

Three New Carabid Beetles from Shizuoka Prefecture, Central Honshu, Japan

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Abstract Two new species and a new subspecies of the montane carabid beetles, *Pterostichus (Nialoe) tahirai* sp. nov., *P. (N.) rhanis katoii* subsp. nov., and *Trichotichnus (Trichotichnus) ishikawai* sp. nov., are described from Mt. Ryûtô-zan in Shizuoka Prefecture, Central Japan. All seem restricted to the southernmost part of the Akaishi Mountain Range.

Through the courtesy of Mr. Yoshiaki TAHIRA, I recently had an opportunity to examine many examples of carabid beetles collected by Mr. Tohru KATÔ on Mt. Ryûtô-zan in Shizuoka Prefecture, central Honshu, Japan. The collection consists of forty species including many interesting carabids, some of which must be new to science. Mt. Ryûtô-zan (1,351 m alt.) is a small head on the range lying on the left side of the lower part of the River Tenryû-gawa, and is situated at the southernmost part of the Akaishi Mountain Range. The carabid fauna of this area has hitherto been poorly known.

In the last summer, I made a collecting trip to that mountain in collaboration with Mr. Hitoshi ISHIKAWA, and succeeded in obtaining series of some unnamed forms with many other carabids. In this paper, I will describe two new species and a new subspecies of the genera *Pterostichus* and *Trichotichnus*. The abbreviations used herein are the same as those explained in other papers of mine. All the holo- and allotypes are preserved in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Before going further, I wish to express my deep gratitude to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for his advice and for reading the manuscript of this paper. Thanks are also due to Messrs. Hitoshi ISHIKAWA, Tohru KATÔ and Yoshiaki TAHIRA for their kind help in materials and field works.

Pterostichus (Nialoe) tahirai sp. nov.

[Japanese name: Ryûtô-nagagamimushi]

(Figs. 1–3)

Description. Length (measured from apex of labrum to apices of elytra) 15.2–16.7 mm. Width 5.3–5.8 mm. Black, shiny, faintly iridescent on elytra; labrum and mandibles dark reddish brown to blackish; palpi and tarsi reddish brown.

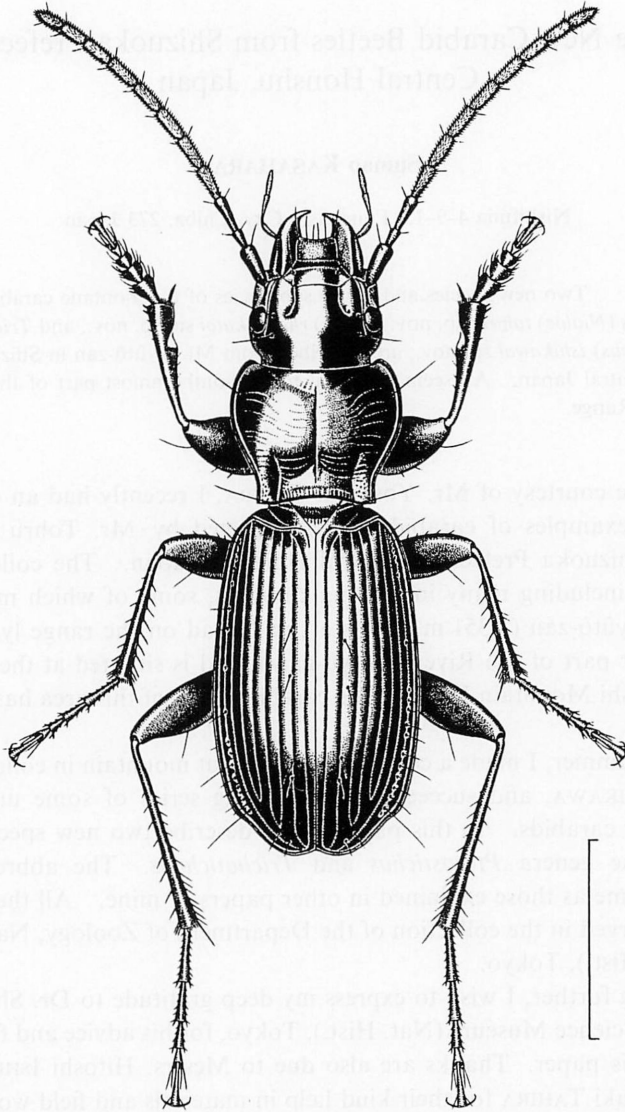


Fig. 1. *Pterostichus (Nialoe) tahirai* sp. nov., ♂, from Mt. Ryûtô-zan in Shizuoka Pref. Scale 5 mm.

Head moderately convex; eyes convex, more or less prominent; temporae shorter than eyes, swollen; genae rugose; labrum and mandibles normal; clypeus gently emarginate at apex; clypeal suture distinct; frontal furrows deep, with linear impressions at the bottoms, posterior halves divergent, and extending to the mid-eye level; lateral grooves deep, extending to behind the post-eye level; surface smooth, though

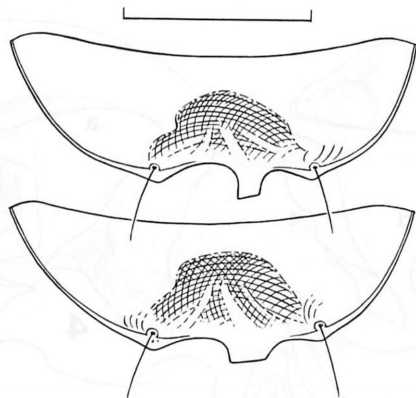
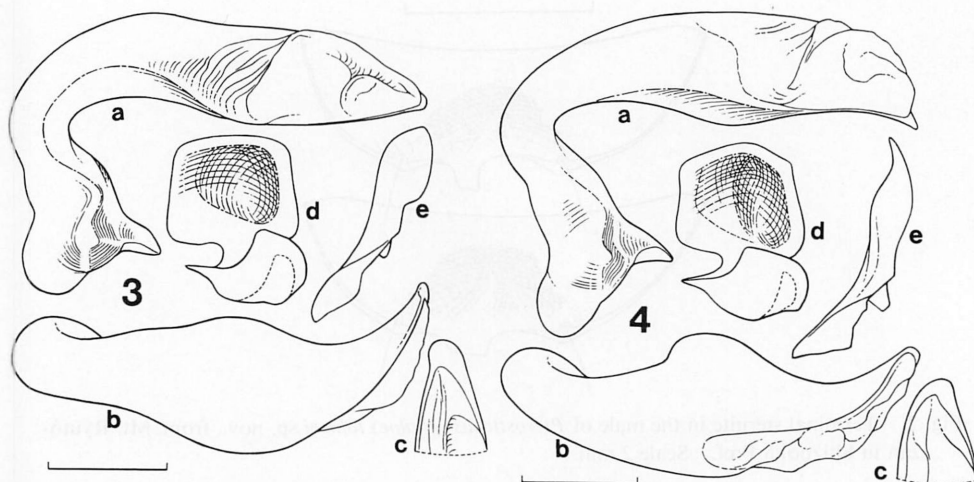


Fig. 2. Terminal sternite in the male of *Pterostichus (Nialoe) tahirai* sp. nov., from Mt. Ryûtôzan in Shizuoka Pref. Scale 2 mm.

very minutely and sparsely punctate; microsculpture hardly visible; antennae moderately long, extending to the basal fourth of elytra; relative lengths of scape and segments 2–6 as follows:— 1: 0.5: 0.8: 0.9: 0.8: 0.8; segment 2 plurisetose at apex.

Pronotum cordate, moderately convex, though rather flat on basal part, widest at apical fourth, ca. 1.3 times as wide as head (PW/HW 1.22–1.32, mean 1.27), as wide as long in a similar proportion (PW/PL 1.22–1.31, mean 1.28), about a half as wide again as base (PW/PBW 1.41–1.52, mean 1.45); lateral margins well arcuate, then strongly convergent posteriad, and fully sinuate before base, basal part nearly parallel-sided, or slightly narrowed posteriad; apical margin gently emarginate, not bordered, apical angles somewhat produced, rounded at the tips; basal margin narrower than the apical, weakly emarginate, and somewhat oblique on each side, basal angles almost rectangular, pointed at the tips; median line deeply impressed; basal foveae deep, frontal halves divergent anteriorly, the foveae and their outer side punctate; apical and basal transverse depressions generally weak; surface with transverse wrinkles, which are more distinct on basal part than on frontal disc; microsculpture slightly visible, formed by fine transverse meshes.

Apterous. Elytra oblong, gently convex, widest at middle, about a fifth as wide again as pronotum (EW/PW 1.19–1.27, mean 1.22), about one and a half as long again as pronotum (EL/PL 2.36–2.55, mean 2.46), more than a half as long again as wide (EL/EW 1.56–1.62, mean 1.57); basal border curved, obliquely extending to shoulder, and joining lateral border at an obtuse but distinct angle; shoulders rounded; lateral margins evenly and gently arcuate from behind shoulders to preapical parts, then rather abruptly convergent posteriad, and forming relatively distinct preapical emarginations; apex of each elytron rounded, its sutural angle often obtusely angulate, though sometimes rounded; scutellar striole short, lying on interval 1, and connected with basal border; striae strongly impressed throughout, smooth; intervals gently



Figs. 3-4. Male genitalia of *Pterostichus (Nialoe)* spp. — 3, *P. (N.) tahirai* sp. nov., from Mt. Ryûtô-zan in Shizuoka Pref.; 4, *P. (N.) katashinensis naganoensis* TANAKA, from Mt. Yatsugatake in Nagano Pref.; a-c, aedeagus; a, left lateral view; b, dorsal view; c, apical part in dorsal view; d, left paramere; e, right paramere. Scale 1 mm; c, $\times 1.5$.

convex; interval 3 with four to six (rarely three) dorsal pores, anterior one adjoining stria 3 at basal fourth, remainings adjoining stria 2, and irregularly arranged at about middle to apical fifth, respectively; marginal series of pores 16-20 in number, widely spaced at middle; microsculpture slightly visible, formed by very fine transverse meshes. Basal three segments of meso- and metatarsi externally sulcate.

Ventral side almost smooth, though the mesepisterna are punctate; prosternal process weakly depressed at middle, not bordered; in the male, terminal sternite deeply excavated in apical two-thirds, its apical margin deeply bi-emarginate, and with a quadrate projection, which is rather variable in proportion, generally as wide as long but sometimes distinctly wider than long.

Aedeagus strongly bent at basal third, then almost straightly extending to apex in lateral view, widening at apical third, with the apical part distinctly bent rightwards in dorsal view; apical lobe a little wider than long, slightly enlarged rightwards, rounded at apex; left paramere square, subtruncate at apex; right one thick, rather pointed but blunt at apex.

Type series. Holotype: ♂, Mt. Ryûtô-zan, Haruno-chô, Shizuoka Pref., 7-VIII-1988, T. KATÔ leg.; allotype: ♀, same data as for the holotype. Paratypes: 1 ♂, 2 ♀♀, same data as for the holotype; 1 ♂, same locality as for the holotype, 6-VIII-1988, T. KATÔ leg.; 2 ♂♂, 4 ♀♀, same locality, 9-VIII-1988, T. KATÔ leg.; 1 ♂, same locality, 25-VI-1989, H. MATSUMOTO leg.; 2 ♂♂, same locality, 16-VII-1989, T. KATÔ leg.; 4 ♂♂, 7 ♀♀, Mt. Ryûtô-zan, Sakuma-chô, Shizuoka Pref., 26-27-VII-1991, S. KASAHARA & H. ISHIKAWA leg.; 2 ♂♂, 1 ♀, same locality, 27-VII-1991, S. KASAHARA

& H. ISHIKAWA leg.; 15 ♂♂, 11 ♀♀, same locality, 27~28-VII-1991, S. KASAHARA & H. ISHIKAWA leg.; 2 ♂♂, 3 ♀♀, same locality, 28-VII-1991, H. ISHIKAWA leg.

Other specimens examined. 4 ♂♂, 4 ♀♀, Mt. Sobatsubu-yama, Nakakawane-chô, Shizuoka Pref., 25~26-VII-1991, S. KASAHARA & H. ISHIKAWA leg.

Notes. Though the present new species is rather similar to *P. (N.) asymmetricus* BATES in general appearance, it may be related to *P. (N.) katashinensis* HABU in view of the conformation of both the terminal sternite and genitalia in the male. It is, however, easily distinguished from the latter and its subspecies *naganoensis* TANAKA by less convex body with more cordate prothorax and clearly different configuration of the genitalia in the male. The specific name is given after Mr. Yoshiaki TAHIRA, who is keenly studying the coleopteran fauna of Shizuoka Prefecture.

Pterostichus (Nialoe) rhanis katoi subsp. nov.

(Figs. 5-7)

Description. Smaller than *P. (N.) rhanis angustistylis* TANAKA from Mt. Fuji-san and Hakone. Length (measured as in the preceding species) 12.3-13.8 mm. Width 4.5-4.9 mm. Black, shiny, elytra subopaque in the female; labrum, mandibles and appendages reddish brown to dark reddish brown or blackish. Head moderately convex; eyes convex, sometimes more or less prominent; temporae oblique, weakly swollen as in the subspecies *angustistylis* TANAKA; frontal furrows deep, posterior parts divergent and vaguely punctate; clypeal suture more distinct than in *angustistylis* TANAKA; surface very minutely and sparsely punctate as in *angustistylis* TANAKA.

Pronotum cordate, convex, narrower than that of *angustistylis* TANAKA, widest at apical fourth, ca. 1.4 times as wide as head (PW/HW 1.35-1.45, mean 1.39), as wide as base in almost the same proportion (PW/PBW 1.40-1.53, mean 1.44), ca. 1.3 times as wide as long (PW/PL 1.22-1.36, mean 1.30); lateral margins well arcuate, then strongly convergent posteriad and gently sinuate before base; apical margin gently emarginate, finely bordered except on the middle, apical angles somewhat produced, rounded at the tips; basal margin almost as wide as the apical, weakly emarginate, not bordered, basal angles rectangular, often more or less produced laterally; median line deep; basal foveae distinct, strongly and ruggedly punctate.

Apterous. Elytra shorter than those of *angustistylis* TANAKA, oblong-ovate, gently convex, widest at middle, or a little behind middle, ca. 1.2 times as wide as pronotum (EW/PW 1.16-1.25, mean 1.21), ca. 2.4 times as long as pronotum (EL/PL 2.30-2.47, mean 2.37), about a half as long again as wide (EL/EW 1.47-1.57, mean 1.52); basal border at shoulder less oblique than that of *angustistylis* TANAKA; intervals less convex than those of *angustistylis* TANAKA; interval 3 with three dorsal pores; marginal series of pores 17-19 in number; microsculpture finer and weaker than that of *angustistylis* TANAKA in the female.

Basal three segments of meso- and metatarsi externally sulcate. Venter almost smooth, though the mesosternum and mesepisterna are punctate, sternites 3-4 vaguely

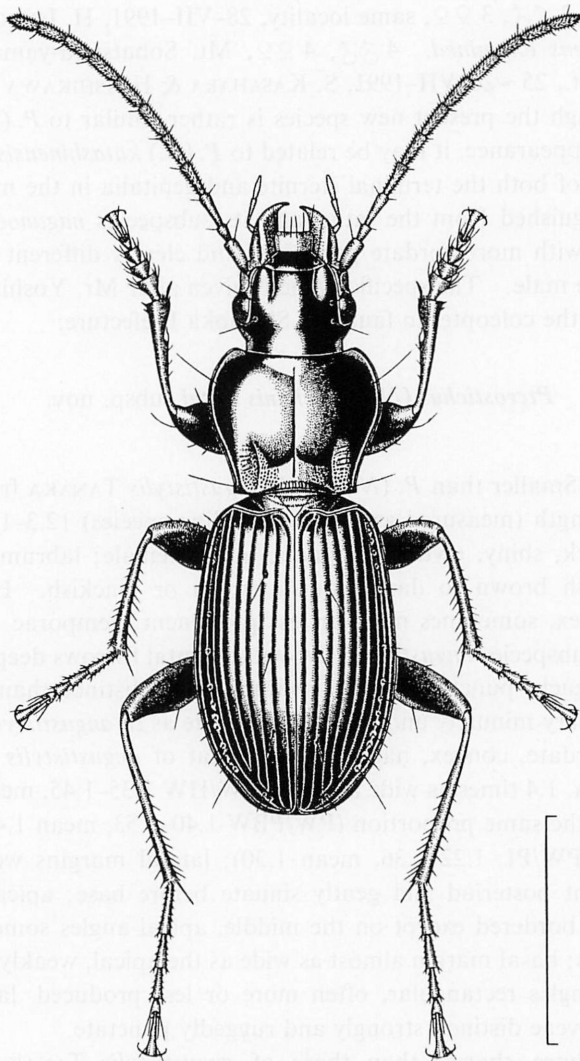


Fig. 5. *Pterostichus (Nialoe) rhanis katoi* subsp. nov., ♂, from Mt. Ryūtō-zan in Shizuoka Pref.
Scale 5 mm.

punctate and rugose; in the male, terminal sternite deeply excavated, its margin deeply emarginate and with an asymmetrical projection, which is similar to that of *angustistylis* TANAKA. Aedeagus thicker than that of *angustistylis* TANAKA in apical two-thirds, the tumidity on the right side not so swollen as in *angustistylis* TANAKA, ventrally almost flat in lateral view; right paramere more slender and arcuate than that of *angustistylis* TANAKA.

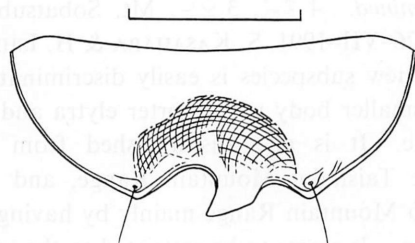
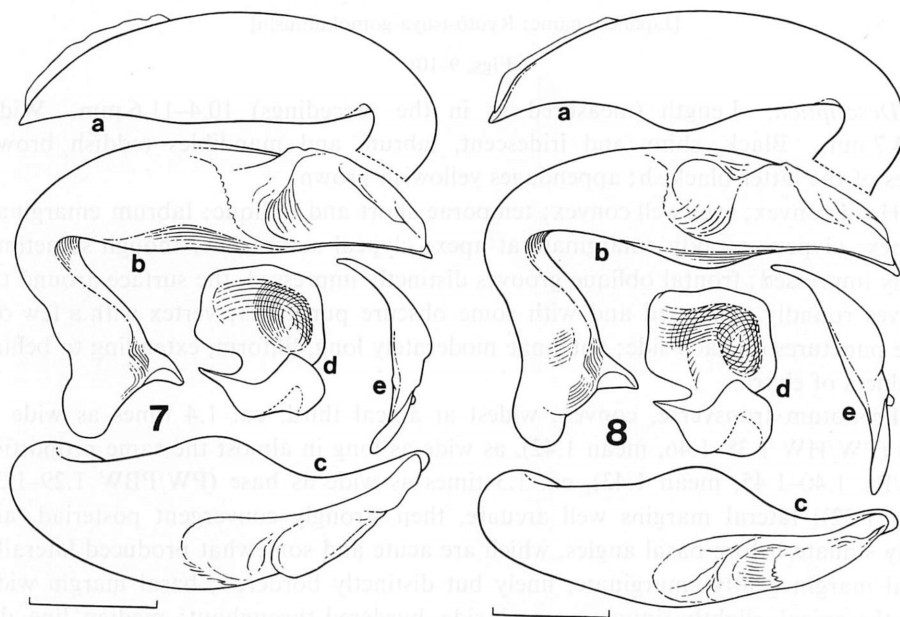


Fig. 6. Terminal sternite in the male of *Pterostichus (Nialoe) rhanis katoii* subsp. nov., from Mt. Ryûtô-zan in Shizuoka Pref. Scale 1.5 mm.



Figs. 7-8. Male genitalia of *Pterostichus (Nialoe) rhanis* subsp. — 7, *P. (N.) rhanis katoii* subsp. nov., from Mt. Ryûtô-zan in Shizuoka Pref.; 8, *P. (N.) rhanis angustistylis* TANAKA, from Mt. Fuji-san in Shizuoka Pref.; a-c, aedeagus; a, right lateral view, basal part omitted; b, left lateral view; c, dorsal view; d, left paramere; e, right paramere. Scale 1 mm.

Type series. Holotype: ♂, Mt. Ryûtô-zan, Haruno-chô, Shizuoka Pref., 9-VIII-1988, T. KATÔ leg.; allotype: ♀, same data as for the holotype. Paratypes: 2 ♀♀, same data as for the holotype; 3 ♂♂, same locality as for the holotype, 7-VIII-1989, T. KATÔ leg.; 2 ♂♂, same locality, 16-VII-1989, T. KATÔ leg.; 5 ♂♂, 7 ♀♀ (3 ♂♂, 5 ♀♀ teneral), Mt. Ryûtô-zan, Sakauma-chô, Shizuoka Pref., 26~27-VII-1991, S. KASAHARA & H. ISHIKAWA leg.; 4 ♂♂, 4 ♀♀, same locality, 27~28-VII-1991, S. KASAHARA & H. ISHIKAWA leg.

Other specimens examined. 4 ♂♂, 3 ♀♀, Mt. Sobatsubu-yama, Nakakawane-chô, Shizuoka Pref., 25~26-VII-1991, S. KASAHARA & H. ISHIKAWA leg.

Notes. The present new subspecies is easily discriminated from *P. (N.) rhanis angustistylis* TANAKA by smaller body with shorter elytra and different configuration of genitalia in the male. It is also distinguished from *P. (N.) rhanis rhanis* TSCHITSCHÉRINE from the Taishaku Mountain Range, and *P. (N.) rhanis kantous* TANAKA from the Kwantô Mountain Range mainly by having different configuration of the genitalia in the male. It seems to be restricted to the southernmost part of the Akaishi Mountain Range.

***Trichotichnus (Trichotichnus) ishikawai* sp. nov.**

[Japanese name: Ryûtô-tsuya-gomokumushi]

(Figs. 9-10)

Description. Length (measured as in the precedings) 10.4-11.6 mm. Width 4.1-4.7 mm. Black, shiny and iridescent, labrum and mandibles reddish brown, apices of the latter blackish; appendages yellowish brown.

Head convex; eyes well convex; temporae short and oblique; labrum emarginate at apex; clypeus weakly emarginate at apex; clypeal suture fine, though sometimes deeply impressed; frontal oblique grooves distinctly impressed, the surface around the grooves roundly depressed and with some obscure punctures; vertex with a few obscure punctures on each side; antennae moderately long, filiform, extending to behind shoulders of elytra.

Pronotum transverse, convex, widest at apical third, ca. 1.4 times as wide as head (PW/HW 1.38-1.46, mean 1.42), as wide as long in almost the same proportion (PW/PL 1.40-1.45, mean 1.43), ca. 1.3 times as wide as base (PW/PBW 1.29-1.37, mean 1.32); lateral margins well arcuate, then strongly convergent posteriad, and gently sinuate before basal angles, which are acute and somewhat produced laterally; apical margin gently emarginate, finely but distinctly bordered; basal margin wider than the apical, slightly sinuate on each side, bordered throughout; median line distinct, its posterior end reaching the basal margin; basal foveae distinct, though becoming shallower and divergent anteriad, densely punctate; outer side of the foveae depressed and punctate, the depressions extending anteriad along lateral margins; apical and basal transverse impressions more distinct in the former, though equally punctate; surface almost wholly but minutely punctate.

Wings reduced. Elytra elliptical, moderately convex, widest at middle, ca. 1.26 times as wide as pronotum (EW/PW 1.22-1.30, mean 1.26), ca. 2.7 times as long as pronotum (EL/PL 2.63-2.78, mean 2.70), about a half as long again as wide (EL/EW 1.43-1.54, mean 1.50); basal border slightly curved, minutely dentate at shoulder; humeral angles very obtuse, though defined; lateral margins evenly and gently arcuate from behind shoulders to preapical emarginations, which are shallow; apex of each elytron pointed though dull at the tip; striae finely but deeply impressed throughout;

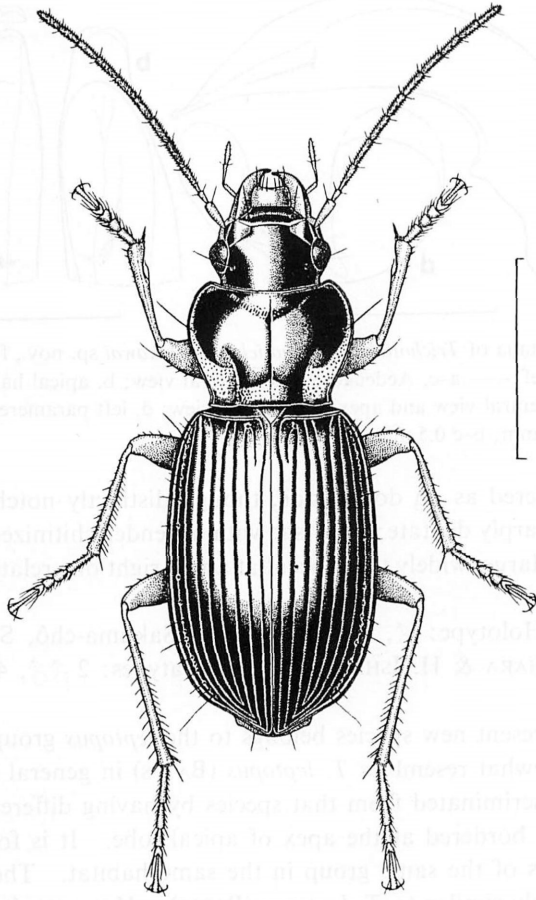


Fig. 9. *Trichotichnus (Trichotichnus) ishikawai* sp. nov., ♂, from Mt. Ryūtō-zan in Shizuoka Pref.
Scale 5 mm.

intervals rather flat on disc; interval 3 with a dorsal pore, adjoining stria 2 at a little behind middle; marginal series of pores 25–27 in number, some small pores of them lying on interval 9.

Venter shiny; prosternum punctate and ciliated; lateral sides of metasternum, and pro-, meso- and metepisterna punctate; abdominal sternite 3 and lateral sides of sternite 4 irregularly rugose and punctate; median part of sternite 4 minutely punctate and ciliated; prosternal process with three to four setae at apex. Protibiae sulcate on each inner side.

Aedeagus thick in basal part, arcuate and tapered towards apex in lateral view; apical part slightly curved rightwards in dorsal view; apical lobe as long as wide, apex distinctly raised and bordered, its apical margin emarginate at middle; apex of ventral

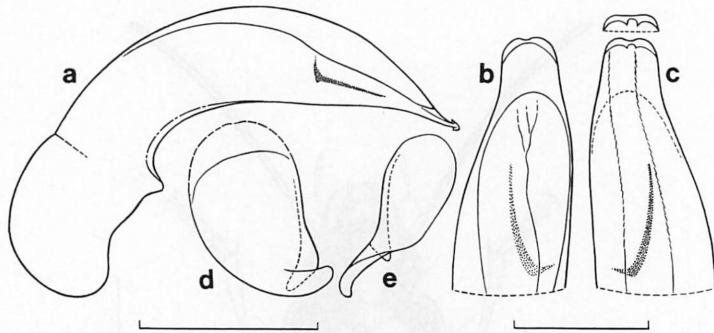


Fig. 10. Male genitalia of *Trichotichus (Trichotichnus) ishikawai* sp. nov., from Mt. Ryûtô-zan in Shizuoka Pref. — a-c, Aedeagus; a, left lateral view; b, apical half in dorsal view; c, apical half in ventral view and apex in posterior view; d, left paramere; e, right paramere. Scale: a, d-e 1 mm; b-c 0.5 mm.

side distinctly bordered as on dorsal side, though distinctly notched at middle, each side of the notch sharply dentate; inner sac with a slender chitinized piece at preapical part; left paramere large, widely translucent at apex; right one relatively wide, rounded at apex.

Type series. Holotype: ♂, Mt. Ryûtô-zan, Sakuma-chô, Shizuoka Pref., 27-VII-1991, S. KASAHARA & H. ISHIKAWA leg. Paratypes: 2 ♂♂, 4 ♀♀, same data as for the holotype.

Notes. The present new species belongs to the *leptopus* group (HABU, 1973, pp. 282-300), and somewhat resembles *T. leptopus* (BATES) in general appearance. It is, however, clearly discriminated from that species by having different configuration of aedeagus peculiarly bordered at the apex of apical lobe. It is found in coexistence with another species of the same group in the same habitat. The latter is larger in size, and more closely similar to *T. leptopus* (BATES). However, it is difficult to identify it with confidence because males are not available until now. The specific name of the present species is given after Mr. Hitoshi ISHIKAWA, a good friend of mine.

要 約

筈原須磨生：静岡県産歩行虫の2新種と1新亜種。——静岡県の天竜川左岸に位置する竜頭山から、ナガゴミムシ属 *Pterostichus* の1新種と1新亜種、およびツヤゴモクムシ属 *Trichotichnus* の1新種を記載した。

1) リュウトウナガゴミムシ *P. (Nialoe) tahirai* は、外形がベーツナガゴミムシ *P. (N.) asymmetricus* BATES に似ているが、雄の末端腹板と交尾器の形態からみて明らかにカタシナナガゴミムシ *P. (N.) katashinensis* HABU に類縁関係をもつ種と考えられる。しかし、後者とその亜種 *naganoensis* TANAKA とは、より扁平な体と後方へ強くせばまる心臓形の前胸背板に加えて、交尾器の形態がいちじるしく異なり、容易に区別できる。

2) ミヤマナガゴミムシ亜種 *P. (N.) rhanis katoi* は、近隣の富士・箱根地方に分布する亜種 *P.*

(*N.*) *r. angustistylis* TANAKA よりも小型で上翅が短かく、前胸背板の形態も異なる。陰茎の形態も独特で、この点からも帝釈山地に分布する基亜種 *P. (N.) r. rhanis* Tschitschérine や、関東山地に分布する亜種 *P. (N.) r. kantous* TANAKA とも区別される。なお、本新亜種と前記新種は、ともに大井川右岸の蕎麦粒山からも得られている。

3) リュウトウツヤゴモクムシ *T. (Trichotichnus) ishikawai* は、ツヤゴモクムシ種群 *leptopus* group に属する種であるが、関東・中部地方に分布する *T. (T.) leptopus* (BATES) とその近縁種とは外形が異なり、さらに、陰茎先端片の前縁が背腹ともに顕著に縁取られ、腹面のそれに切れ込みがある点で特異である。

上記のゴミムシは、赤石山脈南端部に特有の種と考えられ、これまで歩行虫相に関しては知見の乏しかったこの地域の特性を示唆するものである。

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