

**Note on the subgenus *Pseudotrichotichnus*
of the genus *Trichotichnus* from Southeast Asia
(Coleoptera: Carabidae: Harpalini)**

Noboru ITO

1-7-18 Higashiuneno, Kawanishi City, Hyôgo Pref., 666-0117, Japan;
e-mail: noboru.itou23@konicaminolta.jp

Abstract. Three new species of the subgenus *Pseudotrichotichnus* Habu, 1973 of the harpaline genus *Trichotichnus* Morawitz, 1863 are described from Southeast Asia: *Trichotichnus (Pseudotrichotichnus) jelineki* sp. nov. (Laos), *T. (P.) tenuitibialis* sp. nov. (Malaysia), and *T. (P.) vietnamensis* sp. nov. (Vietnam). The aedeagi of *Trichotichnus (P.) niger* Louwerens, 1951 and *T. (P.) miyakei* Habu, 1980 are illustrated.

Keywords. Coleoptera, Carabidae, taxonomy, Laos, Malaysia, Oriental Region

Introduction

The subgenus *Pseudotrichotichnus* Habu, 1973 of the harpaline genus *Trichotichnus* Morawitz, 1863 is characterized by the combination of deep frontal impressions, robust and not elongate mandibles and plurisetose segment 2 of labial palpi. The subgenus includes 35 described species distributed in the area from Japan in the north, through Taiwan, Southeast Asia and Sunda Archipelago to New Guinea in the southeast. Some of them are difficult to identify; indeed, the species described in this paper are similar to one another and the examination of aedeagi is needed.

In this paper I describe three new species: *Trichotichnus (Pseudotrichotichnus) jelineki* sp. nov. from Laos, *T. (P.) tenuitibialis* sp. nov. from Malaysia and *T. (P.) vietnamensis* sp. nov. from Vietnam. I also illustrate the aedeagi of *Trichotichnus (P.) miyakei* Habu, 1980 and *T. (P.) niger* Louwerens, 1951 to facilitate their identification.

Material and methods

The specimens were examined under a Nikon SMZ10 binocular microscope. The following measurements were taken: body length (distance between apex of labrum and elytral apex), body width (measured at widest point, usually at the widest point of elytra), width of

head (maximum width including eyes), (maximum) width of pronotum, length of pronotum (distance between anterior margin and base along median line), (maximum) width of elytra and length of elytra (distance between apex and base along sutural line).

The specimens are deposited in the following collections:

CNC	Agriculture & Agrifood Canada, Ottawa;
DWBG	David W. Wrase collection, Berlin, Germany;
HNHM	Hungarian Natural History Museum, Budapest, Hungary;
NIKJ	Noburu Ito collection, Kawanishi, Japan;
NMNS	National Museum of Nature and Science, Tokyo, Japan;
OMNH	Osaka Museum of Natural History, Osaka, Japan.

Taxonomy

Trichotichnus (*Pseudotrichotichnus*) *jelineki* sp. nov.

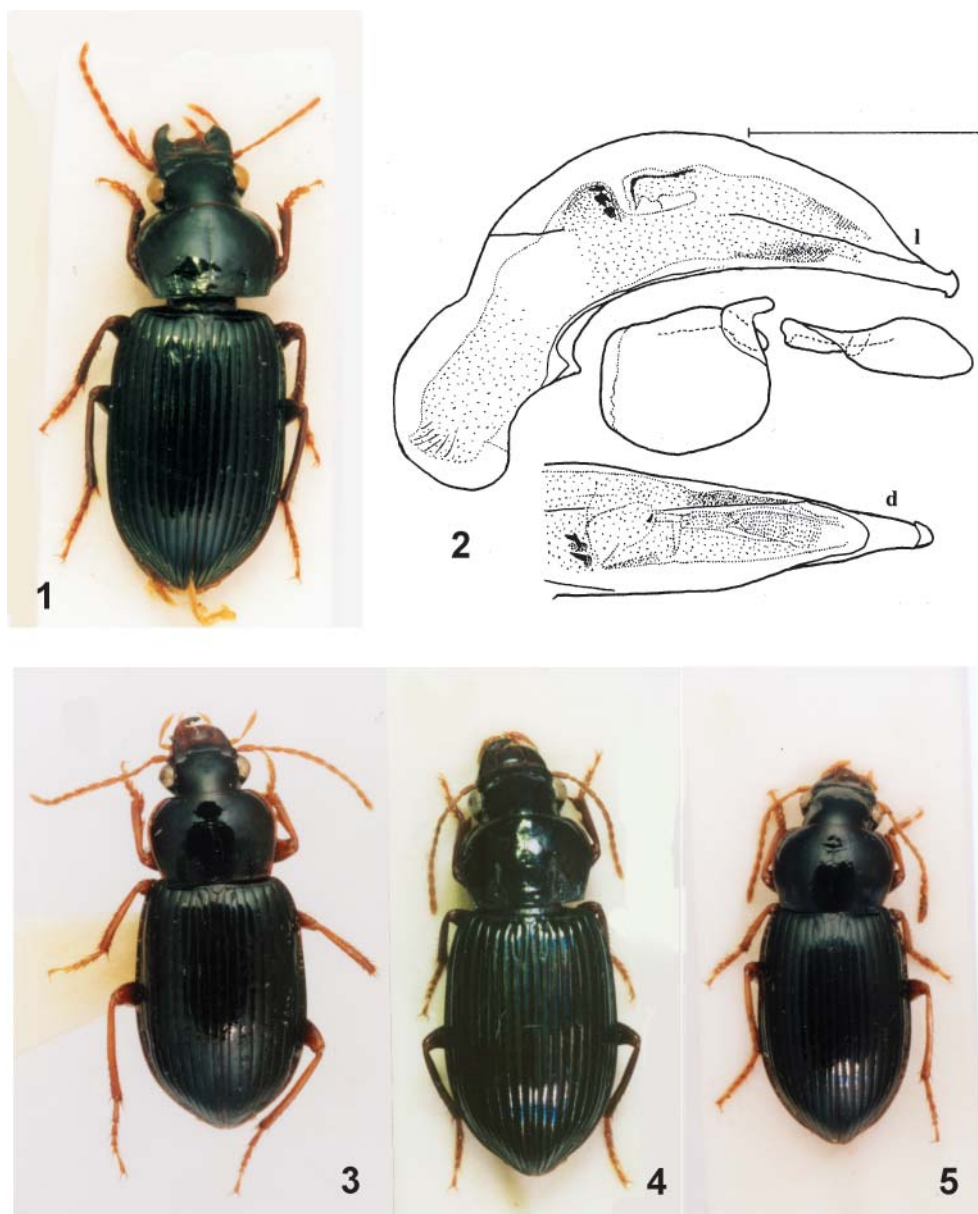
(Figs. 1–2)

Type material. HOLOTYPE: ♂, 'Nong Lom (lake) env., N 15°02' E 106°35', alt. 800m, 15 km SE of Ban Houaykong, Bolaven Plateau, Attapu prov., South Laos, 18-30.IV. 1999, E. Jendek & O. Šauša leg.' (OMNH). PARATYPES: 1 ♂ 10 ♀♀, same data as the holotype (NIKJ).

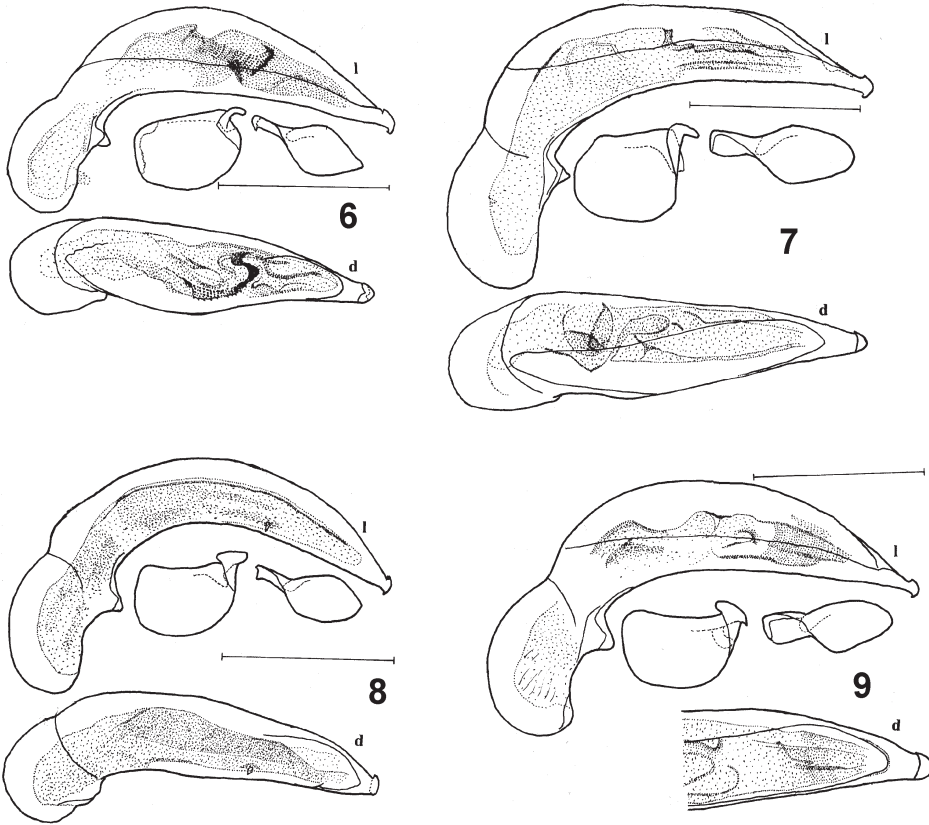
Description. Body oblong, pitchy black, very shiny, with iridescent lustre on elytra; labial and maxillary palpi, antennae and tarsi light reddish brown, tibiae and femora dark reddish brown, labrum blackish brown.

Head gently elevated on vertex, large, 0.75–0.78 times as wide as pronotum, with sparsely scattered, minute punctures; labrum subtrapezoidal, triangularly emarginate at apex; clypeus gently emarginate apically, with several obscure rugosities near each lateral seta; clypeal suture almost straight and deep throughout; frontal impressions also deep till supraorbital grooves, linearly oblique; eyes large, fairly prominent; temples short, steeply contracted behind; space between buccal fissure and genuine ventral margins of eyes fairly wide; antennae short, not surpassing elytral base, segment 3 pubescent in apical three fourths, as long as segment 4 and 1.8 times as long as segment 2; palpi slender, segment 3 of labial palpus 0.9 times as long as segment 2; ligula narrow, parallel-sided, with apical angles rectangular; paraglossae narrowly fan-shaped; mentum sharply toothed at middle of apex, epilobes not widened apically; microsculpture visible as isodiametric meshes in apical half of clypeus, partly as vague transverse meshes on the other parts.

Pronotum transversely subquadrate, widest at apical two fifths, 1.44–1.46 times as wide as long, sides arcuate in apical third, thence linearly oblique to base; surface moderately convex, largely smooth, sparsely covered with minute and somewhat coarse punctures only on basal foveae; anterior margin shallowly and obtrapezoidally concave, with thin border throughout; base 1.2 times as wide as apex, hardly bisinuate, with no border in middle; apical angles widely rounded, slightly protruding; basal angles obtuse, angularly rounded; lateral furrows impressed in a line throughout; basal foveae shallow, each with short groove at inner side; front and hind transverse impressions almost obsolete; median line thin, not reaching both anterior margin and base, with several minute punctures; microsculpture consisting of fine transverse meshes on disc and of isodiametric meshes in basal areas.



Figs. 1–5. 1–2 – *Trichotichnus (Pseudtrichotichnus) jelineki* sp. nov., holotype (1 – habitus; 2 – male genitalia); 3 – *T. (P.) vietnamensis* sp. nov.; 4 – *T. (P.) tenuitibialis* sp. nov.; 5 – *T. (P.) niger* Louwerens, 1951. Scale bar: 1 mm. Abbreviations: l – lateral aspect, d – dorsal aspect.



Figs. 6–9. Male genitalia. 6 – *Trichotichnus* (*Pseudotrictichnus*) *vietnamensis* sp. nov.; 7 – *T. (P.) tenuitibialis* sp. nov.; 8 – *T. (P.) niger* Louwerens, 1951; 9 – *T. (P.) miyakei* Habu, 1980. Scale bar: 1 mm. Abbreviations: l – lateral aspect, d – dorsal aspect.

Elytra oblong-oval, 1.25 times as wide as pronotum, nearly 1.5 times as long as wide, gently convex, impunctate; sides gently curved behind humeri, very weakly arcuate around midlength, rather steeply arcuate in apical one fifth; apices widely arcuate at sides, narrowly rounded at tips which are close to each other; base of each elytron very shallowly emarginate, rounded at humeral angles; striae deep, rather wide, and clearly crenulate, scutellar striole moderately long; intervals barely convex on disc, gradually becoming more convex apicad and basad, interval 3 with setiferous pore between apical third and two-fifths; marginal series consisting of (7–8) + (10–11) umbilicate pores; microsculpture observable as vague transverse lines. Hind wings developed.

Ventral surface mostly smooth, sparsely punctate on mesepisterna; metepisterna elongate, 1.5 times as long as wide; metepisterna elongate, 1.55–1.60 times as long as wide; abdominal sternite 6 with two setae on each side in both sexes, truncate or feebly emarginate in male and fairly arcuate in female.

Legs moderately long; fore tibiae more or less dilated apicad, clearly sulcate in basal four-fifths, with two or three spines near apex along each external margin; hind tarsi short, 0.78–0.80 times as long as the width of head including eyes in male and 0.74–0.76 times as long in female, segment 1 0.92 times as long as segments 2 and 3 taken together, segment 3 0.85 times as long as segment 2 and 1.2 times as long as segment 4, all claws with two setae on ventral margin.

Aedeagus (Fig. 2) robust, clearly arcuate dorsally, thinned at apex, knob-shaped at tip; apical orifice wide, inner sac armed with small spines near basal bulb; apical lobe elongate, about 1.50 times as long as wide.

Body length: 10.4–10.9 mm; body width: 3.8–4.0 mm.

Differential diagnosis. This new species is closely allied to *T. (P.) miyakei*, but is distinguishable by the pronotal foveae more clearly depressed, the hind tarsi longer and the aedeagus armed with three small sclerites (Fig. 2), which are missing in *T. miyakei* (Fig. 9).

Etymology. This species is dedicated to the eminent Czech coleopterist Josef Jelínek at the occasion of his 70th anniversary.

Distribution. Known only from the type locality in southern Laos (Attapu province).

Trichotichnus (Pseudotrichotichnus) vietnamensis sp. nov.

(Figs. 3, 6)

Type material. HOLOTYPE: ♂, 'Mt. Pia Oac, alt. 1,200m, Cao Bang Prov., N. Vietnam, 23.V.1999, S. Uéno leg.' (NMNS). PARATYPES: 2 ♀♀, same data as the holotype; 2 ♂♂ 1 ♀, 'Sa Pa, alt. 1,550 m, Lao Cai Prov., 10.V.1995, S. Uéno leg.'; 1 ♂, 'Tam Dao, alt. 960 m, N. Vietnam, 22.IV.1995, S. Uéno leg.' (NMNS, NIKJ), 1 ♀, the same locality, 15.V.1995; 2 ♂♂ 3 ♀♀, the same locality, '22.IV.1995, S. Uéno leg.'; 1 ♀, the same locality, alt. 930m, 21.IV.1995'; 2 ♀♀, the same locality, 'alt. 900m, 16.–23.IV.1991, Strnad Jan leg.' (HNHM); 1 ♀, 'Da Lat, Vietnam, 20.IV.1989, F. Schmidt leg.' (DWBG).

Description. Body oblong, fairly convex, pitchy black though a little lighter than in *T. miyakei*, strongly shiny, iridescent on elytra; palpi, antennae, tarsi and tibiae light reddish brown, femora brown to blackish brown.

Head rather large, 0.71–0.74 times as wide as pronotum, gently convex, very sparsely and microscopically punctate; labrum subquadrate, triangularly emarginate apically; clypeus transversely elevated, shallowly emarginate at apex; clypeal suture very weakly curved, deep even in middle, more strongly deepened at sides; frontal impressions as deep as clypeal suture at sides, obliquely linear; eyes large, well convex; temples steeply inclined, rather long, one-third the eye length; genuine ventral margin of eyes widely isolated from buccal fissure; antennae short, hardly reaching pronotal base, segment 3 pubescent in apical half, as long as segment 4 and 1.5 times as long as segment 2; labial palpi moderately thick, segment 3 as long as segment 2; ligula slim, slightly thickened apicad; paraglossae narrow, prolonged forwards beyond ligula; mentum with median tooth small and triangular, epilobes not widened apicad; microsculpture mostly invisible in 80× magnification.

Pronotum almost quadrate, widest at apical third, 1.4 times as wide as long, so widely convex that lateral furrows are linearly impressed; sides weakly curved between anterior margin and midlength, obliquely linear elsewhere; anterior margin weakly emarginate, straight in middle, without border in narrow middle area; base with broken border; anterior angles widely arcuate; basal angles obtuse, very narrowly rounded; basal foveae flattened,

each with shallow groove; front transverse impression very shallow, hind one also shallow; disc smooth, punctation absent or sparse anteriorly, coarse and moderately dense in basal foveae; microsculpture largely consisting of transverse meshes, and of isodiametric meshes near basal punctures.

Elytra oblong, weakly oval, 1.30 times as wide as pronotum, a little less than 1.50 times as long as wide, evenly convex, very sparsely and microscopically punctate; sides subparallel near midlength, abruptly and arcuately curved posteriorly; apices widely rounded at sides, with tips close to each other; base of each elytron shallowly emarginate, forming rounded angle with lateral margin; striae as in *T. (P.) jelineki* sp. nov.; intervals gently convex, becoming more convex towards apex and base, discal pore of interval 3 situated between apical third and two-fifths; marginal series widely interrupted medially, composed of 8 + 10 umbilicate pores; microsculpture consisting of fine and obscure transverse lines. Hind wings well developed.

Ventral surface largely impunctate, very sparsely and minutely punctate on lateral areas of metasternum; metepisterna convergent posteriorly, nearly 1.5 times as long as wide; abdominal sternite 6 sparsely pubescent, with two setae at each side in both sexes, apex truncate or feebly emarginate in male and narrowly rounded in female.

Fore tibiae a little more widened apicad than in *T. miyakei*, sulcate in basal four-fifths, terminal spur expanded in basal third; hind tarsi 0.70–0.74 times as long as the width of head in male and 0.65–0.69 times as long in female, segment 1 0.9 times as long as segments 2 and 3 combined and 1.65 times as long as segment 2, segment 3 1.5 times as long as segment 4, all claws with two setae on outer margin and three setae on inner margin of ventral surface.

Aedeagus (Fig. 6) similar in shape to *T. jelineki* sp. nov., though less stout, with a little smaller basal bulb; apical orifice widely opened, inner sac not bearing spinose sclerites but with clusters of microtrichia near middle; apical lobe short, thickened at tip.

Body length: 8.8–10.2 mm; body width: 3.6–4.2 mm.

Differential diagnosis. This new species is similar to *T. miyakei*, but the body is smaller, the legs are paler and the aedeagus bears smaller basal bulb and narrow apical orifice armed with clusters of microtrichia (Fig. 6).

Etymology. The species name is derived from country of type locality.

Distribution. Vietnam.

Trichotichnus (*Pseudotrictotichnus*) *tenuitibialis* sp. nov.

(Figs. 4, 7)

Trichotichnus miyakei: ITO (1991): 159 (misidentification).

Type material. HOLOTYPE: ♂, 'Tanah Rata, singled in and around the town, Cameron Highlands, Pahang, Malaysia, 21.–30.iii.1995, O. Merkl leg.' (HNHM). PARATYPES: 1 ♀, 'Cameron Hi, Tanah Rata, Malaysia, 7.iv.1974, Y. Kiyoyama leg.'; 1 ♀, 'Maxwell's Hill, Malaysia, 5.III.1974, Y. Kiyoyama leg.'; 1 ♂ 1 ♀, 'Tanah Rata, Malaysia, 29.v.1975, Y. Kiyoyama leg.' (NIKJ); 1 ♂ 4 ♀♀, '2 km S Tanah Rata on Tapah Road, montane rainforest, at light, Cameron Highlands, Pahang, Malaysia, 29.iii.1995, O. Merkl & I. Szikossy leg.'; 5 ♀♀, 'Tanah Rata, edge of degraded rainforest, at light, Cameron Highlands, Pahang, Malaysia, 21.iii.–2.iv.1995, O. Merkl leg.'; 1 ♀, the same locality, flight intercept trap (HNHM).

Description. Body similar in shape to *T. miyakei*, pitchy black though a little lighter than in *T. miyakei*, iridescent on elytra; buccal parts, antennae and tarsi light brown, labrum, tibiae and femora reddish brown to light reddish brown, mandibles blackish brown.

Head more or less large, 0.69–0.71 times as wide as pronotum, very sparsely and microscopically punctate, moderately raised; labrum subquadrate, with apex almost straight or shallowly emarginate; clypeus weakly protruding at apical angles, sometimes slightly swollen behind anterior margin; clypeal suture deep, slightly sinuate in middle; frontal impressions also deepened throughout, straight, oblique; eyes not prominent; temples abruptly declined, one-third the eye length; buccal fissure widely separated from genuine ventral margin of eyes; antennae short, not reaching pronotal base, submoniliform, segment 3 as long as segment 4 and twice as long as segment 2; palpi slender, segment 3 of labial palpus 1.1 times as long as segment 2; suture of mentum not distinct only near lateral ends of submentum, median tooth narrow and pointed at apex, epilobes narrow and parallel-sided; microsculpture invisible under 80× magnification.

Pronotum gently convex, transversely subquadrate, widest at anterior third, 1.5 times as wide as long, at base 1.25 times as wide as on anterior margin, sides moderately arcuate in anterior half and straight in posterior half; surface mostly impunctate, punctures in basal foveae more sparse and finer than in *T. miyakei*; anterior margin slightly emarginate, without border in middle; basal margin bordered only at sides or with broken border throughout; anterior angles weakly produced, clearly arcuate; basal angles angulate, slightly obtuse; lateral furrows wholly impressed in a line; basal foveae shallow or only flattened, very obscurely grooved at inner sides; front transverse impression very shallow, hind one more vague; median line distinct to more or less vague, not reaching both anterior and basal margin; microsculpture obscure, consisting of transverse meshes and lines on disc and of isodiametric meshes near basal punctures.

Elytra oblong, suboval, 1.25 times as wide as pronotum and 1.50–1.53 times as long as wide, uniformly convex; sides gently rounded behind humeri, subarcuate near middle and rounded in apical third; apices widely rounded, tips narrowly separated from each other; base almost straight, rounded at humeral angles; striae wide, deep and clearly crenulate, scutellar striole long; intervals almost flat or weakly elevated on disc, fairly convex apically and basally, interval 3 with discal pore near apical two-fifths; marginal series widely spaced, consisting of (8–9) + (9–11) umbilicate pores; microsculpture sparsely visible as transverse thin lines. Hind wings well developed.

Ventral surface almost smooth; metepisterna convergent behind, 1.6 times as long as wide; apical margin of abdominal sternite 6 truncate or very slightly emarginate in male and narrowly rounded in female, with four setae in both sexes.

Legs slender; fore tibiae weakly dilated apicad, not sulcate in apical fifth, with three spines along external margin near apex; hind tarsi short, 0.78 times as long as the width of head in male and 0.64–0.66 times as long in female, segment 1 0.79 times as long as segments 2 and 3 taken together, segment 2 1.25 times as long as segment 3 and twice as long as segment 4, all claws with two setae on both inner and outer ventral margin.

Aedeagus (Fig. 7) large, stout, dorsal surface straight in middle in lateral aspect; apical orifice not wide, opening oblique, placed laterally, inner sac without sclerite; apical lobe wide, subtriangular.

Length: 7.8–10.0 mm; width: 3.7–4.3 mm.

Differential diagnosis. This new species is allied to *T. (P.) miyakei*, but in addition to the characters mentioned in the description, the body is smaller and the aedeagus is not arcuate dorsally but straight in middle.

Etymology. The species name is composed from the Latin *tenuis* (= slim, slender) and *tibialis*, referring to the slender tibiae of the species.

Distribution. Cameron Highlands (Peninsular Malaysia, Pahang state).

Remark. I treated the Malaysian specimens as *T. miyakei* (ITO 1991), but a more detailed examination including the study of the aedeagus revealed that they belong to a separate species.

Trichotichnus (*Pseudotrictichnus*) *niger* Louwerens, 1951

(Figs. 5, 8)

Trichotichnus niger Louwerens, 1951: 124. Type locality: Luwu, Celebes Is. (= Indonesia: Sulawesi Is.).

Material examined. 20 ♂♂ 23 ♀♀, 'Pulupuru Toraja, 1,800 m a.s.l., Sulawesi Is., 30.viii.1986, N. Nishikawa leg.' (NIKJ).

Remarks. Aedeagus (Fig. 8) not thickened, arcuate, weakly gradually thinned apicad, with small and knob-shaped tip; apical lobe small; inner sac armed with tiny sclerite before middle.

Trichotichnus (*Pseudotrictichnus*) *miyakei* Habu, 1980

(Fig. 9)

Trichotichnus miyakei Habu, 1980: 11–12. Type locality: Musha, Taiwan.

Material examined. 1 ♂, 'Lenhwachi, Taiwan, 14.iv.1973, Y. Kiyoyama leg.'; 1 ♂, 'Lishan, Taiwan, 18.vi.1980, K. Kuzugami leg.'; 1 ♀, 'Musha (= Wushe), Taiwan, 2.iv.1981, M. Yamamoto leg.'; 12 ♂♂ 12 ♀♀, 'Liukuei, Kaohsiung Hsien, Taiwan, v.1985, M. L. Chen leg.' (NIKJ); 1 ♂, 'Road above Tona, alt. 1,700–1,800m, Kaohsiung Hsien, Taiwan, 28.iv.1998, A. Smetana leg.' (CNC).

Remarks. Aedeagus (Fig. 9) thick, slightly arcuate, rather abruptly thinned apicad, clearly knob-shaped at tip; dorsal orifice widely opened, without any sclerites; apical lobe subtriangular, a little longer than wide.

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