

A Review of Pselaphine Beetles (Coleoptera, Staphylinidae) from the Izu-shotô Isls., Tokyo, Japan

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Abstract The pselaphine fauna of the Izu-shotô Isls., Tokyo, Japan is reviewed. Numbers of recorded species from respective islands before and after the present study are as follows: Izu-ôshima Is. (0, 7), Miyakejima Is. (3, 7), Niijima Is. (0, 1), Kôzushima Is. (1, 1), Mikurajima Is. (3, 7), Hachijô-jima Is. (0, 4). *Diartiger toshioi* NOMURA, 2012 is elevated from a subspecies of *D. fossulatus* to species level.

Key words: Pselaphinae, Staphylinidae, *Diartiger*, Izu-shotô Isls., Tokyo, fauna.

The pselaphine fauna of the Izu-shotô Islands off Tokyo, Honshu, Japan was poorly known. They are composed of nine islands in the Pacific Ocean, namely, from the north, Izu-ôshima, Toshima, Niijima, Shikinejima, Kôzushima, Miyakejima, Mikurajima, Hachijôjima and Aogashima Isls. As the first record of pselaphines from the Izu-shotô Isls., two species were reported from Mikurajima Is. by SAWADA and WATANABE (1969). Three species were added from Miyakejima Is. by WATANABE and SOHMA (1972). NOMURA (1997) described a new subspecies, *Diartiger fossulatus izuinsulicola* from Kôzushima Is., and recently, NOMURA and KOMATSU (2012) described the other new subspecies, *D. f. toshioi* from Mikurajima Is.

Some collectors from the Tokyo University of Agriculture visited Miyakejima, Mikurajima and Hachijôjima Isls. in the 1990's to the 2000's and collected some pselaphines. Recently (2012) the second author of the present study, KAMEZAWA collected some pselaphines on Mikurajima and Izu-ôshima Isls. Additionally, old records of *Diartiger fossulatus izuinsulicola* NOMURA from Niijima Is. are also recognized. After the present study, the number of pselaphine species known from the respective islands are: Izu-ôshima Is. (7), Miyakejima Is. (7), Niijima Is. (1), Kôzushima Is. (1), Mikurajima Is. (7), Hachijô-jima Is. (4).

Diartiger toshioi NOMURA described as a subspecies of *D. fossulatus* is elevated to species level. Two subspecies of *D. fossulatus* are compared on the basis of SEM observations.

Materials and Methods

The material obtained by KAMEZAWA was collected by shifting leaf litter, checking under bark and ant nests. They were examined by a digital microscope (KEYENCE digital microscope system VHX-2000+VHX-D510). For the SEM observation, all specimens were non-coated, and examined with a low acv 1.2 kV by the digital microscope shown above. The specimens examined in the present study are deposited in the National Museum of Nature and Science, Tokyo (NSMT).

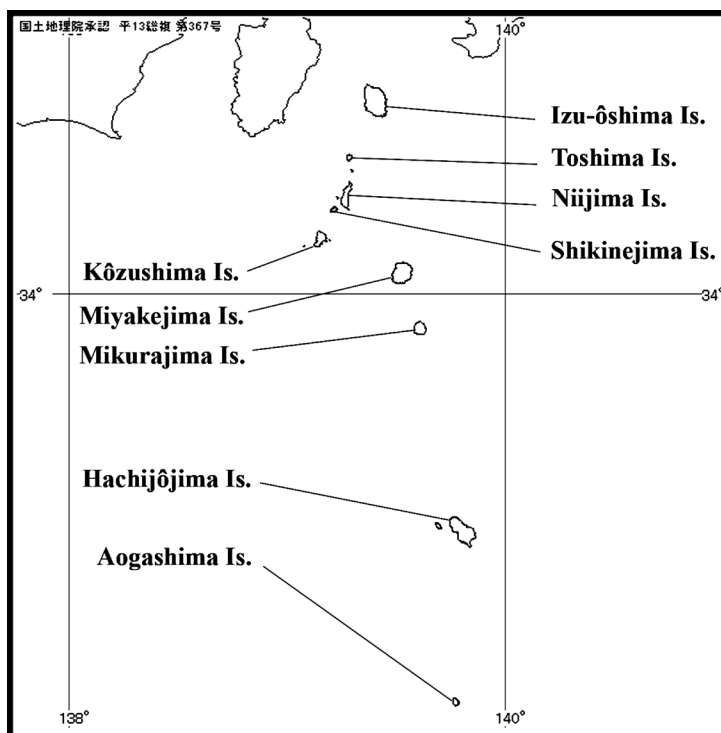


Fig. 1 A map of the Izu-shotô Isls.

Lists of Pselaphine Species from Each Island

The records of pselaphine species from each of the Izu-shotô Isls. are listed below. Collecting data, taxonomical and morphological remarks are also noted by species.

Izu-ôshima Is.

Pselaphine species were unknown from this island. Seven pselaphine species listed below are recorded from this island for the first time. The collector of the specimens examined in the following list is KAMEZAWA.

Batriscenellus (Scaioscenellus) similis (SHARP, 1883)

[Japanese name: Anabara arizukamushi]

(Figs. 3A, B)

Specimens examined. 9 males, 10 females, Genya, Senzu [N34°43'15" E139°25'37"], 1-X-2012; 13 males, 13 females, Tsubaitsuki, Motomachi [N34°45'60" E139°22' 25"], 4-X-2012.

Remarks. This species is sometimes very common on the Pacific coast of Honshu, its habitat is usually leaf litter of broadleaved forest as shown in Figs. 2B and 2C.

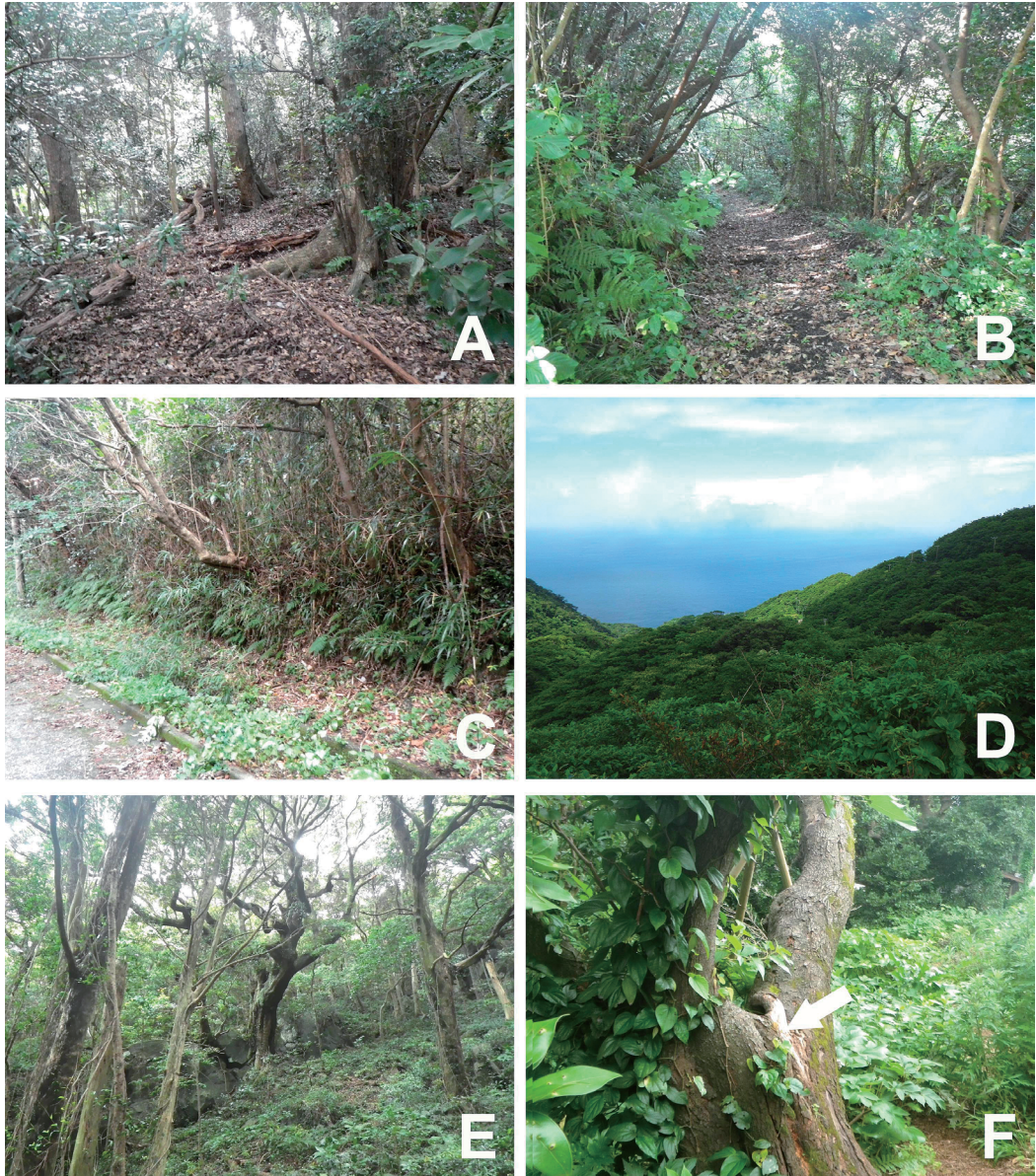


Fig. 2. Views of the collecting sites in Izu-ôshima Is. (A–C) and Mikurajima Is. (D–F). — A, Fukujû; B, Genya; C, Tsubaitsuki; D, a view from the road to Mt. Kurosakitakaisan; E, Sato; F, the collecting point (arrow) of *Diartiger toshioi* in Sato.

***Batriscenaulax longipes longipes* JEANNEL, 1958**

[Japanese name: Nagasune arizukamushi]

(Figs. 3C, D)

Specimens examined. 6 males, 3 females, Genya, Senzu [N34°43'15" E139°25'37"], 1–X–2012; 9 males, 3 females, Tsubaitsuki, Motomachi [N34°45'60" E139°22'25"], 4–X–2012.

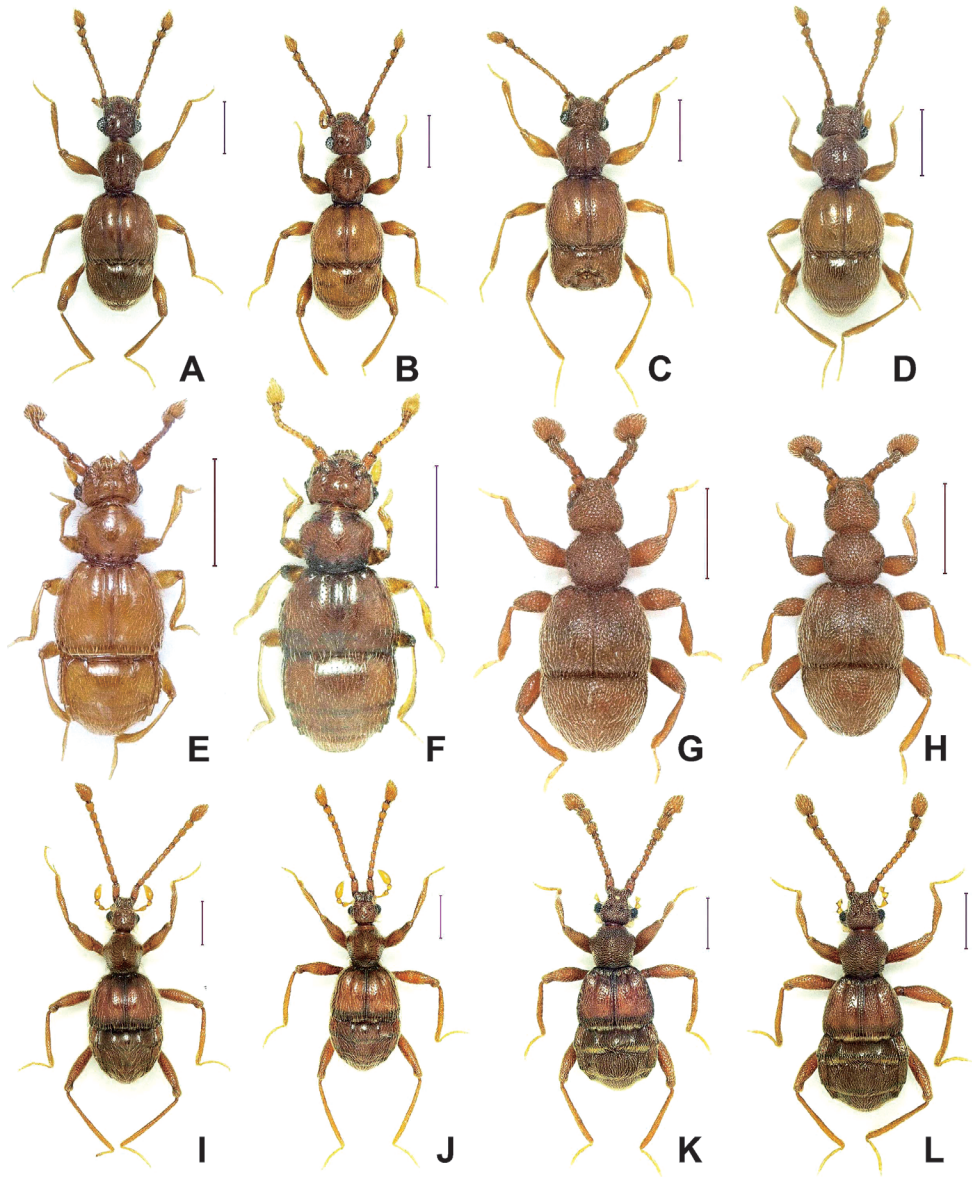


Fig. 3. Pselaphine species collected from Izu-ôshima Is. — A, *Batriscenellus (Batriscenellus) similis*, male; B, ditto, female; C, *Batriscenaulax longipes longipes*, male; D, ditto, female; E, *Morana elegans*, male; F, ditto, female; G, *Plagiophorus fujiyamai*, male; H, ditto, female; I, *Saltisedes brunneus*, male; J, ditto, female; K, *Raphitreus speratus*, male; L, ditto, female.

Remarks. This species is distributed in Hokkaido, Honshu, Shikoku and Kyushu. The habitat of this species is usually dry forest and bamboo stands. It was collected at the points shown in Figs. 2B and 2C.

Morana elegans TANOKUCHI, 1988

[Japanese name: Tôkai-mame arizukamushi]

(Figs. 3E, F)

Specimens examined. 2 males, 2 females, Genya, Senzu [N34°43'15" E139°25'37"], 1–X–2012.

Remarks. This species is similar to the common species, *M. discedens* SHARP, but, is separated by the enlarged antennal club in the male and prolonged antennal segment II in both sexes. It is distributed in the Kantô and Chûbu Districts in Honshu. Its habitat is shown in Fig. 2B.

Plagiophorus fujiyamai (KUBOTA, 1944)

[Japanese name: Fujiyama-daruma arizukamushi]

(Figs. 3G, H)

Specimens examined. 2 males, 2 females, Fukujû, Senzu [N34°45'54" E139°25'55"], 2–X–2012; 3 males, 9 females, Tsubaitsuki, Motomachi [N34°45'60" E139°22'25"], 4–X–2012.

Remarks. This distinct species is sometimes common in evergreen forest in Kantô District. It is also recorded from Miyakejima Is. in the present study. Its habitat in Izu-ôshima is shown in Figs. 2A and 2C.

Saltisedes brunneus KUBOTA, 1943

[Japanese name: Sedaka arizukamushi]

(Figs. 3I, J)

Specimens examined. 1 male, 1 female, Fukujû, Senzu [N34°45'54" E139°25'55"], 2–X–2012.

Remarks. This species is not particularly common in Honshu. This is the first record of the species from any island. This species usually occurs under bark of decaying wood, and its habitat in this island is shown in Fig. 2A.

Raphitreus speratus (SHARP, 1874)

[Japanese name: Higebuto-ekubo arizukamushi]

(Figs. 3K, L)

Specimens examined. 2 males, 1 female, Fukujû, Senzu [N34°45'54" E139°25'55"], 2–X–2012.

Remarks. The habit of this species is leaf litter or dead wood in evergreen forest, shown in Fig. 2A.

Lasinus sp.

(Figs. 4A, B)

Specimens examined. 1 male, 2 females, Genya, Senzu [N34°43'15" E139°25'37"], 1–X–2012; 1 male, Fukujû, Senzu [N34°45'54" E139°25'55"], 2–X–2012; 24 males, 1 female, Tsubaitsuki, Motomachi [N34°45'60" E139°22'25"], 4–X–2012.

Remarks. This is an unnamed species distributed in Honshu and its adjacent islands. It is very similar to *L. spinosus* SHARP in many characters, but separated by the male antennomere IX which has

a deep excavation on the dorso-apical side. Examples of the habitat type for this species on this island are shown in Figs. 2A, 2B and 2C.

Miyakejima Is.

The following three pselaphine species were already collected from this island by WATANABE and SOHMA (1972): *Coryphomodes dionysius* (SHAUFUSS) (= *Coryphomus spinicollis* (SHARP)), *Trissemus alienus* (SHARP) and *Diartiger fossulatus* SHARP.

Coryphomodes dionysius (SCHAUFUSS, 1888)

[Japanese name: Futaana-munetoge arizukamushi]

(Fig. 4C)

Specimens examined. 1 male, Tsubota, 8–VII–1964, Y. WATANABE leg.; 2 females, same locality as above, but 17–V–1999, K. TOYODA leg.

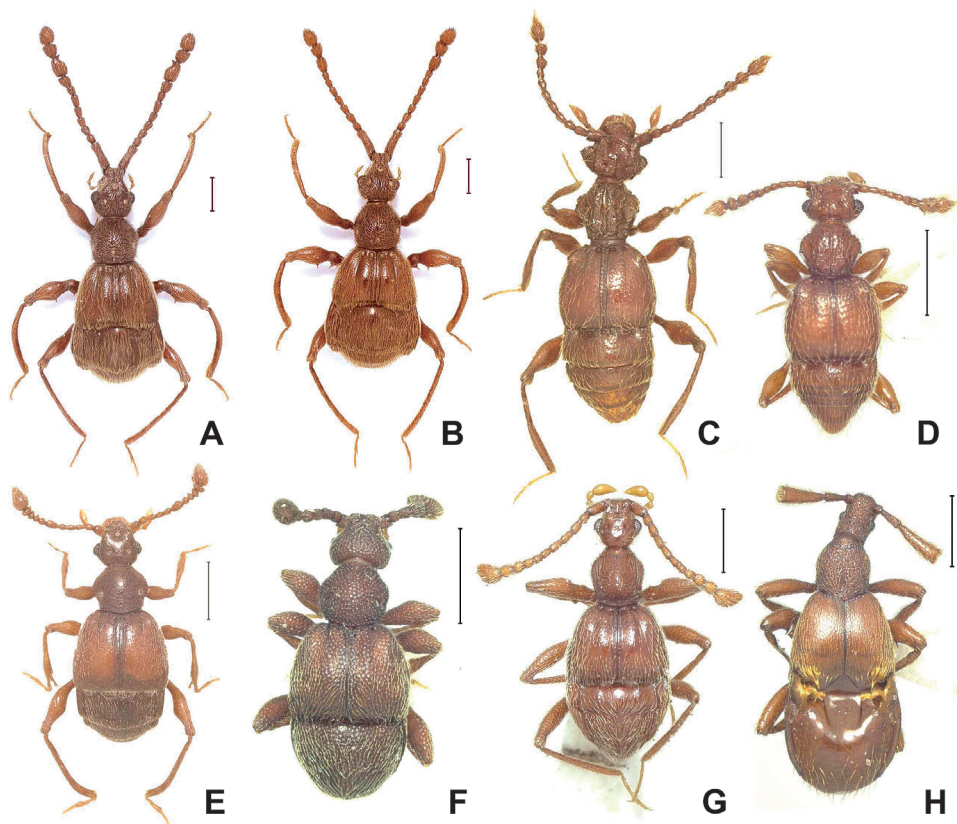


Fig. 4. Pselaphine species collected from Izu-ôshima (A, B) and Miyakejima (C–H) Isls. — A, *Lasinus* sp., male; B, ditto, female; C, *Coryphomodes dionysius*, male; D, *Tribasodes?* sp., female; E, *Trissemus alienus*, male; F, *Plagiophorus fujiyamai*, male; G, *Saltisedes brunneus*, male; H, *Diartiger fossulatus izuinsulicola*, male.

Remarks. This species is already known from Miyakejima Is. under the name of *Coryphomus spinicollis* (SHARP). Usually this species is found in decayed wood or under bark of pine trees.

***Tribasodes?* sp.**

(Fig. 4D)

Specimens examined. 1 female, Tsubota, 15–V–1999, S. ARAI leg.; 2 females, same data as above, but 15–V–1999.

Remarks. This is an undescribed species of the *Tribasodes* group. It is characterized by the small body and the large eyes without sexual modification.

***Batriscenellus (Batriscenellus) fallax* (SHARP, 1883)**

[Japanese name: Hime-harakubo arizukamushi]

Specimens examined. 1 male, Mt. Oyama, 20–VI–1959, Y. WATANABE leg.; 1 female, same data as above, but 12–VI–1964; 1 male, Tsubota, 9–VII–1964, K. YAMAOKA leg.; 4 males, same locality as above, 15 to 16–V–1999, T. ISHIKAWA, K. TOYODA & H. MIZUSHIMA leg.

Remarks. This species is common in the Izu Peninsula, Honshu, and this is the first record of this species from the Izu-shotô Isls. The habitat of this species is leaf litter in woods.

***Trissemus alienus* (SHARP, 1874)**

[Japanese name: Nami-enma arizukamushi]

(Fig. 4E)

Specimens examined. 1 male, Tsubota, 9–VII–1964, K. TAKAHASHI leg.; 3 males, 3 females. Son-ei Bokujô, 15–V–1999, T. SHIMADA leg.

Remarks. This common species in the Japanese mainland was recorded from Miyakejima Is. by WATANABE and SOHMA (1972). In the Japanese mainland, this species is usually found on sandy riverbanks. Males and females are often collected via light trap.

***Plagiophorus fujiyamai* (KUBOTA, 1944)**

[Japanese name: Fujiyama-daruma arizukamushi]

(Fig. 4F)

Specimens examined. 4 males, 4 females, Tsubota, 15 to 16–V–1999, H. MIZUSHIMA, S. ARAI & K. TOYODA leg.

Remarks. In the present study, this species is recorded for the first time from the Izu-shotô Isls. It is also distributed in Izu-ôshima and Hachijôjima Isls.

***Saltisedes brunneus* KUBOTA, 1943**

[Japanese name: Sedaka arizukamushi]

(Fig. 4G)

Specimen examined. 1 male, Tsubota, 9–VII–1964, K. SASAKI leg.

Remarks. In the present study, this species is also reported from Izu-ôshima Is. This is the first record of the species from the Izu-shotô Isls.

***Diartiger fossulatus izuinsulicola* NOMURA, 1997**

[Japanese name: Ko-yamato-higebuto arizukamushi Izu-shotô ashu]

(Figs. 4H, 6C, 7C)

Specimens examined. 1 male, Mt. Oyama, 12–VII–1964, Y. WATANABE leg.; 3 males, 2 females, Tsubota, 15–V–1999, S. ARAI & K. TOYODA leg.; 2 males, 7 females, same data as above, but 16–V–1999; 5 males, 5 females, same data as above, but 17–V–1999.

Host ant. The specimens examined by ARAI and TOYODA were collected from ant nests of *Lasius japonicus* SANTSCHI.

Remarks. The specimen documented in WATANABE and SOHMA (1972) was checked again by the authors in this study. It belongs to the subspecies *izuinsulicola* which is also distributed in Niijima, Kôzushima, and Mikurajima Isls.

Niijima Is.

No pselaphine species have hitherto been known from this island.

***Diartiger fossulatus izuinsulicola* NOMURA, 1997**

[Japanese name: Ko-yamato-higebuto arizukamushi Izu-shotô ashu]

(Figs. 6B, 7B)

Specimens examined. 4 males, 4 females, Niijima Is., 25–VII–1997, M. TOGASHI leg.

Remarks. This subspecies was described from Kôzushima Is., and is very similar to the nomotypical subspecies, *D. f. fossulatus* SHARP. However, it is separable by having the elongate antenna and well-curved lateral trichomes at the base of abdomen.

Kôzushima Is.

This is the type locality of the endemic subspecies of the Izu-shotô Islands, *Diartiger fossulatus izuinsulicola* NOMURA (Figs. 6A, 7A). No additional records of pselaphine species are known.

Mikurajima Is.

From this island, the following three species were already recorded: *Coryphomodes dionysius* (SCHAUFUSS) (= *Coryphomus spinicollis* (SHARP)), *Trissemus alienus* (SHARP) by SAWADA and WATANABE (1969), *Diartiger toshioi* NOMURA et KOMATSU by NOMURA and KOMATSU (2012). The specimens examined without collector's name in the following list were collected by KAMEZAWA.

***Batriscenellus (Batriscenellus) fallax* (SHARP, 1883)**

[Japanese name: Hime-harakubo arizukamushi]

(Fig. 5A)

Specimens examined. 1 female, Mt. Oyama (700–750 m alt.), 12–V–1999, T. KISHIMOTO leg.; 1 male, 1 female, same data as above, but 490 m alt., 14–V–1999; 6 males, 10 females, same data as above, but 790–830 m alt.; 9 males, Sato [N33°53'40" E139°35'37"], 1 to 2–VII–2012; 3 males, Sato [N33°53'25" E139°35'13"], 4–VII–2012; 4 males, Sato [N33°53'44" E139°35'50"], 5–VII–2012.

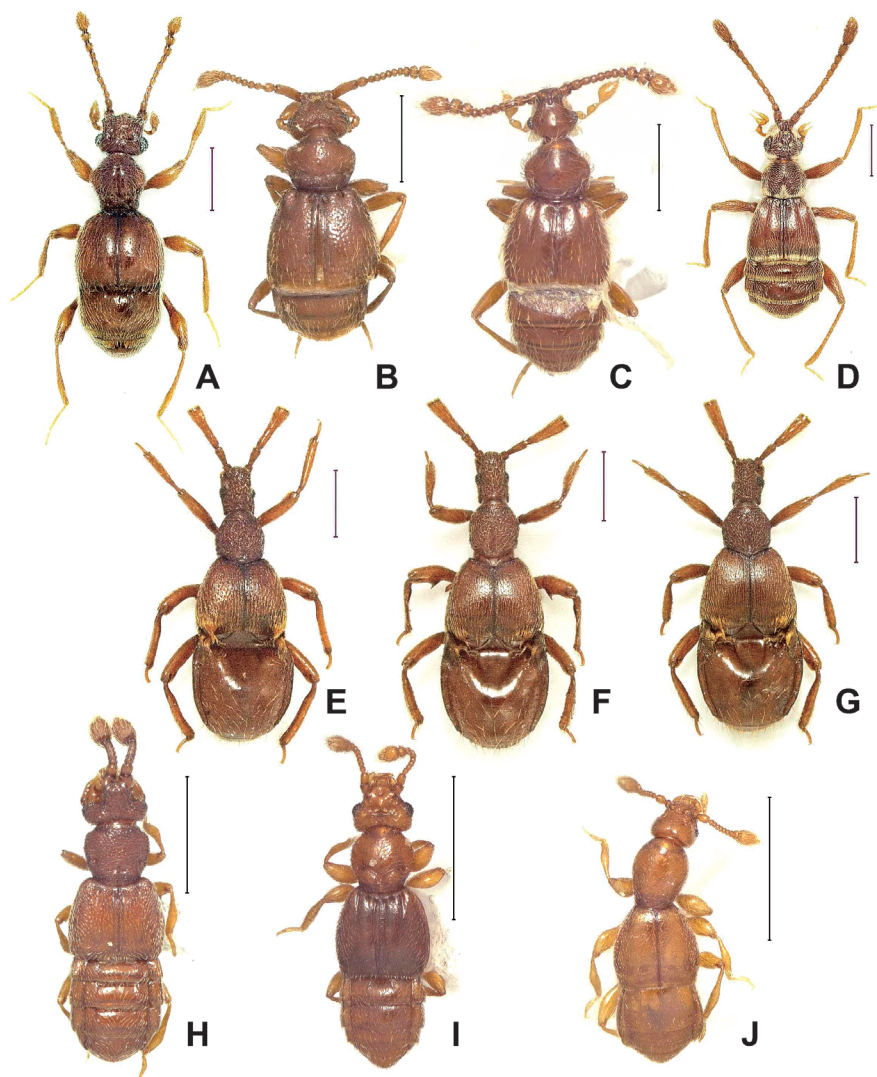


Fig. 5. Pselaphine species collected from Mikurajima (A–G) and Hachijôjima (H–J) Isls. — A, *Batriscenellus (Batriscenellus) fallax*, male; B, *Tychobythinus* sp., male; C, *Tychus dichotomus*, female; D, *Ctenisodes discedens*, female; E, *Diartiger toshioi*, female; F, *D. fossulatus izuinsulicola*, male; G, ditto, female; H, *Nipponozethus* sp., female; I, *Pseudoplectus?* sp., male; J, *Aphilia* sp., female.

Remarks. This species was also recorded from Miyakejima Is. in this study. The condition of the collection point of this species on this island is shown in Fig. 2E.

***Trissemus alienus* (SHARP, 1874)**

[Japanese name: Nami-enma arizukamushi]

Specimens examined. 1 female, Mt. Oyama (640 m alt.), 12–V–1999, T. KISHIMOTO leg.; 1

male, same data as above, but 790–830 m alt., 14–V–1999.

Remarks. This species is already known from Mikurajima Is. as shown above. It is also distributed in Miyakejima Is.

***Tychobythinus* sp.**

(Fig. 5B)

Specimen examined. 1 male, Mt. Oyama (790–830 m alt.), 14–V–1999, T. KISHIMOTO leg.

Remarks. The genus *Tychobythinus* includes two congeners in Japan, *T. aino* and *T. japonicus*. This species is closely allied to *T. aino* KURBATOV known from Honshu and Kuril Isls. in the male genital structure. However, it is separable from *T. aino* by lacking large excavation and secretory setae on the ventral side of the male head.

***Tychus dichotomus* NOMURA et LEE, 1992**

[Japanese name: Tairiku-mori arizukamushi]

(Fig. 5C)

Specimen examined. 1 female, Mt. Oyama (790–830 m alt.), 14–V–1999, T. KISHIMOTO leg.

Remarks. This species was described from Chejûdo Is., South Korea. Up to the present, it is known also from the Japanese mainland (Honshu, Kyushu). This is the first record of the species from the Izu-shotô Isls.

***Ctenisodes discedens* (SHARP, 1883)**

[Japanese name: Hoso-kushihige arizukamushi]

(Fig. 5D)

Specimens examined. 7 females, Sato [N33°53'44" E139°35'50"], 5–VII–2012.

Remarks. This species belongs to the tribe Ctenistini. It was already recorded from Tokyo, but without data. It is recorded from the Izu-shotô Isls. for the first time in the present study. The habitat of this species in Mikurajima Is. is shown in Fig. 2E.

***Diartiger toshioi* NOMURA et KOMATSU, 2012**

[Japanese name: Mikura-yamato-higebuto arizukamushi]

(Fig. 5E)

Diartiger fossulartus toshioi NOMURA and KOMATSU, 2012, Esakia, Fukuoka, (52): 10.

Specimens examined. 2 males, Sato [N33° 53' 45" E139° 35' 28"], 1 to 2–VII–2012.

Host ant. This is a myrmecophilous species inhabiting ant nest of *Lasius japonicus* SANTSCHI.

Remarks. This species was described as a subspecies of *D. fossulatus* by NOMURA and KOMATSU (2012). Later, *D. fossulatus izuinsulicola* was discovered from the same locality in the present study. The former subspecies is clearly different from all subspecies of *D. fossulatus* by the male mid femur with a small denticle near the base and the aedeagus thickened near the middle. The latter subspecies is very similar to the nominotypical subspecies of *D. fossulatus* in the characters of the male mid femur and the aedeagus. Because of this morphological difference, the subspecies *D. f. toshioi* was concluded to be elevated to the species level. The collected point of this species is shown

in Fig. 2F.

***Diartiger fossulatus izuinsulicola* NOMURA, 1997**

[Japanese name: Ko-yamato-higebuto arizukamushi Izu-shotô ashu]

(Figs. 5F, G, 6D, E, 7D, E)

Specimens examined. 3 males, 2 females, Sato-Kawada, [N33°53'04" E139°36'38"], 2–VII–2012.

Host ant. This species was collected from an ant nest of *Lasius japonicus* SANTSCHI in Mikurajima Is.

Remarks. This is a subspecies of *D. fossulatus* SHARP described from Kôzushima Is. It is separated from the nominotypical subspecies by having the slender antenna and the strongly curled basal trichome of the abdomen.

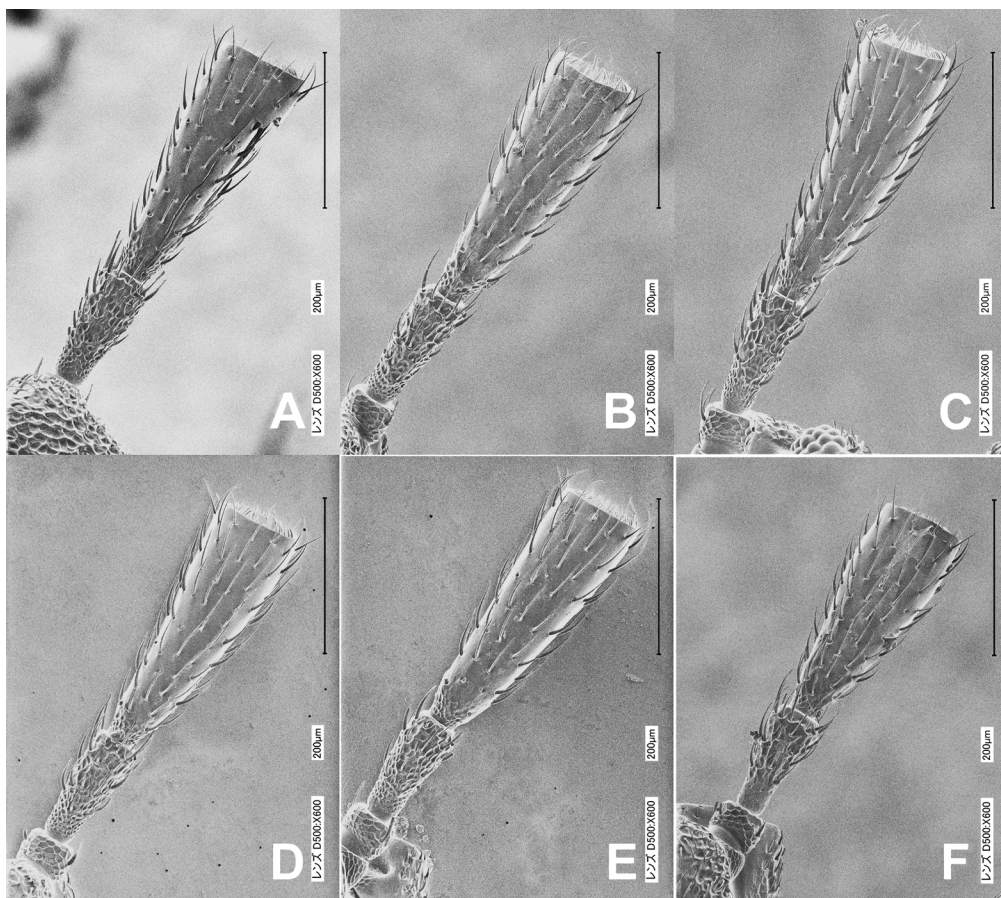


Fig. 6. SEM photos of right antenna of *Diartiger fossulatus*. — A, *D. f. izuinsulicola*, female, holotype from Kôzushima Is.; B, ditto, male from Nijima Is.; C, ditto, male from Miyakejima Is.; D, ditto, male from Mikurajima Is.; E, ditto, female from Mikurajima Is.; F, *D. f. fossulatus*, male from Sunosaki-jinja, Tateyama-shi, Chiba Pref.

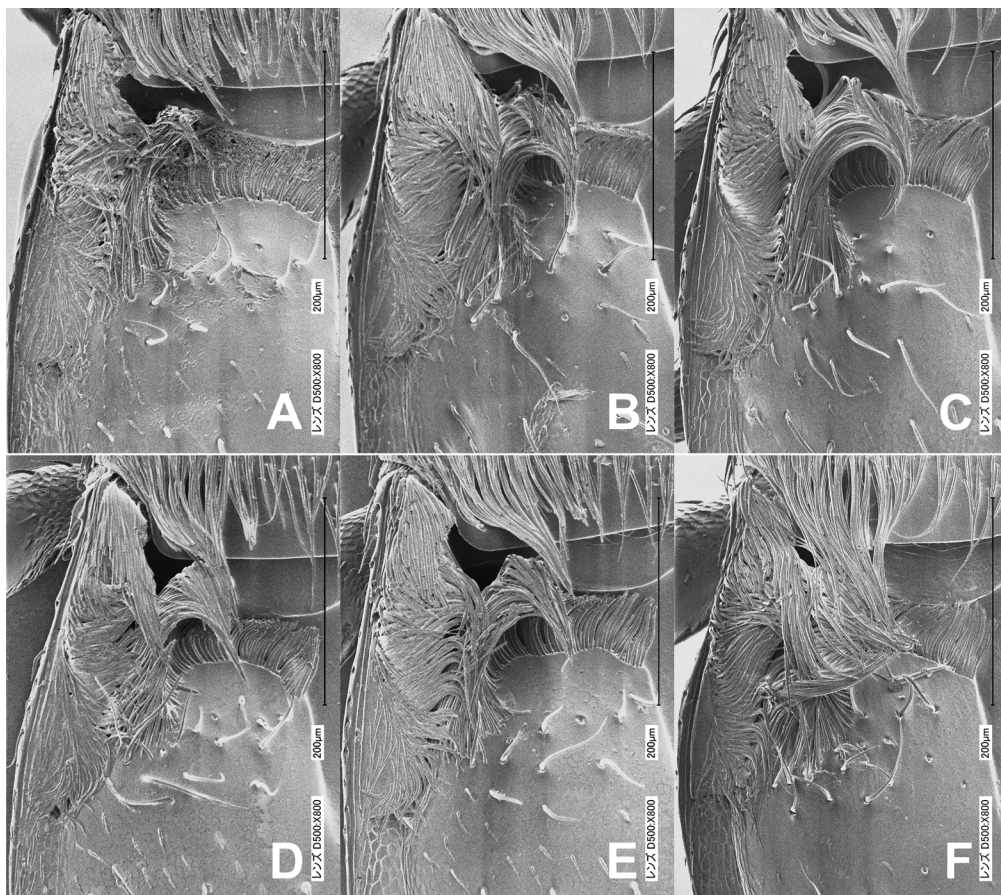


Fig. 7. SEM photos of left abdominal base of *Diartiger fossulatus*. — A, *D. f. izuinsulicola*, female, holotype from Kôzushima Is.; B, ditto, male from Nijijima Is.; C, ditto, male from Miyakejima Is.; D, ditto, male from Mikurajima Is.; E, ditto, female from Mikurajima Is.; F, *D. f. fossulatus*, male from Sunosaki-jinja, Tateyama-shi, Chiba Pref.

As shown in Figs. 6 and 7, the subspecies *izuinsulicola* is morphologically distinguished from the nominotypical subspecies (Figs. 6F, 7F). The antennal segment IV is elongate and slightly curved in the subsp. *izuinsulicola*, but it is short and straight in the nominotypical subspecies. In the lateral part of abdominal base, the basi-lateral trichome is strongly curled in the subsp. *izuinsulicola*, though it is less curled in the nominotypical subspecies. These two characters are stable and scarcely vary among the four islands of the Izu-shotô Isls.

Hachijôjima Is.

Nipponozethus sp.

(Fig. 5H)

Specimen examined. 1 female, Noboryô-tôge Pass, 5-VII-2001, T. ISHIKAWA leg.

Remarks. The genus *Nipponozethus* defined by COULON (1989) includes two Japanese species, *N. delicatulus* and *N. lativentris*. In this group, males are needed for species-level identification, so the female collected remains unidentified.

***Pseudoplectus?* sp.**

(Fig. 5I)

Specimens examined. 6 males, 7 females, Noboryô-tôge Pass, 5–VII–2001, T. ISHIKAWA leg.

Remarks. The genus *Pseudoplectus* has not been recorded from Japan, though some undescribed species were discovered from the Japanese mainland.

***Aphilia* sp.**

(Fig. 5J)

Specimens examined. 2 females, Noboryô-tôge Pass, 5–VII–2001, T. ISHIKAWA leg.

Remarks. This species is very similar to *Aphilia longicollis* (JEANNEL) known from the Japanese mainland (Honshu, Shikoku and Kyushu). However, it is also uncertain if it belongs to the same species since only females were found.

***Plagiophorus fujiyamai* (KUBOTA, 1944)**

[Japanese name: Fujiyama-daruma arizukamushi]

Specimens examined. 1 male, 4 females, Noboryô-tôge Pass, 5–VII–2001, T. ISHIKAWA leg.

Remarks. As shown above, this species was also discovered from Izu-ôshima and Miyakejima Isls.

Acknowledgements

I wish to express my hearty thanks to Dr. Shun-Ichi UENO for his critical reading of the manuscript. Our cordial thanks are due to Professor emeritas Yasuaki WATANABE for his kind assistance in examination of type material. This study was supported by KAKENHI (No. 24510333; principal investigator: Hiroaki KOJIMA; No. 24120002; principal investigator: Shûhei NOMURA).

Literatures Cited

- COULON, G., 1989. Révision générique des Bythinoplectini SCHAUFUSS, 1890 (=Pyxidicerini RAFFRAY, 1903, syn. nov.) (Coleoptera, Pselaphidae, Faroninae). *Mém. Soc. r. Belge. Ent.*, **34**: 1–282.
- NOMURA, S., 1997. A systematic revision of the Clavigerine genus *Diartiger* SHARP from East Asia (Coleoptera, Staphylinidae, Pselaphinae). *Esakia, Fukuoka*, (37): 77–110.
- & T. KOMATSU, 2012. Two new subspecies of *Diartiger fossulatus* SHARP (Coleoptera, Staphylinidae, Pselaphinae) from Japan. *Ibid.*, (52): 9–15.
- SAWADA, H., & Y. WATANABE, 1969. The insect-fauna of Mikura-jima Island. *J. agric. Sci. Tokyo Nogyo Daigaku*, **14**: 1–48. (In Japanese, with English summary.)
- WATANABE, Y., & K. SOHMA, 1972. Insect-fauna of Miyake-jima Island in the Izu Islands. *Ibid.*, **17**: 1–58. (In Japanese, with English summary.)