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*Hiroshi Morino\**

**DESCRIPTION OF *AOKIORCHEESTIA JAJIMA*, A NEW  
GENUS AND SPECIES FROM COASTAL FORESTS  
IN SOUTHERN JAPAN (CRUSTACEA: AMPHIPODA:  
TALITRIDAE)**

*Abstract*

A new genus and species, *Aokiorchestia jajima*, is described from coastal forests in southern Japan. It shows morphological similarities with species of *Morinoia* Lowry and Myers, 2019, and *Ditmorchestia* Morino and Miyamoto, 2015d. This species is noteworthy in having southern geographical boundary on Tokara Channel, Japan (Watase line).

*Keywords:* Amphipoda, Talitridae, *Aokiorchestia*, Watase geographic line, new genus, new species, coastal forests

**INTRODUCTION**

Five species of talitrid amphipods have so far been recorded from coastal terrestrial habitats in Japan. Among them, *Ditmorchestia ditmari* (Derzhavina, 1923), *Ezotinorchestia solifuga* (Iwasa, 1939), and *Kokuborchestia kokuboi* (Uéno, 1929) occur in Hokkaido and the northern tip of Honshu (*K. kokuboi*) (Morino and Miyamoto, 2015c, d; 2016). The remaining two species, *Nipponorchestia curvatus* (Morino and Miyamoto, 2015a) and *Pyatakoveestia iwaisai* (Morino and Miyamoto, 2015b), are distributed in the southern part of Japan, including archipelagos in the Pacific Ocean. It has been known that an undescribed talitrid species, which has tentatively been placed in the genus *Platorchestia* in

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\* Hiroshi Morino, Department of Zoology, National Museum of Nature and Science, 4-1-1 Amakubo, Tsukuba, Ibaraki 305-0005, Japan. E-mail: [morino631@gmail.com](mailto:morino631@gmail.com)

the sense of Miyamoto and Morino (2004), occurs in the coastal forests in southern Japan (Morino, 2015).

This species is exceptional within the genus in having marginal robust setae on the outer ramus of uropod 1, and peculiar among the members of this family in exhibiting its southern geographical boundary on Tokara Channel (Watase geographical line). In this paper, this taxon is described as a new species of a new genus, and its morphological relationships are discussed.

## MATERIALS AND METHODS

A part of the specimens studied was collected from several coastal forests in Honshu by the author. A large part of them was donated from colleagues for study. The general methodology follows Morino (2014). The specimens were dissected under a stereomicroscope and appendages and bodies were illustrated under a light microscope using a drawing tube. The body length was measured from the tip of head to the tip of telson along the straightened dorsal margin. The specimens are lodged in the collection of the National Museum of Nature and Science, Tsukuba (NSMT-Cr).

## TAXONOMIC PART

### Family Talitridae Rafinesque, 1815

#### *AOKIORCHESTIA* gen. nov.

[New Japanese name: minami-okatobimushi zoku]

Type species: *Aokiorchestia jajima* sp. nov.

#### Diagnosis

Body size medium. Eyes medium. Antennal 1 reaching (not extending beyond) end of peduncular article 4 of antenna 2, peduncle longer than flagellum; peduncular articles 1–3 subequal in length. Antenna 2 in male not incrassate, flagellum slightly longer than peduncle. Upper lip lacking robust setae. Lacinia mobilis of left mandible 5 (rarely 4)-dentate. In maxilliped, outer margin of precoxa not stepped, palp articles 2 and 4 broad, article 2 mediodistally lobate, article 4 reduced.

Gnathopod 1 sexually dimorphic; in male, propodus deeply subchelate, carpus and propodus each with broad-based pellucid lobe, merus lacking pellucid lobe and scabrous surface, lateral surface of propodus with row of submarginal robust setae, dactylus not cusped, or rarely weakly cusped; in female, propodus weakly subchelate, palm much shorter than dactylus, carpus and propodus lacking pellucid lobe and scabrous surface. In gnathopod 2 of male, propodus

powerfully subchelate, dactylus recurved apically; in female, mitten-shaped, basis weakly expanded anteroproximally, merus with lobe covered with scabrous surface posteriorly, propodus with row of facial setae on lateral surface.

Pereopods bi-cuspidactylate, locking robust setae of propodi small, coxa of pereopod 4 wider than deep, dactylus of pereopod 4 not pinched (rarely weakly pinched) posteriorly. Posterior lobe of pereopod 6 angular shaped anteroventrally. Coxal gills medium sized, simply convoluted, gill of gnathopod 2 as large as that of pereopod 6, both gills much larger than gills of pereopods 3–5.

Pleonite side plates lacking marginal pits; peduncles of pleopods with 2 retinacula; rami slightly reduced, ca. 0.5 times as long as peduncles. Uropod 1, peduncle distolateral robust seta shorter than subdistal one; inner ramus with outer and dorsal marginal robust setae, outer ramus with marginal robust setae. Uropod 2 with rami of subequal length, inner ramus with outer and dorsal marginal robust setae, outer ramus with marginal robust setae. Uropod 3 with deep peduncle, ramus shorter than peduncle. Telson longer than wide, with dorsolateral, lateral and distal robust setae, up to 8 setae per lobe. Oostegites linguiform, with simple-tipped setae.

### Etymology

The name of this genus is dedicated to Dr. Jun-ichi Aoki, who has made great efforts toward developing soil zoology in Japan, combined with stem *Orchestia*.

### Remarks

The new genus belongs to a morphological group within the Talitridae, which is characterized by sharing the following features:

1) antenna 1 short, not extending beyond end of peduncular article 4 of antenna 2, 2) male antenna 2 not incrassate, 3) maxilliped palp article 2 mediolaterally lobate and article 4 reduced, 4) male gnathopod 1 deeply subchelate (“subtriangular” propodus), carpus and propodus with distinct pellucid lobe, 5) female gnathopod 1 weakly subchelate (“parachelate”), carpus and propodus lacking pellucid lobe, 6) male gnathopod 2 powerfully subchelate (mascupod), and 7) pereopods cuspidactylate. Ecologically, most of the member of this group are beach hoppers, and marsh hoppers, field hoppers and riparian hoppers are also found among them. The component genera are divided into two subgroups by the armament of the outer ramus of uropod 1. Subgroup A is characterized by having a marginally robust setose outer ramus, as in the present new genus, while subgroup B is by having a marginally smooth outer ramus. In what follows, the morphological relationships of genus *Aokiorchestia* are discussed for each subgroup:

Subgroup A comprises the following eight genera: *Cryptorchestia* Lowry & Fanini, 2013, *Defeo* Lowry & Myers, 2019, *Ditmorchestia* Morino & Miyamoto, 2015d, *Macarorchestia* Stock, 1989, *Notorchestia* Serejo & Lowry, 2008, *Orchestia* Leach, 1814 (sensu Lowry & Fanini, 2013), *Speziorchestia* Lowry & Myers, 2019 and *Traskorchestia* Bousfield, 1982 (sensu Lowry & Myers, 2019). Genera *Defeo*, *Speziorchestia* and *Orchestia* (some species) have slightly incrassate antenna 2 in male (vs. non-incrassate). Meri of male gnathopod 1 in genera *Cryptorchestia* and *Traskorchestia* have a pellucid lobe on the posterior margin (vs. lacking the lobe). Genus *Macarorchestia* has reduced pleopods with a single article on rami (vs. slightly reduced with multi-articles), and the other genera have well-developed pleopods (vs. slightly reduced). Genera *Ditmorchestia* and *Defeo* have 4-dentate lacinia mobilis on the left mandible (vs. basically 5-dentate).

Subgroup B contains five genera: *Laniporchestia* Lowry & Myers, 2019, *Mexorchestia* Wildish & LeCroy, 2014, *Morinoia* Lowry & Myers, 2019, *Tethorchestia* Bousfield, 1984 (sensu Lowry & Myers, 2019) and *Tropicorchestia* Lowry & Springthorpe, 2015. Genus *Laniporchestia* has a slender article 2 on maxilliped palp (vs. broad), genus *Tropicorchestia* has a lobed merus on male gnathopod 1 (vs. lacking lobe). Genera *Mexorchestia*, *Tethorchestia*, and *Tropicorchestia* have a dactylus of pereopod 4 pinched (vs. smooth). Genus *Morinoia* shows highest similarity in this subgroup to the new genera, including clearly 5-dentate lacinia mobilis in left mandible (others are basically 4-dentate).

If we assume the weight of the mentioned character on the uropod 1 less important, then the new genus is very close to genus *Morinoia*, which occurs in inland field to riparian habitats from Korea, eastern China, Japan and Taiwan (Lowry & Myers, 2019). While if we put much weight on this character, the new genus may make a morphological cluster with genus *Ditmorchestia*, which is distributed along beaches in northern Japan (Morino & Miyamoto, 2015d). Notwithstanding the new genus exhibits common features within this morphological group and has no unique character but unique combination of characters, it is arguable that the new genus may have a remote ancestor and followed an independent history.

*Aokiorchestia jajima* sp. nov.

[Japanese Name: Minami-okatobimushi]

(Figures 1–4)

*Platorchestia solifuga*: Miyamoto, 1984.

*Platorchestia* sp.: Morino, 2015: 1077, Fig. 1, 1087.

**Type material.** Holotype (NSMT-Cr 26211), male 9.7 mm; Jajima Is. (under litter of forest), Maizuru, Kyoto Pref. (35°29'48"N, 135°22'06"E); 19 November

1972; H. Morino collect. Allotype (NSMT-Cr 26212), female 10.2 mm; same data as holotype. Paratypes: 1 male 8.3 mm (NSMT-Cr 26239) and 1 female 8.8 mm (NSMT-Cr 26240); Hatayama Shrine (*Cryptomeria* forest; 140 m alt.), Shiromoto, Kinko, Kagoshima Pref. (31°14'42"N, 130°52'14"E); 10 October 1982; H. Morino coll. 1 male 10.0 mm (NSMT-Cr 26271) and 1 ovig. female 10.2 mm (NSMT-Cr 26272); Hamamura (*Ficus*, *Pinus*; 60 m alt.), Toshima, Akusekijima Is, Kagoshima Pref. (ca. 29°27'24"N, ca. 129°35'47"E); 17 March 1987; J. Aoki coll.

**Additional materials examined (compiled for each prefecture).**

Fukui Prefecture: 3 males, 2 females (NSMT-Cr 26219); Tojimbo (*Pinus* forest), Mikuni, Sakai (ca. 36°14'14"N, ca. 136°7'45"E); 23 November 1980; N. Nunomura coll, 3 males, 5 females, 4 juveniles (NSMT-Cr 26280); Tojimbo, Mikuni, Sakai (ca. 36°14'14"N, ca. 136°7'45"E); 23 November 1981; N. Nunomura coll. 1 female (NSMT-Cr 26220); Nishiki, Mikuni, Sakai (ca. 36°13'05"N, ca. 136°09'06"E); 28 June 1975; T. Nunomura coll, 3 males, 9 juveniles (NSMT-Cr 26292); Komegawaki, Mikuni, Sakai (ca. 36°13'55"N, ca. 136°07'57"E); 1 February 1976; H. Miyamoto coll, 5 males, 18 ovig. females, 5 nonovigerous females, 5 juveniles, 1 hatchling (NSMT-Cr 26253); Komegawaki, Mikuni, Sakai (ca. 36°13'55"N, ca. 136°07'57"E); 16 May 1981; H. Miyamoto coll, 5 males, 6 ovig. females, 17 females, 5 juveniles (NSMT-Cr 26254); Komegawaki, Mikuni, Sakai (ca. 36°13'55"N, ca. 136°07'57"E); 17 September 1986; H. Miyamoto coll, 12 males, 7 females, 9 juveniles (NSMT-Cr 26293); Jinga-oka, Mikuni, Sakai (ca. 36°14'03"N, ca. 136°08'36"E); 10 October 1973; H. Miyamoto coll, 1 male, 1 ovig. female, 6 females, 2 juveniles (NSMT-Cr 26294); Saikoji Temple, Komegawaki, Mikuni, Sakai (ca. 36°13'04"N, ca. 136°08'47"E); 20 July 1980; H. Miyamoto coll. Kyoto Prefecture: 9 males, 11 females, 11 juveniles (NSMT-Cr 26213); Jajima Is, Maizuru (35°29'48"N, 135°22'06"E); 19 November 1972; H. Morino coll. 1 male, 2 females, 3 juveniles (NSMT-Cr 26214); Karasujima Is. (under litter of forest), Maizuru (35°29'55"N, 135°22'24"E); 19 November; H. Morino coll. 5 males, 1 female (NSMT-Cr 26295); Cape Kyoga, Tango Peninsula (ca. 35°46'32"N, ca. 135°13'24"E); 20 August 1977; H. Miyamoto coll.

Shimane Prefecture: 1 male, 1 juvenile (NSMT-Cr 26245); Tsunozu (broad-leaved, secondary forest), Gotsu (ca. 34°59'36"N, ca. 132°11'39"E); 8 November 1982; N. Nunomura coll, 2 females, 4 juveniles (NSMT-Cr 26246); Tatami-ga-ura (coastal forest), Hamada (ca. 34°56'44"N, ca. 132°06'25"E); 8 November 1982; N. Nunomura coll. 1 male (NSMT-Cr 26247); Hiyoshi Shrine (grove of precincts), Izumo (ca. 35°21'36"N, ca. 132°45'47"E); 3 November 1982; N. Nunomura coll, 1 male, 1 ovig. female, 2 females, 3 juveniles (NSMT-Cr 26296);

Cape Hinomisaki, Shimane Peninsula (ca. 35°25'31"N, ca. 132°38'45"E); 8 August 1977; H. Miyamoto coll.

Hiroshima Prefecture: 1 male, 2 females (NSMT-Cr26221); Setoda, Ikuchijima Is. (ca. 34°18'16"N, ca. 133°05'48"E); 21 July 1976; N. Nunomura coll.

Yamaguchi Prefecture: 1 male 10.6 mm (NSMT-Cr 26224), 2 males (NSMT-Cr 26225); near Myojin-ike Pond, Hagi (ca. 34°27'00"N, ca. 131°24'28"E); 1 August 1978; H. Miyamoto coll, 1 male (NSMT-Cr 26249); Sujigahama, Shimonoseki (ca. 33°57'N, ca. 130°55'E); 25 September 1993; N. Nunomura coll, 1 female, 6 juveniles (NSMT-Cr 26250); near Obatake JR Station, Higashi-seto, Yanai (ca. 33°57'53"N, ca. 132°10'53"E); 26 September 1983; N. Nunomura coll, 1 female (NSMT-Cr 26251); Yoshimi, Shimonoseki (ca.34°04'27"N, ca. 130°54'00"E); 25 September 1983; N. Nunomura coll, 1 female (NSMT-Cr 26300); Omijima Is, Nagato (ca. 34°24'52"N, ca. 131°12'06"E); 1 August 1978; H. Miyamoto coll, 1 male, 1 female (NSMT-Cr 26301); Tadano-hama, Nishi-fukagawa, Nagato (ca. 34°22'19"N, ca. 131°09'41"E); 1 August 1978; H. Miyamoto coll.

Kochi Prefecture: 1 male, 2 females (NSMT-Cr 26215); Cape Ashizuri (ca. 32°43'N, ca. 133°01'E); 24 August 1971; H. Inoue coll, 3 juveniles (NSMT-Cr 26281); Okinoshima, Sukumo (ca. 32°43'30"N, ca. 132°33'31"E); M. Shiba coll, 1 male, 2 females, 2 juveniles (NSMT-Cr 26282); Usa (ca. 33°27'N, ca. 133°26'E); M. Shiba coll. Ehime Prefecture: 1 female (NSMT-Cr 26218); Mt. Garan, Ikata (ca. 33°23'55"N, ca. 132°07'08"E); 7 March 1975; K. Katsura coll, 2 juveniles (NSMT-Cr 26223); Gotanda-kawamai (evergreen, broad-leaved, secondary forest; 70 m alt.), Yawatahama (ca. 33°26'28"N, ca. 132°27'00"E); 5 October 1981; Sh. Tanaka coll, 1 male (NSMT-Cr 26287); Matsuyama Park (secondary forest), Asahiga-oka, Matsuyama (ca. 33°50'37"N, ca. 132°44'24"E); 16 December 2008; E. Yamamoto coll, 1 ovig. female (NSMT-Cr 26288); Matsuyama Park, Asahiga-oka, Matsuyama; (ca. 33°50'37"N, ca. 132°44'24"E); 13 May 2009; E. Yamamoto coll, 1 juvenile (NSMT-Cr 26289); Shiroyama (*Shii* community), Matsuyama (ca. 33°50'43"N, ca. 132°45'56"E); 20 December 2008; E. Yamamoto coll, 8 males, 3 females, 3 juveniles (NSMT-Cr 26290); Kitagawara (lower reach of Shigenobu River, *Phyllostachus* forest), Masaki, Matsuyama (ca. 33°48'21"N, ca. 132°42'36"E); 9 April 2004; E. Yamamoto coll, 1 ovig. female, 2 females (NSMT-Cr 26291); Nishi-takayanagi (lower reach of Shigenobu River, *Celtis* community), Masaki, Matsuyama (ca. 33°48'27"N, ca. 132°43'04"E); 9 April 2004; E. Yamamoto coll. 3 males, 1 female (NSMT-Cr 26299); Dogo-Hot-spring, Matsuyama (ca. 33°51'13"N, ca. 132°47'18"E); 27 December 1976; H. Miyamoto coll.

Oita Prefecture: 1 male, 1 female (NSMT-Cr 26248); Kamegawa, Beppu (ca. 33°19'35"N, ca. 131°29'27"E); 24 September 1983; N. Nunomura coll.

Nagasaki Prefecture: 5 males, 3 females, 2 juveniles (NSMT-Cr 26302); Hirado (ca. 33°20'N, ca. 129°30'E); 16 October 1979; H. Miyamoto coll, 1 male, 1 ovig. female, 2 females (NSMT-Cr 26298); Gono-ura, Iki (ca. 33°45'N, ca. 129°40'E); 31 July 1983; H. Miyamoto coll, 1 male (NSMT-Cr 26216); Kami-misaka (250–480 m alt.), Tsushima (ca. 34°14'31"N, ca. 129°17'11"E); 3 March 1975; K. Katsura coll, 1 male (NSMT-Cr 26217); Bansho-in, Izuhara, Tsushima (ca. 34°12'16"N, ca. 129°17'03"E); 22 June 1974; Hiura coll, 1 juvenile (NSMT-Cr 26222); Kokubu, Izuhara, Tsushima (ca. 34°12'04"N, ca. 129°17'13"E); 5 August 1975; Fujita coll, 1 male, 1 female (NSMT-Cr26297); Namuro, Izuhara, Tsushima (ca. 34°13'30"N, ca. 129°17'55"E); 2 August 1983; H. Miyamoto coll, 2 juveniles (NSMT-Cr 26255); Mogizaki, Kami-tsushima, Tsushima (ca. 34°34'16"N, ca. 129°28'25"E); 11 October 1986; N. Nunomura coll, 1 male, 1 ovig. female (NSMT-Cr 26278); Wani-ura, Kami-tsushima, Tsushima (ca. 34°41'34"N, ca. 129°26'30"E); 4 July 1988; N. Nunomura coll, 2 males, 2 juveniles (39°40'E NSMT-Cr 26256); Kechi, Mitsushima, Tsushima (ca. 34°16'54"N, ca. 129°19'10"E); 12 October 1986; Nunomura coll, 1 juvenile (NSMT-Cr 26258); Mahoshino-hama, Mitsushima, Tsushima (ca. 34°14'59"N, ca. 129°18'58"E); 16 October 1986; N. Nunomura coll, 2 males, 1 ovig. female, 6 females, 2 hatchlings (NSMT-Cr 26257); Iguchi Beach, Kami-agata, Tsushima (ca. 34°38'17"N, ca. 129°21'49"E); 12 October 1986; N. Nunomura coll, 1 juvenile (NSMT-Cr 26260); Shitaru, Kami-agata, Tsushima (ca. 34°34'06"N, ca. 129°18'14"E); 12 October 1986; N. Nunomura coll, 1 male, 3 females, 1 juvenile (NSMT-Cr 26259); So, Toyotama, Tsushima (ca. 34°25'23"N, ca. 129°21'43"E); 11 October 1986; N. Nunomura coll. 1 female (?) (NSMT-Cr 26279); Ogiyama, Narao, Nakadorijima Is. (ca. 32°51'33"N, ca. 129°03'41"E); 8 July 1988; unknown coll.

Miyazaki Prefecture: 1 juvenile (NSMT-Cr 26252); Aoshima, Miyazaki (ca. 31°48'17"N, ca. 131°28'32"E); 23 September 1983; N. Nunomura coll.

Kagoshima Prefecture: 1 male, 8 females, 4 juveniles (NSMT-Cr 26226); near Sata Road Park Tunnel (palm trees, ferns, *Alocasia*); Otomari-Tajiri, Minami-Osumi (31°01'00"N, 130°40'35"E); 7 October 1982; H. Morino coll, 1 male, 1 female, 2 juveniles (NSMT-Cr 26227); Sata-magome (40 m alt.), Minami-Osumi (31°00'05"N, 130°39'57"E); 7 October 1982; H. Morino coll, 1 ovig. female, 3 juveniles (NSMT-Cr 26228); Sata Cape (laurel forest; 30 m alt.), Minami-osumi (30°59'43"N, 130°); 7 October 1982; H. Morino coll, 2 females (NSMT-Cr 26229); Otomari-Tajiri (laurel forest, *Cryptomeria*; 20 m alt.), Minami-osumi (31°00'46"N, 130°40'39"E); 7 October 1982; H. Morino coll, 1 male, 7 females (NSMT-Cr 26230); Otomari (coastal grassland), Minami-osumi (31°01'24"N, 130°40'56"E); 7 October 1982; H. Morino coll, 1 ovig. female, 1 female, 4 juveniles (NSMT-Cr 26231); Otomari (coastal forest:

*Nerium*); Minami-osumi (31°01'25"N, 130°40'55"E); 7 October 1982; H. Morino coll, 2 males, 4 ovig. females, 4 females, 10 juveniles (NSMT-Cr 26232); Otomari (laurel forest with pine trees; 10 m alt.); Minami-osumi (31°01'33"N, 130°41'26"E); 8 October 1982; H. Morino coll, 1 male, 1 ovig. female, 2 females, 5 juveniles (NSMT-Cr 26233); Otomari-Obase (rich in ferns), Minami-osumi (31°02'21"N, 130°41'08"E); 8 October 1982; H. Morino coll, 2 females, 2 juveniles (NSMT-Cr 26234); near Tono-ura Tunnel (laurel forest; 75 m alt.), Minami-osumi (31°01'43"N, 130°41'47"E); 8 October 1982; H. Morino coll, 1 ovig. female, 2 females, 2 juveniles (NSMT-Cr 26235); Shimadomari (broad-leaved forest, ferns), Minami-osumi (31°03'45"N, 130°41'05"E); 8 October 1982; H. Morino coll, 2 males, 6 females, 12 juveniles (NSMT-Cr 26236); Kawakami Shrine (*Cinamomum*, *Machilus*), Shiromoto, Kinko (31°14'18"N, 130°47'35"E); 9 October 1982; H. Morino coll, 1 male, 1 ovig. female, 4 juveniles (NSMT-Cr 26237); on a hill (broad-leaved forest with *Cryptomeria*; 100 m alt, 2 km from sea), Kinko (31°13'54"N, 130°47'36"E); 9 October 1982; H. Morino coll, 2 males, 4 females, 5 juveniles (NSMT-Cr 26243); on a hill (*Cryptomeria* forest; 170 m alt, 2 km from sea), Kinko (31°14'07"N, 130°48'11"E); 10 October 1982; H. Morino coll, 2 males (NSMT-Cr 26238), 1 male, 1 ovig. female, 7 females and 23 juveniles (NSMT-Cr 26241); Hatayama Shrine (*Cryptomeria* forest; 140 m alt.); Shiromoto, Kinko (31°14'42"N, 130°52'14"E); 10 October 1982; H. Morino coll, 2 males, 4 juveniles (NSMT-Cr 26242); Hachiman Shrine (*Cryptomeria* forest; 200 m alt.), Nejime-yamamoto, Minami-osumi (31°13'23"N, 130°49'44"E); 10 October 1982; H. Morino coll, 2 males, 3 females, 8 juveniles (NSMT-Cr 26244); Gokoku Shrine (broad-leaved forest: *Cinnamomum*, *Podocarpus*), Central Park, Kanoya (31°23'00"N, 130°50'56"E); 11 October 1982; H. Morino coll, 3 males, 3 females, 4 juveniles (NSMT-Cr 26261); Injo Beach (coastal forest: *Rhaphiolepis*, *Eurya*; 10 m alt.), Nishinoomote, Tanegashima Is. (ca. 30°34'44"N, ca. 131°02'03"E); 15 March 1978; J. Aoki coll, 6 males, 2 females, 8 juveniles (NSMT-Cr 26262); Tanowaki (coastal forest: *Litsea*; 2 m alt.), Nishinoomote, Tanegashima Is. (ca. 30°41'49"N, ca. 131°04'41"E); 15 March 1978; J. Aoki coll, 3 males, 1 female, 4 juveniles (NSMT-Cr 26263); Kumano (coastal grassland: *Miscanthus*; 4 m alt.), Nakatane, Tanegashima Is. (ca. 30°28'29"N, ca. 130°57'47"E); 16 March 1978; J. Aoki coll, 2 juveniles (NSMT-Cr 26264); Kadokurasaki (coastal forest: *Pittosporum*, *Euonymus*; 30 m alt.), Nakatane, Tanegashima Is. (ca. 30°20'45"N, ca. 130°52'57"E); 16 March 1978; J. Aoki coll. 1 male, 1 female, 1 juvenile (NSMT-Cr 26265); Mugio (*Machilus*, *Ficus*; 35 m alt.), Yakushima, Yakushima Is. (ca. 30°15'22"N, ca. 130°36'01"E); 31 July 1981; H. Harada coll, 1 female 10.3 mm (NSMT-Cr 26266), 2 males, 1 female (NSMT-Cr 26267); Mt. Yokodake (near summit) (*Castanopsis*, *Gilibertia*; 470 m alt.), Toshima, Kuchinoshima Is. (c a.



29°58'07"N, ca. 129°55'00"E); 19 March 1987; J. Aoki coll, 2 females, 1 juvenile (NSMT-Cr 26268); eastern slope of Mt. Moedake (*Cinamomum*, *Machilus*; 215 m alt.), Toshima, Kuchinoshima Is. (ca. 29°57'44"N, ca. 129°56'20"E); 20 March 1987; J. Aoki coll, 1 male (NSMT-Cr 26269); Takao (*Litsea*, *Villebrunea*; 245 m alt.), Toshima, Nakanoshima Is. (ca. 29°50'46"N, ca. 129°52'26"E); 16 March 1987; J. Aoki coll, 7 males, 1 ovig. female, 6 females, 14 juveniles (NSMT-Cr 26285); Satomura Shrine, Toshima, Nakanoshima Is. (ca. 29°50'22"N, ca. 129°51'16"E); 9 March 1994; T. Kurozumi coll, 1 juvenile (NSMT-Cr 26286); Nakanoshima Is. (10 males ca. 29°50'N, ca. 129°51'E); 9 March 1994; T. Kurozumi coll, 4 ovig. females, 17 females, 41 juveniles, 23 hatchlings (NSMT-Cr 26284); southeast slope of Mt. Mitake (200 m alt.), Toshima, Akusekijima Is. (ca. 29°28'N, ca. 129°36'E); 7 March 1994; T. Kurozumi coll, 2 males, 5 juveniles (NSMT-Cr 26270); Mt. Mitake (Evergreen, broad-leaved forest: *Daphniphyllum*, *Camellia*; 380 m alt.), Toshima, Akusekijima Is. (ca. 29°27'51"N, ca. 129°35'56"E); 17 March 1987; J. Aoki coll, 16 males, 2 ovig. females, 8 females, 30 juveniles, 4 hatchlings (?) (NSMT-Cr 26273), 1 male (NSMT-Cr 26274); Hamamura (*Ficus*, *Pinus*; 60 m alt.), Toshima, Akusekijima Is. (ca. 29°27'24"N, ca. 129°35'47"E); 17 March 1987; J. Aoki coll, 9 males, 4 females (?), 6 juveniles (NSMT-Cr 26275); Mitera Shrine (*Ficus*, *Ardisia*; 110 m alt.), Uemura, Toshima, Akusekijima Is. (ca. 29°27'N, ca. 129°36'E); 17 March 1987; J. Aoki coll, 1 female, 1 juvenile (NSMT-Cr 26276); Cape Megamiyama (*Ardisia*, *Distylium*; 100 m alt.), Toshima, Akusekijima Is. (ca. 29°26'59"N, ca. 129°37'10"E); 18 March 1987; J. Aoki coll, 1 juvenile (NSMT-Cr 26277); Uemura (grassland of a school ground: *Imperata*, *Cerastium*; 180 m alt.), Toshima, Akusekijima Is. (29°27'03"N, 129°36'15"E); 18 March 1987; Aoki coll, 16 males, 2 ovig. females, 12 females, 36 juveniles, 6 hatchlings (NSMT-Cr 26283); Akiba Shrine (200 m alt.), Uemura, Toshima, Akusekijima Is. (ca. 29°27'N, ca. 129°37'E); 7 March 1994; T. Kurozumi coll.

#### **Description of male** (Holotype 9.7 mm)

Eyes (Fig. 1A) spherical, ca. 0.4 times as long as head length. Antenna 1 (Fig. 1B) with flagellum of 5 articles. Antenna 2 (Fig. 1A) with peduncular article 5 subequal in length to articles 3 and 4 combined, flagellum with 17 articles.

Maxilliped (Fig. 2G, H) with palp article 4 small, covered by apical robust setae on article 3. Upper lip (Fig. 2A), lower lip (Fig. 2B), maxillae 1 and 2 (Fig. 2E, F), left and right mandibles (Fig. 2C, D) as described in generic characters or illustrated in respective figures.

Gnathopod 1 (Fig. 3A) with carpus 1.35 times as long as propodus, propodus with palm longer than dactylus, lateral surface with 8 submarginal robust setae.

Gnathopod 2 (Figs 1A, 3B) with smooth palm, which is shorter than posterior margin of propodus, dactylus recurved apically.

Pereopods 3–7 (Fig. 3M–Q) bi-cuspidactylate, propodi with small locking robust setae. Pereopod 4 shorter than pereopod 3, dactylus of pereopod 4 similar to that of pereopod 3, not pinched. Bases of pereopods 5–7 expanded posteriorly and lobed ventrally. Posterior lobe of coxa of pereopod 6 (Fig. 3F) with anteroventral corner rectangular. Pereopod 6 subequal to pereopod 7 in length, carpi and propodi of both pereopods slender.

Coxal gills (Fig. 3H–L) medium sized, simply convoluted, gill of gnathopod 2 (Fig. 3H) as large as that of pereopod 6 (Fig. 3L), both much larger than gills of pereopods 3–5 (Fig. 3I–K).

Pleonite side plates (Fig. 4D) weakly acuminate posteriorly, with several minute setae on posterior margins. Pleopod 1 (Fig. 4A) and pleopod 2 (Fig. 4B) subequal in length, with peduncles lacking setae. Pleopod 3 (Fig. 4C) shorter than pleopods 1 and 2 each, with peduncle bearing several short setae. Rami of pleopods 1–3 with 4–5 articles which are not clearly segmented, 0.50, 0.49, and 0.48 times as long as peduncle for respective pleopods.

Uropod 1 (Fig. 4E) with peduncle bearing 4 outer and 5 inner marginal robust setae, distolateral robust seta shorter than subdistal one; outer ramus with 3 marginal robust setae, inner ramus with 3 robust setae on inner and dorsal margins each. Uropod 2 (Fig. 4F) with peduncle bearing 2 outer and 2 inner marginal robust setae; rami subequal in length, outer ramus with 2 marginal robust setae, inner ramus with 2 outer and 2 dorsal marginal robust setae. Uropod 3 (Fig. 4G) with peduncle bearing 2 robust setae, one dorsally and one distally; ramus slender, ca. 0.5 times as long as peduncle, with 3 apical robust setae.

Telson (Fig. 4H) longer than broad, dorsal suture line complete, with dorso-lateral, lateral and distal robust setae, 8 setae per lobe.

**Description of female** (Allotype 10.2 mm; paratype NSMT-Cr 26272, 10.2 mm with setose oostegite of gnathopod 2)

Gnathopod 1 (Fig. 3C, D) with carpus 1.54 times as long as propodus, propodus weakly narrowed distally to produce short palm. Gnathopod 2 (Fig. 3E) with basis weakly expanded anteroproximally, merus with shallow pellucid lobe posteriorly. Oostegite of gnathopod 2 linguiform, that of pereopod 5 (Fig. 3G) short, weakly concaved distally. Oostegite of gnathopod 2 in a paratype (NSMT-Cr 26272) with 17 simple-tipped setae.

### Etymology

The name of the species is derived from the type locality, Jajima Island, a small island in Maizuru Bay, Kyoto.

## DISTRIBUTION

This new species occurs in the coastal forests from the Japan Sea coast of south-west Honshu, Shikoku, Kyushu and south to Tokara Archipelago (Fig. 5). Here forests in high mountains on small islands and inland forests in peninsulas are treated as coastal forests, since the climate of these habitats are expected to be coastal. It is noteworthy that the southern boundary corresponds to the Watase geographical line, which runs at the southernmost part of Tokara Archipelago (south of Akusekijima Island), and has been marked as one of the most distinctive boundaries between Honshu and Ryukyu (Okinawa) elements for terrestrial animals, and also recognized by some scientists as the boundary between Palearctic and Oriental region (Ujiie and Saito, 1974).

## Remarks

**A paratype male** (10.0 mm, NSMT-Cr 26271) from Akusekijima Island, Kagoshima Prefecture, displays the following variations: antenna 2 shorter, with 15 articles on the flagellum, lacinia mobilis of left mandible 4-dentate, gnathopod 1 weakly cuspidactylate, propodus with 4 setae on lateral surface, pereopod 4 dactylus weakly pinched, rami of pleopods 1–3 longer, 0.69, 0.63, and 0.57 times as long as respective peduncles, telson less setose, with 4–5 setae per lobe. Values of these characters for other paratypes are within the range between this paratype and the holotype.

As stated at the beginning, from coastal habitats in middle to south-west Japan, two species of the Talitridae have been known: *Nipponorchestia curvatus* Morino & Miyamoto, 2015a, and *Pyatakoveestia iwasai* Morino & Miyamoto, 2015b. Both species are distinguished from the new species by having: 1) antenna 1 extending beyond the end of peduncular article 4 of antenna 2 (vs. not extending), 2) uropod 1 peduncle with distolateral robust seta longer than subdistal one (vs. shorter), 3) uropod 1, outer ramus marginally bare (vs. robust-setose). In addition, *N. curvatus* is distinctive in having antenna 1 flagellum, the middle article of which longest (vs. as long as basal one); *P. iwasai*, a larger species with more than 15 mm body length, is characterized by having a stepped outer margin in maxilliped precoxa (vs. not stepped). In a large scale, the distribution of these three coastal forest species are overlapped to each other. However, they exhibit differences in a smaller scale. *Nipponorchestia curvatus* occurs mainly in Pacific coast of Honshu, including Shikoku and Kyushu, and in the islands of Izu and Ogasawara Archipelagos, rarely from Osumi to Okinawa Archipelagos (Morino and Miyamoto, 2015a, Fig. 5). *Pyatakoveestia iwasai* also abounds in the Pacific coast of Honshu (Shikoku and Kyushu), and Tokara to Yaeyama Archipelagos, but rarely in Izu Archipelago (Morino and Miyamoto, 2015b, Fig. 5). In contrast, the present new species is distributed richly from

Japan Sea coast of Honshu (Shikoku and Kyushu), and confined southerly to Watase line in Tokara Archipelago in the south-western Archipelagos. It does not occur on the Pacific side of Honshu including Izu and Ogasawara Archipelagos. These differential patterns may suggest the ecological aspects of interspecific action, and reflect the evolutionary history of each species, which needs a phylogenetic analysis aiming at elucidation of land invasion by talitrid animals in the north-west Pacific.

*Morinoia* spp. (*M. humicola* (Martens, 1868) and *M. japonica* (Tattersall, 1922)) discussed in a preceding section, are distributed from lowland forests and riparian habitats from Hokkaido to Kyushu, south to Miyako-Yaeyama Archipelagos, but interestingly so far not recorded from Osumi-Tokara Archipelagos (Morino, unpublished), that the present new species inhabits.

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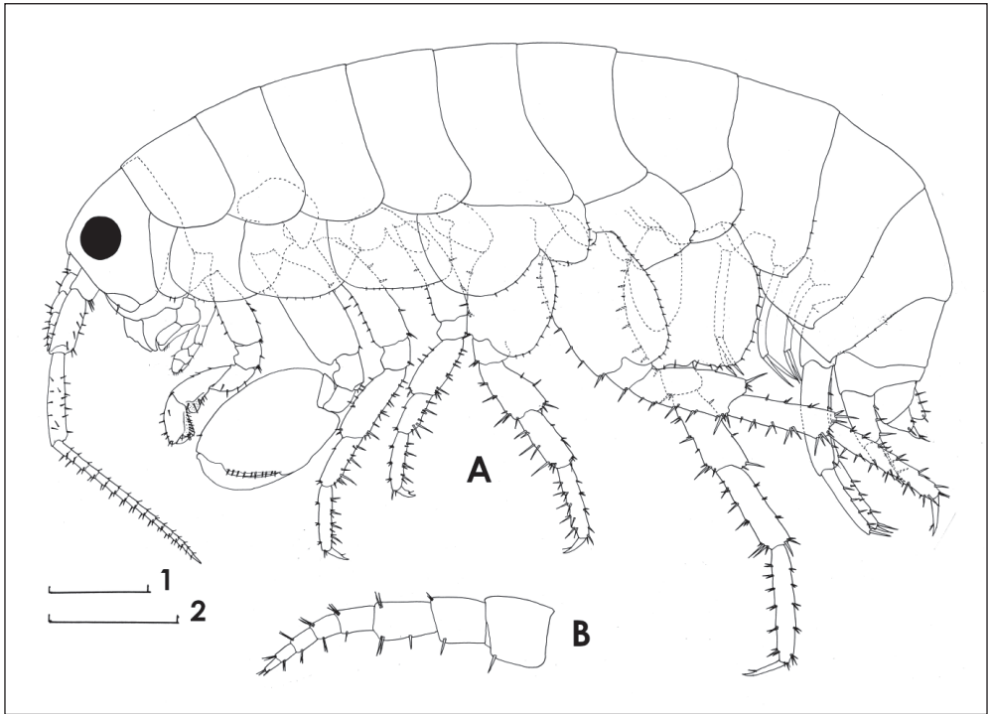


FIGURE 1. *Aokiorchestia jajima* gen. et sp. nov., Male 9.7 mm (holotype, NSMT-Cr 26211). A, habitus, lateral view (after Morino, 2015); B, antenna 1. Scale 1, 1.0 mm for A; scale 2, 0.5 mm for B.

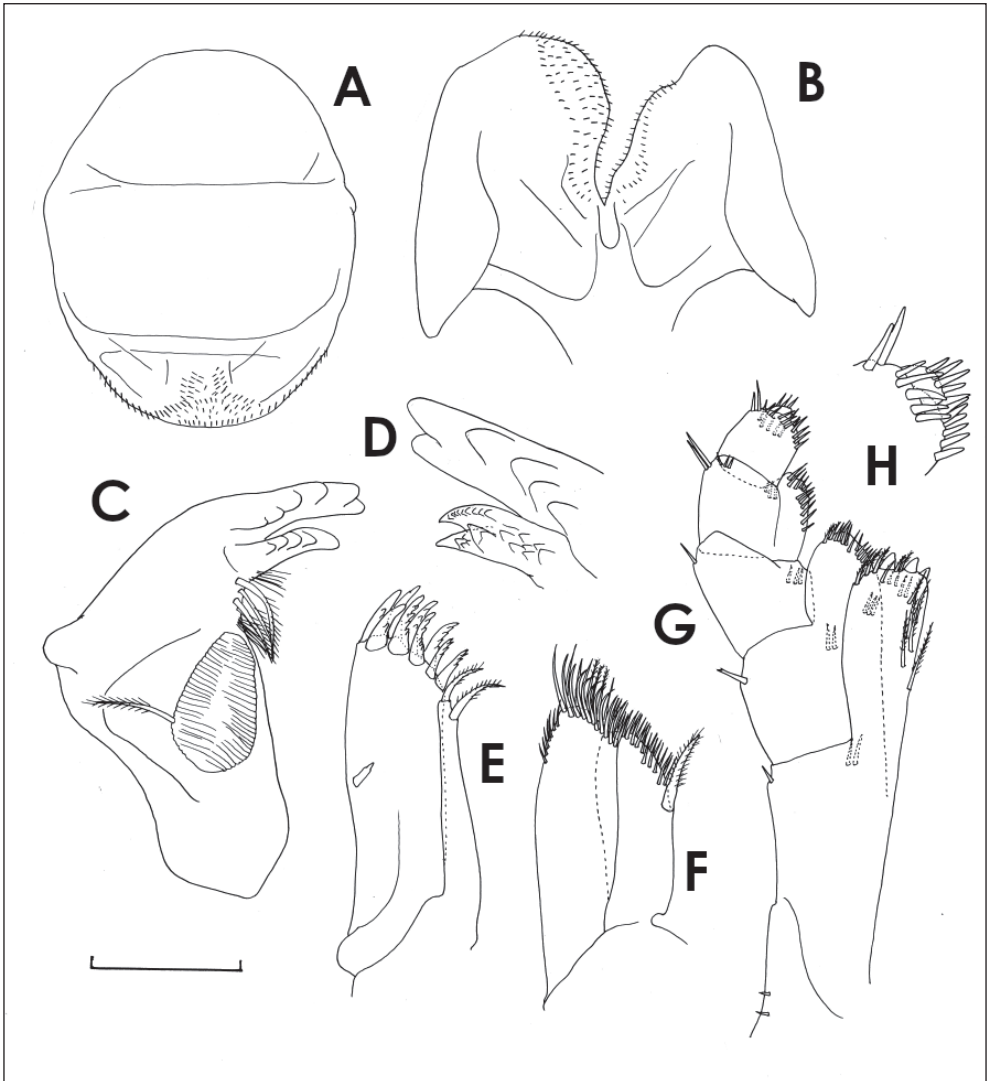


FIGURE 2. *Aokiorchestia jajima* gen. et sp. nov., Male 9.7 mm (holotype, NSMT-Cr 26211). A, upper lip; B, lower lip; C, left mandible; D, distal part of right mandible; E, maxilla 1; F, maxilla 2; G, maxilliped; H, palp article 4 of maxilliped. Scale, 0.1 mm for H, 0.2 mm for others.

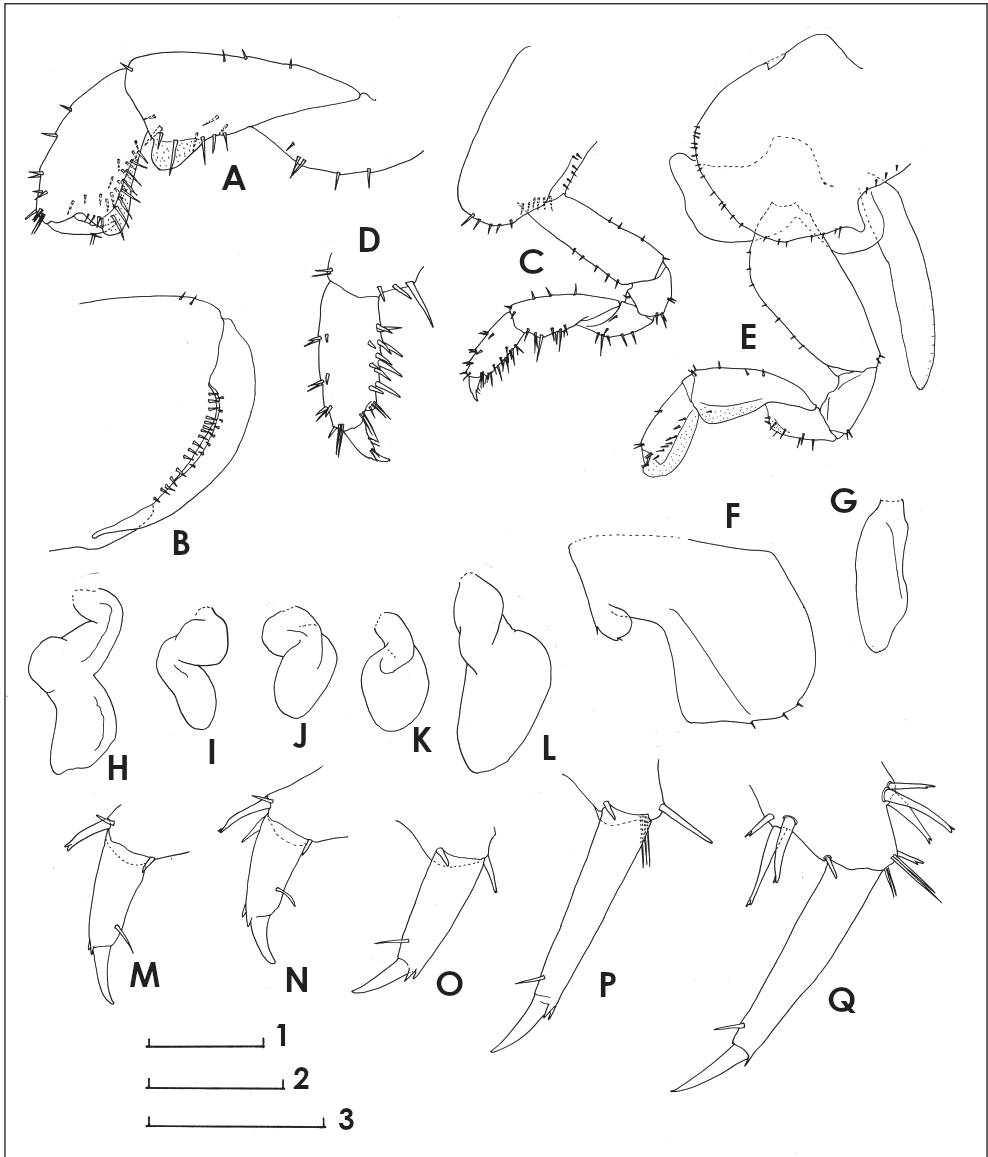


FIGURE 3. *Aokiorchestia jajima* gen. et sp. nov., Male 9.7 mm (holotype, NSMT-Cr 26211); female 10.2 mm (allotype, NSMT-Cr 26212). A, distal articles of gnathopod 1; B, palm and dactylus of gnathopod 2; C, gnathopod 1; D, distal articles of gnathopod 1; E, gnathopod 2; F, coxal plate of pereopod 5; G, oostegite of pereopod 5; H-L, coxal gills of gnathopod 2 to pereopod 6; M-Q, distal parts of pereopods 3-7. C-E, G, female; others, male. Scale 1, 0.2 mm for A, 0.5 mm for B; scale 2, 0.2 mm for M-Q; scale 3, 0.5 mm for D, 1.0 mm for C, E-L.



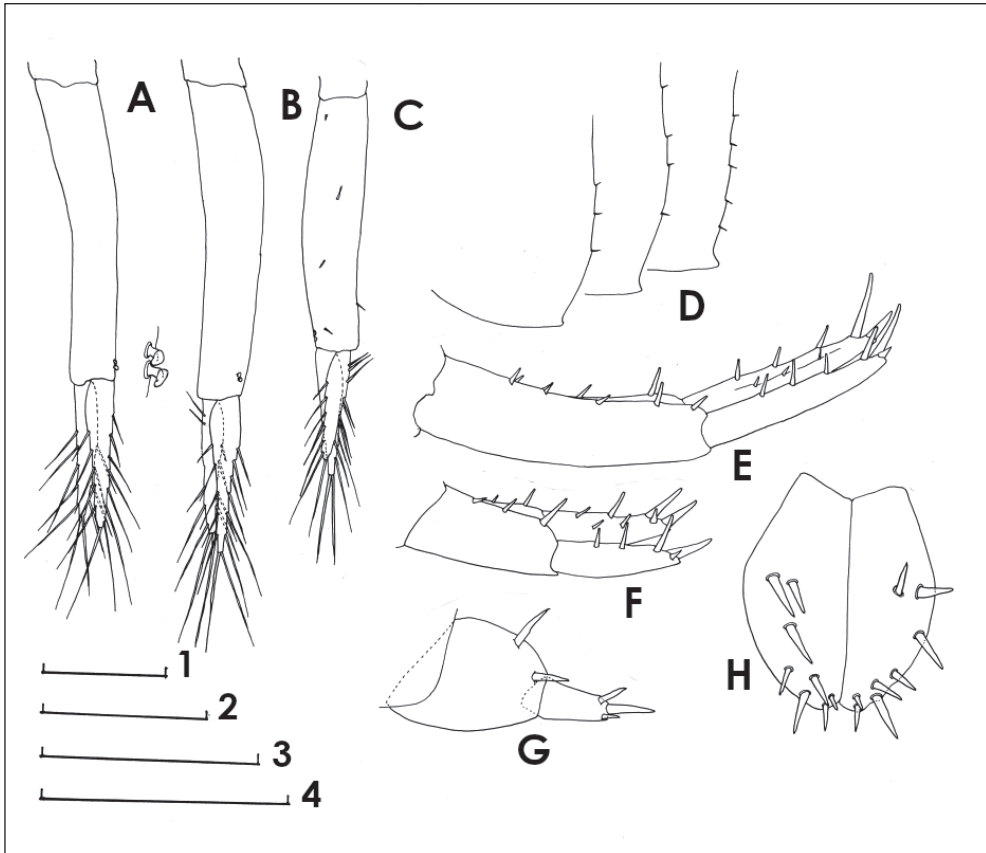


FIGURE 4. *Aokiorchestia jajima* gen. et sp. nov., Male 9.7 mm (holotype, NSMT-Cr 26211). A-C, pleopods 1–3 with enlarged retinacula; D, posterior part of pleonite side plates 1–3; E–G, uropods 1–3; H, telson. Scale 1, 0.5 mm for E, F; scale 2, 0.5 mm for A–C; scale 3, 1.0 mm for D; scale 4, 0.5 mm for G, H.



FIGURE 5. Geographical distribution map of *Aokiorchestia jajima* gen. et sp. nov., Black circles: selected sampling sites of *A. jajima* in this study. Dashed line indicates Watase Line (Tokara Channel).