

First Record of the Genus *Horaeomorphus* Schaufuss (Coleoptera, Scydmaenidae) from Japan, with Description of a New Species

Paweł Jąloszyński

Wieniecka 30/105 87–800 Włocławek, Poland

e-mail: japawel@man.poznan.pl

Abstract *Horaeomorphus sakishimanus* sp. nov. (Coleoptera, Scydmaenidae) from the Sakishima Archipelago, Okinawa Pref., Japan, is described. This species represents the first *Horaeomorphus* known from Japan. Morphological characters are illustrated, including mouthparts and male and female genitalia, and a key to the Scydmaenidae genera of Japan is provided.

Key words: Coleoptera, Scydmaenidae, *Horaeomorphus* Schaufuss, new species, Japan, Okinawa Prefecture.

Introduction

The genus *Horaeomorphus* Schaufuss belongs to the tribe Cyrtoscydmini within the subfamily Scydmaeninae. According to Newton and Franz (1998), the genus comprises 55 species distributed in South-east Asia, Australia, New Caledonia, Madagascar and Mauritius. Only two species have been described from eastern Asia, *H. chinensis* Franz, 1985 and *H. taiwanensis* Franz, 1985, from Mainland China and Taiwan, respectively. Thanks to the kindness of Dr. Shûhei Nomura, I had the opportunity to examine Scydmaenidae preserved in the collection of the National Science Museum, Tokyo. I have found five specimens representing a new species of *Horaeomorphus* Schaufuss. The material had been collected in Iriomote Is. and Ishigaki Is. belonging to the Sakishima Archipelago, Okinawa Prefecture, Japan. Thus, the new species described herein, under the name *Horaeomorphus sakishimanus* sp. nov., represents the first *Horaeomorphus* known from the Japanese Islands.

Genus *Horaeomorphus* Schaufuss

Horaeomorphus Schaufuss, 1889, p. 21. Type species: *Horaeomorphus eumicroides* Schaufuss, by original designation.

The following combination of characteristics

can be used to identify members of the genus *Horaeomorphus*: body slender, elongate, moderately convex; head small (sometimes strikingly small), supraantennal area elevated or flat, vertex without pits, or with one or (more often) a pair of foveae; eyes distant from anterior margin of pronotum; tempora long, rounded; neck broad; antennae composed of 11 segments, without distinct club, gradually thickened toward apex, first antennomere short, without an apical notch, last antennomere large, clearly separated from the preceding segment; maxillary palpomere III large, elongate, truncated at apex, palpomere IV very small, but clearly visible, elongate, slender and pointed at apex; pronotum oval or heart-shaped, usually longer than broad, widest in the anterior half or near middle, sometimes constricted in its hind part, anterior margin rounded, sides narrowing toward base, hind angles marked, pronotum without sharp edges or lateral carinae, with a row of variable number of basal foveae usually connected by a transversal groove; mesosternal process narrow and moderately high; elytra oval, completely covering pygidium, weakly depressed at base, without basal foveae, usually with indistinct humeri and without humeral carina; mesocoxae separated by narrow mesosternal process; metacoxae weakly separated; femora clavate, in some cases various parts of legs modi-

fied in males. Aedeagus similar to that of *Syndicus* Motschulsky, with symmetrical parameres and various in shape, usually dark and well sclerotized, more or less complicated armature of internal sac. Females with well sclerotized, ovoid spermatheca and elongate bursa copulatrix; ovipositor with long coxites.

Franz (1971) established a new subgenus, *Pseudosyndicus*, for a single species from Nepal, *Horaeomorphus nepalensis* Franz, which, in general, has an appearance closely resembling members of the genus *Syndicus* Motschulsky. According to the original description (Franz, 1971), this subgenus can be distinguished from *Horaeomorphus* s. str. by having a clearly transversal head with a pair of pits on the vertex, and also by an elongate body form. However, the habitus illustration shows a nearly isodiametric head. So, it seems that head proportions used by Franz refer rather to the vertex, which is indeed clearly transversal in this species. Earlier, Franz redescribed a type species of *Horaeomorphus*, *H. eumicroides* Schaufuss, 1889, and this species possesses a pair of pits on its vertex. Moreover, Franz (1985) later classified *H. chinensis* Franz as a member of *Horaeomorphus* s. str., and this species also has a pair of pits on the vertex. The majority of species described later have not been assigned to a subgenus (Franz, 1975, 1986b; Newton & Franz, 1998). The remaining subgeneric characteristics (transversal vertex and elongate body form) seem to be of little use in the taxonomical classification of Cyrtoscydmini. Therefore, the subgeneric classification of *Horaeomorphus* remains unclear, and the new species described in the present paper has not been assigned to a subgenus.

Remarks: Asiatic members of the genus *Horaeomorphus* Schaufuss are very similar to the genera *Stenichnus* Thomson and *Syndicus* Motschulsky. In the original description of *Horaeomorphus eumicroides* Schaufuss, its body shape is described as “syndyciforme” (Schaufuss, 1889). *Horaeomorphus* Schaufuss can be distinguished from *Stenichnus* Thomson by lack of basal pits on the elytra, more slender body form and in some cases by the vertex with a pair

of foveae or a single medial pit; and from *Syndicus* Motschulsky by possessing antennomere XI large and clearly separated from X. Members of *Stenichnus* have two basal foveae on the elytra (sometimes fused) and the head always without foveae; in *Syndicus* antennomere XI is much smaller than X and sits tight on its apex without an interspace, so that the antennae appear to be composed of 10 segments. Other similar genera are: *Allohoraeomorphus* Franz (from Fiji) having a very low mesosternal process, deeply sunk between the coxae (Franz, 1986a); *Anhoraeomorphus* Franz (from Madagascar) with a distinct antennal club composed of segments VII–XI and with a transversal groove between frons and vertex (Franz, 1986b); *Loeblites* Franz (from Thailand and Sabah) possessing very slender antennae, not thickened towards the apex (Franz, 1986c, 1992); and *Syndicomorphus* Franz (from Sabah) which is unique in having clearly 10-segmented antennae (Franz, 1992).

Schaufuss derived the genus name from the greek word “ὠραιομόρφος” (oraiomorfos); “ὠραίοζ” (oraios) meaning “beautiful”, and “μορφή” (morfi) meaning “shape”.

Horaeomorphus sakishimanus sp. nov.

(Figs. 1; 2 A–G; 3 A–F)

Diagnosis. *Horaeomorphus sakishimanus* sp. nov. is unique among east Asiatic members of the genus by having very scarce and shallow punctuation of pronotum and elytra and modified metatrochanters in males. The distal part of the trochanter protrudes and forms a slender, curved process, as long as half of the metafemur.

Description. Body slender, uniformly brown, setation golden, moderately dense, suberect.

Male (Fig. 1). Body length 2.8–2.95 mm (mean: 2.875 mm). Head: Head 0.45–0.5 mm long (mean: 0.475 mm), 0.55–0.6 mm wide (mean: 0.575 mm), widest at eyes, nearly pentagonal in shape, vertex 2× as wide as long, with a shallow, subtriangular depression at posterior margin and with a pair of shallow pits located behind distinct supraantennal elevations, distance

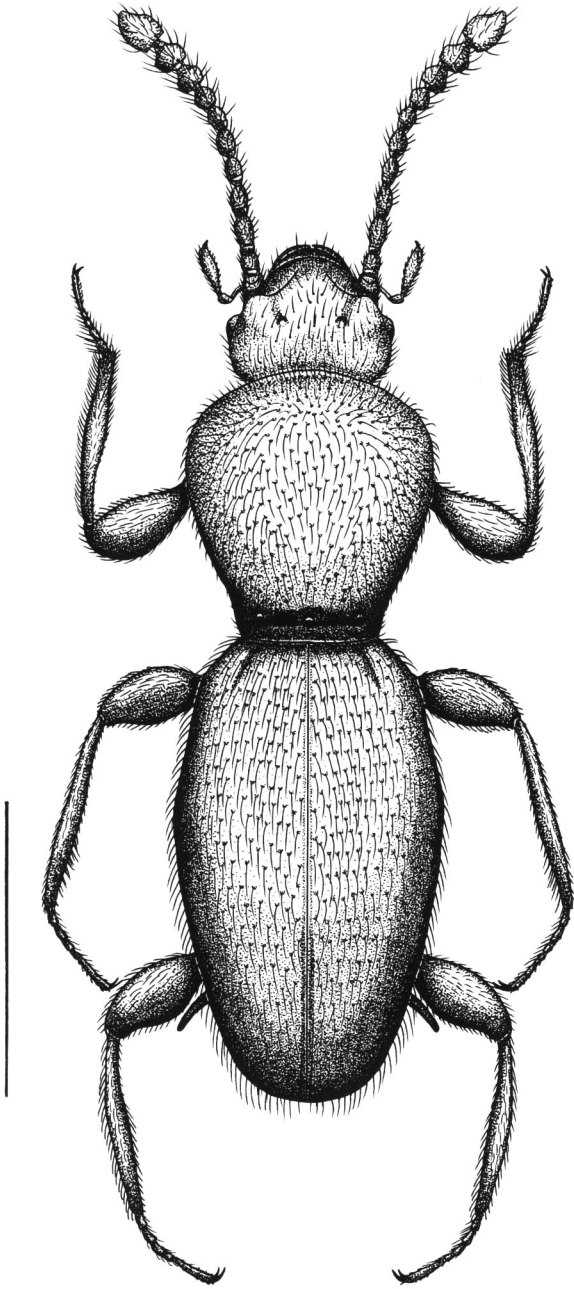


Fig. 1. *Horaeomorphus sakishimanus* sp. nov., male habitus. Scale: 1 mm.

between the pits nearly equal to $\frac{1}{3}$ width of vertex; occiput sharply constricted from vertex, nearly half as wide as head width; tempora as long as eye length, rounded; compound eyes large, nearly semicircular, transversal to the long axis of head, with posterior margin slightly emar-

ginate. Frontoclypeal region broad, convex, antennal insertions located in deep, broad excavations medial to eyes. Antennae (Fig. 2E) relatively short, gradually thickened toward apex, without a distinct club, length nearly equal to the combined length of head and pronotum. Anten-

nal segment I cylindrical, elongate, twice as long as wide, its upper apical margin broadly emarginated. Segments II–VI subcylindrical, with separated, inversely conical basal part, from segment VII this part forms a distinct ring at the base of each next segment, and in the remaining apical segments present as a sharp edge at their bases. Segment II narrower than I, $1.5\times$ as long as wide, III slightly expanded toward apex, nearly $2\times$ as long as wide, IV shorter than III, $1\frac{1}{3}\times$ as long as wide, V slightly shorter than IV, VI as long as II, VII only slightly longer than wide, distinctly broader than VI, with conical apical part, segments VIII–X similar in shape to VII, gradually larger, with basal ring or edge and conical apical part, XI segment conical, $1.5\times$ as long as base width, slightly asymmetrical. Head covered with thin, sparse suberect setae, setation on tempora directed toward eyes, all antennal segments with long, suberect and erect setae, last segments (especially IX–XI) additionally with dense, suberect setation of moderate length.

Mouthparts: Labrum (Fig. 2A) subrectangular, convex, $2.8\times$ as wide as long, basal margin straight, lateral margins rounded, distal edge broadly emarginate, with a row of dense, short setae in the emargination and a weakly sclerotized marginal velum, with two indistinct, transversal rows of long setae. Mandible (Fig. 2B) subtriangular, base moderately broad, apex recurved with one long, sharp apical tooth and two smaller, triangular subapical teeth, protheca convex, with short setae from near base of subapical tooth to near base of mandible. Maxilla (Fig. 2C) with moderately small, triangular stipes with two setae; palpifer subtriangular, elongate, with three short setae on internal margin; lacinia elongate, with a long seta near apex; maxillary palpus enlarged, palpomere I small, twice as long as wide; palpomere II long, slender, pipe-shaped, with expanded and truncate apical part, $3\times$ as long as width of slant, apical margin, covered with moderately dense, short and long suberect setae, except for naked basal part; palpomere III elongate, with slender basal part, expanded in distal $\frac{2}{3}$, slightly narrowed toward truncate apex,

covered with long and short suberect setae; palpomere IV very small, conical, pointed at apex, nearly $2.5\times$ as long as wide at base, with moderately long setation. Labium (Fig. 2D) with rectangular, transverse mentum covered with sparse short setae, width $1\frac{1}{3}\times$ length; palpomere I subconical, expanded toward apex, without setation, length nearly $2\times$ width; palpomere II slightly shorter and narrower than I, subcylindrical, with sparse erect setae; palpomere III elongate, slender, shorter than II, length nearly $5\times$ width at base, apex pointed.

Pronotum: Pronotum slightly longer than wide (length: 0.875–0.9 mm, mean: 0.89 mm; largest width: 0.725–0.78 mm, mean: 0.75 mm; width at base: 0.475–0.5 mm, mean: 0.49 mm) widest at anterior $\frac{1}{3}$, heart-shaped, anterior margin broadly rounded, lateral margins without edges or carinae, distinctly rounded dorsoventrally and anteroposteriorly, without anterior angles, posterior angles marked, hind part of pronotum constricted, base with a row of three moderately deep pits connected by a transversal groove, lateral pits located closer to sides of pronotum than to medial pit. Indistinct, additional pits present between lateral and mediobasal pits in the holotype, in paratypes additional pits absent. Discal part of pronotum with scarce, shallow points, distances between points much longer than diameters of individual points, setation long, suberect, directed toward base.

Elytra: Elytra entire, elongate, as convex as pronotum, slightly flattened in middle, length 1.4–1.475 mm (mean: 1.44 mm), combined width 0.925–0.95 mm (mean: 0.94 mm), widest just posterior to middle, base as wide as posterior of pronotum, with very short and relatively shallow basal depression, basal foveae lacking, humeri moderately distinct, apex broadly rounded. Elytral punctuation scarce, individual points larger than on pronotum, distances between points much longer than point diameters, setation slightly shorter than on pronotum, setae suberect, directed backwards. Hindwings fully developed.

Legs: Legs moderately long, procoxae contiguous, subconical, relatively large; mesocoxae sep-

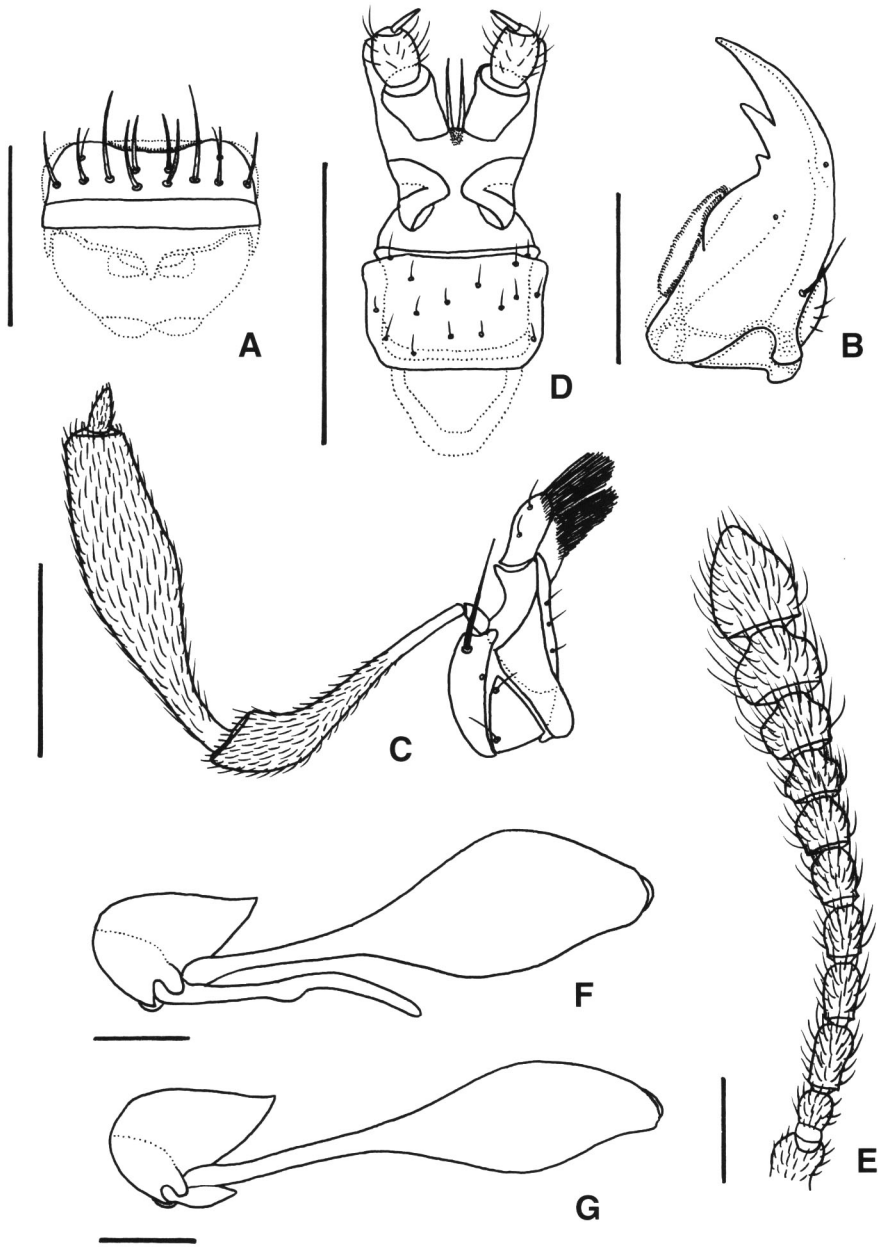


Fig. 2. *Horaeomorphus sakishimanus* sp. nov.; labrum, dorsal view (A); right mandible, dorsal view (B); right maxilla, ventral view (C); labium, ventral view (D); left antenna (E); right coxa, trochanter and femur of male, ventral view (F); ditto, female (G). Scale: 0.2 mm.

arated with a narrow and low mesosternal process, elongate; metacoxae weakly separated, transversal. Pro- and mesotrochanters clearly longer than wide, metatrochanters (Fig. 2F) modified, with distal part protruded, as long as half of

the metafemur, slender, with a swelling at middle and curved backwards in the apical half, apex rounded. All femora clavate, with slender basal half and expanded distal part; tibiae slender, narrow at base and near apex, widest in middle part,

slightly curved, pro- and mesotibiae with dense setal patch along distal $\frac{1}{3}$. Tarsi relatively long, slender, tarsomeres I–IV decreasing in length and width, tarsomere V elongate, nearly as long as 3 preceding segments. Protarsi with long, erect setae on tarsomeres I–IV.

Abdominal sternites: Ventral, visible part of abdomen very short, as long as metasternum, sternites III–VI subequal in length, individual lengths of sternites VII–VIII 1.5× length of VI, sutures between sternites slightly arcuate; last visible sternite subtriangular.

Male genitalia: Aedeagus (Fig. 3A–C) elongate, 2× as long as wide, widest at middle. Median lobe ovoid, bulbous, basal part (from base of aedeagus to base of parameres) trapezoidal, ventral opening hardly visible, small, located near base of parameres, ovoid; dorsal opening large, ovoid. Apical part of aedeagus weakly separated from median lobe, narrowing toward apex; apex wide, triangular; ventral plate in side view slightly curved backwards in apical part. Endophallus with symmetrical, strongly sclerotized, complicated armature composed of medial, subquadrate part and paired, subtriangular, longitudinal processes protruding from its apical part toward apex of aedeagus; medial part surrounded at both sides by C-shaped sclerites with their convex parts directed externally, bifurcate in basal end; subapical part of aedeagus with weakly sclerotized, paired, slightly curved and elongate elements; aedeagus with indistinct medial, longitudinal duct. Parameres present, elongate, slender, weakly curved, exceeding apex of aedeagus, with several short apical setae. Male genital segment (Fig. 3D) composed of triangular sternite IX with setose apex, IX tergite with elongate, subtriangular lateral parts, and small X tergite with broadly emarginate hind margin.

Female. Body length 2.65–2.75 mm (mean: 2.7 mm), width 0.825 mm. Slightly smaller and more slender than male, femora less clavate, hind trochanters (Fig. 2G) not modified.

Female genitalia: Ovipositor (Fig. 3E) slightly sclerotized, paired valvifers in ventral view subtriangular, anterior parts elongate, posterior parts

expanded; coxites long, slender and slightly curved, length nearly 5× width, apex rounded, distal $\frac{1}{3}$ with short and moderately dense setae. Spermatheca (Fig. 3F) ovoid, length 0.11 mm, width 0.08 mm, with spherical accessory gland connected to spermatheca with short and thin duct, spermathecal duct very thin, as long as half of abdomen, near its connection to bursa copulatrix the duct forms elongate spiral; bursa copulatrix well sclerotized, with elongate, ovoid vesicle connected to spermathecal duct and to long and thin distal duct on the opposite side.

Distribution. Sakishima Archipelago, Okinawa Prefecture, Japan.

Holotype: ♂, Mt. Omotodake, Ishigaki Is., Sakishima Archipelago, Okinawa Pref., 16 v 1988, Y. Takematsu leg. *Paratypes:* 1 ♀, same data as holotype; 2 ♂♂, 1 ♀, Gunkan-Iwa, Iriomote Is., Sakishima Archipelago, Okinawa Pref., 4 v 1995 (date when rotten wood was collected, beetles found in the wood in Sept., 1995), Hiromu Kamezawa leg. (labels typed in Japanese). Type material is deposited in the National Science Museum, Tokyo, except for a single paratype (male), which remains in the author's private collection.

Etymology. Locotypical, after the Sakishima Archipelago, where the type material has been collected.

Remarks. Specimens of the new species have been collected on Iriomote Is. and Ishigaki Is., Okinawa Pref. Both the islands belong to the Sakishima Archipelago, the southernmost part of the Japanese Islands, distant from mainland Japan, about 200 km east of Taiwan, and about 100 km north of the Tropic of Cancer. *Horaeomorphus sakishimanus* sp. nov. is the first scydmaenid reported from this distant group of subtropical islands.

Two species of *Horaeomorphus* have been described from eastern Asia: *H. chinensis* Franz, 1985 and *H. taiwanensis* Franz, 1985, both species described on the basis of single females (Franz, 1985; O'Keefe & Ke, 1998). According to the original description, *Horaeomorphus chinensis* Franz is characteristic by having the

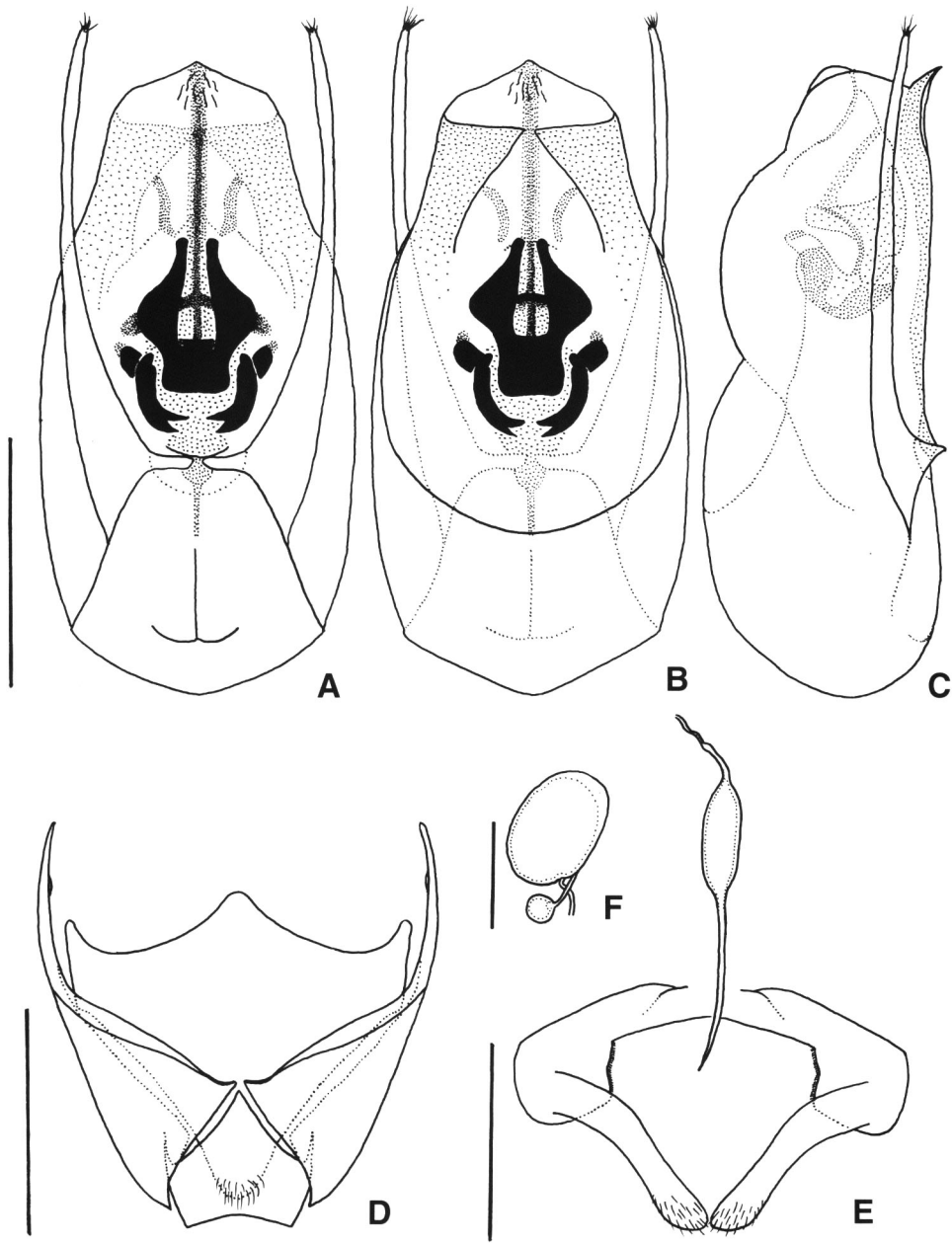


Fig. 3. Genitalia of *Horaeomorphus sakishimanus* sp. nov.; aedeagus in ventral (A), dorsal (B) and lateral view (C); genital abdominal segment of male in dorsal view (D); ovipositor and bursa copulatrix in dorsal view (E); spermatheca with accessory gland (F). Scale: 0.2 mm for A–E; 0.1 mm for F.

pronotum with five basal foveae and a very densely punctate elytra, individual points being much larger than distances between them (in oryg.: “Flügel (...) grob und gedrängt puntiert, die Zwischenräume viel schmäler als der

Durchmesser der Punkte”, Franz, 1985). *Horaeomorphus sakishimanus* n. sp. has the pronotum with 3 basal foveae and points on the elytra are much smaller than distances between them, both in males and females. *Horaeomorphus taiwanen-*

sis Franz can be easily distinguished from all southern and eastern Asiatic species by having a single, deep medial pit on the vertex (Franz, 1985). *Horaeomorphus sakishimanus* n. sp. bears two shallow pits on the vertex, both in males and females.

The modified hind trochanters in male has been used as a unique feature to establish a new subgenus of the genus *Syndicus* Motschulsky. *Syndicus (Androsyndicus) calcalifer* Franz, 1971 from Sri Lanka is unique in having metatrochanters with a protruded apical part, forming a long, recurved process as long as a half of metafemur (Franz, 1971). A similar modification of metatrochanters is also known in males of *Allohoreomorphus calcarifer* Franz, 1986 from Fiji Is. In *Horaeomorphus* similar modification has been described in males of *H. punctatissimus* Franz from Sabah; this species clearly differs from *Horaeomorphus sakishimanus* n. sp. by having a very dense body punctation composed of large points and a smaller body (Franz, 1992). The function of modified metatrochanters remains unknown.

Remarks on the Scydmaenidae of Japan

The first description of the Scydmaenidae from Japan was made by Sharp (1874; 1886) at the end of the 19th Century (11 species of Cyrtoscydmini and 1 of Cephenniini, from Kyushu and Honshu). A few years later Reitter (1891) gave a brief description of a single *Euconnus* from Japan without a precise localization. Seventy years later Sawada (1962) reported the first Japanese Eutheini from Honshu, and one year later Nakane (1963) described a single *Scydmaenus* from Takara Is. More recently, Franz (1976) described five new species, Hisamatsu (1985) described a new *Veraphis* from Hokkaido, and Kurbatov (1995) gave detailed descriptions of five new Cephenniini from Shikoku and Honshu. All Japanese species are listed in the checklist of Scydmaenidae of eastern Asia provided by O'Keefe and Ke (1998); earlier checklists (Csiki, 1919; Franz, 1976) contain only species known

at that time.

To the present date, 30 species of Scydmaenidae have been described from Japan, all belonging to the subfamily Scydmaeninae: 4 spp. of Eutheini (2 spp. of *Eutheia* Stephens, 1 sp. of *Euthiconus* Reitter and *Veraphis* Casey), 6 spp. of Cephenniini (1 sp. of *Cephennodes* Reitter and 5 spp. of *Chelonoidum* Strand), 13 spp. of Cyrtoscydmini (1 sp. of *Neuraphes* Thomson, *Scydromorphes* Reitter and *Stenichnus* Thomson, 10 spp. of *Euconnus* Thomson) and 7 spp. of Scydmaenini (*Scydmaenus* Latreille). All the species are believed to be endemic to Japan, with a single exception, *Scydmaenus vestitus* (Sharp, 1874), which has been reported to occur in Taiwan (Reitter, 1913). Since the copulatory organ of this species has never been described, the Taiwanese specimens have yet to be verified. Many undescribed species are present in the National Science Museum in Tokyo. In particular, the genus *Euconnus* Thomson is rich in species from all parts of Japan, members of the genus *Scydmaenus* Latreille seem to be rather rare in Honshu but abundant in the southern islands; specimens representing undescribed species of Cephenniini have been collected mainly in mountainous areas throughout the country (unpublished data).

The Japanese members of Scydmaenidae can be classified into genera by means of the following, simplified key:

Key to Tribes and Genera of Scydmaenidae of Japan

1. First antennomere with a notch in its apical part so that antennae can bend upwards; hind trochanters elongate, slender; metepisterna clearly visible, not covered by elytra
..... **Scydmaenini (*Scydmaenus* Latreille)**
- First antennomere sometimes broadly emarginate in apical part but never with a notch; hind trochanters short or moderately elongate; metepisterna covered by elytra2
2. Body stout, neck invisible, head behind eyes not narrowed posteriorly, usually up to the

- hind edge of eyes retracted into pronotum
 **Cephenniini**3
- Body slender, neck visible, head narrowed posteriorly behind eyes; eyes distant from anterior margin of pronotum4
3. Aedeagus with asymmetrical parameres; pronotum often with lateral carinae (at least in hind 1/3)..... **Cephennodes Reitter**
- Aedeagus with symmetrical parameres; pronotum without lateral carinae.....
 **Chelonoidum Strand**
4. Pygidium exposed; IV maxillary palpus small, sometimes hardly visible, broad and short; neck nearly as wide as head
 **Eutheiini**.....5
- Pygidium usually covered by elytra (sometimes apex of pygidium visible); IV maxillary palpus clearly visible, elongate; neck clearly narrower than head
 **Cyrtoscydmini**7
5. Last antennomere asymmetrical, with wide excavation; pronotum with transversal basal groove **Veraphis Casey**
- Last antennomere without excavation; pronotum with basal foveae or/and basal groove.....6
6. Mesosternum flat or only with very low carina **Eutheia Stephens**
- Mesosternum with narrow and high longitudinal process..... **Euthiconus Reitter**
7. Pronotum with distinct lateral edges at least in hind 1/38
- Pronotum without lateral edges.....9
8. Pronotum with short, longitudinal medio-basal carina or transversal basal groove with a gap in the middle, aedeagus without parameres **Neuraphes Thomson**
- Pronotum with complete transversal basal groove, without a gap or carina in middle, aedeagus with parameres.....
 **Scydmoraphes Reitter**
9. Hind coxae broadly separated, antennae gradually thickened towards apex or with a club composed of three or more antennomeres **Euconnus Thomson**
- Hind coxae weakly separated10

10. Body very small, below 0.9 mm, antennal club distinct, composed of three segments.....
 **Microscydmus Saulcy et Croissandeau**
- Body larger, over 1 mm, antennae gradually thickened toward apex, without distinct club .
11
11. Elytra with basal foveae, vertex without pits .
 **Stenichnus Thomson**
- Elytra without basal foveae, vertex sometimes with one or two pits
 **Horaeomorphus Schaufuss**

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