

A New Species of *Thitarodes* VIETTE (Lepidoptera, Hepialidae) from Japan

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Abstract A new species of *Thitarodes* VIETTE is named and described: *Thitarodes nipponensis*. Its morphology is described and figured.

The genus *Thitarodes* was erected by VIETTE (1968) to accommodate small, dark species of Hepialidae distinguished by the presence of an acute process from the base of the valva; *Hepialus armoricanus* OBERTHÜR, 1909 was designated as the type-species. He added three new species from Nepal: *Thitarodes danieli*, *T. eberti* and *T. dierli* to this genus (VIETTE, l. c.). CHU & WANG (1985) revised hepialid specimens from China associated with the "insect-herb" (the fungus *Cordyceps*) and described 19 species in five genera. They did not adopt the genus *Thitarodes* VIETTE in their system as they regarded the morphological difference in male genitalia insignificant as a generic character and that using VIETTE's criteria would lead to the establishment of many new genera. They assigned 13 species to the genus *Hepialus* FABRICIUS. They, however, described many character differences in the labial palpus and even wing venation among those 13 species, the differences of which are usually regarded as generic characters. If we followed VIETTE's definition of the genus *Thitarodes*, at least four species might be assigned to the genus: *kangdingensis*, *oblifurcus*, *kangdingroides*, and *zhangmoensis*.

In this paper I describe one new species of the genus *Thitarodes*, the first record of the genus from Japan. The terminology used in descriptions of male and female genitalia follows mainly UEDA (1988). MEYER's Haematoxylin was used for staining preparations. All scales on the figures represent 1 mm.

Description of species

Thitarodes nipponensis sp. nov.

Japanese name: Usuiro-koumori

Antenna filiform with 23 flagellar segments; apical segment acute; ochreous. Frons swollen. Tentorial pits at 2/3 of lateral margin of frontoclypeus; labrum

lightly sclerotized, with two pairs of dorsolateral sensory pits. Epipharynx not defined, mandible small. Maxillary palpus with single short segment, weakly sclerotized. Labium oval in ventral view; labial palpus short and one-segmented

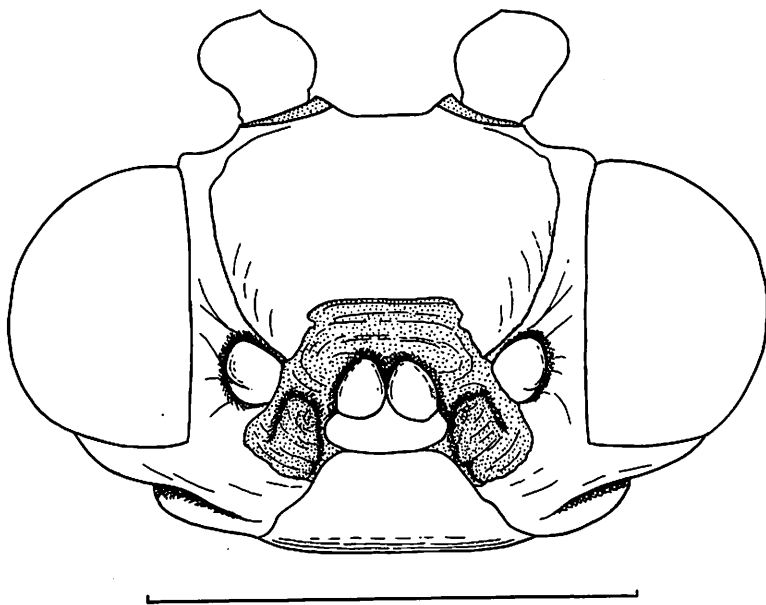


Fig. 1. Head of male *Thitarodes nipponensis* sp. nov., ventral view.

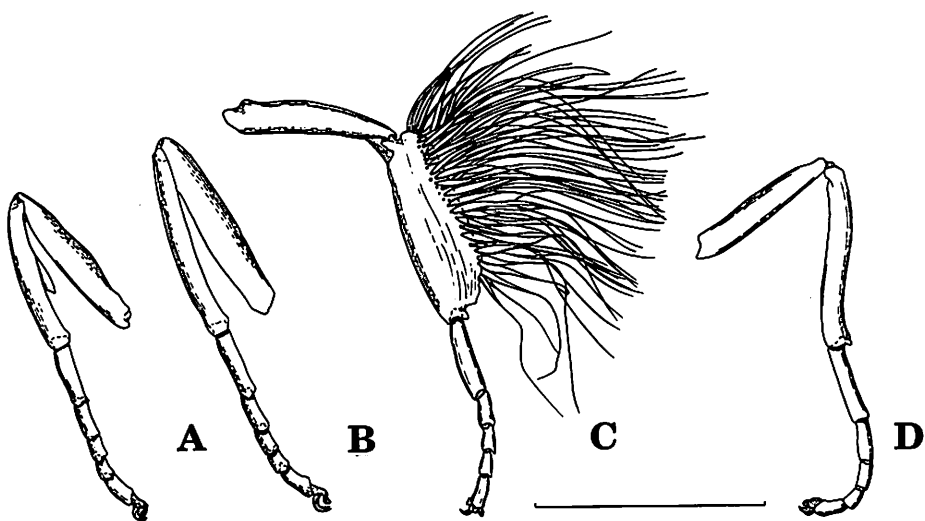
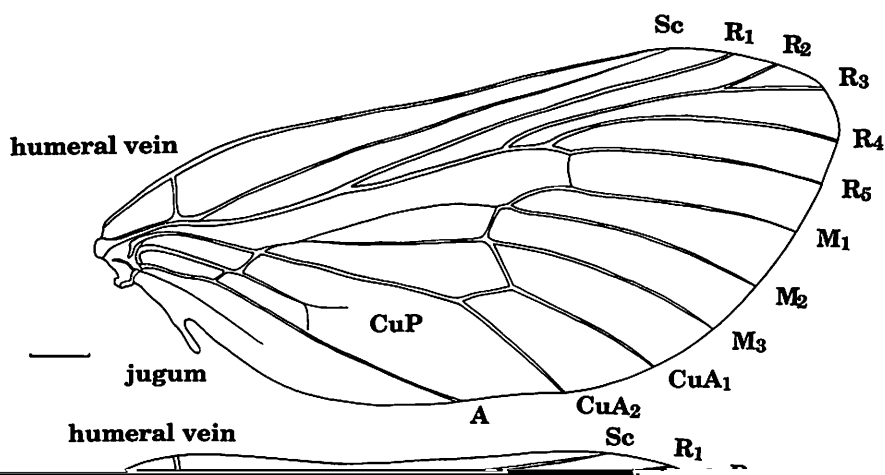


Fig. 2. Legs of *Thitarodes nipponensis* sp. nov. A: male fore leg. B: male mid leg. C: male hind leg. D: female hind leg.

(Fig. 1). All legs without spurs; arolium well-developed; fore leg with an epiphysis on the tibia; male hind tibia moderately broadened, and densely clothed dorsally with scent-brushes (Fig. 2). Fore wing 14–19 mm long, brownish or yellowish with bold, paler markings forming indistinct patterns. Costa straight; termen and posterior margin evenly curved; Sc unbranched; $R_2 + R_3$ and $R_4 + R_5$ stalked; cross-vein R-M₁ reaching R₅ distad from the furcation of R₄ and R₅; a kink present there; stalk R_{2+3} long, about three-quarters length from base of R_{2+3} to margin and about six times as long as stalk R_{4+5} ; 1st M branch very weak; CuP weak, reaching about half distance to wing margin; 2A weak but discernible. Hind wing fuscous to greyish brown, slightly tinged with ochreous on apical area of costa and cilia; hind wing venation similar to that of fore wing; CuP reaching to margin; 1A weak (Fig. 3). Shallow pocket present on the lateral membranous region of male 2nd abdominal segment; scent-brushes of hind tibia reaching this pocket. Tuberculate plate present on 2nd to 6th abdominal segments (Fig. 3).

Male genitalia (Fig. 6). Eighth abdominal sternite present, well sclerotized. Tegumen with a pair of slender and acute projections on dorso-posterior region; the



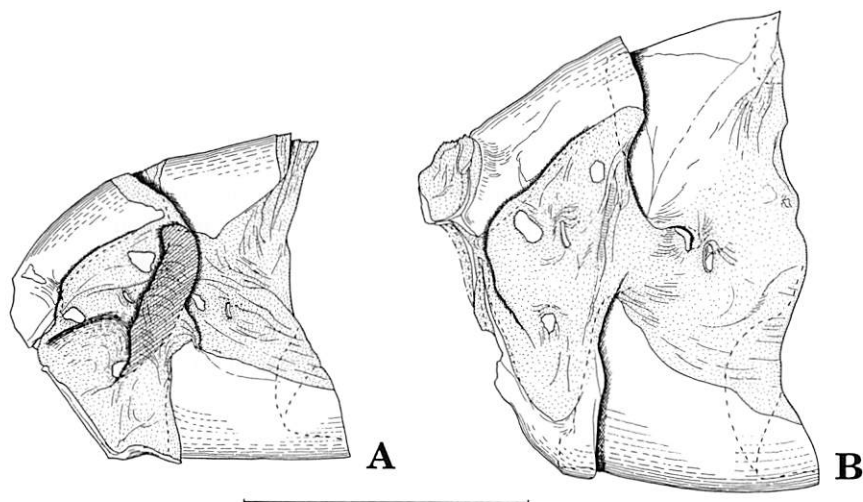


Fig. 4. Second and third abdominal segments of *Thitarodes nipponensis* sp. nov. A: male. B: female.

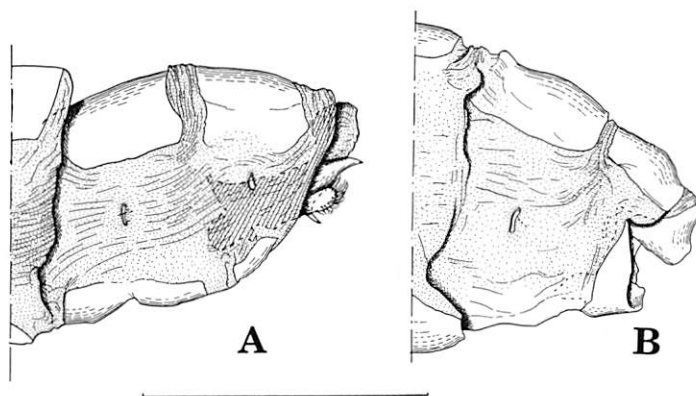


Fig. 5. Terminalia of *Thitarodes nipponensis* sp. nov. A: male. B: female.

posterior margin between this projection and valvella arm rather straight and not strongly concave in lateral view; subanal sclerite absent; processus momenti separated from tegumen by membrane; valvella with acute ventral arms. Vinculum 2/3 as deep as tegumen, without processes but swollen posteriorly in laterodorsal region, stout and U-shaped; saccus semicircular. Valva with an acute and short process at the ventroposterior end, and densely setose especially on its inner surface. Mesosome with arms fused ventromedially; lateral margin of mesosome serrated. Juxta trapezoidal, dilating to posterior margin and with a keel-like structure on ventrome-

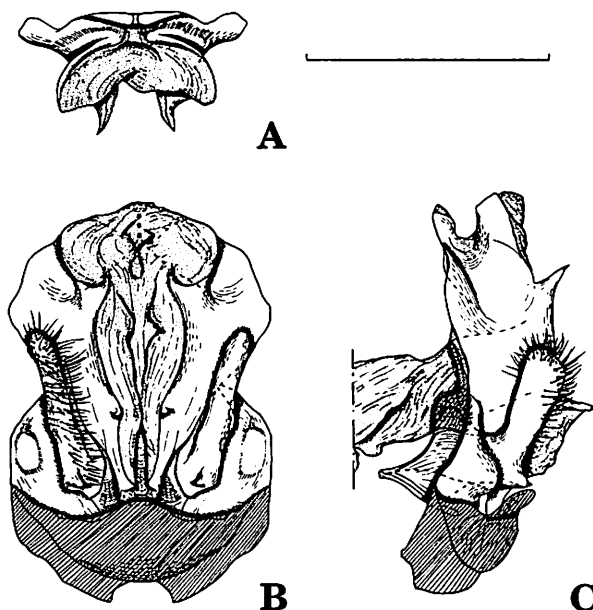


Fig. 6. Male genitalia of *Thitarodes nipponensis* sp. nov. A: dorsum, dorsal view. B: whole genitalia, caudal view. C: ditto, lateral view.

dial area. Aedeagus not sclerotized.

Female genitalia (Fig. 7). Ninth abdominal tergum roof-like with lateroposterior margin produced posteriorly and densely setose. Subanal plates present on the diaphragma laterally, meeting each other medially and covering the seminal gutter. Ninth abdominal sternum without a pair of lateral processes; medial portion well sclerotized and moderately swollen. Apophyses absent. Signum absent on bursa copulatrix. Spermatheca well-developed.

Distribution. Japan (Kyushu).

Material examined.

Holotype ♂, Japan: Shirakawadani, Izumimura, Kumamoto Pref., 9. v. 1981., Isao OHTSUKA leg., (KMNHIR000, 229).

Paratypes. ♂, Nitao, Izumimura, Kumamoto Pref., 4. v. 1980., Isao OHTSUKA leg., (KMNHIR000, 230); ♂, Mt. Unzendake (alt. 1,200 m), Nagasaki Pref., 8. vi. 1968., Teinosuke SADA leg., (in Dr. H. INOUE's collection, Slide no. 7196); ♂, Hagi (alt. c. 800 m), Gokanosyô, Kumamoto Pref., 4. vi. 1988., S. MORIUTI leg., (in the collection of Osaka Prefectural University); ♀, Mt. Fugendake, Nagasaki Pref., 16. vi. 1968, Teinosuke SADA leg., (KMNHIR000, 231).

Remarks. *Thitarodes nipponensis* is similar to *Thitarodes variabilis* (BREMER, 1861)

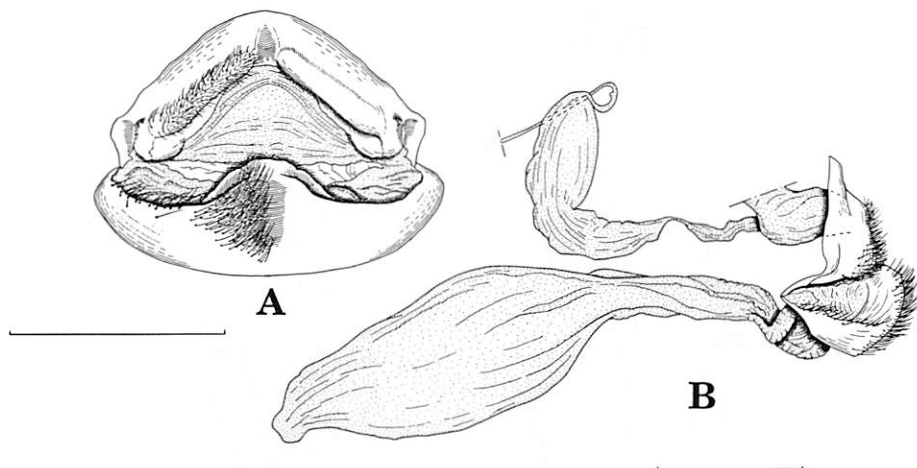


Fig. 7. Female genitalia of *Thitarodes nipponensis* sp. nov. A: ninth abdominal segment, caudal view. B: whole genitalia, lateral view.

in male genitalia, but *nipponensis* is distinguished from *variabilis* by the rather straight posterior margin between the dorsal projection of the tegumen and the valvella arm, and weakly produced process from the base of the valva. The cross-vein R-M₁ of *nipponensis* reaches R₅ distad from the furcation of R₄ and R₅. The same character state is found in *Thitarodes armoricanus* (OBERTHÜR), *T. danieli* VIETTE, *T. oblifurcus* (CHU & WANG), *T. kangdingoides* (CHU & WANG) and *T. zhangmoensis* (CHU & WANG). The cross-vein R-M₁, however, reaches R₅ at the furcation of R₄ and R₅ in *T. eberti* VIETTE and *T. kangdingensis* (CHU & WANG). A one-segmented labial palpus is found in *T. nipponensis*; however, a two-segmented palpus is present in *T. eberti* and *T. danieli*. In the genus *Fraus*, only *F. pelagia* has a one-segmented labial palpus and all other species have a functionally two-segmented palpus (NIELSEN & KRISTENSEN, 1989). The hind tibia is moderately swollen in *T. nipponensis* and *T. danieli*, but not swollen in *T. eberti*. In *T. eberti* the scent-brushes from the hind tibia are not so broad and the lateral membranous region of 2nd abdominal segment has no conspicuous depression to accommodate these brushes.

The structural differences mentioned above may suggest further subdivision of the genus "*Thitarodes*", but such a decision should await more detailed study of comparative morphology within this genus in question.

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Plate 11

Explanation of Plate 11

- A. *Thitarodes nipponensis* sp. nov., male holotype, Japan (Shirakawadani, Kumamoto Pref.). 2: ditto, male paratype, Japan (Hagi, Kumamoto Pref.). 3: ditto, male paratype, Japan (Mt. Unzendake, Nagasaki Pref.). 4: ditto, female paratype, Japan (Mt. Fugendake, Nagasaki Pref.). 5: *Thitarodes eberti* VIETTE, male, E. Nepal (Janakpur). 6: ditto, male, E. Nepal (Sagarmatha).

