

Alpine Trechids from Hokkaido, Japan  
IV. Two New Species of the Subgenus *Epaphius*

By

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Since 1927, when JEANNEL<sup>1)</sup> first recorded *Trechus ephippiatus* from Hakodate, almost nothing has been added to our knowledge of the *Epaphius* fauna of Hokkaido. The only adequate work dealing with the subject is that of HABU<sup>2)</sup>, who recorded the same species again from Sapporo and Obihiro. This species is usually alate and is widespread in the Far East<sup>3)</sup>, its range of distribution covering the four main islands of Japan, Is. Sado, Is. Yaku-shima, Is. Tsushima, Korea, eastern Siberia, Sze-chwan and northeastern Tibet.

According to the recent investigations, however, it has become evident that there inhabit at least two apterous species of the subgenus on two volcanoes in northern Japan, one on the western coast of central Hokkaido and the other on the Island of Rishiri-tô off the northwestern coast of the main island. These two species are greatly different from each other and seem to be unknown to science. Their descriptions will be given in the present article.

The writer wishes herewith to acknowledge his indebtedness to Mr. Masahito HASHIMOTO of the Academic Alpine Club of Hokkaido, who has given to the writer much more aid than could be demanded from him during the collecting trip made in this summer. He is also greatly indebted to Mr. Yoshikazu IKUTANI for the opportunity to examine and describe another new species of the subgenus *Epaphius*.

***Trechus* (*Epaphius*) *hashimotoi* S. UÉNO, sp. nov.**

*Diagnosis*: Discriminated from all the described species of the subgenus by the peculiarity in pronotal hind angles and in the structure of aedeagus. General appearance short and wide, with short appendages. Body small, depigmented and apterous. Head with entire subangulate frontal furrows; eyes rather flat;

1) JEANNEL, R., 1927, L'Abeille, Paris, 33, p. 136.

2) HABU, A., 1941, Ent. World, Tokyo, 9, pp. 652-653.

3) Cf. JEANNEL, R., 1935, Rev. franç. d'Ent., 1, p. 274.

mentum tooth simple. Pronotum transverse, with lateral sides hardly sinuate behind; base evidently wider than apex, gently produced at middle and usually continuous on each side to lateral border; hind angles more or less obliterated; basal transverse impression interrupted at middle and without a fovea on each side of median line. Elytra ovate, with distinct shoulders and long prehumeral borders; four inner striae distinct, others more or less obsolete. Protibia with a shallow groove on the external face. Aedeagus short and robust, with a long apical beak and a small sagittal aileron; inner sac covered with numerous large teeth; differentiated copulatory piece absent; styles wide, number of apical setae variable.

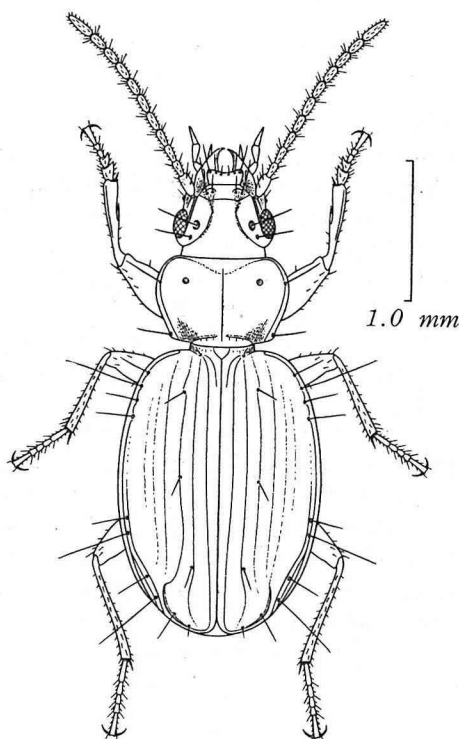


Fig. 1. *Trechus (Ephapius) hashimotoi* sp. nov.,  
♂, of Mt. Shokanbetsu-daké in Hokkaido.

Larva elongate, with short appendages. Head gently contracted behind and with distinct neck constriction; ocelli imperfect; clypeal lobe without serration on naso-mandibular emargination, each lateral lobe provided with four teeth, which are larger than those on median lobe; segment 2 of maxillary palpus nearly as long as segments 3 and 4 together; basal segment of labial palpus large, much longer than the remaining segments together. Cerci shorter than anal tube,

*Description of adult*: Length: 2.9–3.2 mm (from front margin of clypeus to anal end).

Apterous and depigmented. Colour reddish brown to dark reddish brown, shiny; head somewhat darker than the rest of body; palpi, apical segments of antennae, epipleura and legs yellowish brown.

Head large and wide, with entire frontal furrows, which are deep throughout, subangulate and widely divergent both in front and behind; both supraorbital areas and front moderately convex; microsculpture distinct and reticulate; eyes fairly large but rather flat; genae moderately convex but short, about two-sevenths the length of eyes; neck constriction deep; neck wide; labrum deeply emarginate; mandibles short and stout, hooked at apices; mentum tooth very wide, simply triangular or somewhat rounded at apex; palpi short and stout, with apical segments subacuminate; antennae relatively short and stout, sub-filiform, reaching basal one-fourth of elytra, with segment 3 slightly longer than segment 2 or segment 3.

Pronotum transverse, moderately convex, 1.29–1.32 times wider than head (mean 1.30), 1.47–1.50 times wider than long (mean 1.49), widest at about two-thirds from base; the ratio of the greatest width to the width of apex 1.43–1.48 (mean 1.45), that to the width of base 1.27–1.29 (mean 1.28); lateral sides entirely bordered and rather widely reflexed, rather strongly rounded in front, less so behind and hardly sinuate before hind angles, with marginal gutters widening basally; present both lateral and postangular setae, the latter of which is not removed forwards; apex nearly straight or slightly emarginate; base 1.13–1.15 times wider than apex (mean 1.14), gently produced at the median part, slightly oblique on each side and rather abruptly curved forwards just inside hind angles; front angles widely rounded and hardly advanced; hind angles more or less obliterated, either rounded or marked on each side by an obtuse angle; median line rather shallow, reaching neither apex nor base; apical transverse impression shallow though more or less rugose; basal transverse impression deep, close to basal border, interrupted at middle and merging on each side into basal fovea, which is not so large but deep and extends anteriorly along the side border; postangular carina either absent or rudimentary; surface smooth; in ♂ a small rounded discal fovea present on each side before middle; microsculpture distinct, composed of fine transverse lines.

Elytra ovate and convex, 1.49–1.55 times wider than pronotum (mean 1.52), 1.34–1.40 times longer than wide (mean 1.38), widest at about middle; shoulders distinct though rounded; prehumeral border nearly reaching the base of stria 4 and ending almost perpendicularly to the mid-line; lateral sides narrowly bordered, gently rounded at middle, slightly or hardly emarginate before apices, which are rounded and separated from each other by a small re-entrant angle; crenulate-striate, striae 1–4 moderately impressed, 5 more or less shallower and fainter than the inner, 6–7 nearly obliterated, 8 deep in the apical part and close to the side-border; scutellar striole deep and fairly long; apical striole rather

short but deep, moderately curved, either interrupted at the end or joining one of striae 3, 4 and 5; intervals smooth, moderately convex near suture but flat at the sides; apical carina prominent; stria 3 with two setiferous dorsal pores located at one-seventh to one-fifth from base and a little before middle; preapical pore adjoining stria 2 and situated at one-fifth to one-fourth from apex; microsculpture formed by fine transverse lines but quite indistinct.

Ventral surface smooth; anal sternite with one seta on each side in ♂, two in ♀. Legs short; protibiae thick, with a shallow groove on the external face; in ♂ protarsal segments 1 and 2 widely dilated as usual.

Male genital organ small but well chitinized. Aedeagus robust, gently arcuate and widely membranous on the dorsal side; viewed laterally, dorsal side semicircularly rounded at middle; basal part fairly large and strongly bent towards the ventral side, with a small sagittal aileron; lateral sides of basal

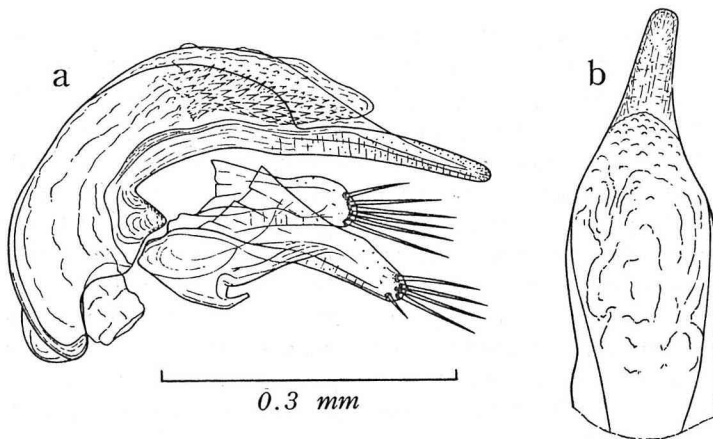


Fig. 2. Male genital organ of *Trechus (Epaphius) hashimotoi* sp. nov., of Mt. Shokanbetsu-daké in Hokkaido; left lateral view (a) and dorsal view of the apical part of aedeagus (b).

orifice deeply emarginate; apical part prolonged into a long apical beak, which bends to the left and is narrowly rounded at the extremity; ventral side slightly convex behind middle. Inner sac covered with numerous large teeth but without differentiated copulatory piece. Styles large and wide, left style obviously longer than the right, each provided with four, five or six setae at apex.

*Description of mature larva:* Length: 5.4 mm (from apex of clypeal lobe to the tip of anal tube).

Body elongate, with short appendages; head and pronotum moderately chitinized. Colour yellowish white and translucent; head, cephalic appendages, pronotum and cerci light reddish brown.

Head large, gently contracted behind, with distinct neck constriction;

integument covered with coarse reticulation, which becomes indistinct on the disk; present on each lateral face two longitudinal carinae, of which the dorsal one is longer than the ventral; cranial sutures deeply sinuate; ocelli only poorly developed though visible, represented by a small, poorly pigmented patch situated just behind the insertion of each antenna. Clypeal lobe trilobed, without serration on nasomandibular emargination; median lobe porrect from lateral lobes, provided with three teeth at apex and three on each lateral side; each lateral lobe provided with four large teeth, of which the outermost one is bifid. Mandibles stout and arcuate, with retinacles prominent. Maxillae with fairly long stipes, which is about 4 times longer than wide; galea with slender apical segment, which is nearly twice as long as basal segment but only a half as wide as the latter; maxillary palpus composed of five segments, of which two proximal segments are distinctly larger than the rest; segment 1 globular; segment 2 nearly as long as segments 3 and 4 together and twice as wide as segment 4; segment 4 shortest. Labium subtrapezoid, contracted basally and about as wide as long; labial palpus of four segments; basal segment large, much longer than segments 2-4 together and more than twice as wide as segment 2; segment 2 longer than segment 3 or 4 but shorter than segments 3 and 4 together. Antennae thick, of four segments; segment 1 twice as long as wide and slightly longer than segment 2; segment 3 largest, twice as long as wide; segment 4 small, a little less than a half as long as segment 3 and nearly twice as long as wide.

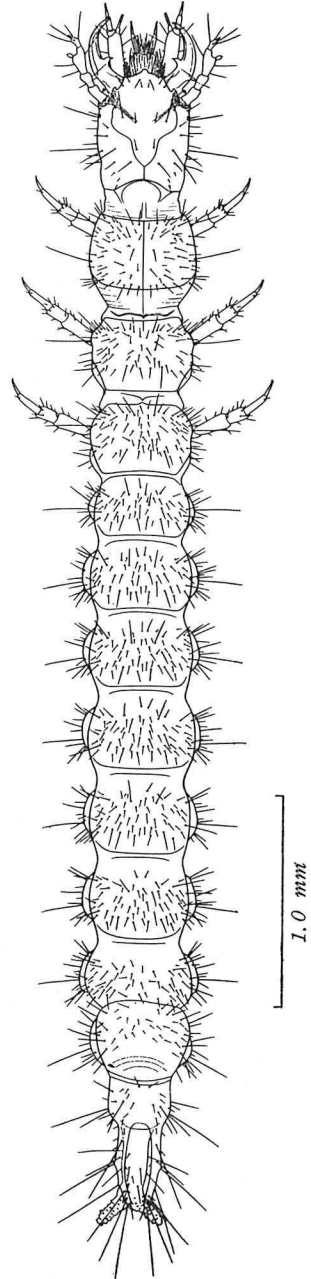
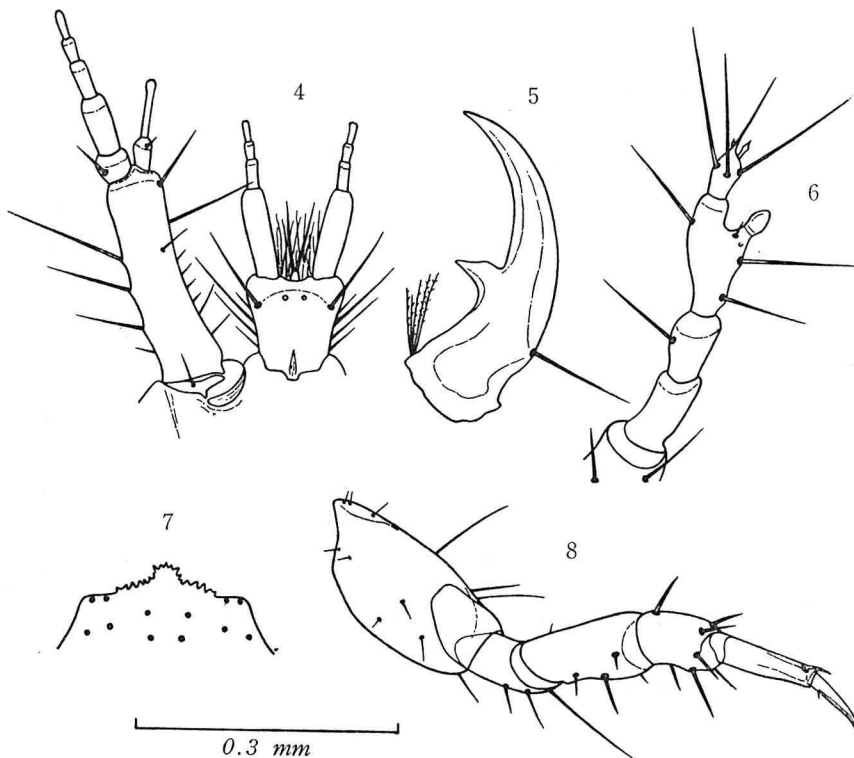


Fig. 3. *Trechus (Epaphius) hashimotoi* sp. nov., mature larva, of Mt. Shokanbetsu-daké in Hokkaido.

Prothorax distinctly wider than head and much shorter than meso- and metathoraces together, with lateral sides gently rounded; pronotum transverse, with apex widely emarginate. Scuta pubescent. Legs stout, with slender tarsus



Figs. 4-8. *Trechus (Epaphius) hashimotoi* sp. nov., mature larva, of Mt. Shokanbetsu-daké in Hokkaido.—4. Right maxilla and labium, ventral view.—5. Right mandible, dorsal view.—6. Right antenna, dorsal view.—7. Clypeal lobe, dorsal view.—8. Right front leg, dorso-posterior face.

and claw. Abdominal segments pubescent. Anal tube long, gradually narrowing towards anal orifice, which forms a shape of Y. Cerci relatively short, shorter than anal tube and about 9 times longer than median width.

*Type-specimens*: Holotype: ♂ (3-IX-1961, collected by S. UÉNO). Allotype: ♀, paratypes: 2♂♂, 1 mature larva (4-IX-1961, by S. UÉNO).

All the type-specimens are preserved in the writer's collection.

*Type-locality*: Mt. Shokanbetsu-daké, on the boundary between Teshio and Ishikari Provinces, on the western coast of central Hokkaido.

In view of the structure of its aedeagus, the present new species may be related to the group of *T. ephippiatus*, though smaller than any of the known

species of the species-group. Externally, it resembles more closely the members of the group of *T. vicarius*, but is markedly different from the latter in the depigmented body and in the short robust form of aedeagus (cf. S. UÉNO, 1954, Sci. Res. Ozegahara Moor, Tokyo, pp. 721-722, figs. 1-2). *Trechus hashimotoi* may be a peculiar offshoot, which has been isolated on Mt. Shokanbetsu-daké and adapted to some extent to endogean environment.

Mt. Shokanbetsu-daké (1,491 m in height) is an isolated volcano of Middle Pleistocene origin, and is situated on the western coast of central Hokkaido. As is usual with such isolated volcanoes, there are no streams nor pools in the alpine zone of this mountain. Consequently, damp places preferred by the trechid are very scarce above timber-line. Despite of a careful investigation, the writer could meet with the beetle only in a limited place on the northern slope of the main peak at an elevation of about 1,300 m. It occurred along a groove cut down by rainfall, under large stones deeply embedded in the moist soil. The place was situated just below timber limit and was shaded by a shrub of dwarf birch. The beetle was not very active, highly hygrophilous and, in one case, was found on soft, very wet mud beneath a stone. The larva was found coexisting with the adults.

***Trechus* (*Epaphius*) *ikutanii* S. UÉNO, sp. nov.**

*Diagnosis*: Externally similar to *T. yosiiianus* S. UÉNO, but markedly different from the latter in the large fore-body, more convex eyes and genae, much wider pronotal base, and so on.

*Description*: Length: 3.6 mm (from front margin of clypeus to anal end).

Apterous; general appearance short and wide. Colour black, shiny, somewhat iridescent on elytra; mouth parts, marginal areas of pronotum and elytra, and elytral interval 1 dark reddish brown; palpi, antennae, ventral sides of thoraces, epipleura and legs reddish brown.

Head large and wide, with supraorbital areas and front moderately convex; neck wide; frontal furrows entire, deep throughout, not angulate and rather widely distant from each other; microsculpture clearly reticulate, isodiametric on front; eyes fairly large and moderately convex; genae convex, about two-fifths the length of eyes; neck constriction deep; labrum deeply emarginate at apex; mandibles short and stout, hooked at apices; mentum tooth very wide and obtuse at the tip; palpi short and stout; antennae short, subfiliform, extending a little beyond basal one-sixth of elytra, with segments 2-4 nearly equal in length to one another.

Pronotum transverse and convex, much less contracted posteriorly than that in *T. yosiiianus*, 1.40 times wider than head, 1.51 times wider than long, widest at about two-thirds from base; the ratio of the greatest width to the width of apex 1.48, that to the width of base 1.20; lateral sides entirely bordered and reflexed, gently rounded in front and not sinuate behind, with marginal gutters

widening basally; present both lateral and postangular setae, of which the latter is on the angle; apex slightly but widely emarginate; base 1.24 times wider than apex, produced at the median part and distinctly emarginate on each side; front angles rounded and hardly advanced; hind angles somewhat obtuse but forming on each side a small denticle; median line fairly deep, not reaching apex and not widening near base; apical transverse impression vague; basal transverse impression shallow, widely interrupted at middle, without a fovea on each side of median line and merging on each side into basal fovea, which is not large but deep and somewhat extends anteriorly; trace of postangular carina perceptible; surface smooth; microsculpture consisting of fine transverse lines.

Elytra ovate and convex, though depressed on the disk, 1.44 times wider than pronotum, 1.34 times longer than wide, widest at a level a little before middle; shoulders distinct though rounded; prehumeral borders extending to the base of stria 4 and perpendicular to the mid-line; lateral sides narrowly bordered and reflexed, feebly rounded at middle and very slightly emarginate before apices; apex of each elytron narrowly rounded; striae shallow and indistinctly crenulate, striae 6 and 7 much fainter than the inner, stria 8 deeply impressed in the apical half but obliterated anteriorly; scutellar striole relatively short but distinct; apical striole fairly deep, not strongly curved and joining stria 5; intervals smooth and flat; apical carina salient; stria 3 with two setiferous dorsal pores located at about two-ninths from base and a little before middle; preapical pore adjoining stria 2 and located at two-ninths from apex; microsculpture formed by fine transverse lines but rather indistinct.

Ventral surface smooth; anal sternite provided with two setae on each side in ♀. Legs short; protibiae externally grooved.

Male unknown.

*Type-specimen*: Holotype: ♀ (1-VIII-1960, collected by Y. IKUTANI and preserved in UÉNO's collection).

*Type-locality*: Himé-numa in Oshidomari, at the northern foot of Mt. Rishiri-zan, Higashi-Rishiri-chō, on the Island of Rishiri-tō off the western coast of northern Hokkaido.

Under the present circumstances, it is difficult to determine the real affinity of the present new species. It resembles most closely the members of the group of *T. vicarius*, but the pronotum is quite different in shape. It may form an independent species-group, but confirmation based on aedeagal characters is necessary to accept such an arrangement.

The Island of Rishiri-tō is a volcanic island of Middle Pleistocene origin, and is situated on the Sea of Japan, about 19 km off the western coast of northern Hokkaido. The highest point of this island is the summit of Mt. Rishiri-zan, which attains a height of 1,719 m. Lake Himé-numa, the type-locality of the present new species, is situated at the northern foot of the



volcano, at about 130 m above sea-level. The lake is surrounded by the forest of fir-trees, through which runs a stream that arises from Mt. Rishiri-zan and drains the lake. The holotype of the trechid was found under a stone on the dry bed of this stream near the outlet of the lake.

During a short stay on the island, made in the late summer of 1961, the writer endeavoured to obtain other specimens of this interesting new species, especially at higher altitude. All his efforts were, however, not repaid, owing largely to bad weather.