depressed in postero-median part, almost smooth, sparsely covered with minute hairs. Elytra wider than long, nearly trapezoidal, humeri weakly expanded, gently convex in anterior part, weakly depressed in postero-median part, each elytron with 2 or 3 indistinct basal foveae, 2 fine longitudinal sulci, elytral trichome large and broad. Legs longer and more slender than in *fossulatus*, mid trochanters elongate and thickened distally, each with a large, slender and acute spine at postero-ventral side of the apex, mid femora slender, and arcuately sinuate, weakly thickened distad, each with a large and outcurved spine at posterior side of the apex, mid tibiae elongate and slender, each gently broadened distad, flattened on inner side.

Abdomen slightly larger than elytra, round-sided, composite tergum strongly concave at base, convex medially, smooth and glabrous in basal part, sparsely covered with long and suberect hairs in posterior part, basi-lateral trichome small, with large and distinct transverse fringe, paratergal trichome large and thick, curled internally, paratergal disc very small, nearly fusiform, covered with short hairs, 7th tergite small. transverse and nearly trapezoidal, sparsely covered with long suberect hairs, 8th very small and nearly triangular, 4th sternite largest and transverse, weakly depressed in median part, smooth and sparsely covered with minute hairs, 5th to 7th successively shortened posteriorly, each short and transverse, smooth and pubescent as in 4th, 8th semicircular, flattened medially, with a few long setae at postero-median part.

Aedeagus very small and slender, median lobe elongate, basal bulb subcylindrical, rounded at base, with a broad and less projected basal nodule than in *fossulatus*, and with

an ovoid membranous part on dorsal side, and a pair of longitudinal carinae each running from basal nodule to its lateral side of the apex, apical lobe small and narrowed distally, weakly curved ventrad and rounded at apex, with a narrow membranous part on medio-dorsal side of the base.

Female. Unknown.

Specimens examined. 2 males, Kitadaniyama-rindô (deciduous forest, alt. 600m), Naidaijin, Yabe-chô, Kumamoto Pref., 26. iv. 1994, S. Imasaka leg.

*Distribution.* Japan: Kyushu.

*Remarks.* This species is easily separated from the other congeners by the slender and strongly bent mid femur and the smooth and minutely pubescent metasternum. It was described on the basis of two male specimens collected from "Yuyama" (Mt. Ichifusa, Kumamoto Pref.) by George Lewis, and has not been recorded after the original description for more than 100 years.

*Host ants:* *Lasius niger* Linnaeus?: locality unknown (Kubota, 1956).

***Diartiger kunmingensis* sp. nov.**

[Japanese name: Yunnan-higebuto-arizukamushi]

*Male.* Length 2.01-2.09 mm. Width 0.83 mm.

Body reddish brown, shiny in abdomen, broadened posteriorly.

Head 1.5 times as long as wide, subcylindrical, slightly broadened anteriorly, densely covered with coarse reticulation on dorsal surface; clypeus divergent anteriorly, arcuate on anterior margin, frons strongly convex, angulate and carinate in anterior part, subparallel-sided in posterior part, vertex gently convex, with a pair of dorsal tentorial pits just behind eyes; genae narrowed, each with a broad and nearly glabrous longitudinal groove running from clypeus to dorsal tentorial pit between eye and frontal nodule, postgenae broad, angulate at base. Eyes large and convex, each ovoid and composed of about 20 facets. Antennae short and thickened distally, 0.46-0.49 mm in length, sparsely covered with long and suberect hairs, 1st segment very short and annular, 2nd about as long as wide, subcylindrical, 3rd elongate, gently thickened distad, 4th the largest, slightly longer than 1st + 2nd + 3rd, 2.8 times as long as wide, elongate and subconical, shallowly concave and densely covered with short and bold setae at apex.

Pronotum as long as head, about as long as wide and subglobose, densely covered with coarser reticulation than in *fossulatus*, densely pubescent, with a large and ovoid median and a pair of small and round lateral foveae. Metasternum broad and transverse, gently convex, densely covered with longitudinal linear sculpture on both lateral sides, with a shallow depression between metacoxae and densely with long hairs from mesocoxae to metacoxae along median line. Elytra narrowed anteriorly, nearly trapezoidal, weakly convex, covered with irregular and longitudinal linear sculpture, each elytron with 2 indistinct basal foveae and 2 longitudinal sulci, outer sulci running from outer fovea to apical 2/5, elytral trichome large, broad at base, sharpened distally and strongly incurved near the middle. Legs short and thick, mid trochanters very large, each elongate and thickened distally, with a very large and sword-like spine on postero-apical side, mid femora swollen medially, weakly bent, mid tibiae elongate, slightly thickened distad, with a short mucro on inner side near apex.

Abdomen very large, wider than long, rounded on both lateral sides, composite tergum deeply concave at base, convex in posterior part, glabrous on basal concavity, very sparsely with erect hairs in posterior surface and finely reticulate near the posterior margin, basi-lateral trichome large, broad and thick at base, sharpened and strongly curled posteriorly toward apex, with small and indistinct transverse fringe, paratergal trichome strongly narrowed, paratergal disc about as large as paratergal trichome, elongate and fusiform, bordered by large fringe, transverse trichome indistinct, 7th tergite transverse, very slightly convex, finely reticulate on dorsal surface, 8th longer than 7th, as long as wide, weakly narrowed distad, rounded at apex, covered with fine and irregular reticulation, 4th sternite largest and transverse, glabrous in basal part, with a short basi-median carina, 5th about a half as long as 4th, densely covered with longitudinal microsculpture, 6th to 7th short, each with fine reticulation, 7th semicircular, weakly convex, reticulate as in 5th and 6th, with long and suberect hairs along median line in basal half.

Aedeagus large and strongly sclerotized, median lobe similar in shape to that of *kuhotai*, basal bulb thick and reniform, with small and well projected basal nodule, two pairs of longitudinal carinae and a large ovoid membranous part on dorsal side, apical lobe shorter than basal bulb, constricted at base, then weakly narrowed apicad, gently rounded on both lateral sides, endophallus weakly sclerotized, very slender and weakly S-curved.

*Female.* Unknown.

Holotype, male, Qiongzhu-si (2,100m), Yu'an Shan Hill, Kunming C., Yunnan Prov., Southwest China, 5. xi. 1992, S. Uéno & Y. Watanabe leg. Paratypes, 1 male, same data as holotype.

*Distribution.* China: Yunnan Prov.

*Remarks.* This new species is similar to *D. kubotai* in the habitus and the thick and bilobed aedeagus. It is easily distinguished from the other species by the coarse reticulation of the head and pronotum, the sword-like spine of the mid trochanter in male, and the lack of the transverse fringe at the anterior part of basi-lateral trichome of the composite tergum.

*Host ants:* Unknown.

### *Diantiger japonicus* (K. Sawada)

[Japanese name: Hime-higebuto-arizukamushi]

*Microdiantiger japonicus* K. Sawada, 1964, Ent. Rev. Japan, 17: 13.

*Diantiger japonicus* : Besuchet, 1986, Revue suisse Zool., 93: 263; Nomura, 1989, Check List Jpn. Ins., Fukuoka, 1: 293.

Male. Length 1.38-1.49 mm. Width 0.49-0.51 mm. Body reddish to yellowish brown, tarsi light brown, small-sized and gently broadened posteriorly.

Head longer than wide, subcylindrical, densely covered with fine reticulation on whole surface, sparsely with long and suberect hairs on dorsal and lateral surface, clypeus broadened anteriorly, lamellar in antero-lateral parts, frons convex, narrowed and carinate in anterior part, subparallel behind bases of antennae, vertex gently convex, with a pair of



small dorsal tentorial pits, postgenae broad, slightly narrowed posteriad. Eyes small. each ovoid and composed of about 15 facets. Antennae short and thickened distally, 0.35 mm in length, 0.09-o. 10 mm in width, sparsely covered with long and bold setae. 1st segment very short and ring-shaped, 2nd short, wider than long, subcylindrical, 3rd as wide as 2nd, elongate, 2.6 times as long as wide, narrowed basally, 4th the largest, 1.7 times as long as 3rd, subconical, shallowly concave at apex, densely with short setae on the concavity.

Pronotum as long as head, slightly longer than wide, subglobose, with a shallow and longitudinal depression on dorso-median part, and a pair of shallow basi-lateral depressions, densely covered with fine reticulation as on head, sparsely with long and erect hairs on dorsal surface. Metasternum large and transverse, densely covered with longitudinal linear sculpture on lateral side. Elytra slightly wider than long. nearly trapezoidal, slightly convex, humeri very weakly expanded, densely covered with longitudinal linear sculpture, sparsely with long hairs in posterior part. elytral trichomes each large and conical. Legs short and thick, mid trochanters each elongate and slender. weakly thickened distad, mid femora each very thick, swollen medially, with a large denticle at basal 1/4 on posterior side, mid tibiae each elongate, thickened distally. with a small denticle at apical 1/4 on inner side.

Abdomen slightly larger than elytra, wider than long, round-sided, with a deep and nearly circular basi-median depression and a pair of deep and narrow basi-lateral depressions just inside 4th paratergites, sparsely covered with long and suberect hairs in posterior part, composite tergum very large and strongly convex mediad, covered with fine reticulation in posterior 1/3, basi-lateral trichomes each consisting of a simple transverse fringe, paratergal trichomes each small and narrow, paratergal disc indistinct and flattened, 7th tergite small and transverse, narrowed posteriorly, covered with fine reticulation, sparsely with long and suberect hairs, 8th small and semicircular, sculptured and haired as in 7th, 4th sternite largest and transverse, densely covered with longitudinal strigae, 5th shorter than 4th, sculptured as in 5th, 6th to 7th each very short, covered with fine reticulation, 8th small and U-shaped, covered with fine and irregular reticulation.

Aedeagus well-sclerotized, median lobe short and thick, basal bulb ovoid in dorsal view, nearly reniform in lateral view, with a well-projected basal nodule, 2 pairs of oblique carinae on ventral side, each running from basal nodule to latero-apical corner. and an ovoid membranous part on dorsal side, apical lobe simply narrowed distad, with a short longitudinal slit at apex, and a large and lamellar plate on dorsal side; endophallus weakly sclerotized, composed of 2 slender spines, right spine longer than the left. acute and gently curved leftward at apex, left short, strongly bent rightward at apex.

*Female.* Length 1 SO- 1.58 mm. Width 0.5 I-O.53 mm. Very similar to male, but mid femora and tibiae with neither spine nor denticle.

*Specimens examined.* 1 male, Mt. Koshosan, Amagi C., Fukuoka Pref. 16. vi. 1985. S. Nomura leg.; 1 female, Kikuchi Vall., Kikuchi C., Kumamoto Pref., 24. viii. 1996, S. Onoda leg.; 1 male, 2 females, Miike lakeside, Kobayashi C., Miyazaki Pref., 8. v. 1985, S. Nomura leg.; 1 male, Sata, Kagoshima Pref., 5. v. 1985, Y. Takai leg.

*Distribution.* Japan: Honshu (Kant8 to Kinki districts) and Kyushu.

*Remarks.* This species is very distinctive in having the small-sized body, the short and thick antenna, the linearly sculptured elytra and the reduced abdominal trichomes. It also seems to have some primitive characters, i. e. the large maxillary palpus and the

aedeagus including weakly sclerotized endophallus, and the two pairs of carinae on the basal bulb.

*Host ants: Lasius spatheps* Wheeler?: Mt. Makinoo, Osaka Pref.. Japan (Sawada, 1964).

**A Key to the Species and the Subspecies of  
the Genus *Diartiger* from East Asia**

1. Body small (less than 1.6mm); mid trochanters without spine in male. .... *D. japonicus* (K. Sawada)
- Body large-sized (more than 1.8mm); mid trochanters each with a large spine on posterior side of the apex in male. .... 2
2. Mid tibiae each with a small denticle near apex in male. .... 3
- Mid tibiae each with a small denticle near the middle in male. .... 4
3. Mid trochanters each with a sword-like spine at apex in male, mid femora weakly bent, without spine in male. . . . . *D. kunmingensis* sp. nov.
- Mid trochanters each with a slender and acute spine at apex in male, mid femora elongate and strongly bent, with a curved spine near apex in male. .... *D. spinipes* Sharp
4. Composite abdominal tergum with a large and transverse basal concavity (wider than 1/3 of abdominal width) in both sexes; mid trochanters each with a simply sharpened apical spine in male, mid femora without denticle on posterior side in male; median lobe of aedeagus very thick, apical lobe large at base, narrowed distally. .... *D. kubotai* sp. nov.
- Composite abdominal tergum with a small basal concavity (narrower than 1/3 of abdominal width) in both sexes; mid trochanters each with a variously shaped apical spine in male, mid femora denticulate or not in male: median lobe of aedeagus less swollen on lateral sides, with a very small and trapezoidal apical lobe and a large deep ventral depression. . . . . 5 (*D. fossulatus* Sharp)
5. Fourth antennal segment thick, less than 2.3 times as long as wide: composite abdominal tergum with a pair of hardly sharpened basi-lateral trichomes. .... *D. f. fossulatus* Sharp
- Fourth antennal segment slender, more than 2.3 times as long as wide: composite abdominal tergum with a pair of more or less sharpened basi-lateral trichomes. .... 6
6. Body larger (more than 2.2 mm); basi-lateral trichome of composite abdominal tergum sharpened and curled distally. .... *D. f. izuinsulicola* subsp. nov.
- Body smaller (less than 2.2 mm), if large, basi-lateral trichome of composite abdominal tergum weakly sharpened and scarcely curled distad. .... 7
7. Mid femora each with a few small denticles or without in male. .... 8
- Mid femora each with a large denticle near the middle. .... 9
8. Mid trochanters each with a simply sharpened spine at apex. .... *D. f. ispartae* (Karaman). stat. nov.
- Mid trochanters each with a truncate and flattened spine at apex. .... *D. f. dentipes* Nomura et Lee, stat. nov.

9. Body larger (2.08-2.24 mm); basi-lateral trichome of composite abdominal tergum weakly sharpened and hardly curled distad. .... *D. f.morimotoi* subsp. nov.
- Body smaller (1.88-2.13 mm); basi-lateral trichome of composite abdominal tergum strongly sharpened and curled distad. .... 10
10. Basi-lateral trichome of composite abdominal tergum larger and strongly curled distad. .... *D. f.imasakai* subsp. nov.
- Basi-lateral trichome of composite abdominal tergum smaller and less curled distad. .... *D. f.hirashimai* subsp. nov.

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### Explanation of Figures

- Fig. 1. *Diartiger fossulatus morimotoi* subsp. nov., male habitus.
- Fig. 2. *Diartiger kunmingensis* sp. nov., male habitus.
- Fig. 3. *Diartiger japonicus* (K. Sawada), male habitus.
- Fig. 4. Antennae.
- Fig. 5. Mid legs in ventral view.
- Fig. 6. Mid legs in ventral view. *f.d.-a, km.-a*: trochanters in posterior view.
- Fig. 7. Elytral and abdominal trichomes.
- Fig. 8. Elytral and abdominal trichomes.
- Fig. 9. Aedeagi in ventral (left), lateral (middle) and dorsal (right) views.
- Fig. 10. Aedeagi in ventral (left), lateral (middle) and dorsal (right) views.
- Fig. 11. Aedeagi in ventral (left), lateral (middle) and dorsal (right) views.
- Fig. 12. Aedeagi in ventral (left), lateral (middle) and dorsal (right) views.
- Fig. 13. Distribution of six subspecies of *D. fossulatus* Sharp. Broken line shows possible distributional range of each subspecies.
- Fig. 14. Distribution of three species of *Diartiger*. The broken line shows the possible distributional range of each species.

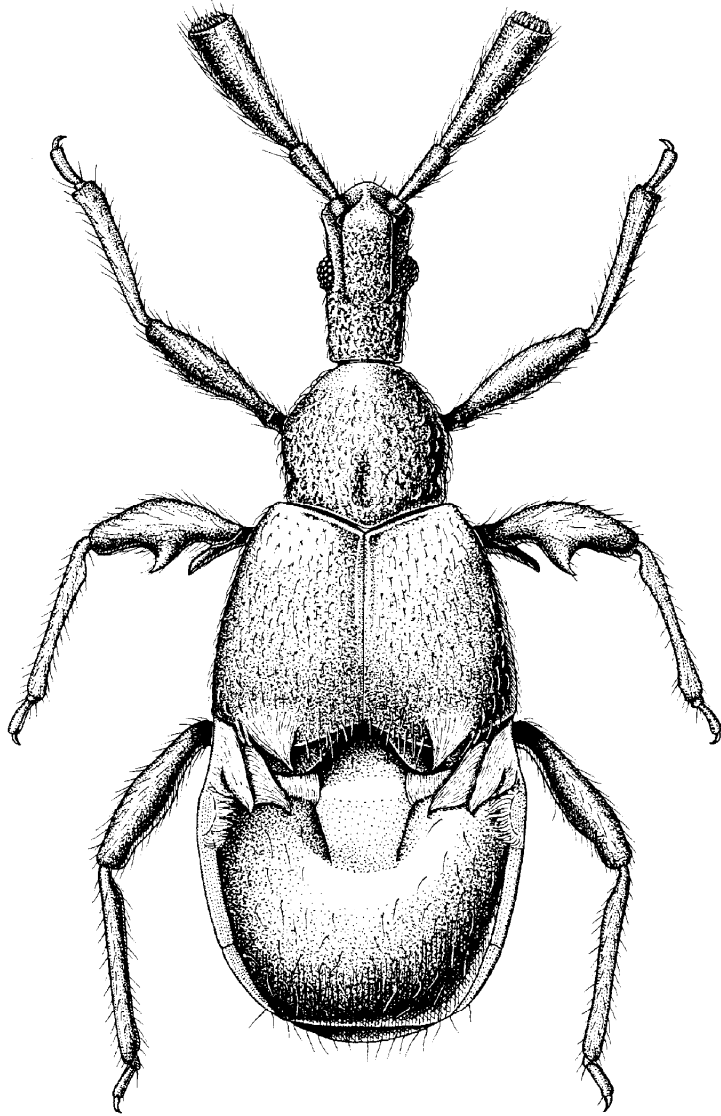
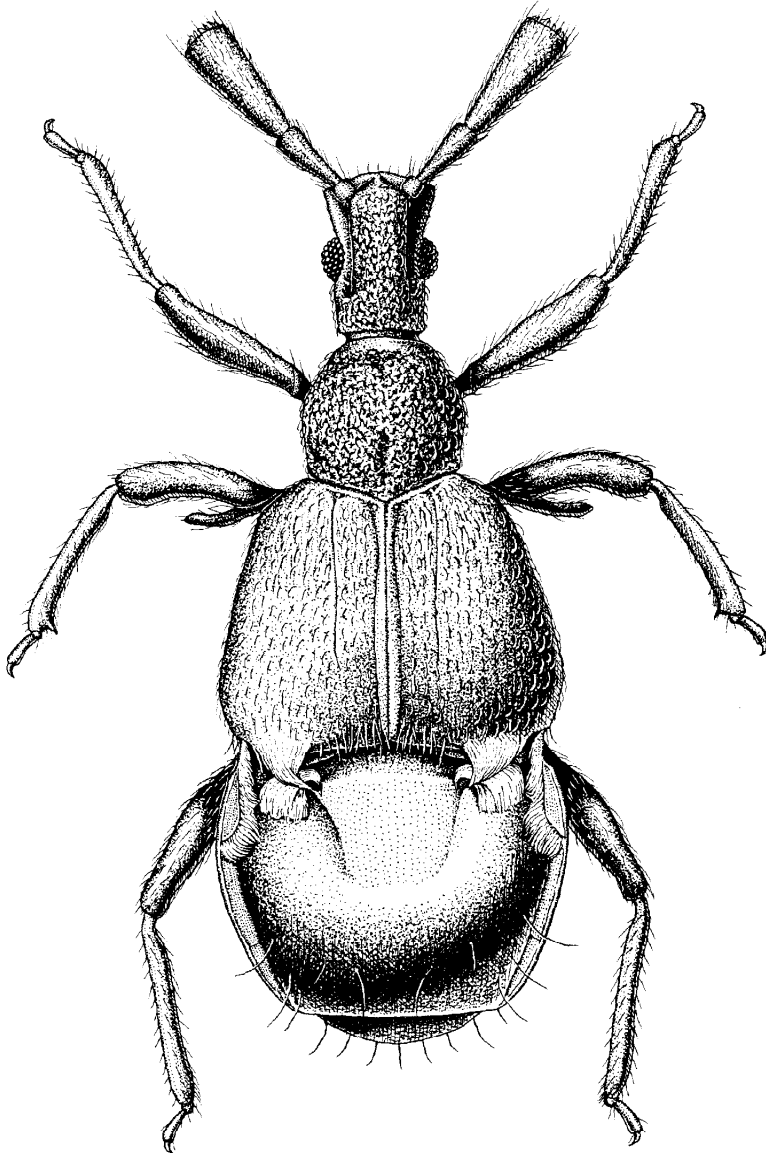


Fig. 1



**Fig. 2**

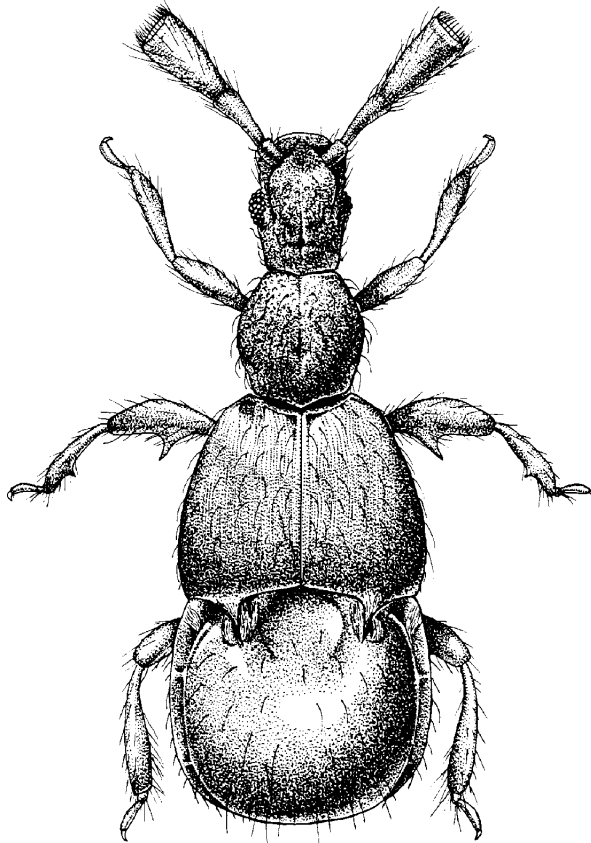


Fig. 3

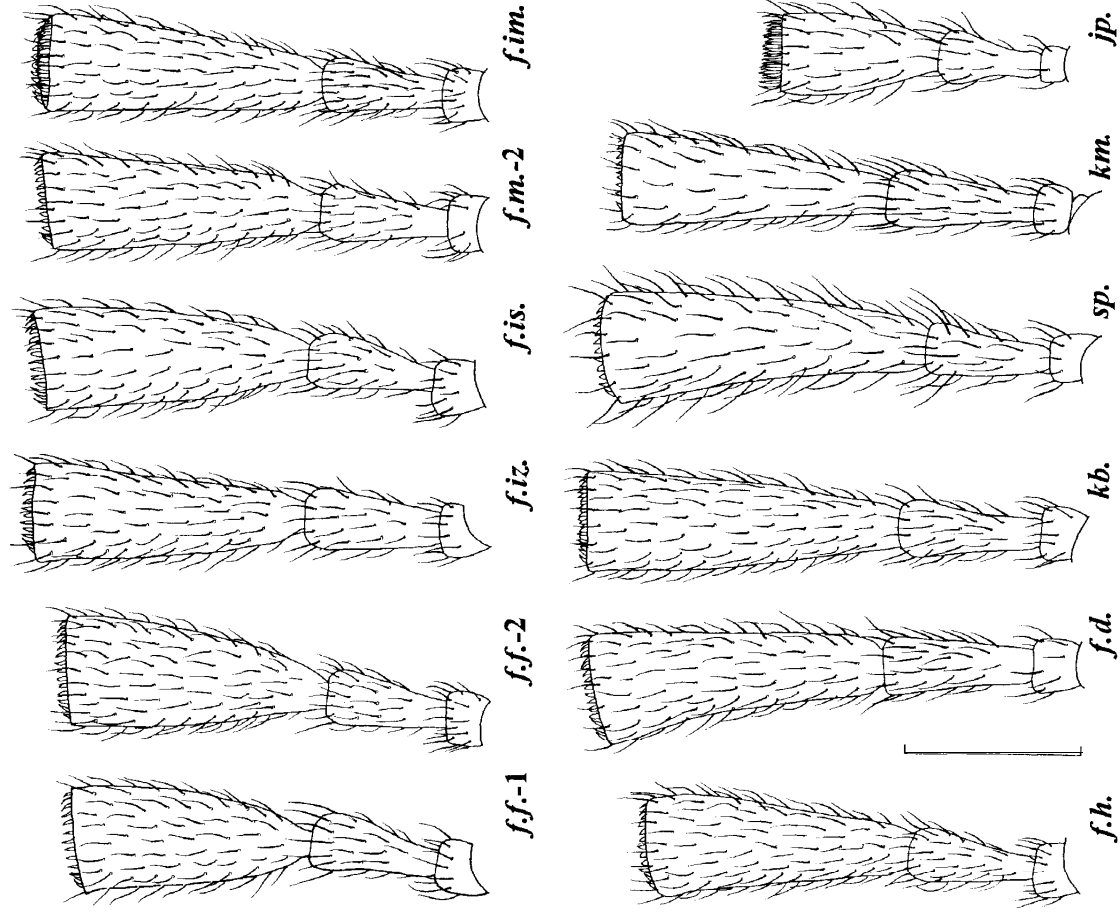


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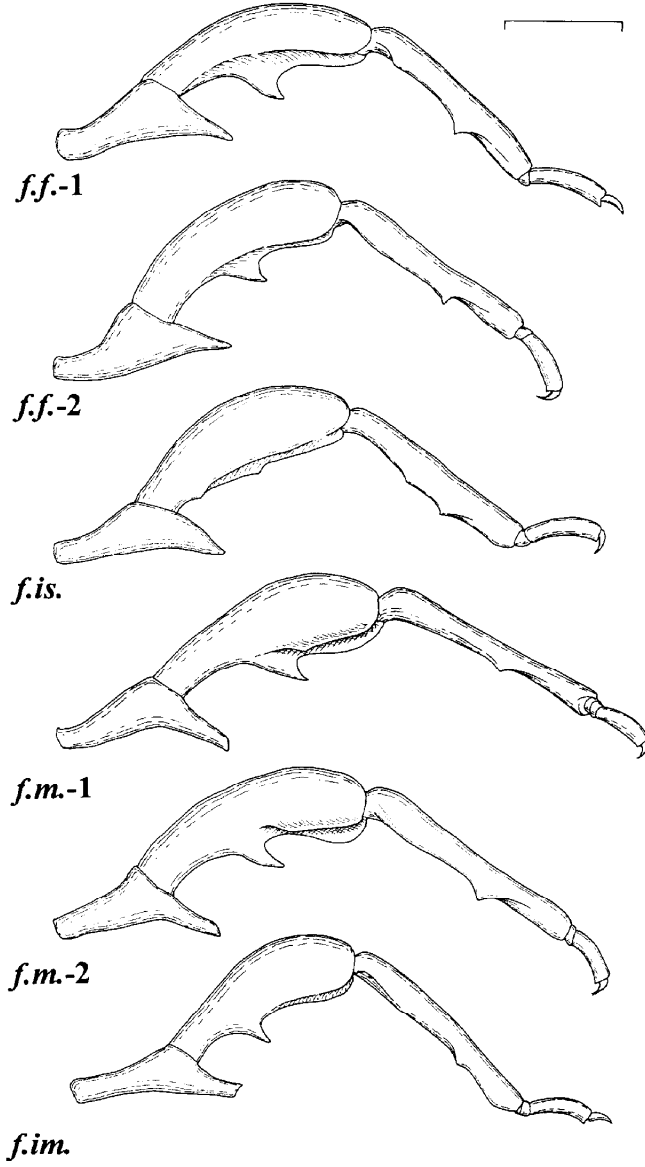
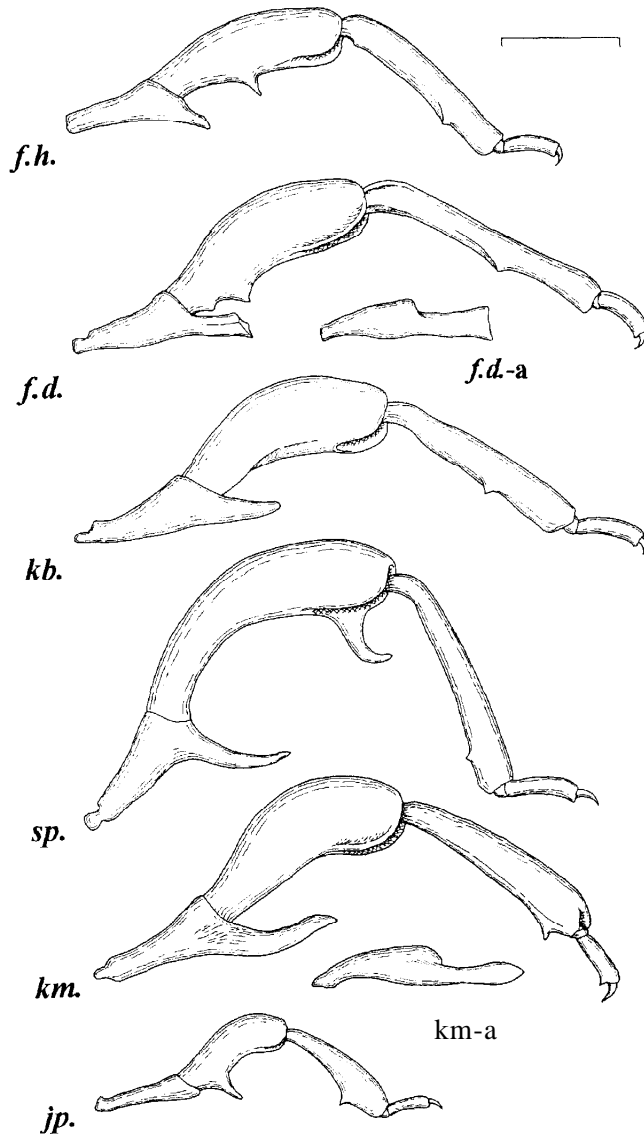


Fig. 5



**Fig. 6**

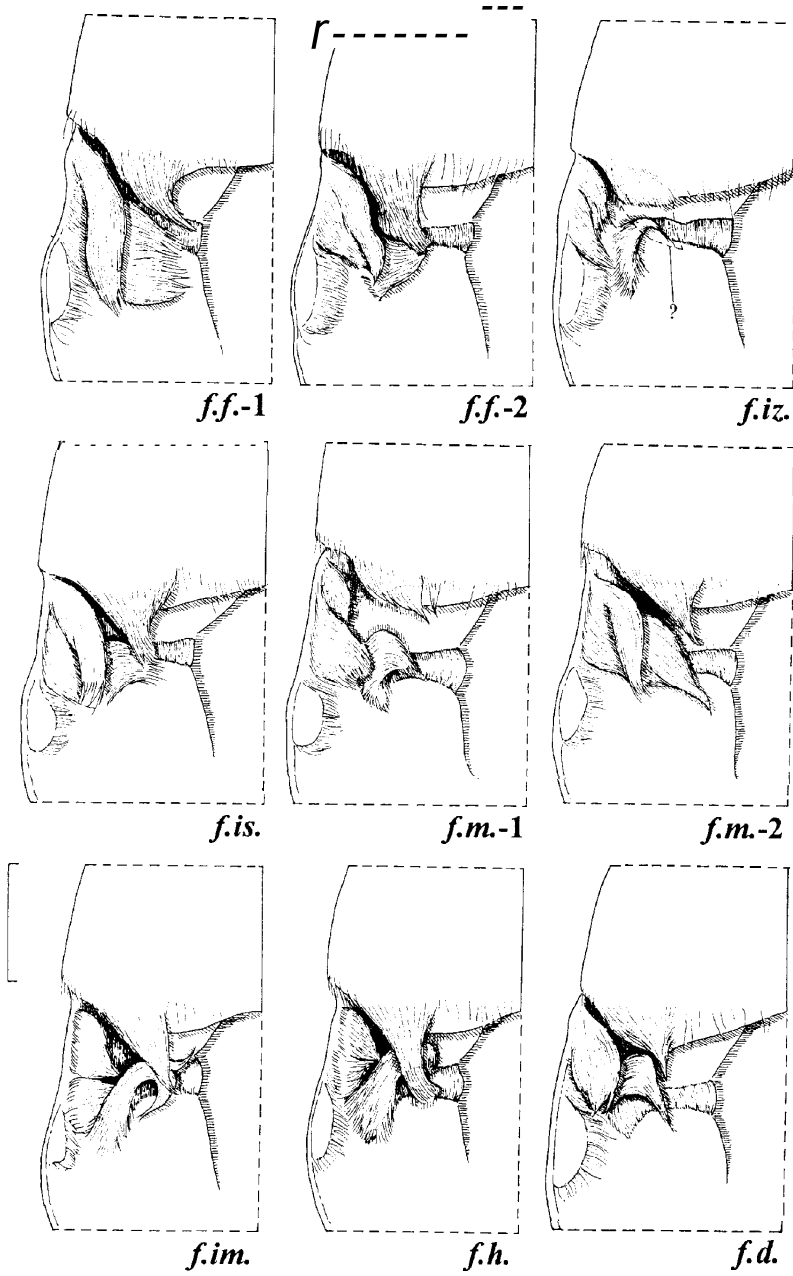
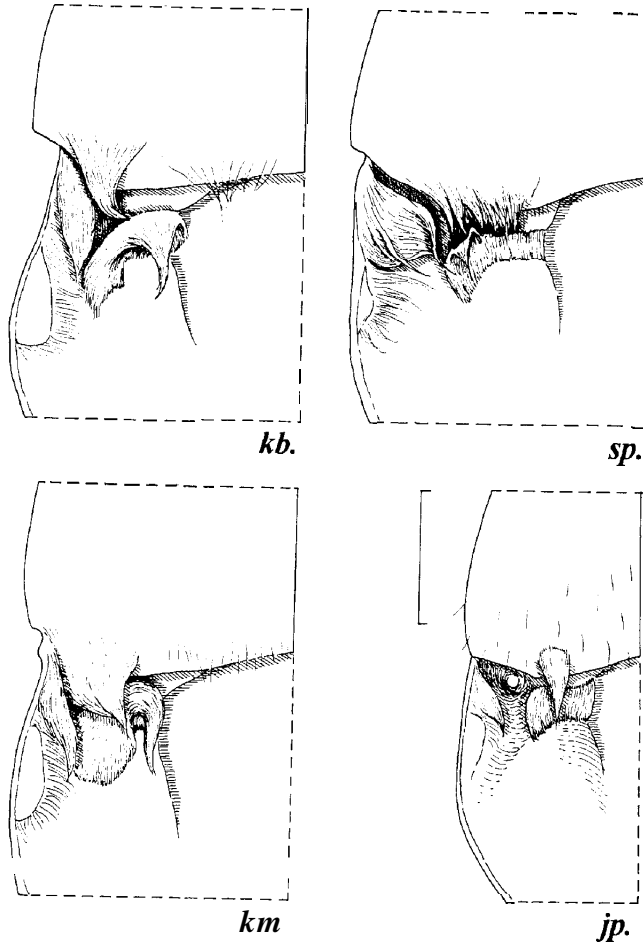
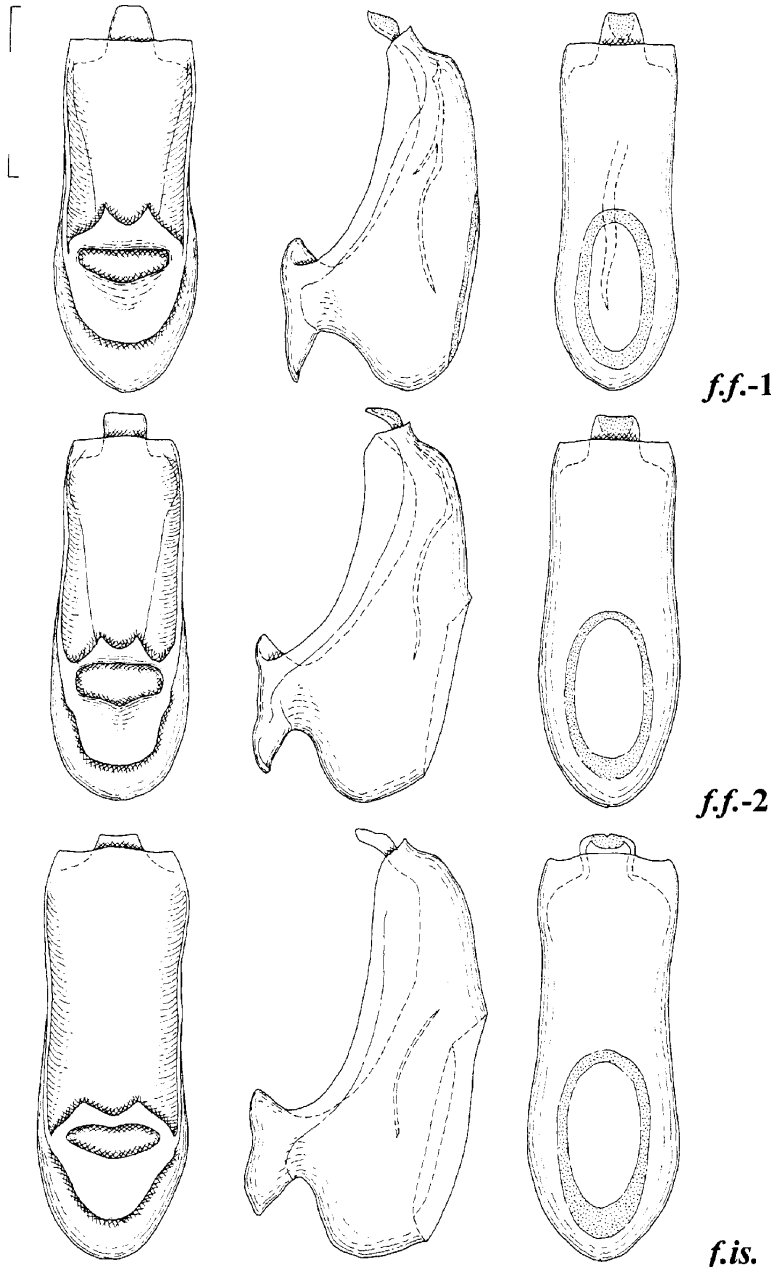


Fig. 7



**Fig. 8**



*f.is.*  
**Fig. 9**

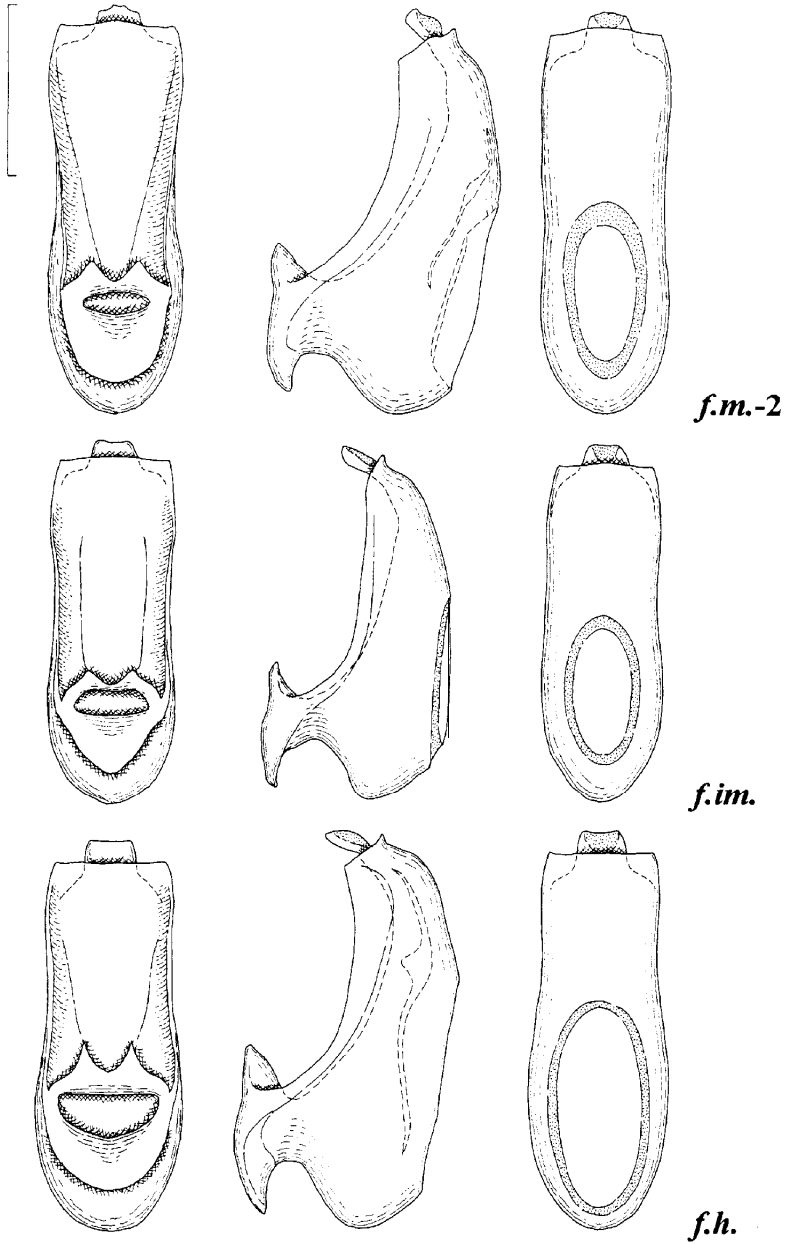
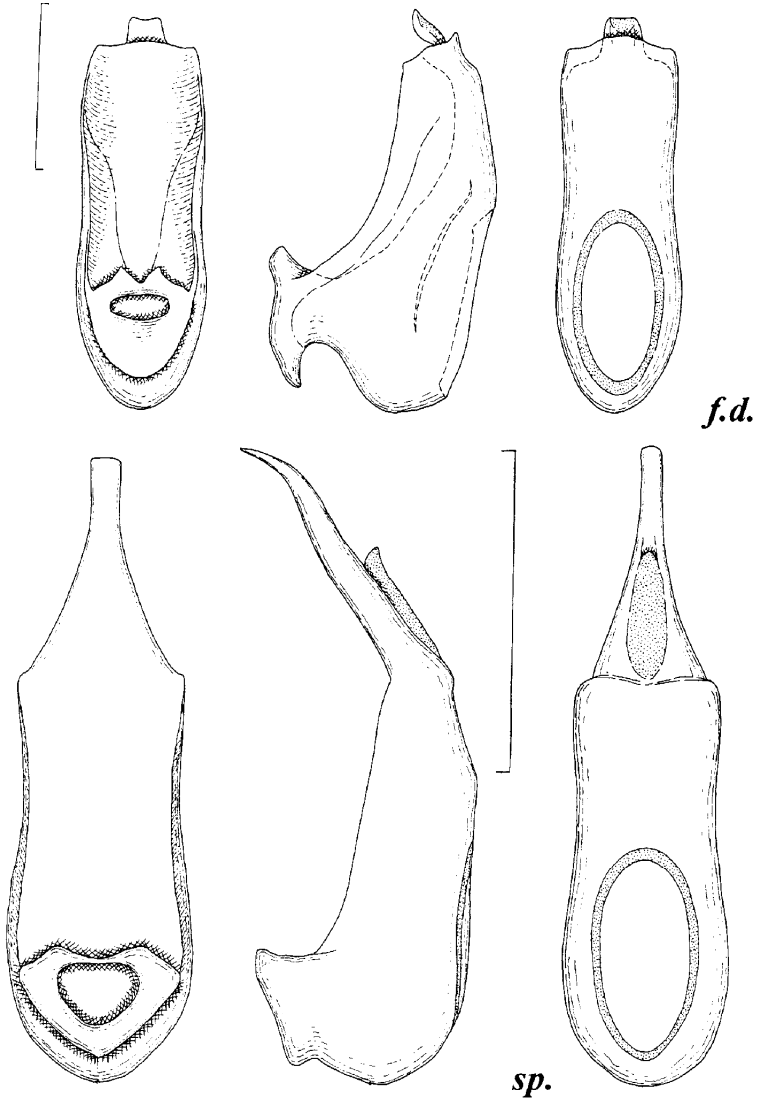
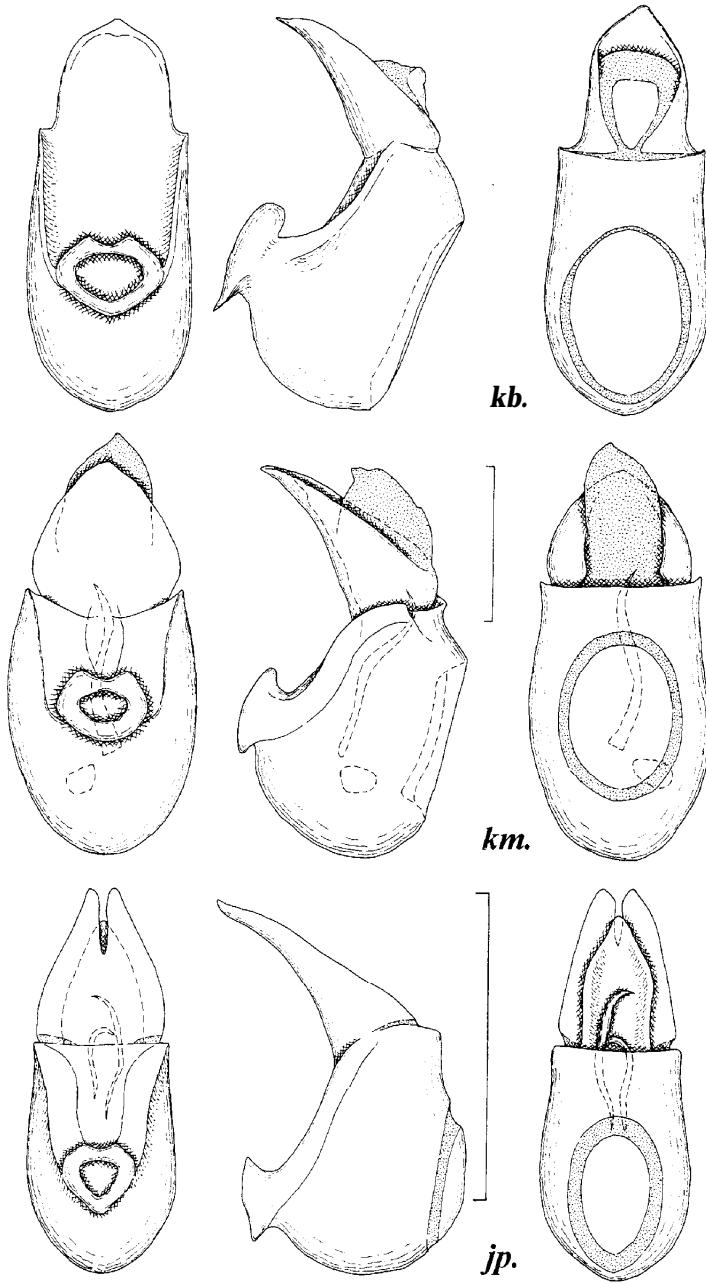


Fig. 10



**Fig. 11**



**Fig. 12**



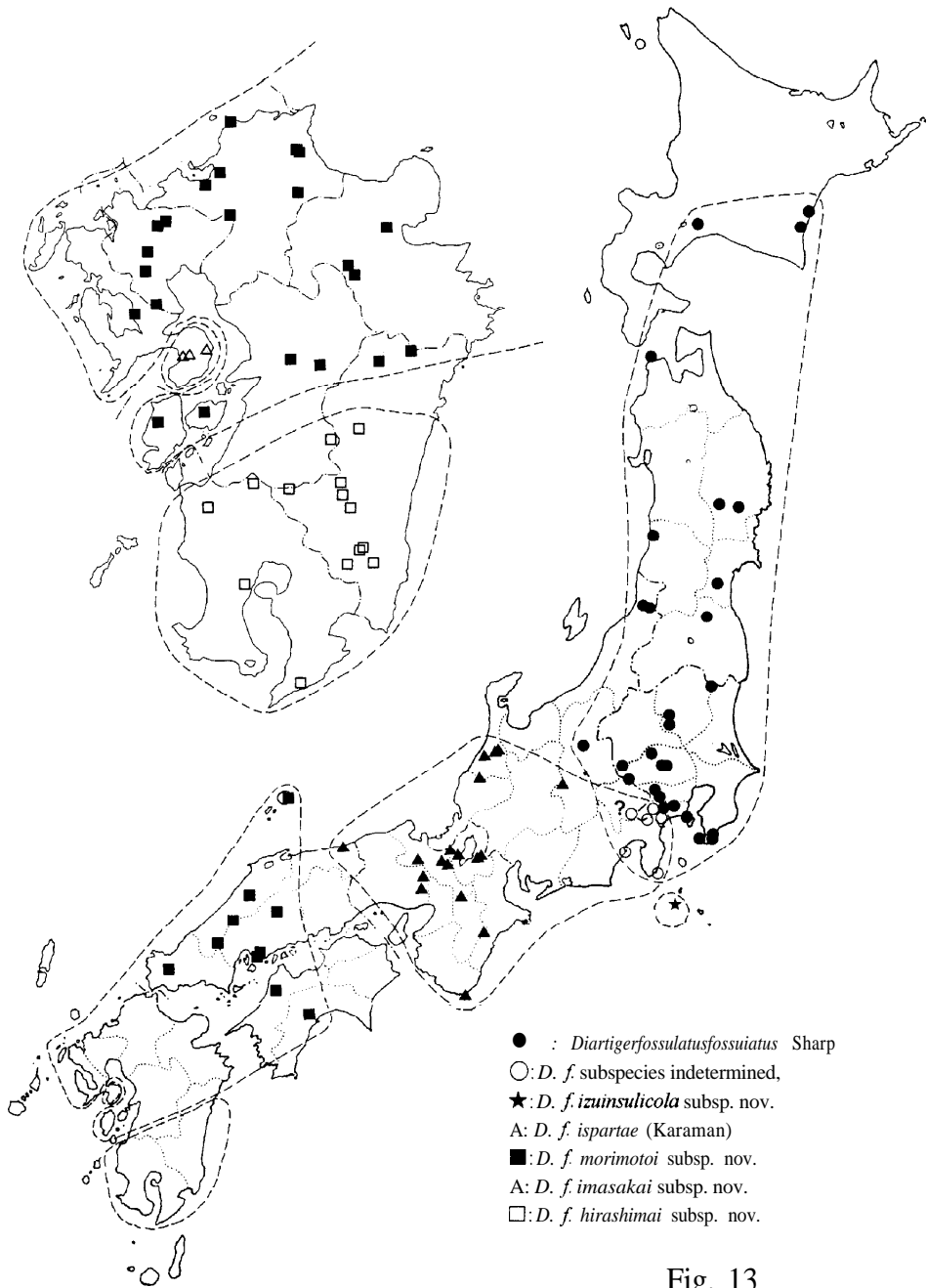


Fig. 13

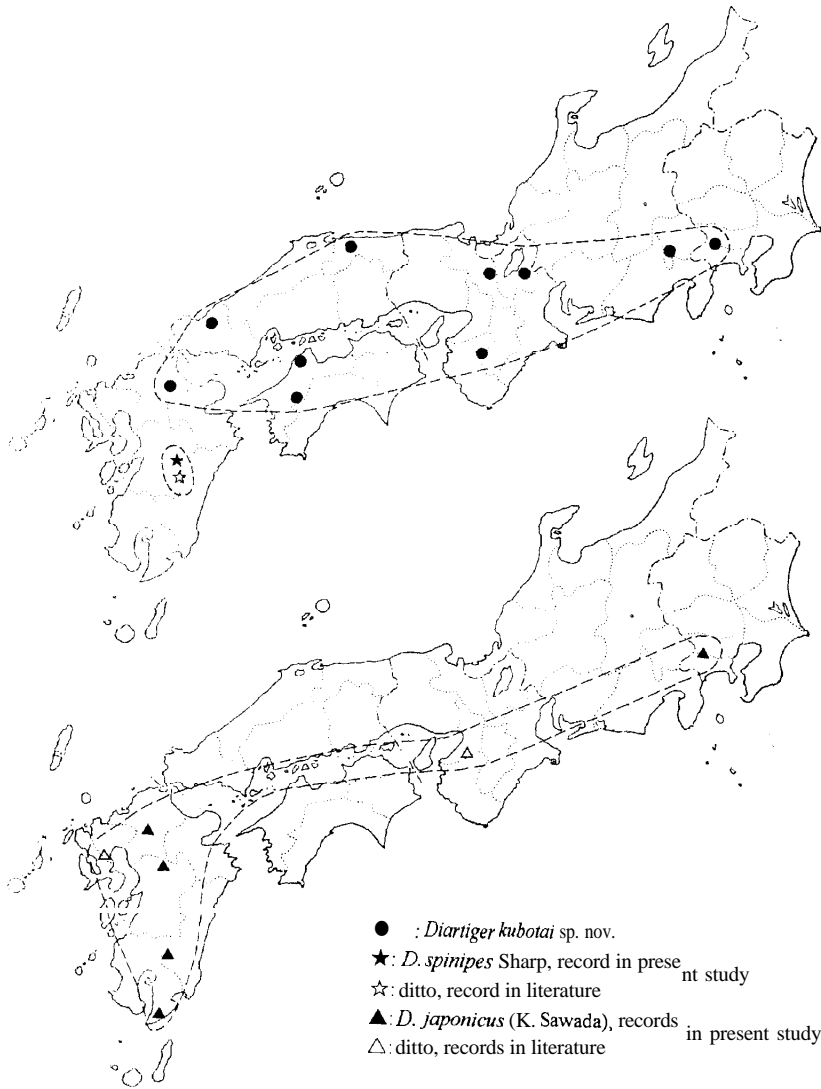


Fig. 14

Abbreviations and the localities of the species and subspecies in Figs. 4- 12.

- f.f.* : *D. fossulatus fossulatus* Sharp; *f.f.*-1: male from Kimontou Lake, Hokkaido; *f.f.*-2: ditto, from Sunosaki-jinja, Chiba Pref.
- f.iz.* : *D. fossulatus izuinsulicola* subsp. nov., female from Kôzu Is., Izu Isls.
- f.is.* : *D. fossulatus ispartae* Karaman, stat. nov., male from Mt. Shiritakayama, Ishikawa Pref. (for Fig. 5) and male from Mt. Mikusayama, Osaka Pref. (for the others).
- f.m.* : *D. fossulatus morimotoi* subsp. nov.; *f.m.*-1: male from Oku-dougo, Ehime Pref.; *f.m.*-2: ditto, from Mt. Kizan, Saga Pref.
- f.im.* : *D. fossulatus imasakai* subsp. nov., male from Token-yama Park, Nagasaki Pref.
- f.h.* : *D. fossulatus hirashimai* subsp. nov., male from Mt. Ichifusayama, Kumamoto Pref.
- f.d.* : *D. fossulatus dentipes* Nomura et Lee, stat. nov., male from Samjeong Ri, Cheonla-buk Do, South Korea.
- kb.** : *D. kubotai* sp. nov., male from Mt. Shirakuchimine, Wakayama Pref. (for Fig. 6) and male from Mt. Hikosan, Fukuoka Pref. (for the others).
- sp.* : *D. spinipes* Sharp, male from Kitadaniyama-rindô, Kumamoto Pref.
- km.* : *D. kunmingensis* sp. nov., male from Qiongzhu-si, Yunnan, China.
- jp.* : *D. japonicus* (K. Sawada), male from Sata, Kagoshima Pref. (for Fig. 12) and male from Mt. Koshosan, Fukuoka Pref. (for the others).

All the scales indicate 0.2 mm.