

Two Japanese Species of the Genus *Namunaria* (Coleoptera, Zopheridae)

Jun-ichi AOKI¹⁾ and Nobuyuki NARUKAWA²⁾

¹⁾3–8–12 Nishi-Azabu, Minato-ku, Tokyo, 106–0031 Japan
E-mail: ja-muck@ma.rosenet.ne.jp

²⁾2399 Kida, Suzuka City, Mie, 513–0015 Japan
E-mail: tritoma@mecha.ne.jp

Abstract An additional species of the genus *Namunaria*, *N. montana* sp. nov., was found from Japan. The new species is distinguishable from the known Japanese species, *N. picta* (SHARP, 1885), by the larger pronotum compared to elytra, the sharp anterior angles of pronotum, the smaller terminal antennomere, the straight parameres of male genitalia and brownish patches of squamiform setae on elytra.

It has long been regarded that the genus *Namunaria* of Japan is represented by only a single species, *Namunaria picta* (SHARP, 1885). The second author collected, however, some individuals in central part of Japan, which have the shape of pronotum and body color different from those of the known species. A close examination of them revealed more differences in antennal club, body setae and male genitalia. On the basis of these evidences we concluded that there are two species of *Namunaria* in Japan, both of which are described below.

The following abbreviations are used in the descriptions. L/W = length/width, W/L = width/length, PW/PL = pronotal width/pronotal length, EL/EW = elytral length/elytral width.

Namunaria picta (SHARP, 1885)

(Figs. 1, 3–9)

Sympanotus pictus SHARP, 1885, p. 62, pl. 3, fig. 2; HETSCHKO, 1930, p. 35; DAJOZ, 1977, p. 85, fig. 70A; NAKANE *et al.*, 1963, p. 219, pl. 110, fig. 3; SASAJI, 1977, p. 3; SASAJI, 1985, p. 294, pl. 48, fig. 14; IVIE & ŚLIPIŃSKI, 1990, p. 8.

Namunaria picta: ŚLIPIŃSKI & LAWRENCE, 1997, p. 400; SCHUH, 1999, p. 141, figs. 5, 8, 11, 12, 18–21, 30; AOKI, 2009, p. 178, fig. (p. 179); AOKI, 2012, p. 71, fig. 63; AOKI, 2013, p. 120, fig. 7–10–59.

Body length. 4.1–5.0 (av. 4.4) mm, rarely 3.7 mm.

Color. Body and femora black, antennae, tibiae and tarsi brown.

Head longer than wide (L/W: 1.3), with exposed part of head wider than long (W/L: 1.4–1.6); lateral margins expanded and elevated in front of eyes; anterior margin of clypeus straight; dorsal side of head almost flat; sculpture of anterior half consisting of large granules of various shapes and sizes. Eyes without facetal setae. Antennae (Fig. 5) 11-segmented; width of antennomeres: $1 > 2 > 3 > 4 = 5 = 6 = 7 < 8 < 9 < 10 > 11$; antennomere 3 elongate, 1.9 times as long as wide; exposed part of antennomere 11 slightly wider than long (1.03–1.22 times as wide as long), 1.2 times as long as 10 and 0.8–1.0 times as wide as 10.

Pronotum (Fig. 3) wider than long (PW/PL: 1.27–1.39, av. 1.33), narrower than elytra; anterior angles well projecting, but not so sharply pointed at tip, extending not or slightly beyond anterior margin of pronotum; posterior angles not prominent; anterior margin well arched, often only slightly concave medially. Disc with several median and paired shallow impressions, forming X-like low ridge bearing white setae mediobasally. Sculpture consisting of large granules various in shape and size,

bearing two types of squamiform setae, white and dark brown, most of them truncate or weakly bifid at tip.

Elytra parallel-sided, rather long and narrow (EL/EW: 1.66–1.77, av. 1.71). Lateral margins denticulate more strongly in humeral region and more weakly in apical part. Punctual striae often winding, with the punctures deep, connected longitudinally by bone-like clamps, bearing squamiform setae which are largely dark brown and partly white, and often truncate or weakly bifid at their tip (Fig. 6). Intervals with white setae slenderer than striae ones and not bifid at tip (Fig. 7), clustered here and there into white patches (Fig. 1); each elytron wearing 8–10 patches.

Prosternal process expanded and nearly flat apically, with a weak median swelling. Metasternum densely covered with small granules of irregular shapes, each bearing white elongate leaf-like setae; median line impressed on apical 1/6–1/7. Sculpture on abdominal ventrites as on metasternum; setae narrowly leaf-like, not sharply pointed at tip (Figs. 8–9). Male with distinct pores on ventrites 3 and 4.

Legs moderately long; mid and hind tarsomeres 4 distinctly longer than (1.32–1.48 times as long as) 1 to 3 combined, respectively.

Male genitalia (Fig. 4) elongate, 4.1–4.4 times as long as wide; parameres more or less bending outside at tips, 1.42–1.53 times as long as phallobasis.

Specimens examined. 1 ex., Shiminno-mori in Kamiyukawa-chô, Hakodate City, Hokkaido, 5.VI.2013, K. NAGOSHI leg.; 2 exs., Masukawa-chô, Hakodate City, 28.XII.2014, K. NAGOSHI leg.; 1 ex., Takamatsu-chô, Hakodate City, 2.II.2015, K. NAGOSHI leg.; 1 ex., Towada, Aomori Pref., 29.IX.1968, K. SHIMOYAMA leg.; 1 ex., Shijû-tani, Haramachi City, Fukushima Pref., 14.V.1979, K. TAZOE leg. 1 ex., Hirusone-rindô, Namie-machi, Fukushima Pref., 7.VI.1980, K. TAZOE leg.; 7 exs., (1 ♀, Eda, Iwaki City, Fukushima Pref., 11.VII.1993, S. OHMOMO leg.; 1 ex., Mt. Matsuishi, Tokyo, 3.VII.1960, K. KIMURA leg.; 6 exs., Ôhunato, Mikura-jima Is., Tokyo, 15.X.2009, J. AOKI leg.; 3 exs. (2 ♂♂, 1 ♀), Nagasaka, Mikura-jima Is., Tokyo, 18.X.2009, J. AOKI leg.; 2 exs., same place, 12.VI.2010, J. AOKI leg.; 5 exs., same place, 19.VII.2010, M. TAKAKUWA leg.; 1 ex., same place, 8.VIII.2010, M. IWAMA leg.; 1 ex., Itani, Miyake-jima Is., Tokyo, 6.IV.2010, J. AOKI leg.; 1 ex., Miho-chô, Yokohama City, Kanagawa Pref., 8.VI.1995, A. IZUMI leg.; 1 ex., Minami-Akaishi-rindô (1,800 m), Nakakawane-chô, 3.VII.1985, K. HOSOKAWA leg.; 6 exs., Shimosagano, Kawazu-chô, Shizuoka Pref., 12.VII.2008, J. AOKI leg.; 2 ♀♀, Kenminno-mori, Shizuoka City, Shizuoka Pref., 28–30.VIII.2009, S. OHMOMO leg.; 2 exs., Sumata-kyô, Kawane-honmachi, Shizuoka Pref., 28.VIII.2009, J. AOKI leg.; 1 ex., Shirabiso-kôgen (1,900 m), Kami-mura, Nagano Pref., 27.VII.1985, K. HOSOKAWA leg.; 3 exs., Mt. Hongusan, Aichi Pref., 1.VI.1956, M. SATO leg.; 1 ex., Mt. Tsubosaka, Nara Pref., 22.I.1976, M. INOUE leg.; 1 ex., Nagasawa-chô, Suzuka City, Mie Pref., 16.II.1982, N. NARUKAWA leg.; 1 ex., Yamamoto-chô, Suzuka City, Mie Pref., 24.IV.1983, N. NARUKAWA leg.; 1 ex., Kuki-jinja, Kuki-chô, Owase City, Mie Pref., 31.VII.1993, N. NARUKAWA leg.; 1 ex., Okochi, Kiwa-chô, Kumano City, Mie Pref., 11.V.1996, N. NARUKAWA leg.; 7 exs., Takaoka, Taiki-chô, Mie Pref., 25.VII.2008, J. AOKI leg.; 6 exs., Mt. Kojindake, Wakayama Pref., 15–16.VIII.1969, S. KINOSHITA leg.; 17 exs., Ashiu, Kyoto Pref., 20.VI.1967, M. TOMOKUNI leg.; 1 ex., Kurama, Kyoto Pref., 25.VI.1965, M. TOMOKUNI leg.; 4 exs. (1 ♂), Mt. Mikusa-yama, Nose-chô, Toyono-gun, Osaka Pref., 1.X.2013, K. MATSUDA leg.; 1 ex., Shiju-Tani, Fukui City, Fukui Pref., 31.VII.2008, J. AOKI leg.; 7 exs., Kami-Ôno, Izumi-mura, Fukui Pref., 1.VIII.2008, J. AOKI leg.; 4 exs., Mt. Onigatake, Yakake-chô, Okayama Pref. 3.VIII.2009, J. AOKI leg.; 1 ex., Kino-mura, Takahashi City, Okayama Pref., 29–30.VIII.1987; 3 exs., Tsunesada, Kuchiwa-chô, Hiroshima Pref., 11.V.1995, Li-Zhen LI leg.; 1 ex., Makinbara, Kuchiwa-chô, Hiroshima Pref., 11.V.1995, K. AITA leg.; 1 ex., Mt. Takahachi-yama, Saji-chô, Tottori City, Tottori Pref., 3.X.1976, O. YAMAJI leg.; 1 ex., Minamigawa, Kitô-son, Tokushima Pref., 2.VIII.1971, S. KINOSHITA leg.; 2 exs., Komaso-goe,

Kitô-son, Tokushima Pref., 29.VIII.1976, Y. ITO leg.; 1 ex., Narukawa-keikoku, Ainan-chô, Ehime Pref., 25.XI.2008, J. AOKI leg.; 2 exs., Yuyama-yanagi, Matsuyama City, Ehime Pref., 15.VIII.2011, K. ISHIKAWA leg.; 1 ♀, Tosa-Yamada-chô, Kami City, Kôchi Pref., 30.IX.2011, J. AOKI leg.; 1 ex., Sorigahara, Nishikuma Valley, Monobe-mura, Kami-Gun, Kôchi Pref., 30.IV.1983, Y. ITO leg.; 15 exs., Nagano, Yusuhara-chô, Kôchi Pref., 1–2.X.1994, Y. UTSUNOMIYA leg.; 2 exs. (1 ♀), Yuyama, Mizukami-mura, Kumamoto Pref., 4.IX.2007, J. AOKI leg.; 2 exs., E of Hitoyoshi City, Kumamoto Pref., 4.IX.2007, J. AOKI leg.; 3 exs. (1 ♀), Mt. Kurodake, Kokonoe-chô, Ôita Pref., 13.VII.1996, S. OHMOMO leg.; 3 exs., Mitake-jinja, Kiyokawa-mura, Ôita Pref., 19.X.2012, J. AOKI leg.; 1 ex., Mt. Yatake, Miyazaki Pref., 8.X.1969, S. HISAMATSU leg.; 2 exs., Kirishima-jingû, Kirishima City, Kagoshima Pref., 18.IX.2007, J. AOKI leg.; 1 ex., Sugiyama-dani, Minami-Ohsumi-chô, Kagoshima Pref., 13–14.IX.2008, T. KURIHARA leg.

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu and Izu Islands), China and Eastern Nepal.

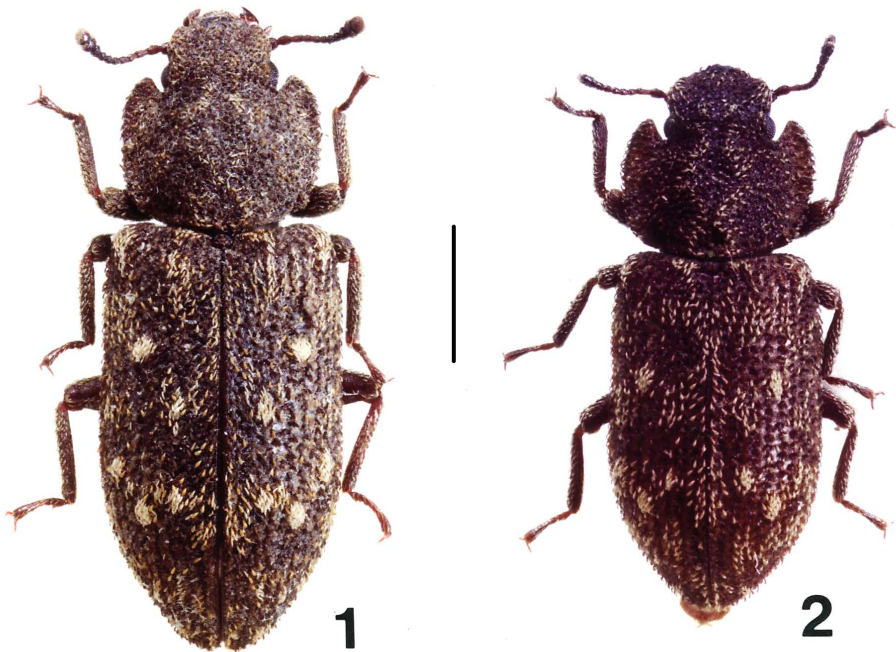
Namunaria montana sp. nov.

(Figs. 2, 10–16)

Body length. 3.5–3.9 (av. 3.7) mm.

Color. Dark brown, antennae sometimes brown, femora, tibiae and tarsi similar in color, dark brown and sometimes black.

Head a little longer than wide (L/W: 1.10–1.20), exposed part wider than long (W/L: 1.3–1.5);



Figs. 1–2. *Namunaria* spp. — 1, *N. picta* (SHARP); 2, *N. montana* sp. nov. Scale: 1 mm.

lateral margins expanded and weakly elevated in front of eyes; anterior margin of clypeus straight; dorsal side of head almost flat; sculpture of anterior half consisting of large granules of various shapes and sizes. Eyes without facetal setae. Antennae (Fig. 12) 11-segmented; widths: $1 > 2 > 3 > 4 = 5 = 6 = 7 < 8 < 9 < 10 > 11$; antennomere 3 elongate, 1.8–1.9 times as long as wide; exposed part of antennomere 11 slightly longer than wide (1.06–1.12 times as long as wide), nearly as long as 10, 0.8 times as wide as 10.

Pronotum (Fig. 10) wider than long (PW/PL: 1.32–1.55, av. 1.43), as broad as elytra; anterior angles strongly projecting apicad, with sharp tip, extending well beyond anterior margin of pronotum; posterior angles not prominent; anterior margin weakly arched, usually devoid of concavity medially. Disc with several median and paired shallow impressions, forming X-like low ridge mediobasally. Sculpture consisting of large convex granules various in shape and size, bearing two types of squamiform setae which are dark brown and partly white, rounded at tip in most cases.

Elytra parallel-sided, rather short and wide (EL/EW: 1.65–1.72, av. 1.67). Lateral margins denticulate more strongly in humeral region and more weakly in apical part. Punctual striae weakly winding partly, with the punctures deep, connected longitudinally by bone-like clamps, each bearing squamiform setae which are largely dark brown and partly white, usually rounded at tip (Fig. 13). Intervals with yellowish setae in the same manner as strial ones (Fig. 14), clustered together here and there and forming yellowish or dirty white patches of setae (Fig. 2); each elytron wearing eight to ten patches.

Prosternal process expanded and nearly flat apically, with weak median swelling.

Metasternum densely covered with small granules irregular in shape, each bearing white slender leaf-like setae; median line impressed on apical 1/5–1/7. Setae on abdominal ventrites (Figs. 15 & 16) slenderer than those on metasternum and sharply pointed at tip.

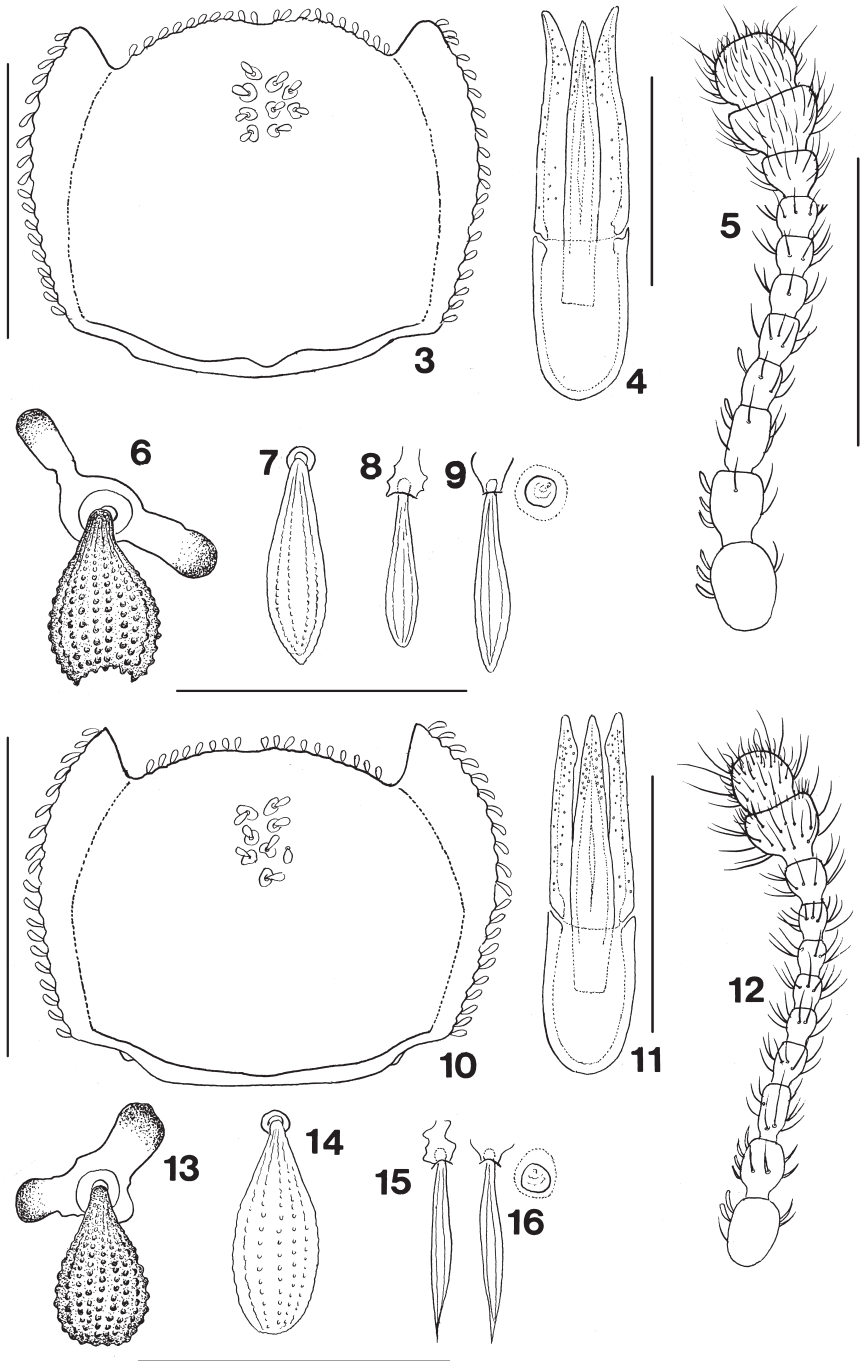
Legs moderately long; mid and hind tarsomeres 4 longer than (1.26–1.40 as long as) 1 to 3 combined, respectively.

Male genitalia (Fig. 11) elongate, 3.7–4.2 times as long as wide; parameres straight and parallel, about 1.5 times as long as phallobasis.

External sexual dimorphism is quite uncertain except for the presence of distinct pores on ventrites 3 and 4 of male.

Type series. Holotype: ♂, Mt. Sanzu-Kouchiyama, Ôdai-chô, Taki-gun, Mie Pref., 17.VII.1985. N. NARUKAWA leg. Paratypes: 3 exs. (Nos. 1–3, two of them are dissected and mounted on slides), Mt. Sanzu-Kôchiyama, Ôdai-chô, Taki-gun, Mie Pref., 19.VIII.1984, N. NARUKAWA leg.; 2 exs. (Nos. 4–5), same place, 10.X.1984, N. NARUKAWA leg.; 1 ex. (No. 6), Ôdaigahara, Kamikitayama-mura, Nara Pref., 24.VIII.1990, K. AKITA leg.; 1 ex. (No. 7), Sengendaru-kôgen, Takayama-shi, Gifu Pref., 2.VIII.1996, K. KANNOU leg.; 1 ex. (No. 8), Mt. Kurokawa, Ôsika-mura, Nagano Pref., 6.IX.2013, K. HOSOKAWA leg.; 2 exs. (Nos. 9–10), Ti-Zawa (1,800 m), Mt. Nyûgasa, Hase-mura, Nagano Pref., 14.IX.2003, K. HOSOKAWA leg.; 1 ex. (No. 11), near Shirokoma-ike (2,000–2,300 m), Mt. Yatsugatake, Nagano Pref., 22.VII.2005, K. AKITA leg.; 1 ex. (No. 12), Mt. Tsurugi-san, Mima-shi, Tokushima Pref., 17.VII.2003, S. SUZUKI leg. Holotype (NSMT-I-C 200302) and eight paratypes (NSMT-I-C 200303–200310) are deposited in the collection of the National Museum of Nature and Science, Tsukuba, two paratypes in the collection of Ehime University Museum, Matsuyama and two paratypes in the collection of the Osaka Museum of Natural History, Osaka.

Other specimens examined. 1 ex. (dissected and mounted on slide), Mt. Sanzu-Kôchiyama, Ôdai-chô, Taki-gun, Mie Pref., 19.VIII.1984, N. NARUKAWA leg.; 2 exs., same place, 2.IX.1984, N. NARUKAWA leg.; 1 ex., same place, 10.X.1984, N. NARUKAWA leg.; 4 exs. (1 whole and 3 dissected), same place, 6.VII.1985, N. NARUKAWA leg.; 1 ex., Ôdaigahara, Kamikitayama-mura, Nara Pref., 7.VII.1985, N. NARUKAWA leg.; 1 ex., same place, 22.VIII.1988, K. AKITA leg.; 1 ex., Shimashima-dani



Figs. 3–16. *Namunaria* spp. — 3–9, *N. picta* (SHARP); 10–16, *N. montana* sp. nov. — 3, 10, Pronota; 4, 11, male genitalia; 5, 12, antennae; 6, 13, elytral setae on striae; 7, 14, elytral setae on intervals; 8, 15, setae on ventrites 3 (♀); 9, 16, setae on ventrites 3 (♂). Scale: 1 mm for 3 and 10; 0.5 mm for 4, 5, 11 and 12; 0.005 mm for 6–9 and 13–16.

Table 1. Comparison of main characters between two Japanese species of *Namunaria*.

	<i>M. picta</i> (SHARP).	<i>M. montana</i> sp. nov.
Body length	Large, 4.1–5.00 (av. 4.4)	Small, 3.5–3.9 (av. 3.7)
Antennomere 11	More transverse, slightly wider than 10 (W/L: 1.03–1.22)	More elongate, slightly narrower than 10 (W/L: 0.89–0.94)
Anterior angles of pronotum	Dull, not markedly projecting beyond anterior margin of pronotum	Sharp, strongly projecting beyond anterior margin of pronotum
Shape of pronotum	Narrower (PW/PL: 1.27–1.39 (av. 1.33))	Broader (PW/PL: 1.32–1.55 (av. 1.43))
Shape of elytra	Long, wider than pronotum (EL/EW: 1.66–1.77 (av. 1.71))	Short, as wide as pronotum (EL/EW: 1.65–1.72 (av. 1.67))
Elytral setae		
Setae on striae	Often cut at tip	Rounded at tip
Setae on intervals	White, leaf-like with weakly pointed tip	White, leaf-like with rounded tip
Setae on ventrite 3	Somewhat broad, not sharply pointed	Slender, sharply pointed at tip
Parameres of male genitalia	Tips bending outward	Tips straight

(1,300–1,800 m), Azumi-mura, Nagano Pref., 25.VII.1990, K. AKITA leg.; 1 ex., Ti-Zawa (1,800 m), Mt. Nyûgasa, Hase-mura, Nagano Pref., 14.IX.2003, K. HOSOKAWA leg.; 1 ex., Mt. Torikura, Ôshika-mura, Nagano Pref., 30.IX.2006, K. HOSOKAWA leg.; 1 ex., Mt. Tsurugi-san, Mima-shi, Tokushima Pref., 17.VII.2003, S. SUZUKI leg.

Distribution. Japan (Honshu and Shikoku).

Etymology. The specific name “montana” is named after the species habitats restricted in mountain region of Japan.

Remarks. HORN (1878) described two North American species of the genus *Coxelus*, *C. guttulatus* LECONTE, 1863 and *C. pacificus* HORN, 1878, both were transferred later to the genus *Namunaria*. SCHUH (1999) revised the Oriental species of the genus *Namunaria*, giving their descriptions and a key to six species: *N. picta* (SHARP, 1885); *N. chinensis* SCHUH, 1999; *N. birmanica* (GROUVELLE, 1896); *N. echinata* SCHUH, 1999; *N. mammillaris* SCHUH, 1999; *N. bhutanensis* (ŠLIPÍŇSKI, 1981). Among them, *N. picta*, *N. chinensis*, *N. mammillaris*, *N. guttulata* and *N. pacifica* are similar to the new species in having elytra with several patches of pale, squamiform setae on elytra. *Namunaria picta*, only known species in Japan, differs from the new species in the characters shown in Table 1. The remaining species are distinguishable from the new species as follows: *N. chinensis* by elytral patches



Fig. 17. Distribution map of *Namunaria picta* (SHARP) (●) and *N. montana* sp. nov. (▲) in the Japanese Archipelago.

of setae situated each on a small gibbosity; *N. mammillaris* by prominent basal gibbosity on elytral interval 3; *N. guttulata* by wide pronotum nearly twice as wide as long, antennomere 3 nearly as long as the two following together and larger body size (4.5 mm); *N. pacifica* by antennomere 3 scarcely longer than 4, which is not longer than 5 and larger body size (4.5 mm).

Distribution of the Two Species

The geographical distribution of *Namunaria* is shown in Fig. 17. The known species, *N. picta*, is widely distributed in four mainlands of Japan from Hokkaido to Kyushu, while the new species, *N. montana*, is found only in the middle part of Honshu and Shikoku.

A clear tendency is found also in their vertical distribution (Fig. 18). The main habitats of *N. picta* may exist in lower altitude, although the distributional range is extending to higher altitude at the

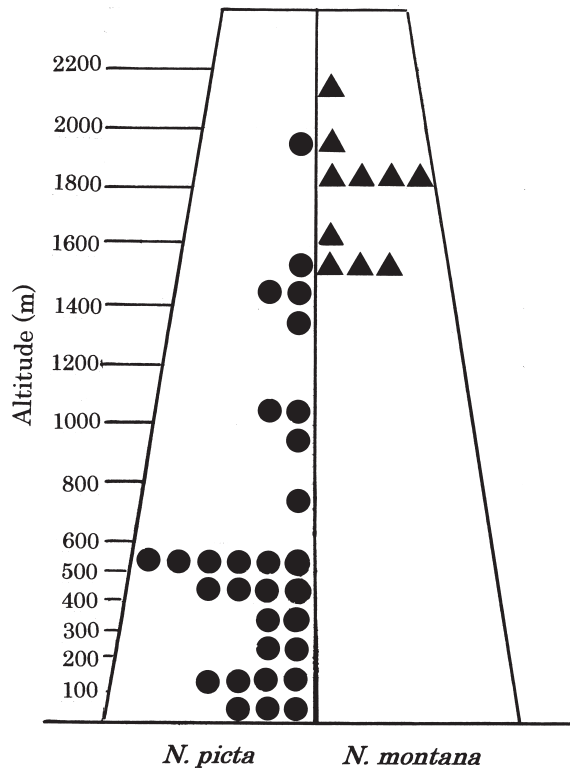


Fig. 18. Collecting points of *Namunaria picta* (SHARP) (●) and *N. montana* sp. nov. (▲).

maximum of 1,900 m. The other species, *N. montana*, has never been found in lowland and it prefers higher altitude from 1,500 m to 2,300 m, namely the montane zoon and the subalpine zoon of Japan.

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要 約

青木淳一・生川展行：日本産ホソマダラホソカタムシ属 *Namunaria* (鞘翅目コブゴミムシダマシ科) の2種について。—— ホソマダラホソカタムシ属は、日本で1種のみが分布すると思われていたが、詳しい調

査の結果、2種が含まれていることがわかった。日本の暖地や平地から低山地に生息するものは従来知られているホソマダラホソカタムシ *Namunaria picta* (SHARP) であるが、本州中部や四国の山地に生息するものは別種とみなされ、ここに新種ミヤマホソマダラホソカタムシ (新称) *Namunaria montana* sp. nov. として報告し、既知種とともに記載した。本新種は既知種に比べ、体が小型で、やや太短く、前胸背板の前角が鋭く突出し、♂交尾器の先端が外側に反るなどの特徴によって区別される。

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