

*Scymnus horishanus* OHTA, 1929 = synonym of *Cryptogonus orbiculus* GYLLENHAL, 1808 (syn. nov.).

To rearrange, the following fifteen species has been recorded from Formosa\*:

*rotundatus*, *fuscatus*, *quadrillum*, *nubilus*, *vilis*, *sodalis*, *contemptus*, *dorcatomoides* (doubtful), *akonis*, *hilaris*, *formosanus*, *hareja*, *quinquepunctatus*, *patagiatus*, *sauteri* and *paranthesis*.

The fact that only one of the five species recorded in the present paper is the species already known from Formosa suggests that many further species will be discovered from the Island.

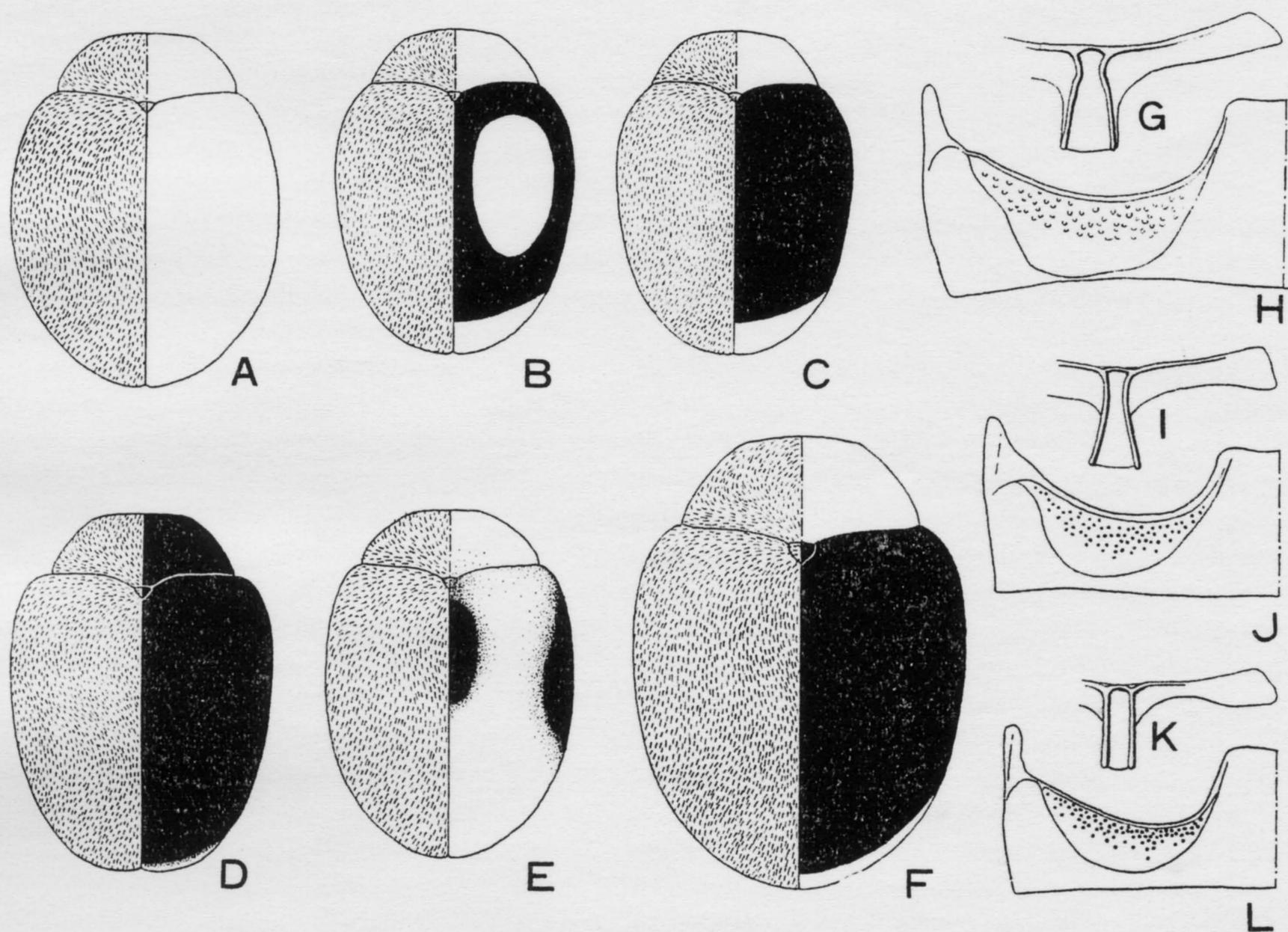


Fig. 1. A~F. Dorsal surfaces, left sides showing the direction of hairs, right sides showing the coloration, each figure is drawn by the same magnifying scale. G, H and K : Prosterna, ventral aspect. H, J and L:Halves of the first abdominal sternum, showing the femoral lines.

A, K, L : *Scymnus (Pullus) takasago*; B, C : *Pseudoscymnus hareja*; D : *Pseudoscymnus kurohime*; E, I, J: *Scymnus (Pullus) centralis*; F, G, H: *Scymnus (Pullus) shirozui*.

*Pseudoscymnus hareja* (WEISE, 1879)

(Fig. 1-B,C)

*Scymnus hareja* WEISE, 1879: Deutsch. Ent. Zeit. 1879: 150 (Japan: Hagi).

*Scymnus hareja*: OHTA, 1929: Ins. Mats. 4(1/2): 11 (Formosa).

*Scymnus (Pullus) hareja*: KURISAKI, 1925: Ins. World 27(14): 14.

\* According to the unpublished opinion by Mr. M. MIYATAKE, the genus *Paraclitostethus* may belong to the tribe Pharini.

*Scymnus (Nephus) hareja*: JACOBSON, 1905: Kaf. Russ. West-Eur.: 976.

*Scymnus (Scymnus) hareja*: MADER, 1955: Ent. Arb. Mus. Frey 6(3): 940.

*Pseudoscymnus hareja*: CHAPIN, 1962: Psyche 69(1): 51.

Distribution: Japan (Hokkaido, Honshu, Shikoku, Kyushu, the Koshiki Is., Yakushima) and Formosa.

Specimens examined: 4 exs., Jitsugetsutan, C. Formosa, 26. vi. 1961, T. SHIRÔZU leg.

*Pseudoscymnus hareja* (WEISE), one of the commonest species in Japan, was originally described from Honshu, Japan. The detailed structures, variability of colour pattern of this species were studied by MIYATAKE (1958) and H. KAMIYA (1961) using the Japanese materials. One of the specimens here studied has coloration allied to the typical form of Japan. While, the other three lack entirely the central marking on the elytron. Despite a long series of the materials of *Pseudoscymnus hareja* of Japan has been examined by the author, there is no specimen which lacks entirely the elytral spot. Sometimes the spots are very small, in such examples the apical red of the elytra is very narrow and the base of the pronotum is broadly dark. On the other hand, in the examples without the elytral spot from Formosa, the apical red of the elytra is normal and the pronotum is entirely reddish, without any dark marking at the base. The Formosan population appears to represent a form different from the nominate race of Japan. But, in spite of the author's examination of the detailed characters such as the punctures, the prosternal carinae, the femoral lines of the first abdominal sternum, the male genitalia, arrangement of the elytral hairs, etc., he could not find any distinct differentiation of the characters except the coloration between the Formosan and the Japanese materials. And, as the colour pattern of the Formosan materials partly overlapped with that of the Japanese materials, the Formosan population can not be treated as a different subspecies from the nominate population of Japan. Additionally, it is interesting that this species has not been discovered from the Ryukyus.

*Pseudoscymnus kurohime* (MIYATAKE, 1959)

(Fig. 1-D)

*Scymnus (Scymnus) kurohime* MIYATAKE, 1959: Mem. Ehime Univ. Sect. VI, 4(2): 136-138, figs. (Okinawa).

*Pseudoscymnus kurohime*: CHAPIN, 1962: Psyche 69(1):51.

Specimen examined: 1 ex., Musha, C. Formosa, 23. vi. 1961, T. SHIRÔZU leg.

Distribution: the Ryukyus (Okinawa, Ishigaki-jima) and Formosa (new record).

This species which was described from the Ryukyus is new to Formosa. It is very characteristic as was described by MIYATAKE (1959) and CHAPIN (1962) separated it from the genus *Scymnus* together with *hareja* WEISE. Indeed, in the structures of the antennae and the tarsi *kurohime* and *hareja*-group (including *seboshii* and *quinquepunctatus*) are very similar to each other, but in the structures of the male and female genitalia they are so different that it seems quite doubtful whether they belong to the same group or not. It seems necessary to study more carefully the problem of the genera and subgenera of the tribe Scymnini.

*Scymnus (Pullus) shirozui* H. KAMIYA, sp. nov.

(Fig. 1-F, G, H; Fig. 2- A, B, C)

Body short oval, relatively large in size, dorsum strongly convex with pubescence. Head, pro-

thorax, legs and abdomen reddish orange; anterior margin of clypeus, mouth parts reddish brown; elytra black with narrow reddish apical margin; scutellum, ventral surface of meso- and metathorax black; lateral and basal portion of the first abdominal sternum blackish.

Head rather narrow, about one-third the maximum width of body, eyes large, frons comparatively narrow, lateral margins of frons weakly and arcuately insides, surface of frons scarcely convex, densely and rather irregularly punctured; clypeus distinctly narrowing apically, marginated, apical margin almost flat.

Pronotum subpentagonal in dorsal aspect, very strongly convergent apically, lateral parts of anterior margin strongly overhung on head, lateral margin slightly arched and marginated, anterior and posterior angles rather distinct, basal margin of pronotum very narrowly and distinctly marginated, each half of basal margin of pronotum bisinuate; surface of pronotum moderately convex. Punctuation of pronotum distinctly finer than that of frons, and at lateral portion strong and dense as same as at frons. Scutellum triangular or subpentagonal, slightly wider than long; latero-posterior margins distinctly swollen; surface of scutellum finely punctured.

Elytra strongly convex, rather short; humeri weakly elevated; elytral base distinctly wider than pronotum, gently and arcuately widening behind and widest at about a third from base of elytra, then smoothly and roundly converging apically, apex of elytra generally round, but each apex of elytron slightly rounded. Apical red margination of elytra very narrow and anteriorly extended along the lateral margins until apical a third of elytra, border between apical red and black ground of elytra rather distinct and smoothly rounded. Punctures of elytra very fine in general and with two pairs of strong punctured striae along the suture at basal half. Elytral hairs rather long and dense, and arranged as shown in fig. 1-F.

Ventral surface rather strongly convex generally; prosternum short, basisternum of prothorax normal, prosternal process rather broad; prosternal carinae broadly separated at posterior part of the process and narrowing anteriorly, carinae at anterior one-fifth characteristic as shown in fig. 1-G.

Femoral line of the first abdominal sternum complete, reaching near posterior margin of the sternum and running along the margin, lateral part of the line strongly bent basally and incurved. Area surrounded by the femoral line trapezoid in form, irregularly punctured at basal half, and entirely smooth at apical half near the line.

Male genitalia: siphon long, basal two-thirds of siphon strongly curved forming three-quarters of a circle; apical a third of siphon nearly straight and narrowing apically; apex of siphon characteristic as shown in fig. 2-A. Outer process of siphonal capsule indistinct and inner one very long. Tegmen dorso-ventrally flatten in general form; median piece of tegmen wide, widest at middle of length, with distinctly pointed tip in ventral aspect. Lateral lobes of tegmen stout, nearly as long as median piece; median strut of tegmen long, distinctly longer than the remaining part of the tegmen.

Body length : 2.8 mm.; width : 2.0 mm.

Distribution: Formosa.

Holotype (♂): Urai-Agyoku, N. Formosa, 11. vii. 1961, T. SHIRÓZU leg.

This species is closely allied to *Scymnus (Pullus) contemptus* (WEISE, 1923), but distinguishable from the latter by the large body, rather narrow apical red of the elytra, not paralleled prosternal

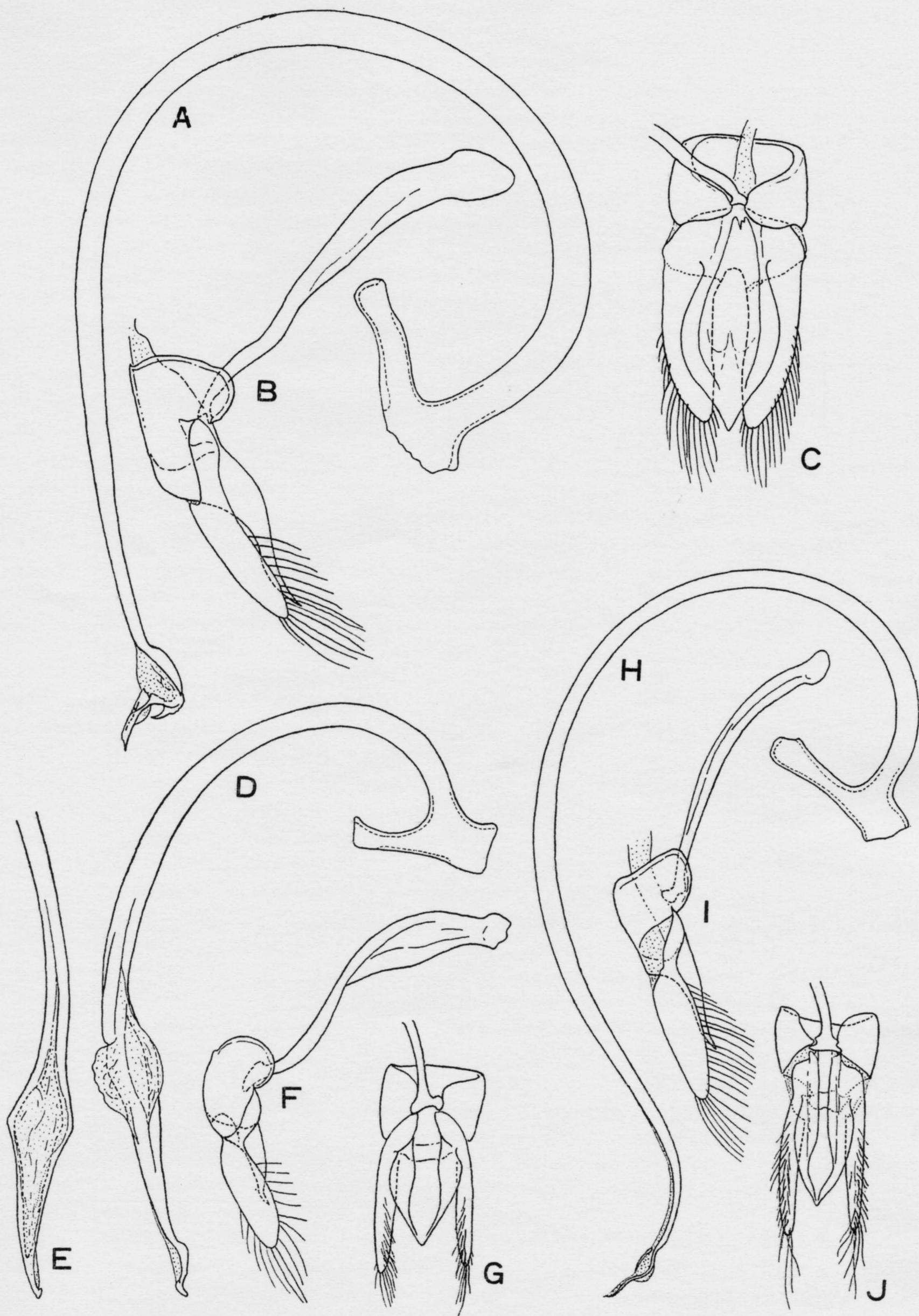


Fig. 2. Male genitalia, A, D and H : Siphus, lateral aspect. E: Apex of siphus, ventral aspect. B, F and I: Tegmen, lateral aspect. C, G and J: Tegmen, ventral aspect. Each figure is drawn by the same magnifying scale. A~C: *Scymnus (Pullus) shirozui*; D~G: *Scymnus (Pullus) takasago*; H~J: *Scymnus (Pullus) centralis*.

carinae, the form of the femoral line of the first abdominal sternum, and by the structure of the apex of the siphon, etc.

*Scymnus (Pullus) takasago* H. KAMIYA, sp. nov.

(Fig. 1-A, K, L; Fig. 2-D, E, F, G)

Body short oval, strongly convex, moderate in size, surface with yellowish pubescence; colour entirely brownish yellow.

Frons moderate in width, about a half of head including eyes, each side of frons distinctly incurvate and weakly marginated, surface of frons slightly convex, finely punctured; clypeus distinctly narrower than frons, parallel-sided, anterior margin of clypeus straight; anterior margin of labrum nearly straight and darkened.

Pronotum subtrapezoid, lateral sides arcuately convergent in dorsal aspect; anterior angles distinct and denticulate, posterior angles of pronotum indistinct and rounded; lateral sides of pronotum narrowly marginated; basal margin of pronotum rounded, marginated, slightly dentate in middle. Punctuation on pronotum as same as on frons, denser at lateral portions.

Scutellum triangular, distinctly wider than long, anterior margin of scutellum slightly swollen; surface of scutellum flat, with very fine punctures.

Elytra rather short, convex, humeri distinct; elytral base distinctly broader than pronotal base, basal angles of elytra rounded, not angulate; elytral sides smoothly rounded, elytral apex rounded. Surface of elytra sparsely punctured, punctuation of elytra consists of two series of punctures, one of them very fine, and another large and navel-like in each form; elytral hairs more yellowish than those of frons or pronotum. Elytral epipleura rather narrow and short, ending at middle of the first abdominal segment. Elytral hairs arranged as shown in fig. 1-A.

Prosternal process parallel-sided, rather narrow; prosternal carinae parallel and straight, anterior ends of both carinae quadrately connected. Basisternum posteriorly incurved forming rather large anterior coxal cavities.

Femoral line of the first abdominal sternum complete, semicircular, reaching to apical one-fifth length of the sternum and ending near lateral margin of the sternum. Area surrounded by the line finely punctured at the basal half, unpunctuated and smooth near the line.

Male genitalia : siphon stout, rather weakly curved, apical a third of siphon characteristic as shown in fig. 2-E, D. Siphonal capsule with short outer process and rather long inner process. Tegmen stout; base of median piece of tegmen very wide, sides of median piece straightly narrowing apically with a pointed tip in ventral aspect; lateral lobes distinctly longer than median piece, spindle shape, rather wide in lateral aspect; median strut long and bisinuate.

Body length : 2.4 mm.; width : 1.6 mm.

Distribution : Formosa.

Holotype (♂) : Oiwake, C. Formosa, 24. vi. 1961, T. SHIRÔZU leg.

Paratypes : 1♂ 1♀, same data as the holotype.

This species resembles *Scymnus (Scymnus) paganus* LEWIS, 1896 from Japan in the entirely yellowish coloration, but easily separable from the latter in having the shorter and rounder outline of the body and the complete femoral line of the first abdominal sternum.

*Scymnus (Pullus) centralis* H. KAMIYA, sp. nov.

(Fig. 1-E, I, J; Fig. 2-H, I, J)

Body oval, moderate in size, rather convex, surface with yellowish white pubescence. General coloration of the dorsal surface reddish brown, elytra with a black marking at center and basal two-thirds of lateral sides of elytra black; the central marking of elytra oval in form, a third of elytral length in size, anterior border of the marking almost touching to scutellum; scutellum and elytral base somewhat darker; antennae and mouth parts dark brown, prosternum brown or dark yellowish brown, meso- and metasternum black or pitchy brown, abdomen reddish brown, elytral epipleurae dark brown to pitchy brown; legs yellowish brown.

Eyes comparatively large, somewhat narrower than the narrowest part of frons in frontal aspect; lateral sides of frons slightly incurved, surface of frons finely and sensely punctured, apical margin of clypeus almost straight and narrowly margined. Pronotum subtrapezoid and anterior margin arcuately swollen and lateral sides arcuately and strongly convergent apically in dorsal aspect; anterior angles distinct and rectangulated, basal angles indistinct and round; pronotum margined laterally, basally and anteriorly; anterior margination distinct at lateral portion and disappears in middle. Punctuation of pronotum finer than that of frons. Surface of scutellum flat and very finely punctured.

Elytra rather strongly convex, humeri raised, basal angles not largely rounded but somewhat angulate; lateral sides of elytra weakly arcuate; widest at about middle of elytral length; apical half of elytra weakly semicircularly convergent and apex of elytra rounded. Lateral margins of basal half distinctly margined. Elytral surface coarsely punctured and with rather coarse, pale yellowish white hairs arranged as shown in fig. 1-E. Elytral epipleura ending at posterior margin of the first abdominal sternum.

Basisternum of prothorax normal, prosternal process rather long; prosternal carinae broadly separated, anterior halves of carinae subparallel, posterior halves incurvated and broadening posteriorly. Area between both prosternal carinae irregularly punctured. Meso- and metasternum densely and relatively finely punctured.

Femoral line of the first abdominal sternum complete, smoothly arched in general form, reaching to apical one-sixth length of the sternum and weakly curved in S-form in lateral parts. Area surrounded by the femoral line finely punctured, at portion near the line unpunctuated and smooth.

Male genitalia : siphon slender, basal half of siphon semicircular, part from apical one-fifth to basal half of siphon weakly incurvated ventrally, apical one-fifth of siphon rather strongly incurvated dorsally and narrowing apically; apex of siphon very characteristic as shown in fig. 2-H. Siphonal capsule with short outer process and long inner process. Tegmen rather stout; median piece of tegmen wide, boat-shape with a pointed tip, in ventral aspect; lateral lobes of tegmen almost straight, distinctly longer than median piece, one and one-half length of the latter. Median strut of tegmen slender and weakly curved, slightly longer than the remaining part of tegmen.

Body length : 2.1 mm.; width : 1.5 mm.

Distribution : Formosa.

Holotype (♂): Rimogan-Magan, N. Formosa, 10. vii. 1961, T. SHIRÔZU leg.

This species is, in general appearance, similar to *Scymnus (Scymnus) nigrosuturalis* H. KAMIYA,

1961 but differs from the latter in having the complete femoral lines of the first abdominal sternum and in the dorsal markings.

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