

STUDIES ON THE JAPANESE TRECHINAE (III)
(COLEOPTERA, HARPALIDAE)

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With 11 Text-figures

Numerous species of the carabid-beetles have been known to be semiaquatic. The habitats of most of those species are adjoining inland waters and only a very few members of them penetrate into the sea. The studies on the marine beetles are, however, one of very interesting subjects to Coleopterologists. A most remarkable feature in the advanced marine forms is a striking morphological resemblance to cavernicoles, that is, the depigmentation of integument, the degeneration of eyes and of metathoracic wings, and so on. Beautiful examples of such adaptations are found in the species belonging to the Trechid subtribe Aepi. In Japan the Coleopterological researches for the intertidal fauna have long been drawn only a little attention, but there are fairly many species inhabiting the intertidal zones on the coast of the insular country.

The present paper deals with three genera, namely, *Perileptus*, *Sakagutia* (new genus) and *Armatocillenus*, all of which contain the marine species. At the same opportunity, adding to the descriptions of the marine forms, the Japanese representatives of the genus *Perileptus* are also enumerated. One of the new species described below was studied in collaboration with Mr. Akinobu HABU of the National Institute of Agricultural Sciences.

This study was started in the Entomological Laboratory of the University under the superintendence of Prof. Syunro UTIDA and was completed in the Zoological Institute under the guidance of Prof. Kenji NAKAMURA, while it had always been supported by Prof. Takasi TOKIOKA of the Seto Marine Biological Laboratory. The writer wishes to express his hearty thanks to these professors. Best gratitudes are also due to the following gentlemen who were kind enough to supply him with either many interesting material or useful information and literature: Prof. Teiso ESAKI of Kyushu University, Mr. Hiroshi ISHIDA of Hyogo Agricultural College, Mr. Ryôsuke ISHIKAWA of Tokyo, Mr. Einar KLEFBECK of Falun, Sweden, Mr. Kazuyoshi KUROSA of Saéki City, Mr. Yoshihiko KUROSAWA of National Science Museum, Mr. Katsura MORIMOTO of Kyushu University, Mr. Takehiko NAKANE of Saikyo University, Mr. Kohei SAKAGUTI of Nishinomiya City, Mr. Kazuo TANAKA of Funabashi City, and Mr. Yasunobu YASUE of Ôhara Institute for Agricultural Biology.

Genus *Perileptus* SCHAUM

Perileptus SCHAUM, 1860; type-species: *Carabus areolatus* CREUTZER, 1799.—PUTZEYS, 1870, Ent. Ztg., Stettin, 31: 9, 362.—GANGLBAUER, 1892, Käf. Mitteleur., 1: 185.—JACOBSON, 1906, Käf. Russl., (4), 296.—REITTER, 1908, Fauna Germ., 1: 126; 1909, in BRAUER, Süßwasserfauna Dtschl., (3-4), 128.—JEANNEL, 1922, Ann. Soc. ent. France, 90: 340; 1923, Ann. Mag. Nat. Hist., (9), 12: 396; 1926, L'Abeille, 32: 401, 402; 1941, Faune de France, 39: 301; 1946, Faune Emp. Franç., 6: 322.—TOSAWA, 1935, Kansai Konchu Zasshi, 3: 22.—ANDREWES, 1935, Fauna Brit. Ind., Col. Carab., 2: 48.—S. UÉNO, 1953, Shin Konchû, Tokyo, 6, (11): 38.

Ochtheophilus NIETNER, 1857, Ann. Mag. Nat. Hist., (2), 20: 275; type-species: *Ochtheophilus ceylanicus* NIETNER, 1857.—JEANNEL, 1922, Ann. Soc. ent. France, 90: 165.

In Japan the genus *Perileptus* has been represented by a single species, *P. japonicus*, which has originally been described by H. W. BATES from Hiogo (1873, p. 296) and has been reported also from China and Celebes (JEANNEL, 1920, p. 108; 1923, p. 397; 1926, p. 414). In examining a good deal of this common species, the writer has found that there are three distinct species among the specimens hitherto considered as one species, *P. japonicus*. Moreover, the writer has discovered another new marine species of this genus on the Pacific coast of the Island of Shikoku. These four Japanese species will be distinguished by the following features.

Key to the species

- 1 (2) Body somewhat brownish black; small species (1.85-2.25 mm), with rather small eyes and distinct oblique genae *P. morimotoi* sp. nov.
- 2 (1) Body more or less brownish, not black.
- 3 (4) Genae very short, not convex; eyes large and prominent, pronotum widest at about apical one-fourth, with sides well rounded; length: 2.55-2.85 mm. *P. japonicus* H. W. BATES*
- 4 (3) Genae conspicuous and subangulately convex; eyes smaller, less prominent, pronotum widest at about apical one-fifth, with sides faintly rounded.
- 5 (6) Larger (2.9-3.5 mm); front depressed behind clypeal suture, front margin of labrum with a central tubercle, and elytral striae with finer punctures *P. laticeps* sp. nov.
- 6 (5) Smaller (2.45 mm); front not depressed behind clypeal suture, front margin of labrum without tubercle, and elytral striae with coarser punctures *P. naraensis* sp. nov.

Perileptus (s. str.) *morimotoi* S. UÉNO, sp. nov.

(Figs. 1-2)

Perileptus (s. str.) *morimotoi* S. UÉNO, 1953 (*in litt.*), Shin Konchû, Tokyo, 6 (11): 39, fig. 4, upper left.

Length: 1.85-2.25 mm (from front margin of clypeus to anal end).

Winged. Body elongate and depressed; pubescence dense but short. Somewhat

* *Perileptus japonicus* H. W. BATES, 1873, Trans. Ent. Soc. London, 296.—JEANNEL, 1920, Ann. Mag. Nat. Hist., (9), 5: 108; 1923, *loc. cit.*, (9), 12: 397; 1926, L'Abeille, 32: 406, 414, figs. 188, 189.—TOSAWA, 1935, Kansai Konchu Zasshi, 3: 23, pl. 2, fig. 9.—S. UÉNO, 1953, Shin Konchû, Tokyo, 6 (11), p. 39.

brownish black, head with black band between eyes, elytra with apical margin yellowish brown; clypeus, labrum, mandibles, propleura and epipleura brown to dark brown; palpi, proximal four segments of antennae (rest becoming darker towards apex) and legs pale yellowish brown to yellowish brown.

Head large, flat on surface, but with curved frontal furrows so deep in front that both front and supraorbital areas are moderately convex; eyes moderate in size, prominent; genae distinct, much shorter than eyes and hardly convex; clypeal suture evident and nearly straight, front margin of labrum deeply emarginate and without central tubercle; neck wide; surface moderately punctate, microsculpture composed of distinct reticulation; antennae stout, extending a little beyond basal one-fourth of elytra.

Pronotum subcordate, moderately convex, about 1.1 times wider than head, about 1.35 times wider than long, widest at about apical one-fifth and contracted behind; sides rounded faintly in front and sinuate behind; apical border slightly but widely emarginate, base narrower than apex, about five-sixths as wide as the latter, produced at middle and distinctly emarginate on each side; front angles rounded, hind angles projected on each side as a small acute tooth and each with a short carina; median line deep, basal foveae small but distinct, merging inwardly into basal transverse impression which is uneven; surface distinctly and rather closely punctate; microsculpture consisted of well marked isodiametric meshes.

Elytra elongate, moderately convex at sides but flat on disk; about 1.25 times wider than pronotum, about 1.75 times longer than wide (the ratio somewhat variable according to individuals); sides slightly rounded, hardly emarginate before apex, shoulders obvious; striae impunctate, 1—5 distinct though shallow, stria 1 becoming deeper towards apex but very faint or nearly disappearing near base, 2—5 disappearing behind, others obsolete, apical striole vanished so that umbilicate pores isolated; intervals flat, with irregular rows of fine punctures; interval 3 with three dorsal pores adjoining stria 3, located at basal one-sixth to two-ninths, a little behind middle and about apical one-fourth respectively, of these pores, basal two distinct, while apical one rather indistinct; isodiametric microsculpture well developed throughout.

Protibiae without external groove.

Male genital organ weakly chitinized. Aedeagus elongate, slightly arcuate and with membranous basal part, apical part wide, apex produced into narrow snout; inner sac inerm. Styles short, subequal in length, each provided with two long apical setae.

Holotype: ♂, allotype: ♀, the estuary of the Niyodogawa River, Suzur , K chi Pref., Shikoku, 4—IV—1953, collected by K. MORIMOTO.

Paratypes: 6 ♂♂, 2 ♀♀, from the same locality with that of the holotype, 25—III—1953, by S. U NO and K. MORIMOTO; 7 ♂♂, 17 ♀♀, from the same locality, 4—IV—1953, by K. MORIMOTO.

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

The present new species inhabits the sandy beach of the intertidal zone and becomes submerged completely at high-water. It was obtained in association with *Armatocillenus yokohamae*, *Peryphus aureofuscus* and a small undetermined Staphylinid.

Perileptus (s. str.) *laticeps* S. UÉNO, sp. nov.

(Figs. 4-6)

Length: 2.9—3.5 mm (from front margin of clypeus to anal end).

Winged. Body elongate and depressed; pubescence rather dense and formed by fairly long hairs. Reddish brown to dark reddish brown, head with obscure dark band between eyes, elytra somewhat lighter than fore-body, ventral side darker than dorsal surface; palpi pale, proximal four segments of antennae (segments 5—11 dark) and legs pale reddish brown.

Head large and wide, flat on surface, with deep curved frontal furrows which are widening out anteriorly into the depression of front, though this depression of the front varies to a certain degree according to individuals; surface sparsely and slightly punctate, punctures rather denser at sides; microsculpture vanished; clypeal suture distinct, well curved, front margin of clypeus slightly arcuate; front margin of labrum emarginate and with a central tubercle; eyes prominent but rather small; genae conspicuous, subangulately convex and with a few fairly long hairs; neck wide; antennae long and stout, reaching basal one-third of elytra, slightly dilated towards apex.

Pronotum subcordate, a little convex or, so to say, rather flat, about as wide as or a little wider than head according to individuals, about 1.2 times wider than long, widest at about apical one-fifth and contracted behind; sides faintly curving round from widest part to hind angles and sinuate just before them, which are projected on each side as a small acute tooth (the sharpness of this tooth is variable according to individuals) and each with a short carina, front angles rounded; base fully three-fourths as wide as apex, well produced at middle and emarginate on each side, the hind margin of produced part nearly straight; median line fairly wide and deep, basal foveae distinct, merging into basal transverse impression which is slight at middle; surface rather closely punctate, without appreciable microsculpture, basal area rugose.

Elytra elongate, with nearly parallel sides, and flat; about 1.3 times wider than pronotum, about 1.8 times longer than wide; shoulders distinct and rounded; striae shallow, punctured, only stria 1 entire and deepening towards apex, 2 to 5 disappearing behind, others obsolete, apical striole shallow; intervals slightly convex, with irregular rows of minute punctures; two indistinct dorsal pores present on stria 3; nearly isodiametric microsculpture visible especially on both sides.

Protibiae without external groove.

Male genital organ weakly chitinized. Aedeagus wide, with membranous basal

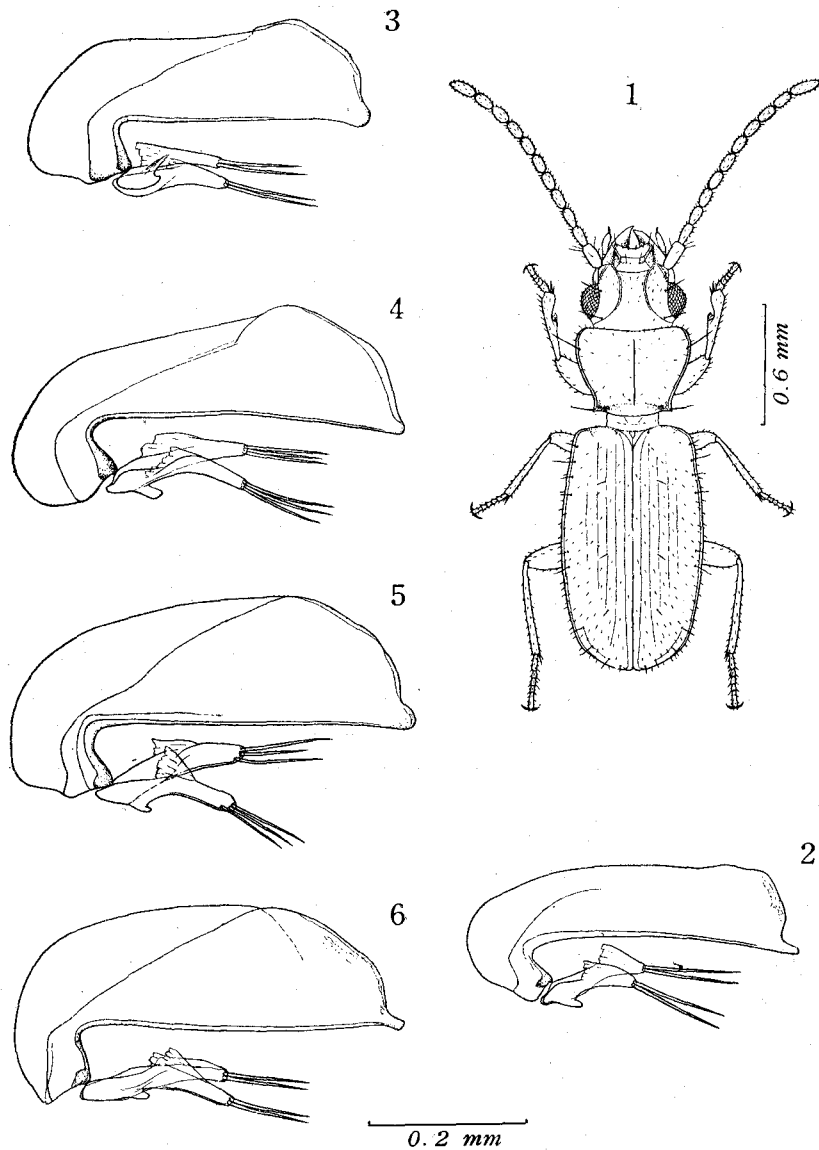


Fig. 1. *Perileptus morimotoi* S. UÉNO, sp. nov., ♂, of the Niyodogawa River.
 Figs. 2-6. Male genital organ, left lateral view.
 2. *Perileptus morimotoi* S. UÉNO, sp. nov., of the Niyodogawa River.
 3. *Perileptus naraensis* S. UÉNO, sp. nov., holotype, of Mt. Kasuga.
 4. *Perileptus laticeps* S. UÉNO, sp. nov., holotype, of the Inukamigawa River.
 5. Same species, of the Hôfukujigawa River.
 6. Same species, of the Takanogawa River.

part; apex produced, varying in shape, rounded in most cases; inner sac inerm. Styles short, but comparatively a little longer than the other Japanese species of the genus, subequal in length, each provided at apex with two, three or four setae according to individuals.

Holotype: ♂, allotype: ♀, the Inukamigawa River, by Kanaya, Shiga Pref., Honshu, 3—V—1952, collected by H. ISHIDA.

Paratypes: 5 ♂♂, 4 ♀♀, the Takanogawa River, by Yase, Kyoto, Honshu, 31—III—1952, by H. ISHIDA; 1 ♂, the Hōfukujigawa River, Nishigori-mura, Higashi-Chikuma-gun, Nagano Pref., Honshu, 19—VI—1952, by S. UENO.

The type-specimens are deposited in the writer's collection. At each locality it was found under pebbles on the exposed river-bed, coexisting with *P. japonicus*.

This new species resembles both *P. areolatus* and *P. japonicus*, but may easily be distinguished from those species by the distinctly wider fore-body, the shape of the pronotum which is widest more in front and with the sides distinctly less rounded, and by many other characteristics described above. The depression of the front behind the clypeal suture is unusual in the genus *Perileptus*, which somewhat resembles the feature described as regards the genus *Neoblemus*.

This species is noticeable in the variability in the structure of the male genital organ. In the holotype and a specimen from the Hōfukujigawa River, the apical setae on each style are three in number, while in the Yase specimens they are two or four according to individuals, even though they were found living in the same habitat. In an individual from Yase, the apex of aedeagus is produced into a narrow snout, while in all the others it is rounded. After a careful examination, no other external differences are detectable, and all these examples are regarded as one species.

Perileptus (s. str.) *naraensis* S. UENO, sp. nov.

(Fig. 3)

Length: 2.45 mm (from front margin of clypeus to anal end).

Winged. Body elongate and depressed, but less than in *P. laticeps*; pubescence fairly long and rather sparse. Dark brownish red, head with blackish band between eyes, ventral side of the hind-body darker; palpi pale, antennae reddish brown with basal segment somewhat lighter, legs paler reddish brown.

Head wide, with deep curved frontal furrows, supraorbital areas and front convex, the latter without depression behind clypeal suture which is evident and moderately curved; front margin of labrum evenly emarginate, without a central tubercle; eyes small, a little prominent; genae remarkable, subangulately convex and with a few long hairs; neck rather narrow; vertex sparsely and finely punctate, punctures coarser and a little denser on both sides, especially on supraorbital areas; micro-sculpture absent; antennae stout, distinctly shorter in proportion than in *P. laticeps*.

Pronotum subcordate, a little convex, about 1.1 times wider than head, fully 1.2

times wider than long, widest at about apical one-fifth and contracted behind; sides faintly rounded and sharply sinuate before hind angles which are projected on each side as an acute tooth and each with a short carina, front angles rounded; base produced at middle and emarginate on each side, about four-fifths as wide as apex; median line distinct, deep, a little widening behind, basal foveae deep, merging into basal transverse impression; surface finely and rather sparsely punctate, without visible microsculpture, basal area rugoso-punctate.

Elytra rather short, moderately convex though rather flat on disk, 1.3 times wider than pronotum, 1.7 times longer than wide, widest at about apical two-fifths; sides slightly rounded, shoulders distinct; striae 1—5 well marked, rather deep, coarsely punctured, only stria 1 entire and deepening towards apex, others disappearing both near base and near apex, except stria 5 which is traceable to basal border, apical striole shallow; intervals slightly convex, with irregular and rather sparse rows of minute punctures; two indistinct dorsal pores present but hardly distinguishable from the punctures in stria 3; reticulate microsculpture present but very indistinct.

Protibiae without external groove.

Male genital organ weakly chitinated. Aedeagus wide, with membranous basal part; apical part large, with apex rounded; inner sac inerm. Styles short, subequal in length, each provided with two long apical setae.

Holotype: ♂, Mt. Kasuga, Nara, Honshu, 23—IX—1948, collected by S. UÉNO. The type is preserved in the writer's collection. It was discovered under a large stone by a stream in the forest.

The present new species is closely allied to *P. laticeps*, but differs from that in many features, *i. e.*, decidedly smaller in size, head narrower and more convex, with distinctly narrower neck, not anteriorly depressed front, front margin of labrum not tuberculate at middle, each antennal segment distinctly shorter, pronotum a little wider at base, elytra shorter and more convex, and with coarser punctures in the striae.

Genus *Sakagutia* S. UÉNO, gen. nov.

Type-species: *Sakagutia marina* S. UÉNO, sp. nov.

Winged. Body elongate and flat; surface impunctate, glabrous and shiny.

Head large and wide, frontal furrows evident, nearly parallel or slightly converging anteriorly and extending a little onto clypeus; eyes rather small, consequently genae remarkable, hind supraorbital pore located far behind the level of hind margins of eyes (as in *Limnaeum*); neck wide, not constricted on dorsal surface; labrum transverse, with front margin nearly straight or a little produced at middle according to individuals; mandibles short, wide, and sharply hooked at apices; mentum with a stout simple tooth, submentum with three setae on each side; ligula quadrate, truncated at apex and bisetose, paraglossae narrow, extending beyond ligula; maxillae hooked at apices and each with rather a few bristles on inner margin; palpi stout,

maxillary palpi with penultimate segment pubescent and strongly dilated at apex, apical segment very small, labial palpi similar to maxillaries, but much smaller and with penultimate segment bearing only a few hairs; antennae filiform, long, with segment 2 evidently shorter than segment 3.

Pronotum transverse cordate, contracted behind; both lateral and postangular setae present; front angles produced, hind angles a little obtuse.

Elytra elongate, shoulders distinct though rounded, basal border not angulate at shoulder and reaching stria 5; punctate-striate, striae all entire, becoming a little deeper towards apex, with the exception of striae 6 and 7 which are free at apices, stria 5 deeper than the others, outwardly sinuate at each dorsal pore and continued to apex without special deepening, so that apical striole is not distinguishable, 8 similar to inner ones, scutellar striole long; intervals 4 and 5 remarkably wider than the others; interval 3 with ten (occasionally nine or eleven) dorsal pores on the middle between striae 2 and 3, stria 5 also with ten (occasionally nine or eleven) dorsal pores; series of umbilicate pores composed of eleven, middle ones of which are sparsely ranged.

Ventral surface glabrous; metasternal process bordered; anal sternite with one seta in ♂, two in ♀ on each side. In ♂ protarsi proximal two segments dilated, produced inwardly at apices and furnished beneath with sexual adhesive hairs.

Aedeagus robust, basal orifice open to right face, with right basal lobe reduced; apex narrowly rounded; inner sac armed with well developed copulatory pieces. Styles subequal in length, each provided with four apical setae.

The present new genus is remarkable in the position of the hind supraorbital pore and the chaetotaxy of elytra, and no close ally is known to the writer.

Sakagutia marina S. UENO, sp. nov.

(Figs. 7-8)

Length: 4.9—5.4 mm (from front margin of clypeus to anal end).

Body elongate and flat. Shiny black with very weak aeneous tinge, epipleura and apical margin of elytra as well as the median areas of apical sternites brownish; labial palpi, segment 1 and basal parts of segments 2 and 3 of antennae as well as legs brown to dark brown.

Head large and wide, with wide, moderately deep but rather short frontal furrows; eyes rather flat, genae conspicuous, supraorbital area hardly prominent, not forming supraorbital carina; microsculpture consisted of isodiametric meshes but indistinct on vertex; antennae long, reaching basal one-third of elytra.

Pronotum transverse cordate, moderately convex, about 1.2 times wider than head (a little narrower in ♀ than in ♂), about 1.3 times wider than long, widest at about apical one-third; sides weakly rounded in front and strongly sinuate behind, side-gutter wide but becoming very narrow behind basal sinuation of side-border; apex slightly emarginate, base narrower than apex, its sides oblique and slightly

emarginate; front angles well projected forwards and narrowly rounded at their tips, hind angles nearly rectangular or a little obtuse according to individuals, each with only a trace of carina; median line very deep, reaching neither apex nor base, both front and basal transverse impressions deep, the latter a little uneven, basal foveae large and deep, a few transverse striations present in anterior part of these foveae; microsculpture formed by isodiametric meshes though indistinct on disk.

Elytra elongate, with nearly parallel sides, very flat on disk though well convex at sides, 1.3–1.4 times wider than pronotum according to individuals (a little wider in ♀ than in ♂), about 1.8 times longer than wide; sides slightly emarginate at about two-sevenths from base and at a portion near apex, which is widely rounded; striae deep, rather finely but distinctly punctate, striae 3 and 4 frequently joined together at apex, 6 and 7 shallower than the others; intervals moderately convex, intervals 4 and 5 very wide, the latter suddenly narrowing just behind shoulder so that interval 6 widened there; microsculpture isodiametric throughout.

Male genital organ well chitinized. Aedeagus robust, tapering towards apex, moderately arcuate near base, more strongly near apex, which is produced into rounded end; a band of pubescence present at the proximal end of apical orifice. Copulatory pieces complicated as shown in figure; they are separated as follows: dorsal twisted whip-shaped piece which is flattened at apex, a bundle of fibres beneath the basal part of dorsal whip, and four smaller and lamellar pieces surrounding this bundle of fibres. Dorsal angle of left style distinct but not hooked.

Holotype: ♂, allotype: ♀, Kuno, Shizuoka Pref., Pacific coast of Honshu, 5–III–1939, collected by S. SUZUKI.

Paratypes: 2 ♂♂, 1 ♀, Kuno, Shizuoka Pref., 5–III–1939, by S. SUZUKI; 1 ♀, Shimizu, Shizuoka Pref., —III–1939, by S. SUZUKI; 1 ♂, Sakai-Minato, Osaka Pref., Honshu, 9–IV–1940, by Y. YANO; 2 ♂♂, Kanayama near Shirahama, Wakayama Pref., Honshu, 28–VII–1941, by K. SAKAGUTI; 1 ♀, Tarumi, west of Kobe, Honshu, 2–IV–1940, by K. KUROSA.

The type-specimens are deposited in the collections of S. UÉNO, K. SAKAGUTI and K. KUROSA.

This interesting new species inhabits the intertidal zone of sandy shore on the Pacific coast in Honshu, and dwells under stones or refuses drifted up by the tide.

Genus *Armatocillen* DUPUIS

*Cillen*us, subgen. *Armatocillen*us DUPUIS, 1912, Ann. Soc. ent. Belg., 56: 334; type-species: *Cillen*us *formosanus* DUPUIS, 1912.

Bembidion, subgen. *Armatocillen*us, ANDREWES, 1938, Proc. R. Ent. Soc. London, (B), 7: 191. —NETOLITZKY, 1942, Koleopt. Rdsch., 28: 38, 68.

Subgen. *Novicillen*us S. UÉNO et HABU, nov.; type-species: *Armatocillen*us *aestuarii* S. UÉNO et HABU, sp. nov.

Subgen. *Desarmatocillen*us NETOLITZKY, 1942, Koleopt. Rdsch., 28: 39, 68; type-species: *Cillen*us *yokohamae* H. W. BATES, 1883.

Subgen. *Corallicillen*us S. UÉNO, nov.; type-species: *Armatocillen*us *tsutsuii* S. UÉNO, sp. nov.*

* The description of this new species will be given on pp. 406–408 of this journal.

In 1912 DUPUIS described an interesting Bembidiid-species, *Cillenus formosanus*, collected by SAUTER at Anping in Formosa, for which he established at that time the subgenus *Armatocillen*. It was described based on a single specimen which seemed to be immature. Later, CSIKI (1928, p. 131) placed it under the genus *Bembidion* (s. lat.). ANDREWES (1938, loc. cit.) and NETOLITZKY (1942, loc. cit.) followed his opinion. *Armatocillen* has since been regarded as a subgenus of *Bembidion*.

In the Japanese fauna, *Cillenus yokohamae* H. W. BATES is only a species hitherto known to belong to the *Cillen*-group. CSIKI (1928, p. 131), ANDREWES (1938, p. 193) and JEANNEL (1941, p. 450) considered that the species should belong to *Cillen*. This seems not to be justifiable, and, moreover, the last named author has quite misunderstood the species. *Cillenus yokohamae* does not agree with the diagnosis of his "série phylétique de *Cillen*" in many respects, viz. the structure of the basal border of the elytra, the chaetotaxy, etc. A year later, NETOLITZKY (1942, loc. cit.) settled this species in a new subgenus *Desarmatocillen* though he did not try to divide the artificial genus *Bembidion* into more natural genera.

The writer has recently obtained two new species belonging to the same group. After a careful study on these material it becomes clear that all the Japanese species are not the close relatives of the European *Cillenus lateralis* and must form a special group. Three subgeneric names are given for the oriental species, i. e., *Chinocillen*, *Armatocillen* and *Desarmatocillen*. The first is evidently different with generic rank from the Japanese species. Of the remaining two, the second name is older than the third. However, there is a question not yet solved whether or not *Armatocillen* and *Desarmatocillen* really belong to the same group. The difference in chaetotaxy between these two groups seems to be important, i. e., that in number of the elytral dorsal pores and of the pores on the anal sternite. So long as it is, DUPUIS' original description is still insufficient to decide the matter. So, the writer will treat here the Japanese representatives as the members of *Armatocillen*, the subject being remained in the future.

The Japanese species of the genus *Armatocillen* are defined as to have the following combination of morphological features:

Body elongate; surface impunctate and glabrous, with more or less distinct isodiametric microsculpture; metathoracic membraneous wings well developed or rudimentary. Colour variable.

Head large and wide, surface rather flat, with distinct, wide and parallel frontal furrows which are extending anteriorly onto clypeus; neck wide, not constricted; labrum transverse; mandibles remarkably long, stout and hooked at apices; mentum with a simple tooth, submentum with three setae on each side; ligula quadrate, bisetose, with apical margin truncated or slightly arcuate, paraglossae, narrow, extending a little beyond ligula; maxillae with rather a few bristles on inner margin; palpi long, apical segments very small and subulate, penultimate segments elongate,

each of them dilated towards apex and sparsely pubescent; antennae stout, filiform to submoniliform, segment 2 subequal to or a little shorter than segment 3.

Pronotum subcordate; sides bordered and more or less reflexed, both lateral and postangular setae present; front angles produced forwards, hind angles rectangular or sharp; median line distinct, not reaching both apical and basal borders, basal foveae and basal sulcus deep, impunctate.

Elytra elongate, border angulate at shoulder and extending inwards to stria 5 or a little beyond it; striae all distinct, impunctate; interval 3 with two dorsal pores close to or nearly adjoining stria 3, apical pores adjoining apical striole which merges anteriorly into stria 5; series of umbilicate pores 4+2+2, posthumeral group nearly regular.

Ventral surface impunctate and without pubescence; metasternal process not bordered; anal sternite with two setae on each side in the two sexes.

Legs stout; protarsi with proximal two segments dilated, inwardly produced at apices and furnished beneath with sexual adhesive hairs in ♂.

Male genital organ well chitinized. Aedeagus elongate, twisted with apex strongly bending to right side; basal orifice widely open to right face, right basal lobe produced; apex widely rounded; copulatory pieces small, consisted of the bundles of fibres and bristles. Styles unequal in length, left style more or less longer than right one, each provided with one or two setae at apex.

The species belonging to this genus are usually of marine dwellers and inhabit the intertidal zone on the Pacific coast.

Key to the subgenera

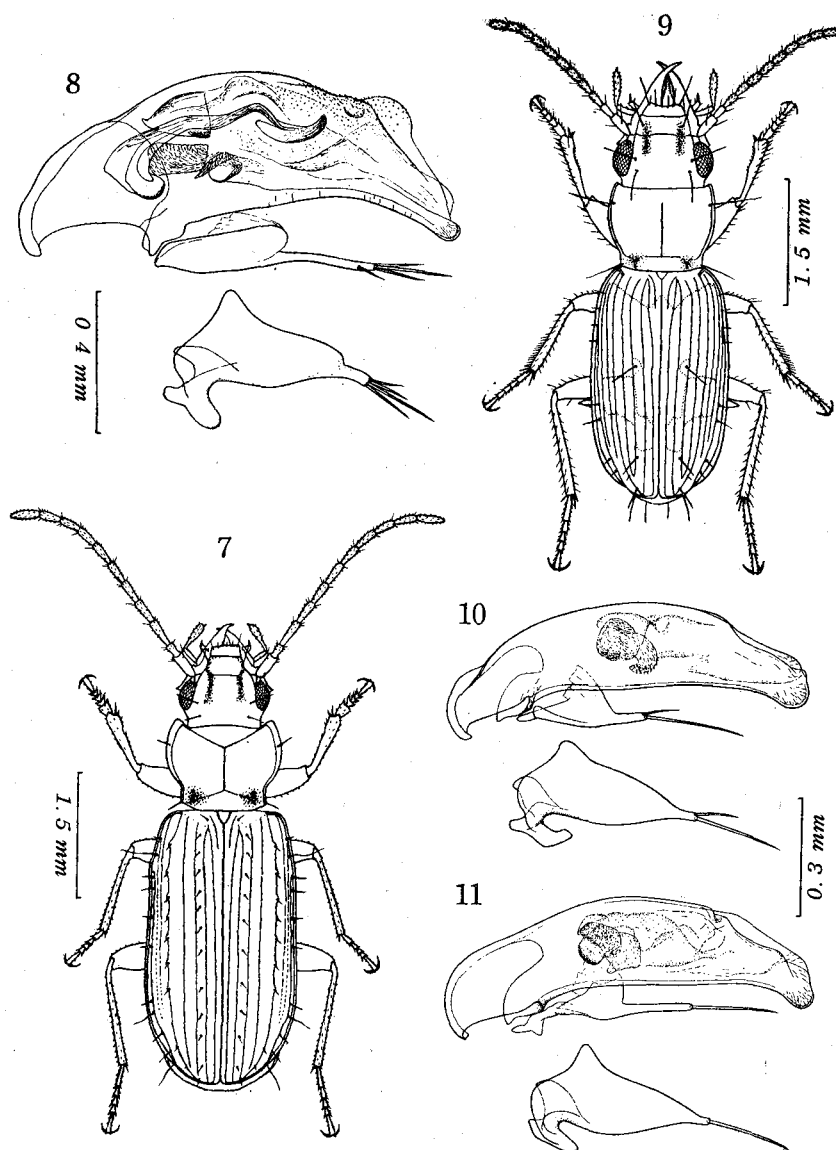
- 1 (2) Metatrochanters long, about two-thirds as long as metafemora, and tapering to an acute point at the extremity; metathoracic wings present; side-gutter of pronotum becoming shallower in front, elytral striae 6 and 7 normal; styles each with two apical setae...
..... *Novicillenus* nov.
- 2 (1) Metatrochanters normal, less than a half as long as metafemora, and each rounded at apex.
- 3 (4) Metathoracic wings present; elytral striae 6 and 7 normal, not abbreviated, side-gutter of pronotum becoming shallower in front; styles each with a single apical seta
..... *Desarmatocillenus* NETOLITZKY.
- 4 (3) Metathoracic wings atrophied; elytral striae 6 and 7 interrupted at about middle, interval 5 widening out from there and forming outside a remarkable carina, which is composed of the merging apical half of intervals 6, 7 and 8; sides of pronotum so strongly reflexed throughout that side-gutter on each side deep even in front; styles each with two apical setae *Coralicillenus* nov.

Armatocillenus (*Novicillenus* nov.) *aestuarii* S. UENO et HABU, sp. nov.

(Figs. 9-10)

Length: 3.9-4.7 mm (from front margin of clypeus to anal end).

Winged. Body elongate. Shiny black with brownish fundamental tone, head



- Fig. 7. *Sakagutia marina* S. UÉNO, gen. et sp. nov., ♂ of Sakai-Minato.
 Fig. 8. Male genital organ of same species, left lateral view, with left style removed.
 Fig. 9. *Armatocillenus aestuarii* S. UÉNO et HABU, sp. nov., ♀, of the Shin-Yodogawa River.
 Fig. 10. Male genital organ of same species, left lateral view, with left style removed.
 Fig. 11. Male genital organ of *Armatocillenus yokohamae* (H. W. BATES), of the Shin-Yodogawa River; left lateral view, with left style removed.

and pronotum with strong aeneous tinge, sternites, especially median areas brownish; propleura and elytra brownish yellow with very weak olivaceous tinge, the latter with dark patterns more or less well developed; these patterns on elytra vary in shape and extent according to individuals: in lighter individuals, they are reduced to three parts, *viz.* basal area, small spot surrounding front dorsal pore, and a somewhat comma-shaped spot lying obliquely at apical one-third on each elytron, while, in darker ones, apical comma-shaped spot on each elytron extends inwardly and approaches as to form a large rhomboidal spot on suture; clypeus and mandibles dark brown; palpi, proximal four segments of antennae (rest fuscous), and legs pale brownish yellow.

Head very large and wide, surface flat, with wide and parallel frontal furrows extending onto clypeus; eyes prominent, genae indistinct; neck very wide, not constricted; labrum short and transverse, frequently asymmetric; well developed isodiametric microsculpture present on whole surface; mandibles remarkably long, stout, hooked at apices; antennae subfiliform, rather short, extending a little beyond the base of elytra, apical segments ovaler than proximal ones.

Pronotum transverse subcordate, contracted behind, moderately convex; a little wider than head, about 1.3 times wider than long, widest at about apical one-fourth; sides slightly rounded in front, moderately sinuate behind, lateral seta inserted at about apical one-fifth; front angles projected forwards though rounded at the extremities, hind angles nearly rectangular or a little obtuse according to individuals; base distinctly narrower than apex, obliquely and slightly emarginate on each side; median line distinct, front transverse impression shallow, basal transverse sulcus deep, basal foveae large and deep; microsculpture consisted of well marked isodiametric meshes, which are rather faint on disk.

Elytra elongate, convex, about 1.3 times wider than pronotum, about 1.8 times longer than wide; sides nearly parallel or slightly rounded according to individuals, slightly emarginate before apex, posthumeral border oblique; striae deep, impunctate, outer striae deeper than inner ones; intervals slightly convex or rather flat near suture, well convex near sides; interval 3 with two dorsal pores close to stria 3 at about three-sevenths and four-fifths from base respectively; microsculpture constructed by well marked isodiametric meshes.

Apices of metatrochanters visible from above.

Aedeagus elongate, bending ventrally before apex which is widely rounded; ventral side slightly convex before middle. Left style evidently longer than right.

Holotype: ♂, allotype: ♀, the Shin-Yodogawa River by Jûsô in Osaka, Honshu, 9—V—1949, collected by S. UÉNO.

Paratypes: 1 ♂, 3 ♀♀, the Shin-Yodogawa River by Tsukamoto in Osaka, 5—VII—1945, by S. UÉNO; 7 ♂♂, 14 ♀♀, the Shin-Yodogawa River by Jûsô in Osaka, 5—VI—1947, by S. UÉNO; 1 ♂, from the same locality, 9—V—1949, by S. UÉNO; 1 ♀, Fukuoka, Kyushu, 11—VI—1953, by Y. MURAKAMI.

The type-specimens are deposited in the collections of S. UÉNO and A. HABU,

This is a remarkable new species which seems to the writers to be allied to *A. albertisi* (PUTZEYS) known from New Guinea (ANDREWES, 1938, p. 192), but may be distinguishable at first sight by the coloration.

In the Shin-Yodogawa River it dwells below the high-water mark near the estuary, associated with *Armatocillen* *yokohamae*, *Peryphus semiluitus* and *P. aureofuscus*. When the tide is on the flow, they seek shelter under stones or in the hollows of other invertebrate animals, or burrow the sand, and rest till the next ebb. A specimen from Fukuoka was caught at a light-trap.

Armatocillen (*Desarmatocillen*) *yokohamae* (H. W. BATES)

(Fig. 11)

Cillen *yokohamae* H. W. BATES, 1883, Trans. Ent. Soc. London, 268; type-locality: Kawasaki, near Yokohama.

Bembidion (*Cillen*) *yokohamae*, ANDREWES, 1938, Proc. R. Ent. Soc. London, (B), 7: 193.

Bembidion (*Desarmatocillen*) *yokohamae*, NETOLITZKY, 1942, Koleopt. Rdsch., 28: 39, 68.

Bembidion yokohamae, HABU, 1950, Iconog. Ins. Jap., ed. 2, 964, fig. 2744.

The excellent redescriptions of this interesting species have been given by ANDREWES and HABU, but the structure of its male genital organ must be added.

Aedeagus similar in structure to that of *A. aestuarii*, but relatively a little more elongate, with apex rather narrowly rounded and bending more strongly. Right style comparatively long, though obviously shorter than left, with long apical prolongation.

This species spreads over the Pacific coast of southern Japan and inhabits the intertidal zone, especially of sandy beaches of brackish water areas. It is often obtained at estuaries, where it feeds upon small larvae of flies or, perhaps, larvae of the other beetles which are found in the same habitat.

The writer has examined the specimens from the following localities:

Honshu: the estuary of the Arakawa River, Tokyo; Hiratsuka, Kanagawa Pref.; the Setogawa River and Numazu, Shizuoka Pref.; the Shin-Yodogawa River and Hamadera, Osaka.

Shikoku: the estuary of the Yoshinogawa River, Tokushima Pref.; the estuary of the Niyodogawa River, Kôchi Pref.

Kyushu: Saéki, Ôita Pref.

The male genital organ was examined in the specimens from the Shin-Yodogawa, the Niyodogawa and Saéki.

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