

A new monobasic Hepialid genus from Taiwan
(Insecta: Lepidoptera; Hepialidae) with a
redescription of *Hepialus arizanus*

MATSUMURA

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(Received December 4, 1998)

Abstract A new genus and species of Hepialidae (*Parathitarodes changi*) is named and described from Taiwan. The holotype specimen of *Hepialus arizanus* MATSUMURA, 1931 is also figured and redescribed.

Mr. Shigero SUGI, Tokyo first collected a pair of an apparently undescribed small hepialid species at Mt. Alishan, Taiwan in 1981. Then Dr. Mamoru OWADA collected five male specimens at Mt. Shūehshan in 1989. More recently Mr. Ban TANAKA, Toyota City, added one male specimen from Mt. Anmashan in 1997. These collecting data and localities, detailed below, clearly show that this species flies in high mountainous region in summer. Such a small (fore wing length 11–14 mm) hepialid species has not previously been recorded from Taiwan except for *Hepialus arizanus* MATSUMURA, 1931 and the species of characteristic genus *Palpifer*.

MATSUMURA (1931) described *Hepialus arizanus* from Taiwan in his “6000 Illustrated Insects of Japan-Empire” (p. 1022–23), and its systematic position has remained uncertain (UEDA, 1992). However, comparison of the recently-collected species with the species holotype specimen of *Hepialus arizanus* shows it to be different. After detailed morphological examination I describe the newly-collected species as new genus and species based on the above specimens. Even though its systematic position is still uncertain, the holotype specimen of *Hepialus arizanus* is also figured for reference and comparison, and a redescription provided. The terminology used in descriptions follows mainly UEDA (1996). MEYER’s Haematoxylin was used for staining preparations. All scales on the figures represent 1 mm.

Parathitarodes gen. nov.

Type-species: *Parathitarodes changi* gen. & sp. nov., by present designation.

Antenna simple, filiform with 18–21 flagellar segments; pale brown. Fronto-

clypeus bulged anteriorly with a pair of sensory pits ventromedially. Labrum not sclerotized, with two pairs of dorsolateral sensory pits. Mandible vestigial, represented by strongly melanized area on the lower rim of the head capsule. Maxillary palpus simple, with very short segments, weakly sclerotized. Labium rounded basally and abruptly pointed anteriorly; labial palpus two-segmented; distal segment distinctly ($\times 2.0$) longer than the proximal one. All legs without spurs; fore tibia with epiphysis.

Fore wing 11–14 mm long, brownish or fuscous brown, with white or pale brown indistinct markings. Costa slightly concave at the middle; termen rounded; posterior margin slightly curved anteriorly below CuA₂; Sc unbranched, R straight, Rs₁ and Rs₂ stalked; cross-vein Rs-M₁ variably reaching Rs₃ + 4, i.e., between furcation Rs₁ + 2/Rs₃ + 4 and Rs₃/Rs₄ (Fig. 2), or just reaching or beyond the Rs₃/Rs₄ furcation; stalk Rs₁ + 2 long, about 8 times length of stalk Rs₃ + 4, if the latter present. The first principal M branch not weak. CuP weak, curved to posterior margin and reaching A in the middle. A₁ tubular throughout its length to distal margin; A₂ very weak and indiscernible. Hind wing fuscous; cilia ochreous, chequered with fuscous at veins; base of M merging with Cu, stalk of M + Cu long.

Male genitalia. Eighth abdominal sternite present, but narrow. Tegumen with a pair of dorsal projections (twin process), which are well developed; subanal sclerite absent; a pair of acute processes on dorso-posterior region; processus momenti large, well produced posteriorly and separated from tegumen by membrane; valvella moderate and terminating in an acute tip. Vinculum as deep as tegumen without processes or swollen portions laterally. Valva very slender and long, about 1.2 length of tegumen, without processes, densely setose on inner surface. Ventral wall of mesosome (trulleum) weakly sclerotized, with two posterolateral arms which are not fused with processus momenti or tegumen. Juxta oblong; posterior portion of juxta strongly curved ventrad. Aedeagus not sclerotized.

Female genitalia. Ninth abdominal tergum as deep as ninth abdominal sternum. Subanal plates rather narrow and not meeting each other medially. Ninth abdominal sternum without lateral processes; medial portion deep and broad, bulging laterally, but not forming a defined central process; sclerotized flat dorsal area present before entrance of ostium. Signum absent on bursa copulatrix.

Remarks. This new genus *Parathitarodes* is distinguished from the genus *Thitarodes* VIETTE by the following characteristics: 1) strongly bulged frontoclypeus, 2) labial palpus with long distal segment, and 3) very slender rod-like valva without acute process basally. It is noteworthy that the position of cross-vein Rs-M₁ is variable, but even judging from the limited material, this seems to be only intraspecific variation.

Description of species

Parathitarodes changi sp. n.

(Figs. 1-6, Plate 33. A-C)

Male. Length of fore wing: 18-21 mm. Head: Vertex and frons ochreous mixed with brown; eyes surrounded by brown piliform scales anteriorly. Thorax ochreous mixed with brown and dark brown dorsally. Fore wing: Dark brown mixed with golden brown. Three or four small white spots on costa; distal spot slender and long; below CuA a white streak from base to middle of CuA cell; postmedial series of white spots indistinct, but posterior one forming a large white mark distad of CuA cell; subterminal line white, irregularly broken or broad; terminal line ochreous; cilia ochreous chequered with fuscous at veins. Hind wing fuscous; costa ochreous; cilia ochreous chequered with fuscous at veins. Legs buff-brown. Moderately deep pocket present on lateral membranous region of male 2nd abdominal segment; scent-brushes of hind tibia held in this pocket. Abdomen fuscous dorsally and ochreous ventrally.

Female. Length of fore wing: 21 mm. Head: Vertex and frons ochreous mixed with buff-brown. Thorax ochreous and mixed with brown dorsally. Fore wing paler than male; but each line and marking almost same as male; white spots present in CuA cell. Hind wing pale brown.

Distribution. Taiwan.

Material examined. Holotype: ♂, Taiwan: Mt. Alishan (2,270 m), Chiai Hsien, 8-10. viii. 1981., S. Sugi leg. (KMNHIR000,232). Paratypes: 1 ♀, same data as holotype (KMNHIR000,233); 5 males, Sanliuchiu-shanchuang (3,100 m), Mt. Shüehshan, Taichung, 30. vi. 1989., Mamoru OWADA leg. (4 ♂♂ preserved in National Science Museum, Tokyo and 1 ♂ preserved in KMNH (KMNHIR000,234); 1 ♂, Mt. Anmashan

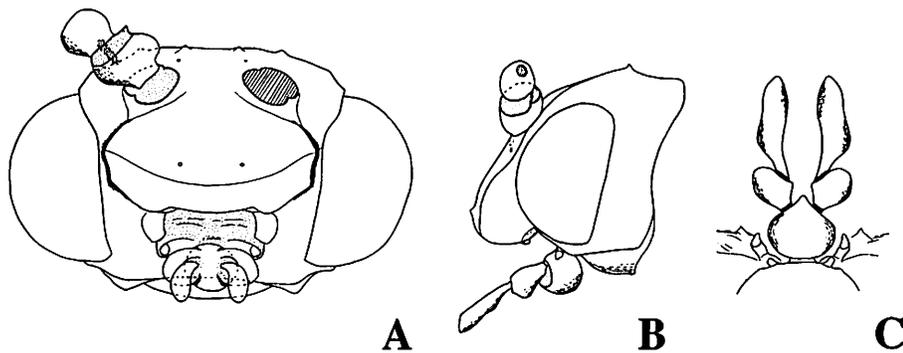


Fig. 1. Head of male *Parathitarodes changi* gen. & sp. nov. A: Frontal view. B: Left lateral view. C: Labial palpus.

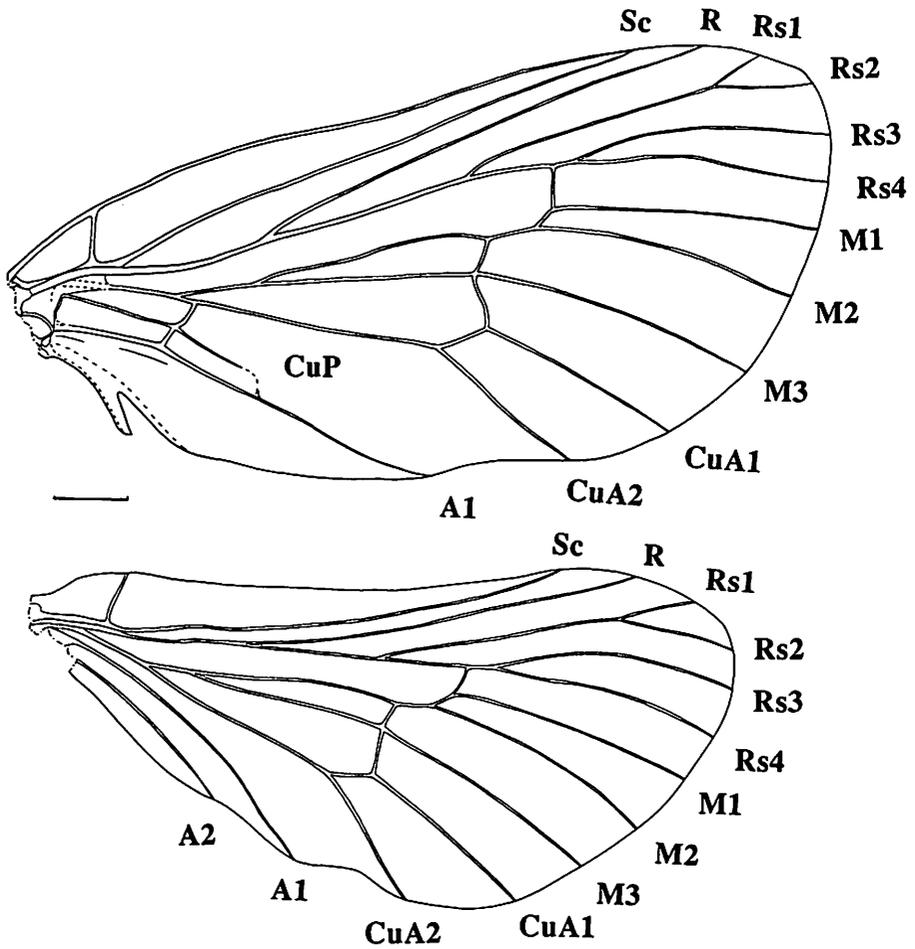


Fig. 2. Venation of male *Parathitarodes changi* gen. & sp. nov.

(2,600 m), Taichung, 29. vii. 1997., B. TANAKA leg. (KMNHIR000,235).

Remarks. This species is named after the late Mr. Baw Sing Chang, the author of *Illustrations of Moths in Taiwan*.

***Hepialus arizanus* MATSUMURA, 1931**

(Figs. 7-8, Plate 33. 4-6)

Holotype: ♀. Labelled as 'Formosa Matsumura; *Hepialus arizanus* MATS.; Holo-type *Hepialus arizanus* MATSUMURA; INST. ENTOMOL. HOKKAIDO UNIV. JAPONIA'.

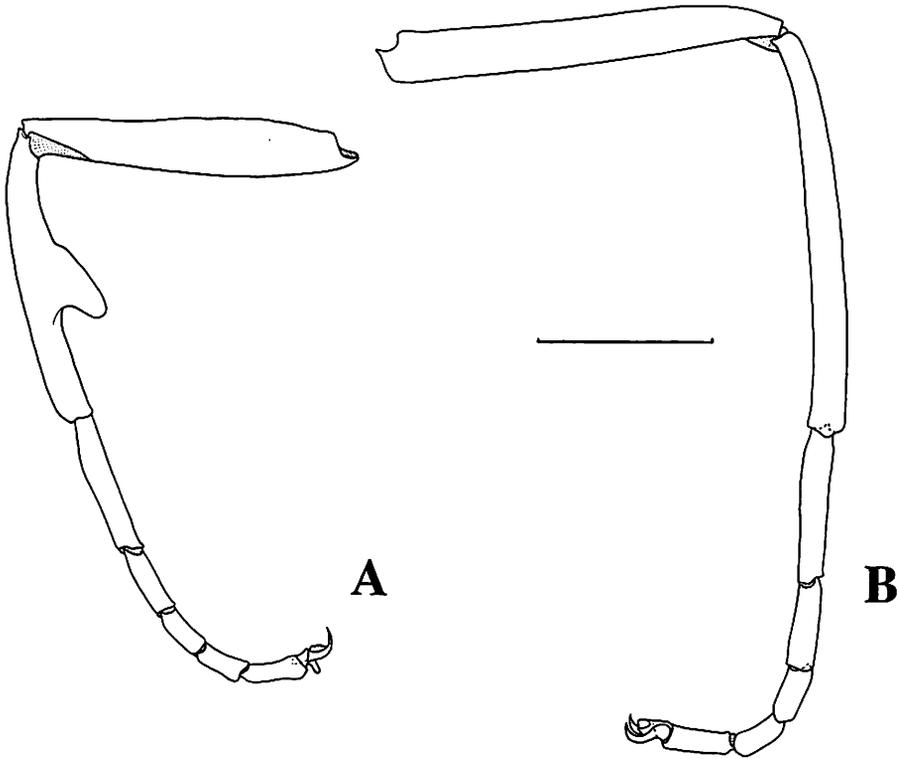


Fig. 3. Legs of *Parathitarodes changi* gen. & sp. nov. A: Male fore leg. B: Male mid leg.

MATSUMURA (l. c.) described this species as follows:

Arisan-shirosuji-kômorî (ga) (1886)

Hepialus arizanus MATS.

Female. Body and wings fuscous grey. Forewing: Costa with a series of six white spots on the distal half; whitish grey lines waved from costa to inner margin but indistinct; greyish white subterminal band fusiform, from veins 5 to 9; outer margin of this band waved and a white spot on vein 4 beyond it; basal half of inner margin fuscous; a middle black spot in 1st cell (CuA2 cell) defined on each side by greyish white. Hind wing: Apical half of costal area ochreous white; cilia black, mixed with white at 6–7th cells. Wingspan: 1 sun 1 bu (= 3.3 cm). This species was collected at Mt. Alishan and rare. Distribution: Taiwan (l. c., p. 1022). (translated here from original Japanese to English)

The holotype specimen is rather poor condition. The left wings and all legs are missing; the basal halves of the right wings were glued onto white paper; the apical

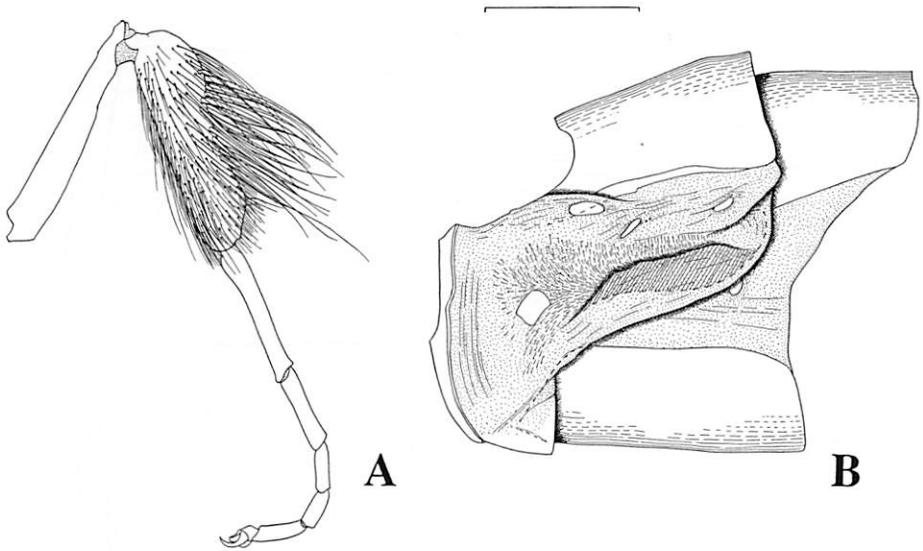


Fig. 4. Male hind leg and second and third abdominal segments of *Parathitarodes changi* gen. & sp. nov. A: Hind leg. B: Second and third abdominal segments.

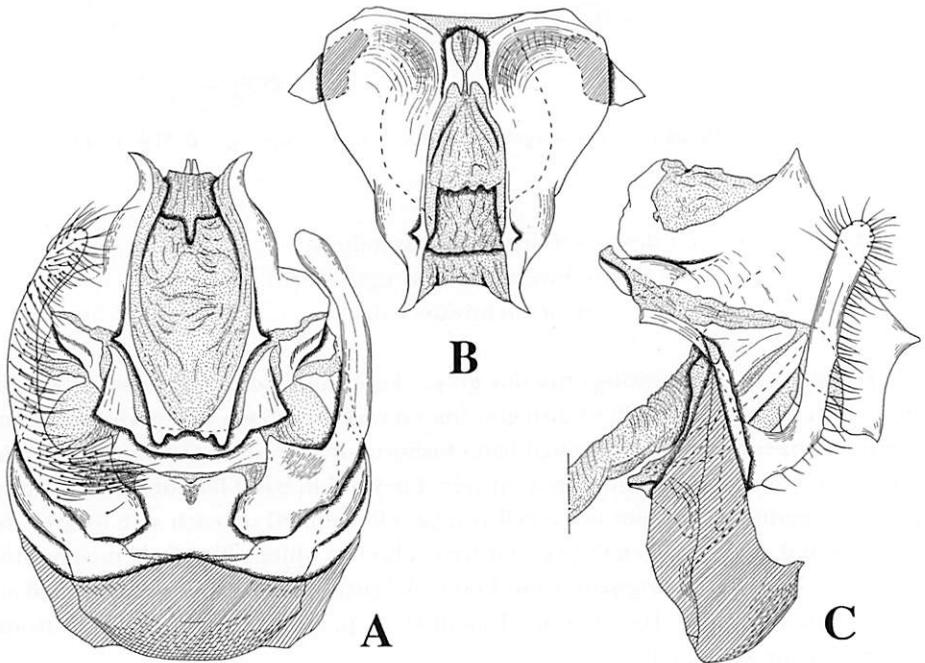


Fig. 5. Male genitalia of *Parathitarodes changi* gen. & sp. nov. A: Whole genitalia, caudal view. B: Dorsum, dorsal view. C: Whole genitalia, lateral view.

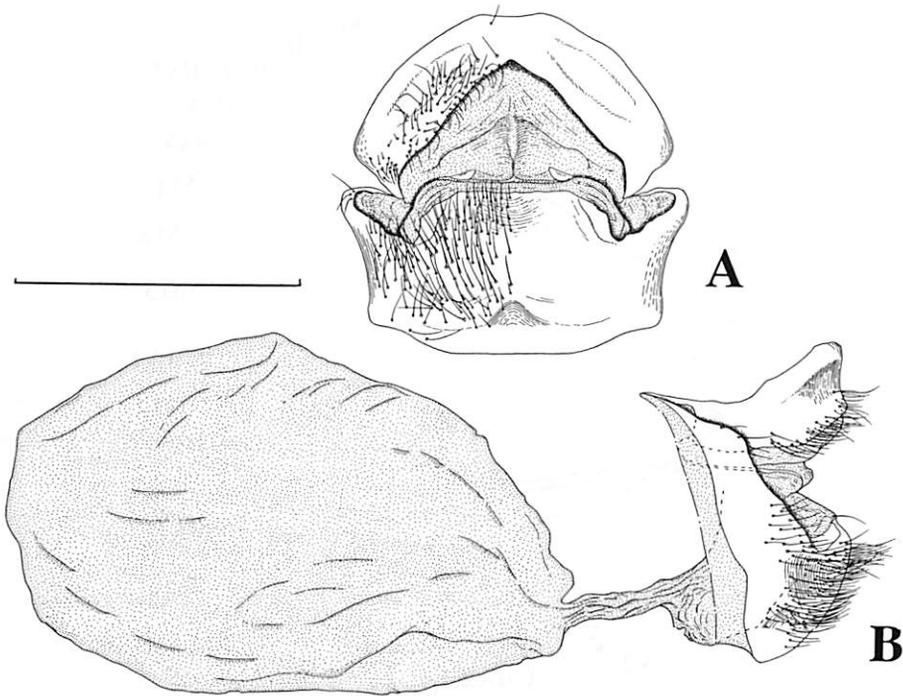


Fig. 6. Female genitalia of *Parathitarodes changi* gen. & sp. nov. A: Ninth abdominal segment, caudal view. B: Whole genitalia, left lateral view.

portions of them are missing. Abdomen and female genitalia were dissected and prepared as permanent slide mounts by someone. The head and thorax have not been examined morphologically.

Wings: The glue-stained whole remnant of wings now show no discernible details of pattern. **Forewing:** Cross-vein Rs-M1 reaches Rs4 beyond furcation Rs3/Rs4; inter M cross-vein not aligned with cross-vein M-CuA. **Hindwing:** Artificially folded near M3. **Female genitalia:** Dorsodistal margin of ninth abdominal tergum deeply concave, but this condition probably caused by deformation during slide mounting. Subanal plate broad, acutely tapering inwardly. Ninth abdominal sternum without prominent lateral processes; medial portion well sclerotized, rounded and produced posteriorly in dorsal aspect, and forming central process; central process abruptly narrowing dorsally in caudal view; dorsal region of this process flat, narrow and well sclerotized; ventral portion of central process deeply concave medially in caudal view.

Remarks.

The holotype specimen of '*Hepialus arizanus*' clearly differs from *Parathitarodes*

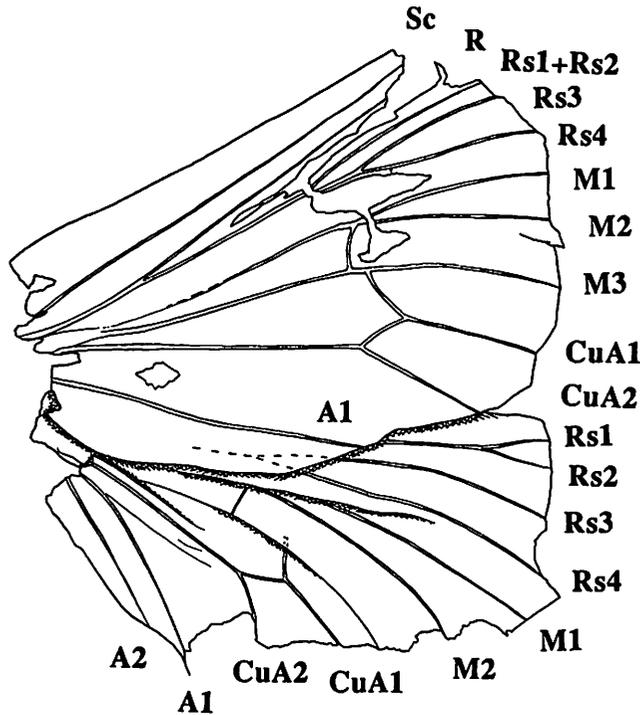


Fig. 7. Venation of female *Hepialus arizanus* MATSUMURA, holotype.

changii in the following characteristics: 1) inter M cross-vein not aligned with cross-vein M-CuA, and the former reaching M3 basad from the latter, 2) subanal plate broad, 3) ninth abdominal sternum forming central process, the ventromedial portion of which deeply concave. I have one male hepialid specimen collected at the same locality (Mt. Alishan, Chiayi Hsien, 15. V. 1973, Y. YOSHIYASU leg.) showing the same condition as *H. arizanus* with the inter M cross-vein not aligned with cross-vein M-CuA, and the costa with a series of white spots on the distal half. Unfortunately, I have no additional specimens and could not identify this specimen as the male of '*Hepialus arizanus*'. This species has well a sclerotized seventh abdominal sternum that is U-shaped in caudal view and male genitalia with long valvella arms that curved dorsally and end in acute tips. The valva with acute process basally and this character may show its relationship with the genus *Thitarodes*. If this male and female specimen proved to be the same species in future, '*Hepialus arizanus*' will need to be assigned to the genus *Thitarodes* or to some new one. Here I still retain '*Hepialus arizanus*' in *Hepialus sensu lato* pending the availability of further material to clarify its placement.

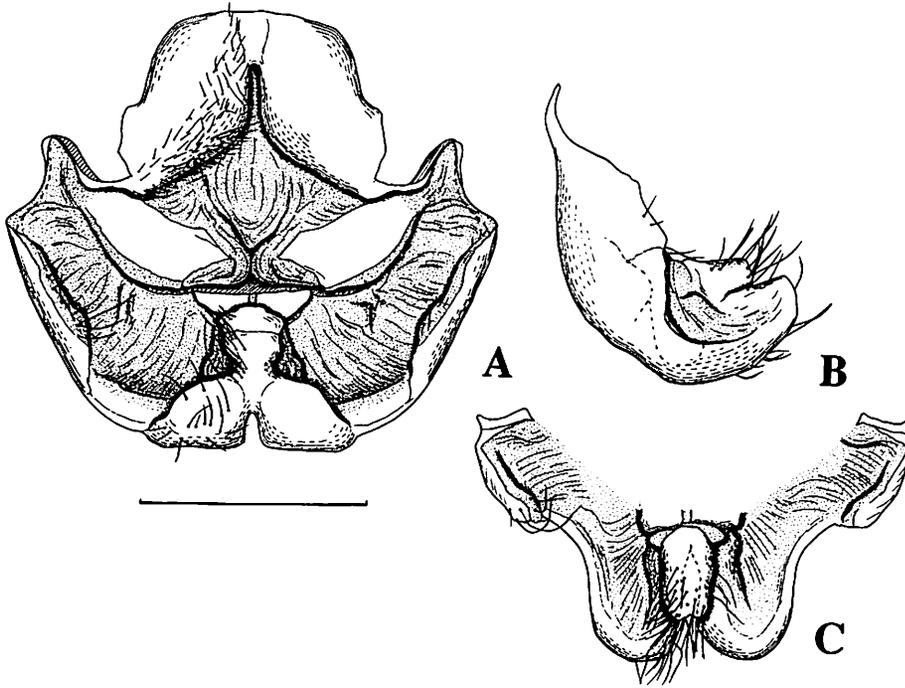


Fig. 8. Female genitalia of *Hepialus arizanus* MATSUMURA, holotype. A: Ninth abdominal segment, caudal view. B: Ninth abdominal sternum, left lateral view. C: Ninth abdominal sternum, dorsal view, showing central process.

Acknowledgements

Dr. Gaden S. ROBINSON, The Natural History Museum, London kindly read the early draft of this paper, corrected my English and gave comments. Dr. Ebbe S. NIELSEN, Division of Entomology, CSIRO also gave valuable comments. Mr. Shigero SUGI, Tokyo, Dr. Mamoru OWADA, National Science Museum, Tokyo, and Mr. Ban TANAKA, Toyota City, donated or loaned their materials to KMNH and gave me the opportunity to study them. Prof. Yutaka YOSHIYASU, Kyoto Prefectural University, donated interesting hepialid specimen to KMNH. Emeritus Professor Toshio KUMATA and Prof. Masaaki SUWA, Hokkaido University loaned me the holotype specimen of *Hepialus arizanus* kept in their collection. I would like to express my hearty thanks to them all.

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Plate 33

Explanation of Plate 33

- A: *Parathitarodes changi* gen. & sp. n., male holotype, Taiwan.
- B: *Parathitarodes changi* gen. & sp. n., female paratype, Taiwan.
- C: *Parathitarodes changi* gen. & sp. n., male paratype, Taiwan.
- D: *Hepialus arizanus* MATSUMURA, female holotype, Taiwan.
- E: *Hepialus arizanus* MATSUMURA, female holotype, head and thorax in right lateral view.
- F: Labels of *Hepialus arizanus* MATSUMURA, attached with female holotype.

