

## Descriptions of Two New Subspecies of *Philonthus* from Japan, with New Combinations for Some *Philonthus* Species (Coleoptera, Staphylinidae, Philonthina)

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**Abstract** Two new subspecies, *Philonthus varians miyama* ssp. nov. and *P. jurgans toyoshimai* ssp. nov. are described from mountainous area of Japan, and *Philonthus jonensis* SAWADA, *P. kamimurai* SAWADA and *P. kobensis* SHARP are transferred to the genus *Bisnius* STEPHENS.

*Philonthus* STEPHENS, 1829 is a very large genus, comprising more than 1,600 species known from all over the world (HERMAN, 2001), and more than 60 species recorded from Japan (SHIBATA *et al.*, 2013). However several Japanese *Philonthus* species still require correct generic assignment.

Recently I found two species of the genus *Philonthus* unknown to the Japanese fauna. One of them is conspecific with Holarctic *Philonthus varians* PAYKULL, 1789 and the other with *P. jurgans* TOTTENHAM, 1937, respectively (sensu COIFFAIT, 1974; SMETANA, 1995). After detailed examination, I concluded that each of them is appropriate to subspecies status in each species, because those have subtle but stable differences in their male genitalia from the nominotypical subspecies of each species. Therefore I describe them as *Philonthus varians miyama* ssp. nov. and *P. jurgans toyoshimai* ssp. nov., respectively.

In the course of taxonomic studies on Japanese Philonthina I have noticed some problems on generic assignments of *Philonthus jonensis* SAWADA, 1965, *P. kamimurai* SAWADA, 1965 and *P. kobensis* SHARP, 1874. As one of the characteristics of the genus *Philonthus*, protarsi are dilated in basal four tarsomeres, and with modified hairs on the ventral sides, but those in the species mentioned above are simple and slender, not having modified hairs on the ventral sides, bearing characteristics of the genus *Bisnius*. Consequently, those three species are transferred to the genus *Bisnius*.

Before going into further details I wish to express my cordial thanks to Messrs. T. ITO (Yawata, Kyoto), M. INAGAKI (Tsu, Mie), K. TOYOSHIMA (Gifu) and N. ITO (Kawanishi, Hyôgo) for their kindly offering interesting materials, and to Dr. K. ANDO, the Faculty of Agriculture, Ehime University for his critically reading the manuscript of this paper.

The type species treated in this study is deposited in the following collections.

OMNH: Osaka Museum of Natural History, Osaka, Japan

EUMJ: Ehime University Museum, Matsuyama, Japan

CYHH: Private collection of Yasuhiko HAYASHI, Hyôgo, Japan

The main terminology and abbreviations used herein are as follows: HW — head width; HL — head length; E — length of eye; T — length of temple; PW — pronotal width; PL — pronotal length; EW — elytral width; EL — elytral length; TL — type locality.

*Philonthus (Philonthus) varians miyama* ssp. nov.

(Figs. 1 &amp; 6–8)

*Diagnosis.* The new subspecies is different from the nominotypical species as follows: elytra reddish brown to dark brown; male genitalia with penis nearly parallel-sided and subtruncate at apex; parameres rather longer, more extending toward apex of penis.

*Description.* Body black, rather robust; elytra reddish brown to dark brown, each elytron rarely with a very ambiguous dark reddish vitta laterally; abdominal ventrites narrowly yellowish brown in each posterior margin; legs dark brown, dusky yellow on inner portions of pro- and mesocoxae, ventral sides of femora and tibiae. Length: 4.9–7.2 mm.

Head oval, slightly longer than wide (HL/HW = 1.09), much narrower and shorter than pronotum (HW/PW = 0.60 & HL/PL = 0.68), with fine striate microsculpture dorsally; eyes large, as long as temples; temples with several small punctures. Antennae long, not thickened apicad, each antennomere longer than wide; 3rd antennomere 1.19 times as long as 2nd; 10th 1.33 times as long as wide; antennomeres with the following relative length from basal one to apical one: 2.14 : 1.22 : 1.45 : 1.00 : 1.14 : 1.14 : 1.14 : 1.10 : 1.10 : 1.10 : 1.50.

Pronotum slightly wider than long (PW/PL = 1.06), microsculptured as on head, rather strongly narrowed anteriorly, gently arcuate at sides and widely rounded posteriorly. Scutellum slightly depressed, sparsely punctured.

Elytra moderately long, subquadrate, weakly widened posteriorly, slightly wider than long (EW/EL = 1.05), a little wider and longer than pronotum (EW/PW = 1.16 & EL/PL = 1.17); surface finely, densely and asperately punctured, without microsculpture. Hind wings well developed.

Abdomen covered with exceedingly fine and dense microsculpture of transverse striae; punctures fine and dense basally, becoming sparser toward apex of abdomen, and also the punctures becoming sparser posteriorly on each tergite, those on ventrites a little larger and sparser than on tergites.

Male genitalia (Figs. 6–8) slender, symmetrical; penis parallel-sided and subtruncate at apex; parameres pediculate, more extended apicad than in the nominotypical species, reaching at apical fifteenth of penis, dilated in apical portion, and its inner face fringed with peg-setae along the rim and scattered with a few ones basally.

*Type series.* Holotype: ♂, Gonbee-pass (alt. 1,250 m), Ina, Nagano Pref., 30.VIII.1997, Y. HAYASHI leg. (OMNH). Paratypes: 1 ♂, same data as the holotype (OMNH); 3 ♂♂, 1 ♀, Nikkô, Tochigi Pref., 2–4.V.2014, M. INAGAKI leg. (CYHH); 3 ♂♂, 1 ♀, Hijiyama (alt. 1,100 m), Ina, Nagano Pref., 17.VII.1960, Y. HAYASHI leg. (1 ♂, 1 ♀ in EUMJ & 2 ♂♂ in CYHH); 1 ♀, Ina, Nagano Pref., 3.IX.1962, Y. HAYASHI leg. (CYHH); 1 ♀, Rokudôhara (alt. 900 m), Ina, Nagano Pref.; 30.VII.1958, Y. HAYASHI leg. (CYHH); 1 ♂, 1 ♀, Mt. Kohjin, Yamato, Nara Pref., 17.VII.1976, T. ITO leg. (OMNH).

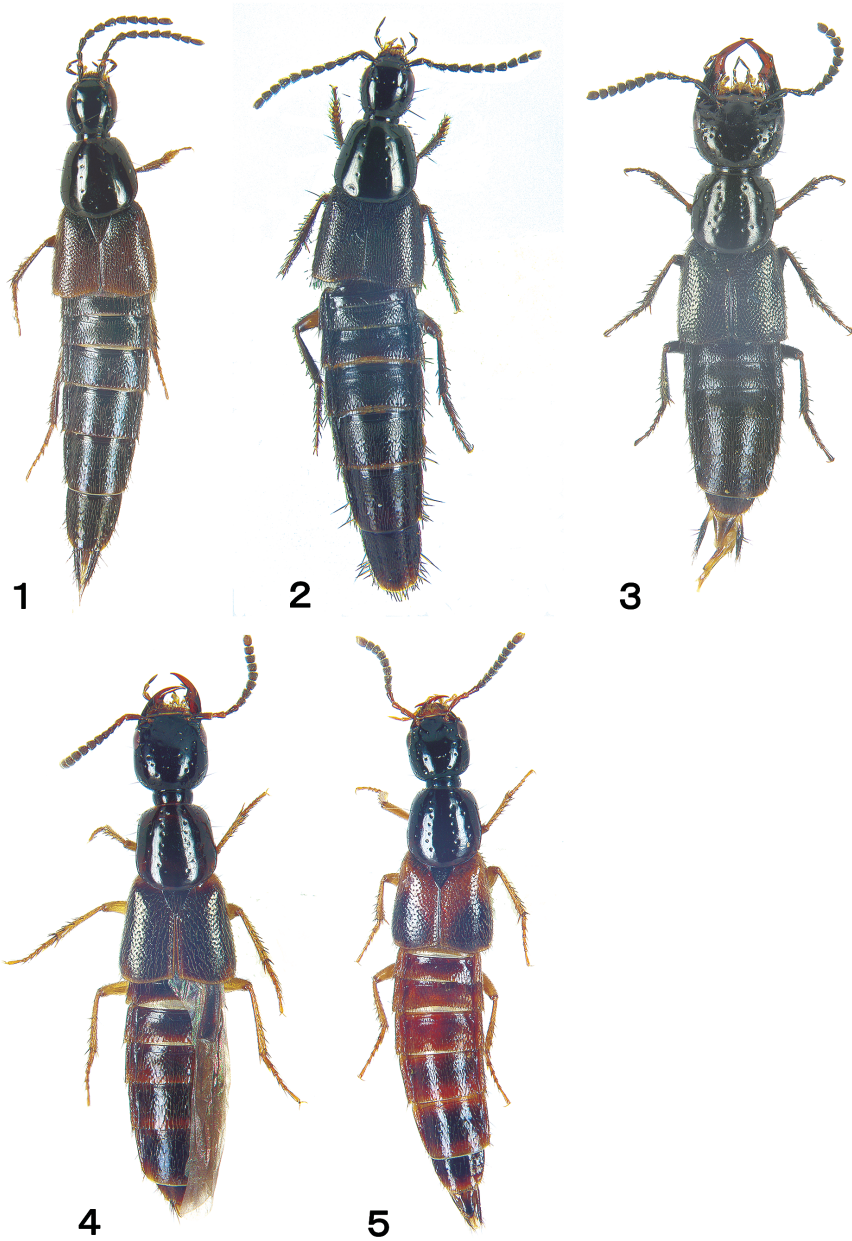
*Etymology.* The subspecific name “*miyama*” means a deep mountainous region in Japanese.

*Notes.* The new subspecies is distributed from about 1,000 m altitudinal area to the alpine zone against the backdrop of the high altitudinal mountains, and captured from dung of livestock, plant debris.

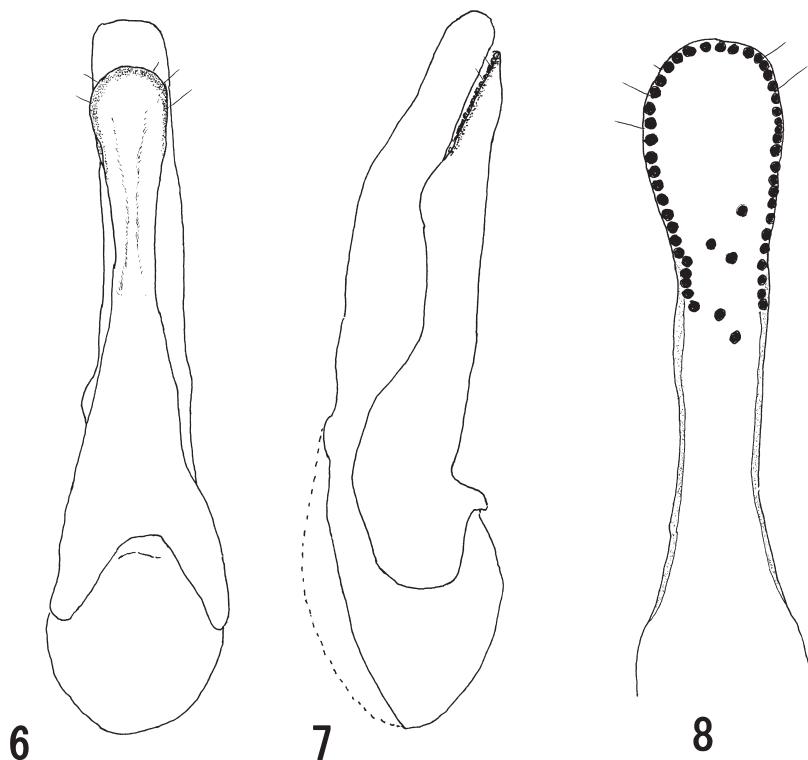
*Philonthus (Philonthus) jurgans toyoshimai* ssp. nov.

(Figs. 2 &amp; 9–11)

*Diagnosis.* The new subspecies is different from the nominotypical species as follows: body robust; male genitalia with penis subparallel-sided, weakly rounded at apex, and parameres much longer, pediculate, the apex reaching nearby the apices of penis and the inner face of apical dilatation



Figs. 1–5. Habitus of *Philonthus* spp. and *Bisnius* spp. — 1, *Philonthus varians miyama* ssp. nov.; 2, *P. jurgans toyoshimai* ssp. nov.; 3, *Bisnius jonenensis* (SAWADA), comb. nov.; 4, *B. kanimurai* (SAWADA), comb. nov.; 5, *B. kobensis* (SHARP), comb. nov.



Figs. 6–8. *Philonthus varians miyama* ssp. nov., male genitalia. — 6, Ventral view; 7, lateral view; 8, inner face of parameres.

with peg-setae only situated along the rim.

*Description.* Body black; elytra black to piceous, narrowly reddish brown at posterior margins, rarely with very obscure reddish tinge laterally; abdominal ventrites rather widely yellowish red in each apical margin; legs pitchy brown, pro- and mesocoxae narrowly yellowish in inner portions, femora and tibiae dusky yellow dorso-ventrally except margins.

Head slightly longer than wide ( $HL/HW = 1.17$ ), with fine striate microsculpture; eyes large, a little longer than temples ( $E/T = 1.11$ ). Antennae long, each antennomere almost longer than wide, though 8th nearly as long as wide; 3rd 1.52 times as long as 2nd, and antennomeres with the following relative length from base to apex: 2.00 : 0.85 : 1.29 : 1.00 : 1.09 : 1.09 : 0.98 : 0.98 : 0.98 : 0.98 : 1.43.

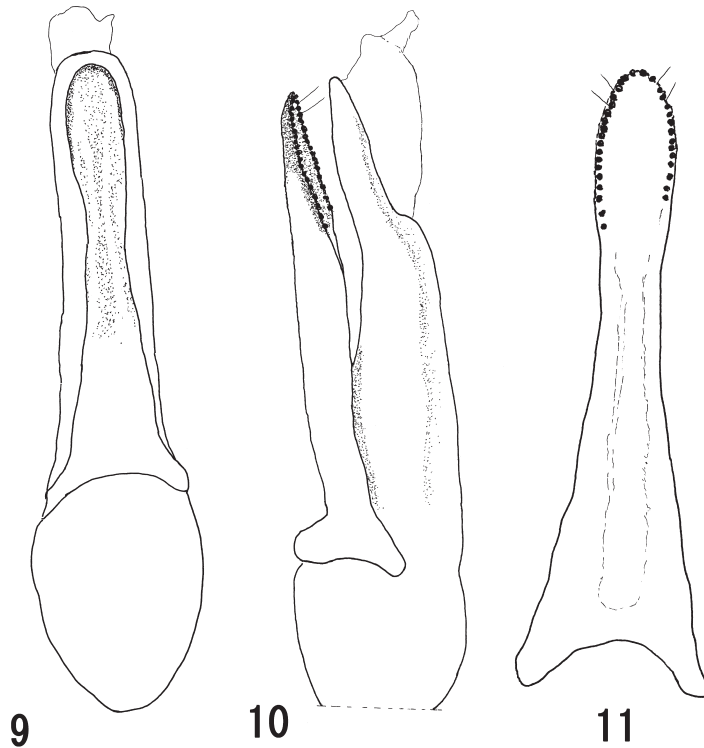
Pronotum as wide as long, microsculptured as on head. Scutellum flattened.

Elytra subquadrate, slightly wider than long ( $EW/EL = 1.04$ ), a little wider and longer than pronotum ( $EW/PW = 1.20$  &  $EL/PL = 1.15$ ), nearly straight at sides; surface finely and densely punctured, without microsculpture.

Abdomen rather finely punctured.

Male genitalia (Figs. 9–11) symmetrical; penis parallel-sided, weakly rounded at apex; parameres elongate, extending near apex of penis, weakly dilated in apical portion, inner face with peg-setae only along the rim of apical dilatation.

*Type series.* Holotype: ♂, 2,500 m point of Norikura Skyline Road, Mt. Norikura-dake, Niugawa-chô, Takayama-shi, Gifu Pref., 29.VII.2017, K. TOYOSHIMA leg. (OMNH). Paratypes: 1 ♂, 1 ♀,



Figs. 9–11. *Philonthus jurgans toyoshimai* ssp. nov., male genitalia. — 9, Ventral view; 10, lateral view; 11, inner face of parameres.

2,400 m point of Norikura Skyline Road, Mt. Norikura-dake, Niugawa-chô, Takayama-shi, Gifu Pref., 4.VIII.2016, K. TOYOSHIMA leg. (CYHH); 1 ♀, beneath Yotsudake (2,600 m), Mt. Norikura-dake, Onsen-gou, Takayama-shi, Gifu Pref., K. TOYOSHIMA leg. (OMNH); 1 ♂, Kinasa, Nagano Pref., 13.VIII.1989, N. ITO leg. (OMNH).

*Etymology.* The subspecific name is dedicated to Mr. Kentarô TOYOSHIMA, who is an eager coleopterist in Gifu Prefecture and collected most of the type specimens.

*Notes.* The new subspecies is distributed around subalpine to alpine zone in Chûbu District of Japan.

As mentioned in the introduction, the following three species are considered to belong to the genus *Bisnius* rather than the genus *Philonthus* by the external characters of protarsi, and these species should be transferred the genus *Bisnius*. Also the characteristics of protarsi of the genus *Bisnius* are common with the genus *Gabrius* STEPHENS, 1829, but the both genera are distinctly separated by the combination of the following characteristics: *Bisnius* having the 4th maxillary palpomeres widest in the middle; 3rd labial palpomeres subfusiform, weakly tumid in the middle; apical portion of profemur with several (about six in number) spines linearly lined up. In contrast, *Gabrius* possesses the 4th maxillary palpomeres widest near the base; 3rd labial palpomeres aciculate, evenly tapered apicad; apical portion of profemur with several (about six in number) spines irregularly lined up.

***Bisnius jonenensis*** (SAWADA, 1965) comb. nov.

(Figs. 3 &amp; 12–14)

*Philonthus jonenensis* SAWADA, 1965: 12 (TL: Mt. Jonen, Nagano Pref.); SHIBATA *et al.*, 2013: 167.*Philonthus jonenensis* (sic): HERMAN, 2001: 2850; SMETANA, 2004: 645; SHÜLKE & SMETANA, 2015: 1042.

*Specimens examined.* 2 ♀♀, Mt. Norikura, Yotudake-shita (alt. 2,600 m), Okuhida-onsengou, Takayama-shi, Gifu Pref., 27.VII.2017, K. TOYOSHIMA leg.; 1 ♂, same locality, 28.VII.2017, K. TOYOSHIMA leg.; 1 ♂, side of road of Mt. Norikura (alt. 2,400 m), Okuhida-onsengou, Takayama-shi, Gifu Pref., 4.VIII.2016, K. TOYOSHIMA leg.; 2 ♂♂, Mt. Chô-ga-take, Jônen Mts., Nagano Pref., 29.VII.2005, K. MASUMOTO leg.

*Supplementary description.* Body deep black, strongly shiny, elytra with subaeneous luster; mouth parts piceous brown; antennae with base of 2nd antennomere reddish; abdomen narrowly obscurely brownish in posterior margin of each ventrite; tibiae dusky yellow in dorsum.

Head a little wider than long (HW/HL = 1.33). Antennae with basal five antennomeres longer than wide; 6th to 10th transverse. Pronotum slightly wider than long (PW/PL = 1.06), slightly narrower and longer than head (PW/HW = 0.95 & PL/HL = 1.20), with striate microsculpture; dorsal rows each with seven to ten coarse punctures, which is rather irregularly arranged. Abdomen finely and densely punctured.

Male genitalia (Figs. 12–14) symmetrical, slender; penis parallel-sided in middle, tapered evenly from apical fifth to subacute apex, thence weakly curved ventrad; parameres unilobed, flabellate in apical portion, inner face with peg-setae along apical margin.

*Notes.* *Bisnius jonenensis* is very similar to *B. puella* NORDMANN from Europe, but it is different from the latter in the structure of the male genitalia. The species is distributed in subalpine to alpine zone in Chûbu district of Japan. The habitat environments of this species in Hokkaido is unknown for me.

*Distribution.* Japan (Hokkaido, Honshu).

***Bisnius kamimurai*** (SAWADA, 1965) comb. nov.

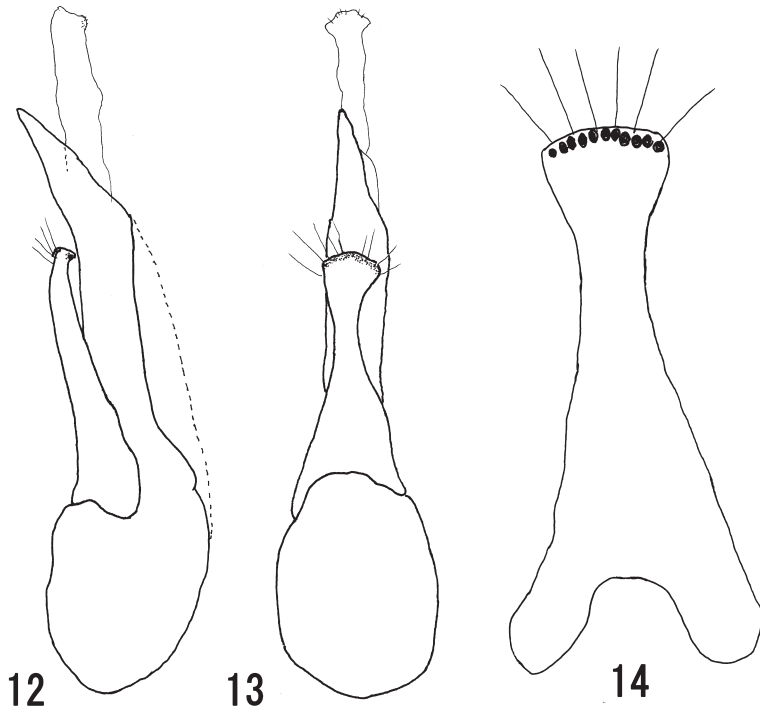
(Figs. 4 &amp; 15–17)

*Paragabrius kamimurai* SAWADA, 1965: 15. (TL: Mt. Jonen, Nagano Pref.); SMETANA, 1995: 51; HERMAN, 2001: 2851; SMETANA, 2004: 645; SHIBATA *et al.*, 2013: 167; SCHÜLKE & SMETANA, 2015: 1042.

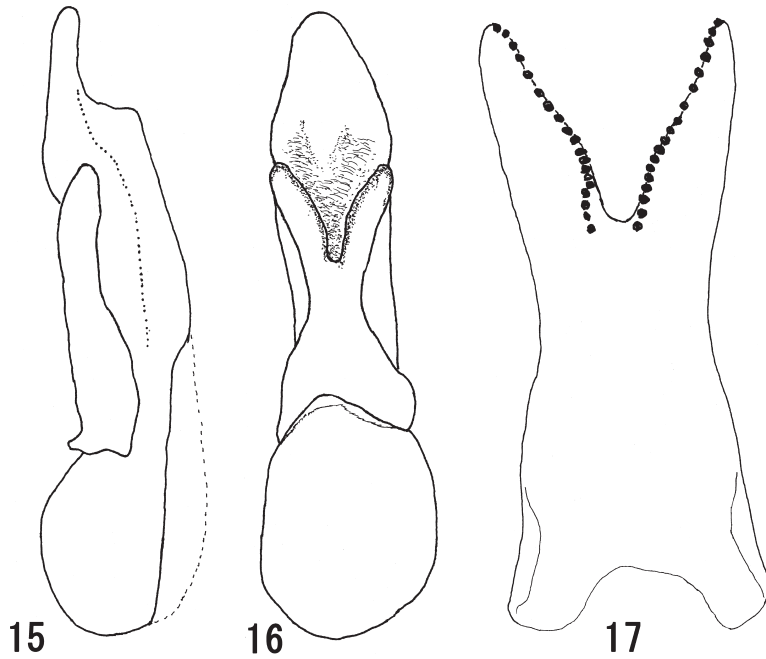
*Specimens examined.* 1 ♂, 2 ♀♀, Kurumijima (FIT), Asahi-machi, Gifu Pref., 3.VIII.2012, K. TOYOSHIMA leg.; 1 ♂, 1 ♀, ditto (FIT), 25.VIII.2012, K. TOYOSHIMA leg.; 2 ♀♀, ditto (FIT), 30.VI.2012, K. TOYOSHIMA leg.; 1 ♀, ditto (FIT), 14.IX.2012, K. TOYOSHIMA leg.; 1 ♂, 2 ♀♀, Mt. Ontake (5 gôme), Nagano Pref., 30.VII.1987, H. NOMURA leg.

*Supplementary description.* Head and pronotum black to piceous; antennae reddish brown in basal three antennomeres, blackish brown in the subsequent antennomeres, last antennomere paler apically; elytra piceous black, with weak brassy sheen, yellowish brown at base, sutural area and apical margin; abdomen piceous, and reddish brown at apical margin of each segment; legs yellowish, coxae dark brown.

Head subquadrate, as long as wide, with striate microsculpture; eyes rather small, about half as long as temples; antennae with 3rd antennomere 1.25 times as long as 2nd, basal four antennomeres longer than wide; 5th as long as wide. Pronotum slightly longer than wide, microsculptured as on head, and dorsal rows each with seven coarse punctures. Elytra nearly as long as wide, coarsely, not closely punctured, without microsculpture.



Figs 12–14. *Bisnius jonenensis* (SAWADA), comb. nov., male genitalia. — 12, Ventral view; 13, lateral view. 14, inner face of parameres.



Figs 15–17. *Bisnius kamimurai* (SAWADA), comb. nov., male genitalia. — 15, Ventral view; 16, lateral view; 17, inner face of parameres.

Male genitalia (Figs. 15–17) symmetrical; penis wide, rounded at apex, strongly convex between lobes of parameres and densely strigulate there; parameres bilobed in apical third, the lobes a little more slender than in *B. kobensis*, with inner face bearing peg-setae along inner margin of the lobes except the middle.

*Notes.* The present species is very closely allied to *Bisnius kobensis*, but it is easily distinguished from the latter by the different color in elytra and abdomen, viz. those are piceous in greater parts, but in *B. kobensis* the elytra and abdomen are reddish in greater part. *Bisnius kamimurai* distributed in subalpine area of Chûbu district in Japan. The habitat environments of this species in Hokkaido are unknown for me.

*Distribution.* Japan (Hokkaido, Honshu).

***Bisnius kobensis* (SHARP, 1874) comb. nov.**

(Figs. 3 & 18–20)

*Philonthus kobensis* SHARP, 1874: 46. (TL: Kôbe, Hyôgo); HERMAN, 2001: 2854; SMETANA, 2004: 646; SHIBATA *et al.*, 2013: 167; SCHÛLKE & SMETANA, 2015: 1043.

*Specimens examined.* 1 ♀, Mt. Hayachine (alt. 1,200 m), Iwate Pref., 26.VII.1986, H. NOMURA leg.; 1 ♂, Mt. Myogohou, Mts. Zaoh, Miyagi Pref., 6.VIII.1967, J. KAMEI leg.; 1 ♀, Okunikkô, Tochigi Pref., 11.IX.1994, K. MASUMOTO leg.; 3 ♂♂, 4 ♀♀, Arasawa-rindô, Nikkô, Tochigi Pref., 2–4.V.2014, M. INAGAKI leg.; 1 ♂, 3 ♀♀, Fujiidani, Matsumoto-shi, Nagano Pref., 4.V.1987, N. ITO leg.; 1 ♀, Sagami-Ohyama, Kanagawa Pref., 9.IV.1969, Y. MIYAKE leg.; 1 ♂, Mizuho-chô, Kyoto Pref., 22.V.1980, Y. HAYASHI leg.; 1 ♀, Mt. Iwawaki, Osaka Pref., 3.V.1958, K. UEDA leg.; 1 ♂, 2 ♀♀, Mt. Ohdai, Nara Pref., 1.VIII.1967, H. NOMURA leg.; 1 ♂, 3 ♀♀, ditto, 2.VIII.1967, H. NOMURA leg.; 7 ♀♀, Mt. Taterikôjin, Nara Pref., 4.V.1969, M. GOTO leg.; 42 exs., Amaishiyama (alt. 260 m), Sasayama-shi, Hyôgo Pref., 4.IV.1980, 5.IV.1980, 11.IV.1980, 18.IV.1980, 21.IV.1980, 23.IV.1980, 26.IV.1980, 2.V.1980, 7.V.1980, 14.V.1979, 20.VI.1980, 23.VI.1980, 27.VI.1980, 14.VII.1980, 23.VII.1980, 12.IX.1980, 13.IX.1980, 23.IX.1980, 24.IX.1980, 8.X.19, 16.X.1980, 24.X.1979, 26.X.1928, 30.X.1930, 4.XI.1980, 7.XI.1980, 9.XI.1979, 11.XI.1980, 19.XI.1980, Y. HAYASHI leg.; 1 ♀, Oki Is., Shimane Pref., 6.V.2003, T. SHIMADA leg.; 1 ♂, 1 ♀, Meotoike, Mt. Tsurugisan, Tokushima Pref., 22.VII.2007, Y. KIYOYAMA leg.

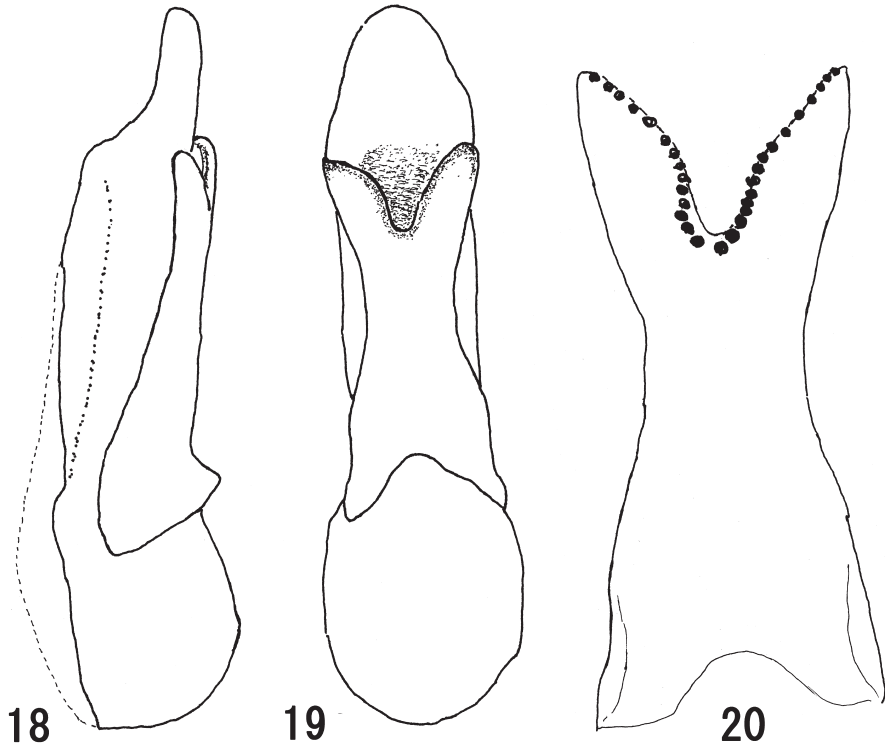
*Supplementary description.* Head and pronotum black; antennae with basal three antennomeres reddish yellow; elytra brownish red, each elytron with a large subtriangular blackish macula, which is free from suture, posterior and lateral margins. Abdomen brownish red; 6th tergite widely piceous in middle; 7th with more widely piceous in middle than 6th, with whitish apical seam, and 8th piceous except apical margin; legs pale brownish yellow.

Head shallowly impressed in frons, as long as wide; eyes rather small, much shorter than temples. Antennae with basal four antennomeres longer than wide; 5th antennomere as long as wide; 6th to 10th each transverse. Pronotum a little longer than wide (PL/PW = 1.06), with striate microsculpture; dorsal rows each with seven coarse punctures. Elytra as long as wide, coarsely and sparsely punctured, without microsculpture. Abdomen finely and rather densely punctured, with extremely fine striate microsculpture.

Male genitalia (Figs. 18–20) symmetrical; penis wide, rounded at apex, strongly darkened between lobes of parameres and finely strigulate there; parameres bi-lobed in apical third, inner face with peg-setae only along inner margin of lobes.

*Notes.* This species is widely distributed from flatland to subalpine area of Japan and captured by bate trap, leaf litter, etc.





Figs. 18–20. *Bisnius kobensis* (SHARP), comb. nov., male genitalia. — 18, Ventral view; 19, lateral view; 20, inner face of parameres.

*Bisnius kobensis* belongs probably to “Picicornis Group” (sensu SMETANA, 1995) because of similar color pattern of body and structures of male genitalia.

*Distribution.* Japan (Honshu, Oki Is., Shikoku, Kyushu).

## 要 約

林 靖彦：日本産コガシラハネカクシ属の2新亜種の記載および既知3種の所属の変更(鞘翅目ハネカクシ科)。——背景に高山を控えた中山地から高山域にかけて採集された日本未記録種と思われるコガシラハネカクシ2種を精査した結果、それぞれ欧米に分布する *Philonthus varians* と *P. jurgans* であると判明した。しかし欧米の個体群とは雄交尾器に差が認められ、その特徴が安定しており、別亜種として扱うべきであると考えられるので、それぞれ *Philonthus varians miyama* ssp. nov. (ミヤマコガシラハネカクシ, 和名新称) および *P. jurgans toyoshimai* ssp. nov. (オクヒダコガシラハネカクシ, 和名新称) と命名、記載した。また、この2種は別種であるにもかかわらず極めてよく類似しており、わずかに雄交尾器の構造が異なるほかに、触角3節/第2節の比率が前者においては約1.2であるのに対して後者では約1.5であることで区別できる。

*Philonthus jonenensis*, *P. kamimurai*, *P. kobensis* はいずれも前跗節が細く下面に特殊毛を欠き、下唇鬚第3節は第2節より細くないこと、雄第9腹板が単純なことなどから *Bisnius* 属に所属すべきものと考え、所属を変更した。また、*Bisnius* 属の前跗節の特徴は *Gabrius* 属と共通するが、両者の下唇鬚第3節と雄第9腹板の構造は相互に異なる。

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Manuscript received 11 June 2018;  
revised and accepted 20 November 2018.