

## A Review of the Northwestern Pacific Species of the Genus *Paguristes* (Decapoda : Anomura : Diogenidae). II. Species Transferred to the Genus *Stratiotes*, with Descriptions of Two New Species

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**Abstract** Recent studies have shown that reduction in pleurobranch and/or arthrobranch number is found in several hermit crab species previously assigned to *Paguristes* Dana, 1851, although the genus has been described as having 13 pairs of gills. This reduction requires confirmation of gill number for all species assigned to *Paguristes*. In the present study, gill number of several Japanese species heretofore assigned to *Paguristes* was examined. It has been confirmed that the gill number is actually 12 pairs in *Paguristes japonicus* Miyake, 1961 and *P. taenia* Komai, 1999, requiring transfer of these two species to the genus *Stratiotes* Thomson, 1899. In this paper, *Stratiotes japonicus* comb. nov. and *S. taenia* comb. nov., are redescribed. Two new species, *S. nigroapiculus* and *S. orbis*, are described and illustrated. The former new species has been confounded with *S. japonicus*; and the latter closely resembles *S. taenia*, *S. breviannatus* Rahayu, 2005, and *S. ngochoae* Rahayu, 2005. Affinities of these four species are discussed.

**Key words :** Crustacea, Decapoda, Anomura, Diogenidae, *Paguristes*, *Stratiotes*, redescriptions, new species, East Asia.

Until McLaughlin (2002) found a diogenid hermit crab species showing a significant reduction of the gill number to eight pairs, it had been thought that all genera of Diogenidae had either 14 or 13 pairs of gills. The new species described by McLaughlin (2002), *Pseudopaguristes janetkae*, superficially resembled *Paguristes* Dana, 1851, a genus thought to have 13 pairs of gills, including a pair of well developed arthrobranches on each third maxilliped and cheliped and each of the second to fourth pereopods and a single pleurobranch on the thoracic wall of fifth to seventh thoracic somites (above second to fourth pereopods). McLaughlin (2002) recommended confirming the gill number of all species of *Paguristes*. Later, Rahayu (2005) showed that a different degree of reduction of gill number occurred in several species in the collection of the Muséum national d'Histoire naturelle, Paris, previously assigned to *Paguristes*. She transferred species characterized by the possession of 12 pairs of gills to the reinstated *Stratiotes* Thomson, 1899, and others having only eight pairs of functional gills to *Pseudopaguristes* McLaughlin, 2002. *Stratiotes* was originally established with its type species *Stratiotes setosus* Thomson, 1899 by Thomson (1899), which is synonymous with *Paguristes setosus*

H. Milne Edwards, 1848 (see Forest and McLaughlin, 2000). Thomson (1899) cited the markedly dissimilar chelipeds of his new species as a character differentiating *Stratiotes* from *Paguristes* sensu stricto, although he failed to notice the gill number. Heterochely alone does not justify removing *P. setosus* from *Paguristes* (cf. Forest and McLaughlin, 2000). Rahayu (2005) showed for the first time that *Paguristes setosus* had 12 pairs of gills (including two pairs of arthrobranchiae above the bases of third maxilliped to fourth pereopods and one pair of pleurobranchiae on the sixth and seventh thoracic somites) and that *Stratiotes* was the available generic name for species having 12 pairs of gills. Despite numerous recent studies (e. g., Komai, 2001; Rahayu, 2005; 2006; 2007; McLaughlin and Rahayu, 2005; Ayon Parente and Hendrickx, 2006; Rahayu and McLaughlin, 2006; McLaughlin *et al.*, 2007; McLaughlin, 2008) the gill formula still remains to be verified for many described species once assigned to *Paguristes*. Species assigned with certainty to *Stratiotes* are listed in Table 1.

This is the second part of the multiserial review of the northwestern Pacific species assigned to *Paguristes* sensu lato. In the first paper (Komai,

Table 1. Species of *Stratiotes* Thomson, 1899 and their geographical ranges.

Species	Geographical range
<i>Stratiotes abbreviatus</i> (Dechancé, 1964)	Madagascar
<i>Stratiotes breviannatus</i> Rahayu, 2005	Indonesia
<i>Stratiotes cyanops</i> (Forest, 1978)	Nigeria, Cameroon
<i>Stratiotes difficilis</i> (Forest, 1952)	Senegal
<i>Stratiotes engyops</i> (Barnard, 1947)	South Africa
<i>Stratiotes hewatti</i> Wass, 1963	Texas, USA
<i>Stratiotes hispidus</i> (A. Milne-Edwards and Bouvier, 1892)	Liberia, Congo
<i>Stratiotes hummi</i> (Wass, 1955)	North Carolina to Louisiana, Caribbean coast of Colombia
<i>Stratiotes iris</i> (Forest and de Saint Laurent, 1967)	Brazil
<i>Stratiotes japonicus</i> (Miyake, 1961), comb. nov.	Japan, Korea, China
<i>Stratiotes mclaughlinae</i> Ayon Parente and Hendrickx, 2006	Pacific coast of Mexico
<i>Stratiotes micheleae</i> Rahayu, 2005	Indonesia
<i>Stratiotes ngochoae</i> Rahayu, 2005	Indonesia
<i>Stratiotes nigroapiculatus</i> sp. nov.	Japan, Far East Russia
<i>Stratiotes perspicax</i> (Nobili, 1906)	Red Sea, Persian Gulf
<i>Stratiotes pilosus</i> (H. Milne Edwards, 1836)	New Zealand
<i>Stratiotes orbis</i> sp. nov.	Izu Islands, Japan
<i>Stratiotes rubrodiscus</i> (Forest, 1952)	Senegal
<i>Stratiotes setosus</i> (H. Milne Edwards, 1848)	New Zealand
<i>Stratiotes taenia</i> (Komai, 1999), comb. nov.	Ogasawara Islands, Ohsumi Islands
<i>Stratiotes tuberculatus</i> (Whitelegge, 1900)	New South Wales, Western Australia, Indonesia
<i>Stratiotes virilis</i> (Forest, 1952)	Guinea, Congo, Angola

2001), seven species (*P. digitalis* Stimpson, 1858, *P. acanthomerus* Ortman, 1892, *P. palythophilus* Ortman, 1892, *P. ortmanni* Miyake, 1978, *P. albimaculatus* Komai, 2001, *P. doederleini* Komai, 2001, and *P. versus* Komai, 2001) were treated, and some elements of taxonomic problems were clarified. Komai (2001) specified gill number of these seven species as 13 pairs, and this has been confirmed again during this study. In addition to the seven species above mentioned, the following 16 taxa have been reported from East Asian waters by Alcock (1905), Tung and Wang (1966), Miyake (1978), Wang and Tung (1982), Baba (1986), Komai (1999), Osawa and Takeda (2004) and McLaughlin *et al.* (2007): *Paguristes antennarius* Rahayu, 2006; *P. arostratus* Rahayu, 2006; *P. balanophilus* sensu Miyake (1978) (not *P. balanophilus* Alcock, 1905; see Rahayu and McLaughlin, 2006); *P. brachytes* Komai, 1999; *P. calvus* Alcock, 1905; *P. jalur* Morgan, 1996; *P. japonicus* Miyake, 1961; *P. gonagurus* (H. Milne Edwards, 1896); *P. incomitatus* Alcock, 1905; *P. miyakei* Forest and McLaughlin, 1998; *P. puniceus* Henderson, 1896; *P. pusillus* Henderson, 1896; *P. zhejiangensis* Wang and Tung, 1982; *P. seminudus* Stimpson, 1858; *P. sinensis* Tung and Wang, 1966; and *P. taenia* Komai, 1999. Among them, the presence of 13 pairs of gills has been confirmed for *P. antennarius*, *P. arostratus*, *P. calvus*, *P. jalur*, *P. miyakei*, *P. puniceus* and *P. pusillus* (Osawa and Takeda, 2004; Rahayu and McLaughlin, 2005; Rahayu, 2006; McLaughlin *et al.*, 2007).

*Paguristes brachytes* was recently found to be a junior synonym of *Pseudopaguristes laurentae* (Morgan and Forest, 1990) (Rahayu, 2007; McLaughlin, 2008). Specific identities of some taxa need to be verified (see *Remarks* for *Stratiotes*).

In this study, two species, *Paguristes japonicus* and *P. taenia*, are reviewed, as the possession of 12 pairs of gills has been confirmed for them. Two new species, *S. nigroapiculatus* sp. nov., and *S. orbis* sp. nov., are described, of them the former has been confounded with *S. japonicus* or *Paguristes puniceus* in previous literature (i.e., Miyake, 1978; Asakura, 2006), and indeed it is very similar to *S. japonicus*. *Stratiotes orbis* is morphologically similar to *S. taenia*, *S. breviannatus* Rahayu, 2005 and *S. ngochoae* Rahayu, 2005. Affinities of these four species are discussed.

## Material and Methods

Specimens examined in this study are deposited in the Kitakyushu Museum of Natural History and Human History (KMNH), Natural History Museum and Institute, Chiba (CBM), and Showa Memorial Institute, National Museum of Nature and Science, Tsukuba (NSMT). The shield length, abbreviated as sl, is measured from the tip of rostrum to the mid-point of posterior margin of the shield. For detailed observation of the surface structure of the integument, the specimens (including removed appendages) were stained with methylene blue. Terminology used in the description follows that of McLaughlin (2008).

The drawings were made with the aid of a drawing tube mounted on a Leica MZ8 stereomicroscope.

### Systematics

#### Genus *Stratiotes* Thomson, 1899

*Remarks.* For more than a century, *Stratiotes* was considered a junior synonym of *Paguristes* [see Forest and McLaughlin (2000)]. Rahayu (2005) is the first to confirm that the type species of *Stratiotes*, *P. setosus* Filhol, 1885 [junior synonym of *S. setosus* (H. Milne Edwards, 1848)] had only 12 pairs of gills. The reduction of the gill number is considered to be apomorphic within Paguroidea (McLaughlin, 1983; Martin and Abele, 1986), and this warrants reinstating *Stratiotes* as a full genus as well as the recognition of *Pseudopaguristes*. Until Rahayu (2005) showed that reduction in gill number was found in species assigned to *Paguristes*, workers dealing with the taxonomy of the genus had not paid great attention to the gill number, because *Paguristes* sensu lato was rather easily recognized by the possession of two anterior pairs of pleopods modified as gonopods in males and of the paired first pleopods in females. With regard to species known from East Asian waters, the possession of 13 pairs of gills has been confirmed for *P. acanthomerus*, *P. albimaculatus*, *P. antennarius*, *P. arostratus*, *P. calvus*, *P. doederleini*, *P. jalur*, *P. miyakei*, *P. palythophilus*, *P. puniceus*, and *P. versus* (Osawa and Takeda, 2004; Rahayu, 2006; McLaughlin *et al.*, 2007). During this study, I have checked the gill number of several Japanese species for confirmation, i.e., *P. balanophilus* sensu Miyake (1978), *P. digitalis*, *P. japonicus*, *P. ortmanni*, and *P. taenia*. It has been confirmed that all but *P. japonicus* and *P. taenia* possess 13 pairs of gills. The latter two species have only 12 pairs of gills, and consequently they are here transferred to *Stratiotes*. Now, *Stratiotes* is represented by 22 species, including the two new species described in this paper. The gill number remains to be verified for some East Asian taxa, i.e., *P. gonagurus*, *P. incomitatus*, *P. seminudus*, and *P. sinensis*, but specific identities of these taxa also need to be clarified.

#### *Stratiotes japonicus* (Miyake, 1961) comb. nov. (Figs. 1-4, 17A)

*Paguristes* sp.: Miyake, 1961b: 169.

*Paguristes japonicus* Miyake, 1961: 243 (in part), text-figs. 5, 6 [type locality: Tomioka, Amakusa, Kyushu]; 1978: 44 (in part), text-fig. 16, pl. 3, fig. 6; 1982: 97, pl. 33, fig. 4; Miyake *et al.*, 1962: 125; Miyake and Imafuku, 1980: 4; Okuno and Arima, 2004: 58, fig. 2L; Asakura, 2006: 33 (in part); Okuno

*et al.*, 2006: 152.

Not *Paguristes japonicus*: Kim, 1964: 4, 8; 1970: 12; 1973: 212, 597, fig. 43, pl. 68, fig. 24; Komai *et al.*, 1992: 196; Asakura, 2006, figs. 21, 22. = *Stratiotes nigroapiculatus* sp. nov.

*Material examined.* Holotype: KMNH-ZLKU 5191, male (sl 4.4 mm), Tomioka, Amakusa, Kumamoto Prefecture, depth not recorded, April 1958, shrimp trawl, coll. Watanabe.

Other material: CMNH-ZC 00672, 1 male (sl 3.8 mm), Igai-jima Islet, Isomura, Kamogawa, Boso Peninsula, Japan, 16 m, with SCUBA, 29 June 2001, coll. J. Okuno; CBM-ZC 5790, 1 male (sl 4.4 mm), Tatsushima Beach, Kyonan, Boso Peninsula, intertidal, rocky shore, September 1998, hand, coll. T. Komai; NSMT-CrR 1809, 1 male (sl 2.5 mm), Arasaki, Yokosuka, Sagami Bay, intertidal, 25 July 1960, hand, S. Miyake det. No. 391; NSMT-Cr 2163, 1 male (sl 3.5 mm), west of Kamegi-sho, Sagami Bay, 14-16 m, 24 July 1963, dredge, S. Miyake det. No. 527; NSMT-CrR 2316, 1 female (sl 3.2 mm), Ohne, Higurashi, off Hayama, Sagami Bay, 21 m, 8 February 1965, dredge, Miyake det. No. 581; CBM-ZC 5106, 3 males (sl 2.7-2.9 mm), 2 females (sl 2.6, 3.0 mm), 2 ovigerous females (sl 3.1, 3.2 mm), Uchiura Bay, Numazu, Suruga Bay, 8 m, 18 October 1997, SCUBA diving, coll. M. Mitsuhashi; CBM-ZC 1040, 1 male (sl 3.4 mm), 1 ovigerous female (sl 3.5 mm), Sabiura, Kushimoto, Kii Peninsula, 5-10 m, December 1994, SCUBA diving, coll. K. Nomura; CBM-ZC 1199, 3 males (sl 3.2-3.6 mm), 2 females (sl 3.2, 3.4 mm), same locality, 5 m, January 1991, SCUBA diving, coll. K. Nomura; CBM-ZC 2028, 1 female (sl 2.2 mm), Myoga-jima Islet, Kushimoto, Kii Peninsula, 25 m, 17 April 1994, SCUBA diving, coll. K. Nomura; CBM-ZC 5904, 2 males (sl 2.9, 3.0 mm), 1 female (sl 2.8 mm), same locality, 6 m, 21 February 1995, SCUBA diving, coll. K. Nomura; CBM-ZC 7317, 1 male (sl 3.8 mm), Sakai Fishing Port, Minabe, Kii Peninsula, 2-3 m, 31 March 1999, trap, coll. T. Komai; CBM-ZC 9528, 5 males (sl 2.7-4.7 mm), 1 ovigerous female (sl 3.0 mm), Yasujima, Mikuni, Fukui Prefecture, 6 m, 24 May 2001, SCUBA diving, coll. T. Sugimoto; CBM-ZC 9529, 11 males (sl 3.1-4.9 mm), 10 females (sl 3.1-3.5 mm), 1 ovigerous female (sl 3.1 mm), Yasujima, Mikuni, Fukui Prefecture, 6 m, 27 August 2001, SCUBA diving, coll. T. Sugimoto.

*Redescription.* Biserial phyllobranchiae. Shield (Fig. 1A) 1.2-1.3 times longer than broad; rostrum triangular, distinctly overreaching lateral projections, reaching or overreaching midlength of ocular acicles;

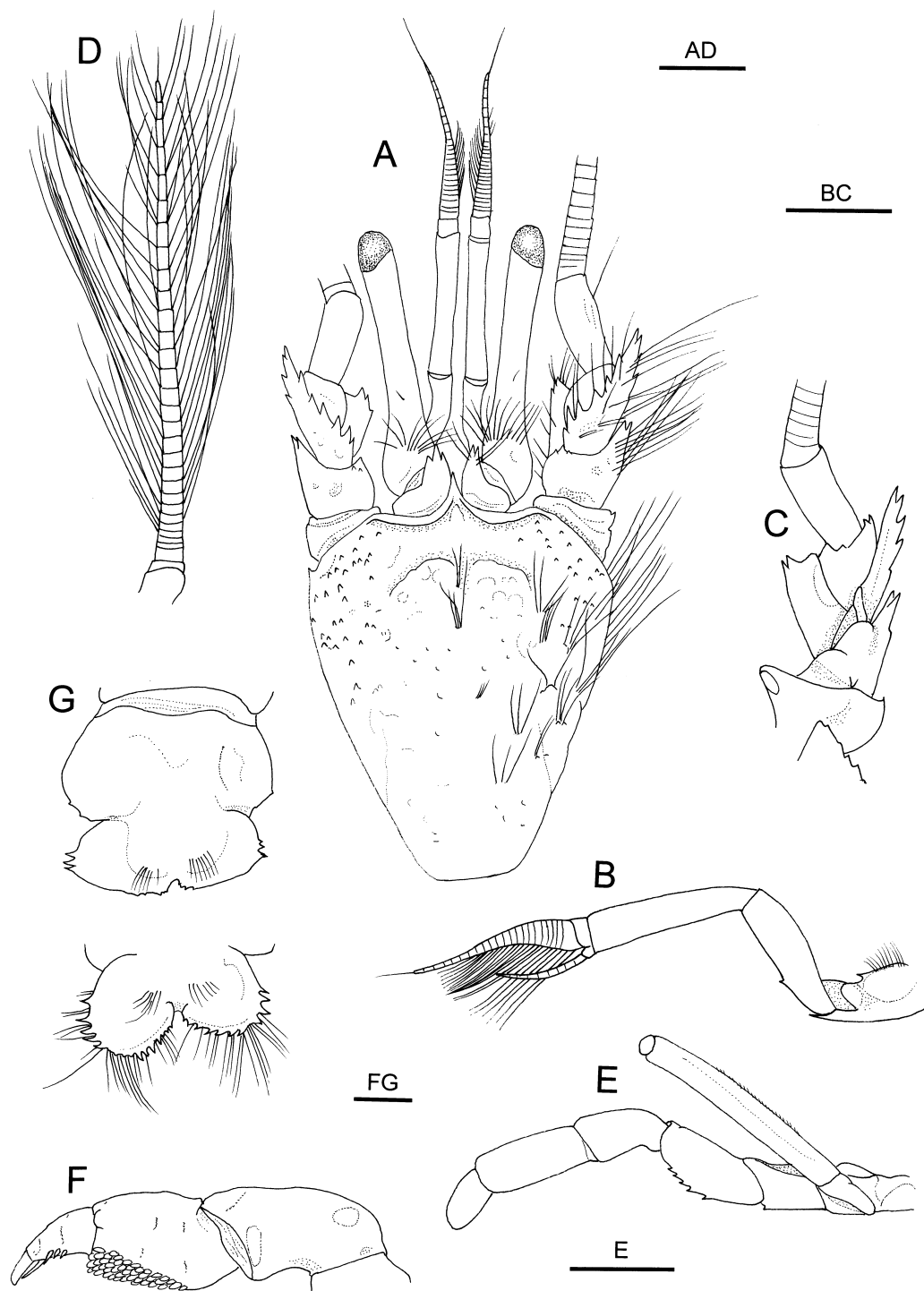


Fig. 1. *Stratiotes japonicus* (Miyake, 1961) comb. nov. Male (sl 4.8 mm), CBM-ZC 9529, Yasujima, Mikuni, Fukui Prefecture. A, shield and cephalic appendages, dorsal view (antennal flagella omitted; setae on left side also omitted); B, left antennule, lateral view; C, left antenna, ventral view (setae omitted); D, left antennal flagellum, dorsal view; E, left third maxilliped, lateral view (setae omitted); F, distal 3 segments of left fourth pereopod, lateral view (setae omitted); G, telson, dorsal view; inset, deflexed posterior lobes, dorsal view. Scale bars: 1 mm for A-E; 0.5 mm for F, G.

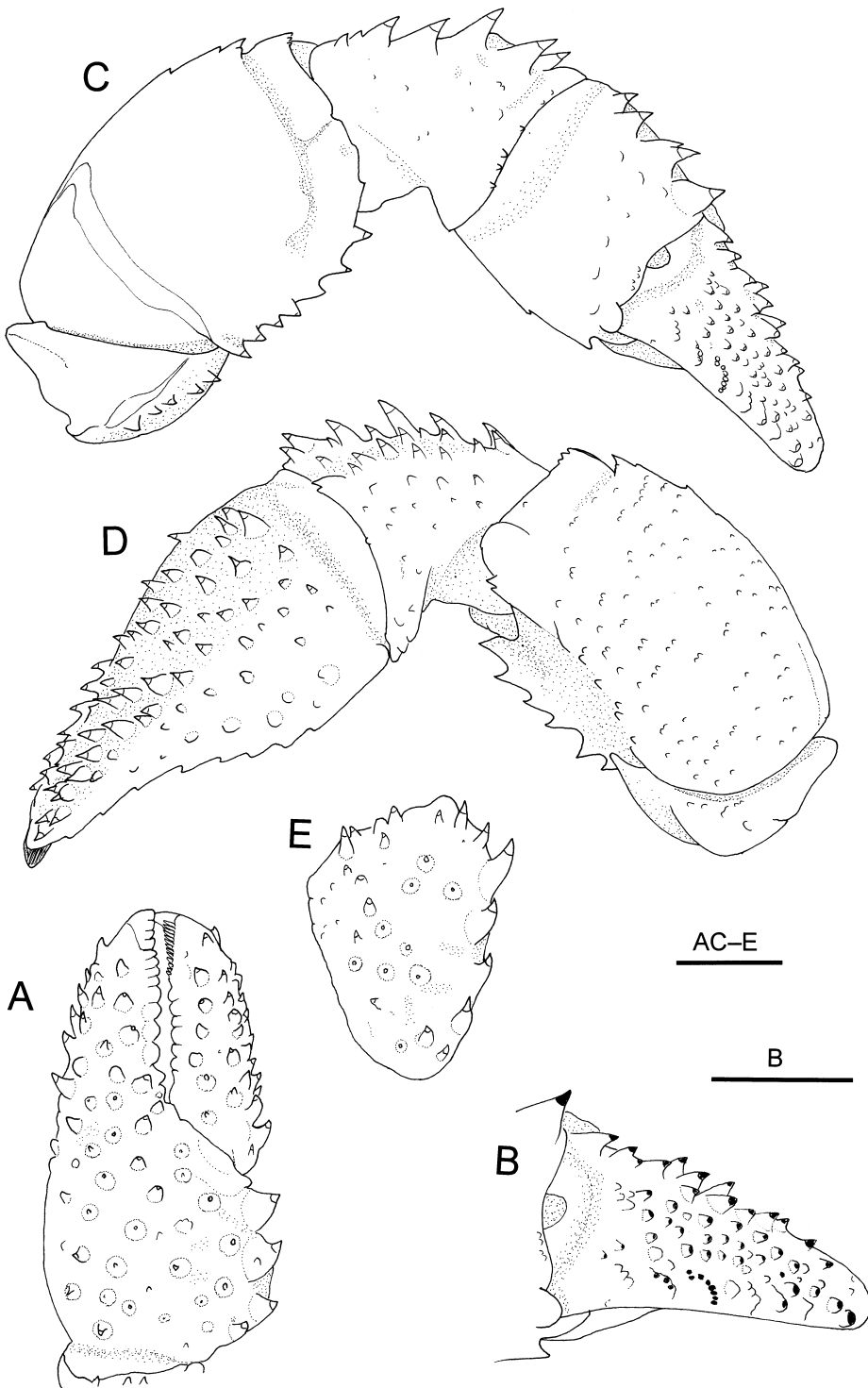


Fig. 2. *Stratiotes japonicus* (Miyake, 1961) comb. nov. Male (sl 4.8 mm), CBM-ZC 9529, Yasujima, Mikuni, Fukui Prefecture. Left cheliped (setae omitted): A, chela, dorsal view; B, dactylus, mesial view; C, entire left cheliped, mesial view; D, same, lateral view; E, carpus, dorsal view. Scale bars: 1 mm.

lateral projections obtusely triangular, each with or without submarginal spinule; anterolateral margins sloping, occasionally with spinules posteriorly; lateral margins slightly convex or nearly straight; dorsal surface with scattered small spines or spiniform granules and several tufts of moderately short to long setae laterally; gastric elevations distinct, rugose. Branchiostegites each with row of small spines on dorsal margin in distal half.

Ocular peduncles (Fig. 1A) slender, equal in length, 0.6-0.8 times as long as shield, somewhat inflated basally, bearing transverse row of setae basally; corneas not dilated, narrower than basal width, corneal diameter 0.1-0.2 of peduncular length; ocular acicles somewhat elongate, moderately broad to slender, terminally bifid or trifid, usually with long setae. Antennular peduncles (Fig. 1A, B) overreaching distal corneal margins by 0.1-0.3 lengths of ultimate segments; basal segment with small spine on distolateral margin of statocyst lobe and with moderately produced ventrodistal margin terminating in slender spine; penultimate segment with spinule arising proximal to midlength of ventral surface; ultimate segment about 1.2 times longer than penultimate segment; dorsal flagellum subequal in length to ultimate segment. Antennal peduncles (Fig. 1A, C) not reaching bases of corneas; fifth segment relatively stout, unarmed; fourth segment with 1 or 2 spinules at distolateral angle; third segment with 1 or 2 small spines at moderately produced ventromesial distal angle; second segment with dorsolateral distal angle produced, terminating in prominent, simple or bifid spine, subdistal spine(s) frequently present on lateral margin, dorsomesial distal angle with small spine; first segment unarmed or armed with spinule(s) laterally, ventromesial distal angle produced; antennal acicle moderately stout, falling slightly short of midlength of fifth peduncular segment, terminating in bifid spine, mesial margin with 5 or 6 spines, lateral margin with 2 or 3 small spines; antennal flagellum relatively stout, longer than shield, but shorter than carapace, consisting of numerous articles (articles in 0.3 distinctly wider than long), each article with long, paired setae ventrally.

Third maxilliped (Fig. 1E) moderately stout; merus armed with some small spines on ventrolateral margin, dorsodistal margin unarmed; ischium with well-developed crista dentata consisting of row of sharp triangular corneous teeth.

Spines on chelipeds and ambulatory legs usually corneous-tipped, corneous tips lightly pigmented, not particularly elongate or curved.

Chelipeds (Fig. 2A-E) subequal, similar. Chelae generally elongate subovate in dorsal view, 1.8-2.0 times longer than broad. Dactyli 1.3-1.5 times longer than palm; dorsal surfaces each with 2 irregular rows of small corneous-tipped spines and scattered tufts of stiff setae, dorsomesial margin with double row of small corneous-tipped spines; mesial surfaces each with more than 20 corneous-tipped spinules (tips rather blunt) and low, occasionally denticulate, protuberances adjacent to ventral margin, and with few short setae; ventral surface smooth, with scattered tufts of stiff setae; cutting edges each with small, blunt calcareous teeth in proximal 0.7, corneous teeth in distal 0.3, terminating in strong corneous claw. Palms slightly shorter than carpi, dorsomesial margins each with 3 or 4 strong, corneous-tipped spines; dorsal surfaces each with scattered moderately small to small, corneous-tipped spines, becoming closely spaced on fixed finger, and with tufts of long stiff setae partially obscuring armature; dorsolateral margin not delimited on palm, but delimited with single or double row of corneous-tipped spines on fixed finger; mesial surfaces each with some low protuberances bearing tufts of setae; ventral surfaces convex, each with row of low tubercles medially, extending onto fixed finger, tuft of setae at base of each tubercle; cutting edges each with row of small, blunt calcareous teeth, terminating in strong corneous claw or plate fused with distal corneous teeth. Carpi about 0.6 length of meri, each with 4 or 5 strong corneous-tipped spines on dorsomesial margin; dorsal surface with scattered small to moderately small corneous-tipped spines, dorsodistal margin produced, with several corneous-tipped spines; dorsolateral margin not delimited, sloping to lateral surface bearing scattered small spines or spinulose tubercles; mesial surfaces each with few tiny tubercles; tufts of long stiff setae on dorsal and lateral surfaces. Meri each with small subdistal spine overhanging transverse groove and few denticles on dorsal margin, dorsodistal margin with some small denticles or spinules; lateral surfaces each with scattered tiny, simple or bifid tubercles, ventrolateral margin with 1 or 2 small spines subdistally; mesial surfaces nearly smooth, each ventromesial margin with row of small corneous-tipped spines over entire length; tufts of stiff setae on dorsal margins and ventral surfaces. Ischia each with row of small spines on ventromesial margin and with few tiny tubercles along distal margin.

Second pereopods (Fig. 3A-C) moderately stout, subequal in length to third pereopods, left and right pereopods with similar armature. Dactyli 1.2-1.3

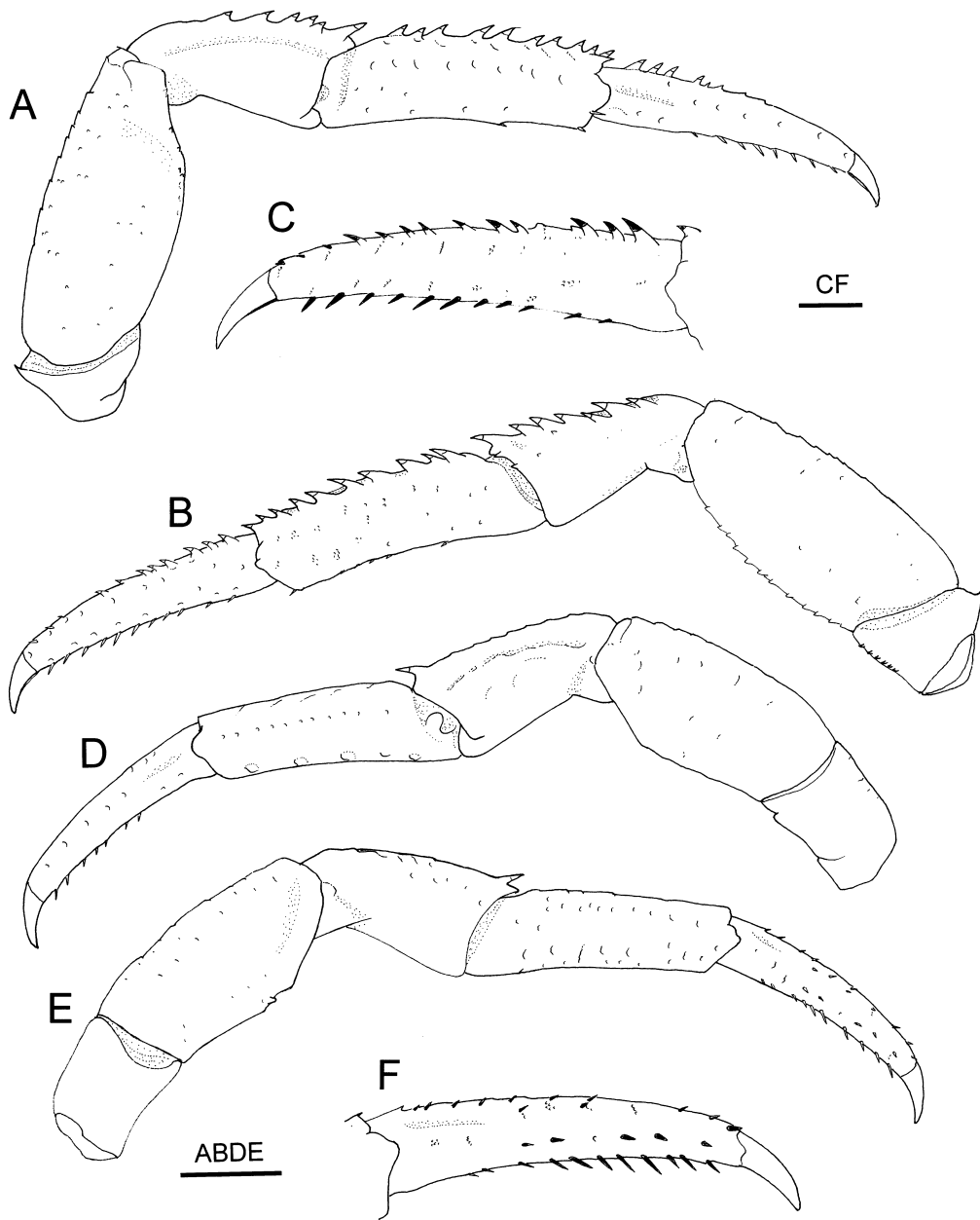


Fig. 3. *Stratiotes japonicus* (Miyake, 1961) comb. nov. Male (sl 4.8 mm), CBM-ZC 9529, Yasujima, Mikuni, Fukui Prefecture. Ambulatory legs (setae omitted): A, right second pereopod, lateral view; B, same, mesial view; C, dactylus of right second pereopod, mesial view; D, left third pereopod, lateral view; E, same, mesial view; F, dactylus of left third pereopod, mesial view. Scale bars: 1 mm for A, B, D, E; 0.5 mm for C, F.

times longer than propodi, 5.0-5.5 times longer than wide, weakly curved; dorsal margins each with row of small corneous-tipped spines becoming smaller and spinulose distally, obscured by tufts of setae; lateral surfaces each with rows of stiff setae; mesial surfaces each with scattered setae, but no particular armature; ventral margins each with 10-14 small corneous spinules. Propodi longer than carpi, each with dorsal row of about 10 large, corneous-tipped spines; lateral surfaces with rows of tufts of setae; mesial surfaces each with scattered tufts of setae, but without conspicuous armature; ventral margins each with row of corneous spinules including 1 or 2 on ventrodorsal margin. Carpi 0.7-0.8 times as long as meri, each with dorsal row of 7 corneous-tipped spines (occasionally arranged in double row); lateral surfaces convex, with shallow longitudinal sulcus dorsal to midline; mesial surfaces each with few tiny tubercles dorsodistally; tufts of setae on dorsal margins and lateral surfaces. Meri with row of tiny tubercles on dorsal margins; lateral surfaces with scattered granules or minute tubercles; ventral margins each with row of minute spines mesially, ventrolateral distal margin with few minute tubercles; tufts of long setae on dorsal and ventral margins. Ischia each with minute dorsodistal spine; ventral margins each with row of minute spines mesially.

Third pereopods (Fig. 3D-F) similar from left to right, and similar to second pereopods in setation and proportion. Dactyli with row of corneous spinules on each dorsal surface mesially; mesial surfaces each with few corneous spinules adjacent to dorsal margin and single row of corneous spinules ventral to midline; ventral margins each with row of slender corneous spinules. Propodi unarmed. Carpi each with moderately small corneous-tipped dorsodistal spine; lateral surfaces convex, each with shallow longitudinal sulcus dorsal to midline. Meri and ischia without conspicuous armature.

Fourth pereopods (Fig. 1F) each with slender preungual process; dactyli each with row of few corneous spines on ventral margin, unarmed on dorsal margin; propodi unarmed on dorsal margins, each rasp consisting of 3 or 4 rows of corneous scales; carpi unarmed on dorsal margins; tufts of long setae on margins and surfaces of segments.

Male first pleopod (Fig. 4A-C) moderately stout; inferior lamella moderately narrow, rounded, marginally and submarginally with numerous hook-like spines arranged in multiple rows; external lobe extending beyond inferior lamella, separated from inferior lamella by moderately deep notch, tip rounded;

internal lobe broadly convex, with numerous stiff setae arising marginally or submarginally. Male second pleopod (Fig. 4D, E) slender, distal segment subequal in length to basal segment; endopod with faint distomesial angle bearing tuft of stiff setae; appendix masculina very slightly twisted, subspatulate, subovately elongate in mesial view, with numerous stiff setae on lateral surface, mesial face slightly concave. Female brood pouch (Fig. 4F) relatively small, subrectangularly elongate, with dense setae on margins and scattered long setae on outer surface. Eggs relatively small, diameter 0.6-0.7 mm in eyed stage.

Telson (Fig. 1G) with slightly to greatly asymmetrical posterior lobes, left lobe larger than right; cleft separating lobes moderately narrow and deep; terminal margins each with row of small to large, occasionally corneous-tipped spines, extending onto lateral margin on either side; lateral margins of anterior lobes each with few minute spinules or denticles posteriorly.

*Coloration.* In life (Fig. 17A). Shield generally pale brown or tan, with dark brown patches medially and laterally; posterior carapace also light brown or tan. Ocular peduncles grayish-blue to blue in distal 0.6-0.7, light brown or tan in proximal 0.3-0.4. Antennular peduncles with grayish or bluish ultimate segment, proximal 2 segments and flagella light brown or tan. Antennal peduncles also light brown or tan, flagellum generally tan, but with slightly darker rings. Chelipeds and ambulatory legs generally light brown or tan. Dactyli of ambulatory legs whitish, each with dark brown ring basally; propodi also each with dark brown ring basally; carpi each with dark brown blotch dorsally; meri each with dark brown blotch medially on lateral surface. Setae on chelipeds and ambulatory legs brown. Pleon yellowish-brown.

*Distribution.* Pacific coast of Japan from Boso Peninsula to Kyushu, Sea of Japan northward to Fukui Prefecture; subtidal to 25 m.

*Remarks.* The form of the ocular peduncles varies in relation to the size of the individual; they become proportionally slenderer with increasing the body size.

*Stratiotes japonicus* closely resembles *S. nigroapiculatus* sp. nov., and in fact, materials referred to *S. japonicus* by Miyake (1961; 1978; as *Paguristes*) include the two taxa. Differences between the two species are discussed under the account of the latter species.

The type series consists of holotype (KMNH-ZLKU 5191), allotype (NSMT-CrR 1753, Miyake det. No. 369) and four lots of paratypes (KMNH-ZLKU



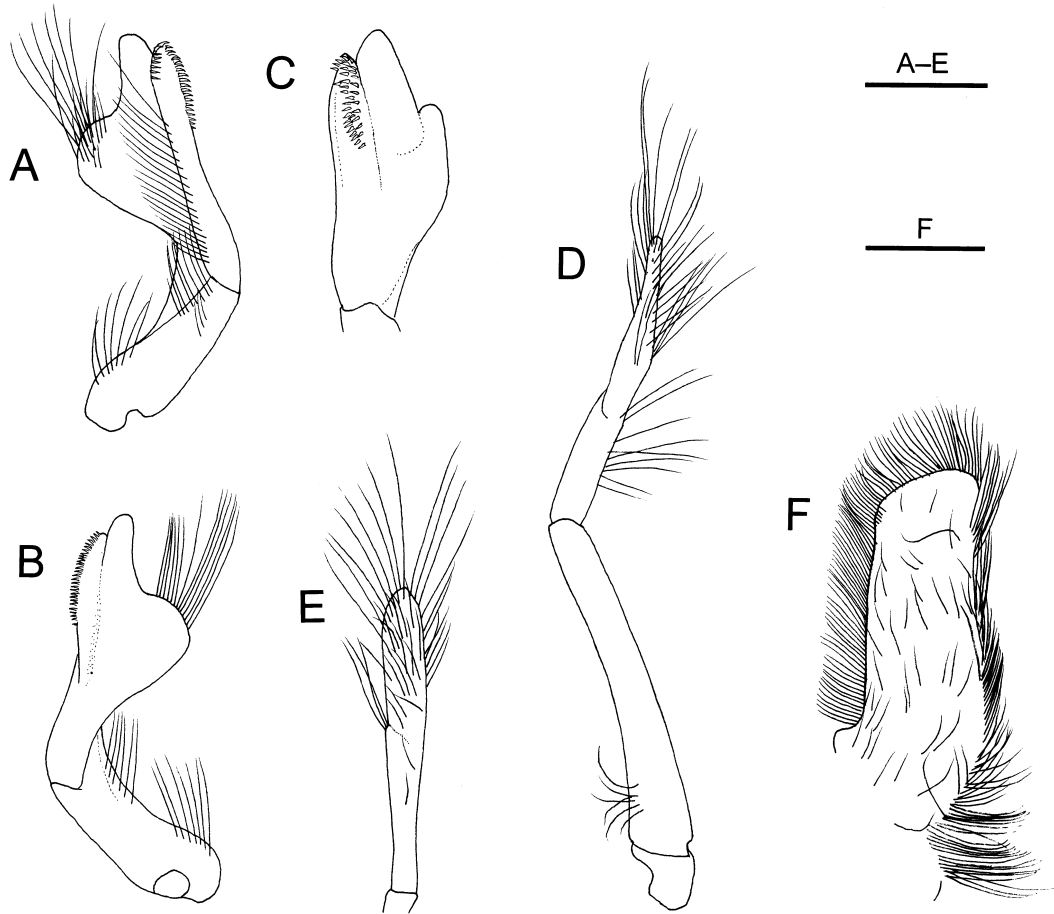


Fig. 4. *Stratiotes japonicus* (Miyake, 1961) comb. nov. A–E, male (sl 4.8 mm), CBM-ZC 9529, Yasujima, Mikuni, Fukui Prefecture; F, ovigerous female (sl 3.0 mm), CBM-ZC 9528, same locality. A, left first pleopod, ventromesial view; B, same, dorsolateral view; C, same, lateral view; D, left second pleopod, ventral view; E, endopod and appendix masculina of left second pleopod, lateral view; F, brood pouch, outer view. Scale bars: 0.5 mm for A–E; 1 mm for F.

7683, 4579, 7393; NSMT-CrR, Miyake det. No. 340) (Miyake, 1961). Of them, the holotype, allotype (NSMT-CrR 1753) and one of the paratypes (NSMT-CrR, Miyake det. No. 340) were available for study. It has been found that the allotype and the paratype actually represent *S. nigroapiculus* sp. nov. Miyake (1978) referred 14 lots of non-type specimens, all from Sagami Bay, to *Paguristes japonicus*. Of them eight lots were located and reexamined. Only three specimens (NSMT-CrR, Miyake det. No. 391; NSMT-CrR 2163, Miyake det. No. 527; NSMT-CrR 2316, Miyake det. No. 581) were correctly identified; five lots (Miyake det. No. 211; 296; 481; 621; and 630) actually represent *S. nigroapiculus* sp. nov.; finally, the single lot (Miyake det. No. 597) represents *Paguristes ortmanni* (cf. Komai, 2001).

Kim (1964, 1970; 1973) reported *Paguristes japonicus* from southern Korea. Although material from Korea has not been available for study, the rather detailed description on the morphology and coloration of Kim (1973) rather agree well with *S. nigroapiculus* sp. nov. than with *S. japonicus*. Therefore, these references are referred to *S. nigroapiculus*.

Komai *et al.* (1992) reported *Paguristes japonicus* from Hokkaido, Japan, but this record is here referred to *S. nigroapiculus* (Komai, personal observation). Asakura (2006) reported *Paguristes japonicus* from Akita Prefecture, northern Japan, but his photograph clearly shows characteristic armature of the chelipeds and ambulatory legs, suggesting that his specimens actually represent *S. nigroapiculus* sp. nov.

Because of the strong similarity to *S. japonicus*, it is

worth mentioning *Paguristes sinensis* described by Tung and Wang (1966) from Chekiang, China. Unfortunately, I have had no chance to examine the type or topotypic material, and thus the gill formula of this taxon remains to be verified. Nevertheless, considering the close similarity of *P. sinensis* to *S. japonicus* and *S. nigroapiculus*, it is possible that the Chinese taxon should actually be referred to *Stratiotes*. In comparison with the original description by Miyake (1961), Tung and Wang (1966) differentiated *P. sinensis* from *S. japonicus* by the following characters: (1) shield setose in *P. sinensis*, rather than smooth in *S. japonicus*; (2) ocular acicles with one to three spinules on outer margin in *P. sinensis*, but bifid in *S. japonicus*; (3) and mesial face of dactylus of cheliped with scattered granules and tufts of setae, rather than with dense fine granules and short setae. Examination of the present series of *S. japonicus* has revealed that neither the first nor second character provides diagnostic differentiation; however, the third character seems to be significant. Furthermore, *P. sinensis* seems to differ from *S. japonicus* in the blunt spines on the dorsal surfaces of chelae and the much broader meri of the second pereopods. Therefore, at present, *P. sinensis* is regarded as a valid species.

*Stratiotes nigroapiculus* sp. nov.  
(Figs. 5-8, 17B)

*Paguristes puniceus*: Miyake, 1978: 38 (in part). Not *Paguristes puniceus* Henderson, 1896.

*Paguristes japonicus*: Kim, 1964: 4, 8; 1970: 12; 1973: 212, 597, fig. 43, pl. 68, fig. 24; 1985: 28; Miyake, 1978: 44 (in part); Komai *et al.*, 1991: 196; Asakura, 2006, figs. 21, 22.

*Paguristes ortmanni*: Petryashov and Kornienko, 2006: 120, fig. 2. Not *Paguristes ortmanni* Miyake, 1978.

*Material examined*. Holotype: CBM-ZC 4843, male (sl 14.0 mm), Akahama Port, Ohtsuchi Bay, Iwate Prefecture, 5-6 m, 15 October 1996, bated trap, coll. T. Komai.

Paratypes: CBM-ZC 9522, 1 male (sl 4.7 mm), 1 ovigerous female (sl 4.2 mm), off Ohmu, Sea of Okhotsk, 44 °35.996 N, 143 °03.710 E, 44 m, sand, 22 August 1996, sledge, coll. J. Sasaki; CBM-ZC 88, 1 male (sl 3.2 mm), off Usujiri, southern Hokkaido, 15-25 m, 11 June 1993, dredge, coll. F. Muto; CBM-ZC 1682, 2 males (sl 11.5, 11.7 mm), off Hei-gawa river mouth, Miyako Bay, Iwate Prefecture, 5-10 m, 24 May 1995, commercial gill net, coll. T. Komai; CBM-ZC 1909, 4 males (sl 2.4-3.9 mm), 5 females (sl 2.5-3.1 mm), Funakoshi Bay, Yamada, Iwate Prefecture,

39 °23.634 N, 141 °57.191 E, 66 m, 25 May 1995, dredge, coll. T. Komai; CBM-ZC 1929, 1 males (sl 5.3 mm), Funakoshi Bay, Yamada, Iwate Prefecture, 39 °23.113 N, 141 °58.493 E, 50 m, 25 May 1995, dredge, coll. T. Komai; CBM-ZC 9527, 1 male (sl 4.0 mm), 1 female (sl 3.0 mm), off Taito-saki, Boso Peninsula, RV *Tansei-maru*, KT95-05 cruise, stn TB-11, 35 °16.27 N, 140 °41.21 E to 35 °16.32 N, 140 °41.41 E, 115-120 m, 21 April 1995, dredge, coll. T. Komai; CBM-ZC 9523, 2 males (sl 6.0, 6.9 mm), off Hota, Kyonan, Boso Peninsula, Uruga Strait, 30-40 m, 14 December 1997, commercial gill net, coll. T. Komai; CBM-ZC 9524, 1 male (sl 6.0 mm), off Takeoka, Futtsu, Boso Peninsula, Uruga Strait, 20-30 m, 6 August 1998, commercial gill net, coll. T. Komai; CBM-ZC 9525, 1 male (sl 9.4 mm), similar locality, 30-40 m, 23 August 2000, commercial gill net, coll. T. Komai; NSMT-CrR 909, 1 male (sl 6.6 mm), Kadone, off Hayama, Sagami Bay, 120 m, 2 February 1955, dredge, Miyake (1978) det. No. 103 (as *Paguristes puniceus*); NSMT-CrR 939, 1 male (sl 5.9 mm), Higashi-oh-ne, Sagami Bay, 140 m, 9 February 1955, dredge, Miyake (1978) det. No. 108 (as *P. puniceus*); NSMT-CrR 979, 1 male (sl 7.2 mm), Kadone, off Hayama, 100-120 m, 16 July 1955, dredge, Miyake (1978) det. No. 119 (as *P. puniceus*); NSMT-CrR 981, 1 male (sl 7.2 mm), same data, Miyake (1978) det. No. 121 (as *P. puniceus*); NSMT-CrR, 1459, 1 female (sl 3.0 mm), between Aoyama-dashi and Kan-nonzuka-dashi, Sagami Bay, 92 m, 15 July 1958, dredge, Miyake (1978) det. No. 211 (as *P. japonicus*); NSMT-CrR 1627, 1 male (sl 4.1 mm), 5 km off Jogashima Islet, 102 m, 27 July 1957, dredge, S. Miyake det. No. 296 (as *P. japonicus*); NSMT-CrR 2059, 1 female (sl 4.4 mm), Aoyama-dashi, Amadaiba, Sagami Bay, 85-90 m, 17 December 1962, dredge, S. Miyake det. No. 481 (as *P. japonicus*); NSMT-CrR 3520, 1 female (sl 3.8 mm), 4 km SW of Jogashima Islet, 93-97 m, 21 January 1966, dredge, S. Miyake det. No. 621 (as *P. japonicus*); NSMT-CrR 3536, 1 male (sl 7.5 mm), 2 females (sl 3.6, 5.8 mm), 3.5 km SW of Jogashima Islet, 90 m, 25 March 1967, dredge, S. Miyake det. No. 630 (as *P. japonicus*); NSMT-CrS 44, 1 male (sl 5.1 mm), off Yokosuka, Sagami Bay, 35 °11.516 N, 139 °34.715 E to 35 °11.382 N, 139 °34.491 E, 76-67 m, 16 March 2001, gill net, coll. H. Namikawa; NSMT-CrS 45, 1 male (sl 7.4 mm), off Yokosuka, Sagami Bay, FB *Noboru-maru*, stn 6, 35 °11.23 N, 139 °34.40 E to 35 °11.06 N, 139 °34.73 E, 119-111 m, 8 March 2002, gill net, coll. T. Kuramochi and T. Ohji; CBM-ZC 9568, 1 male (sl 3.0 mm), 2 females (sl 2.7, 3.0 mm), off Misaki, Sagami Bay, 100-101 m, 22 January 2003, RV *Rinkai-maru*, dredge, coll. T. Komai; CBM-

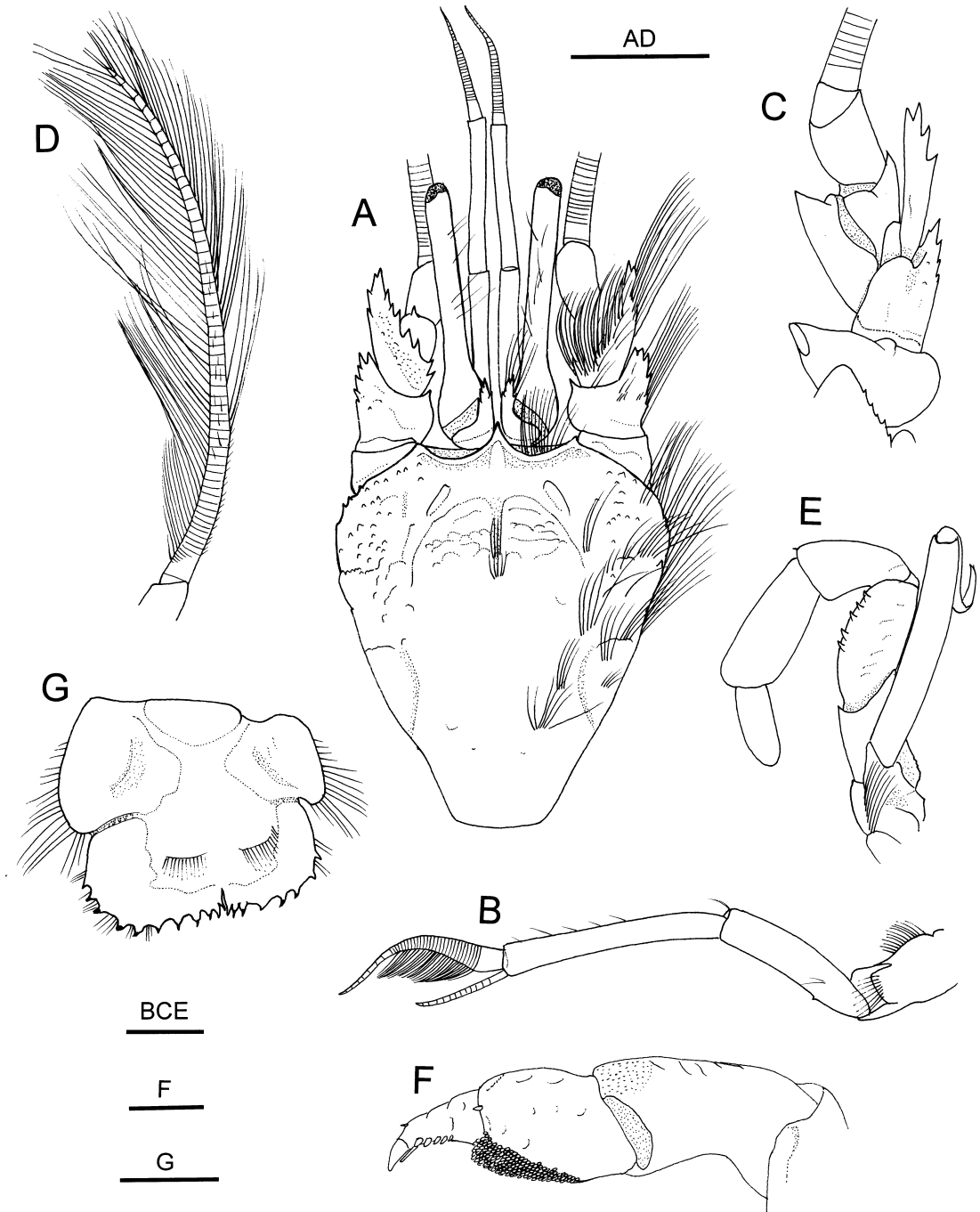


Fig. 5. *Stratiotes nigroapiculus* sp. nov. Holotype, male (sl 144 mm), CBM-ZC 4843, Akahama, Ohtsuchi, Iwate Prefecture. A, shield and cephalic appendages, dorsal view (antennal flagella omitted; setae on left side also omitted); B, left antennule, lateral view; C, left antenna, ventral view (setae omitted); D, left antennal flagellum, dorsal view; E, left third maxilliped, lateral view (setae omitted); F, distal 3 segments of left fourth pereopod, lateral view (setae omitted); G, telson, dorsal view. Scale bars: 5 mm for A, D; 2 mm for G; 1 mm for B, C, E, F.

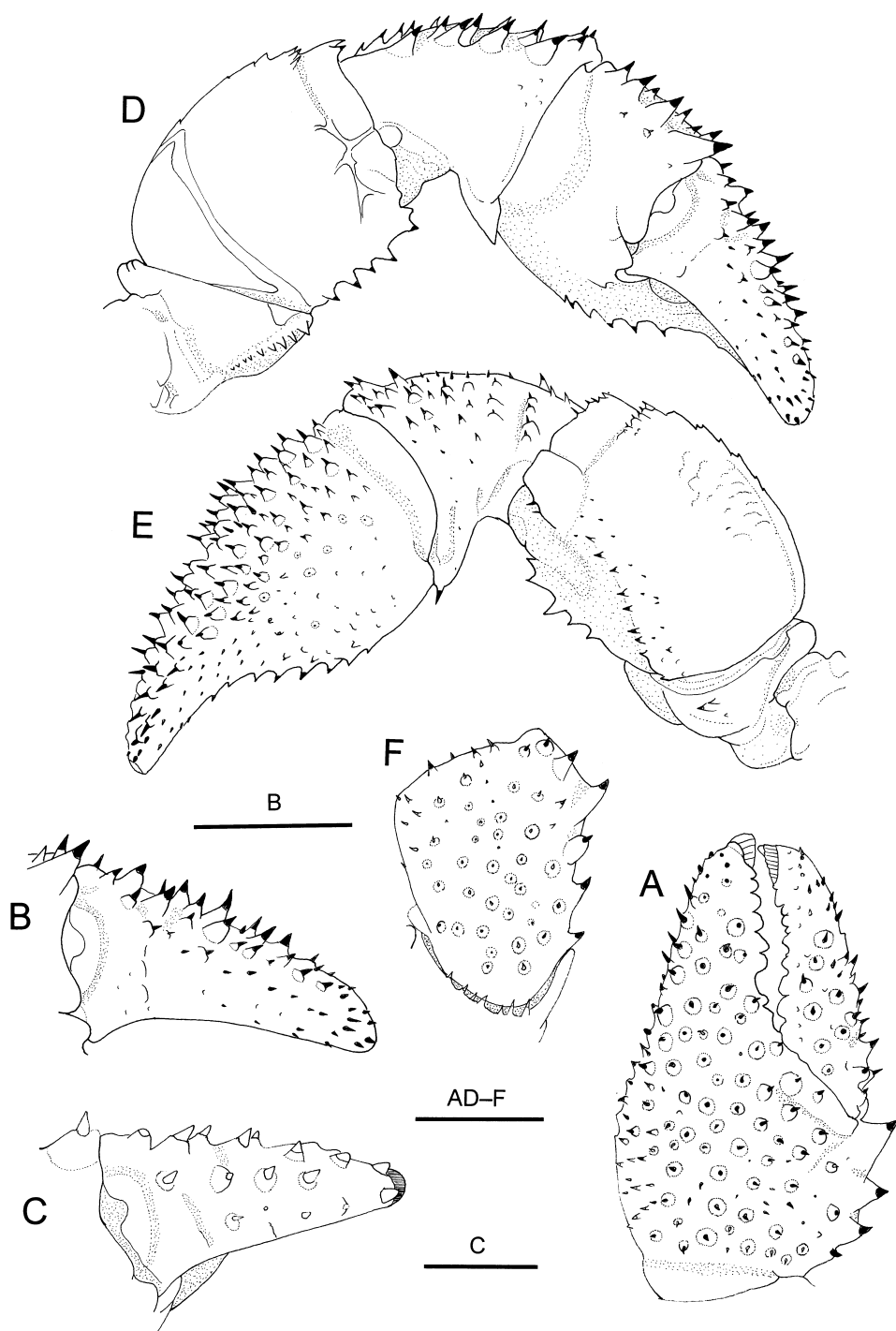


Fig. 6. *Stratiotes nigroapiculus* sp. nov. A, B, D-F, holotype, male (sl 14.4 mm), CBM-ZC 4843, Akahama, Ohtsuchi, Iwate Prefecture; C, paratype, male (sl 4.8 mm), CBM-ZC 9522, off Ohmu, Hokkaido, Sea of Okhotsk. Left chelipeds (setae omitted): A, chela, dorsal view; B, C, dactylus, mesial view; D, entire left cheliped, mesial view; E, same, lateral view; F, carpus, dorsal view. Scale bars: 5 mm for A, B, D-F; 1 mm for C.

ZC 9526, 5 males (sl 4.6–6.5 mm), Vostok Bay, Prymorie, Russian Far East, subtidal, September 2007, coll. O. Korn.

Other material. Allotype of *Stratiotes japonicus*: NSMT-Cr R 1753, 1 female (sl 2.7 mm), 2.5 km south-west of Jogashima Islet, 75–80 m, 6 June 1960, S. Miyake det. No. 369.

Paratype of *Stratiotes japonicus*: NSMT-Cr R 1724, 1 male (sl 3.3 mm), west of Kamegi-sho, Sagami Bay, 120 m, 1 June 1960, S. Miyake det. No. 340.

*Description.* Biserial phyllobranchiae. Shield (Fig. 5A) 1.2–1.3 times longer than broad; rostrum triangular, distinctly overreaching lateral projections, not reaching or overreaching midlength of ocular acicles; lateral projections obtusely triangular, with or without submarginal spinule; anterior margin between rostrum and lateral projections concave; anterolateral margins sloping, occasionally with spinules posteriorly; lateral margins slightly convex; dorsal surface with scattered small spines or spiniform granules and several tufts of moderately short to long setae laterally; gastric elevations distinct, rugose. Branchiostegites each with row of small spines on dorsal margin in distal half.

Ocular peduncles (Fig. 5A) slender to very slender, equal in length, 0.6–0.8 times as long as shield, somewhat inflated basally, bearing transverse row of setae basally; corneas not dilated, distinctly narrower than basal width, corneal diameter less than 0.1 of peduncular length in largest specimens (sl >9.0 mm), 0.1–0.2 in small specimens; ocular acicles somewhat elongate, moderately broad to slender, terminally bifid or multifid, usually with long setae distally. Antennular peduncles (Fig. 5A, B) overreaching distal corneal margins by 0.2–0.4 lengths of ultimate segments; basal segment with small spine on distolateral margin of statocyst lobe and with moderately produced ventrodiscal margin terminating in slender spine; penultimate segment with spinule arising proximal to midlength of ventral surface; ultimate segment becoming proportionally longer with increasing body size, elongate particularly in large specimens, about 1.2–1.3 times longer than penultimate segment; dorsal flagellum subequal in length to distinctly shorter than ultimate segment. Antennal peduncles (Fig. 5A, C) reaching distal 0.2–0.3 of ocular peduncles; fifth segment relatively stout, unarmed; fourth segment with simple or bifid spine at distolateral angle; third segment with 1 or 2 small spines at moderately produced ventromesial distal angle; second segment with dorsolateral distal angle produced, terminating in prominent bifid spine, subdistal spine(s) frequently

present on lateral margin, dorsomesial distal angle with small spine; first segment unarmed laterally, ventromesial distal angle produced; antennal acicle moderately slender to stout, falling slightly short of distal margin of fifth peduncular segment, terminating in bifid spine, mesial margin with 5–7 spines, lateral margin with 2–4 small spines; antennal flagellum (Fig. 5D) relatively stout, longer than shield, but shorter than carapace, consisting of numerous articles (basal articles wider than long, distal articles longer than wide), each article with long, paired setae ventrally.

Third maxilliped (Fig. 5E) moderately stout; carpus with dorsodistal spinule; merus armed with some small spines on ventrolateral margin, dorsodistal margin unarmed; ischium with well-developed crista dentata consisting of row of sharp triangular corneous teeth.

Spines on chelipeds and ambulatory legs usually corneous-tipped; particularly in large specimens (sl >6.0 mm), corneous tips black, occasionally elongate and/or curved.

Chelipeds (Fig. 6A–F) subequal or slightly unequal with left larger, similar in armature. Chelae generally subovately elongate in dorsal view, 1.8–2.0 times longer than broad. Dactyli 1.7–1.9 times longer than palm; dorsal surfaces each with 2 irregular rows of small, corneous-tipped spines (becoming corneous spinules distally) and scattered tufts of stiff setae, dorsomesial margin with double row of small corneous-tipped spines; mesial surfaces each with longitudinal row of some corneous-tipped spines on midline and few additional corneous spinules in small specimens (sl <5.0 mm; Fig. 6C) or several corneous spines or spinules in large specimens (sl >5.0 mm; Fig. 6B) and with few short setae; ventral surface smooth, with scattered tufts of stiff setae; cutting edges each with small, blunt calcareous teeth in proximal 0.8, fused corneous teeth in distal 0.2, terminating in strong corneous claw. Palms shorter than carpi, dorsomesial margins each with 3 or 4 strong, corneous-tipped spines; dorsal surfaces each with numerous, scattered, moderately small to small, corneous-tipped spines, and with tufts of long stiff setae partially obscuring armature; dorsolateral margin not clearly delimited; mesial surfaces each with few small spinulose tubercles or corneous-tipped spinules adjacent to dorsomesial margin; ventral surfaces convex, each with row of small, corneous-tipped spines, extending onto fixed finger, tuft of setae at base of each tubercle; cutting edges each with row of blunt calcareous teeth, terminating in strong

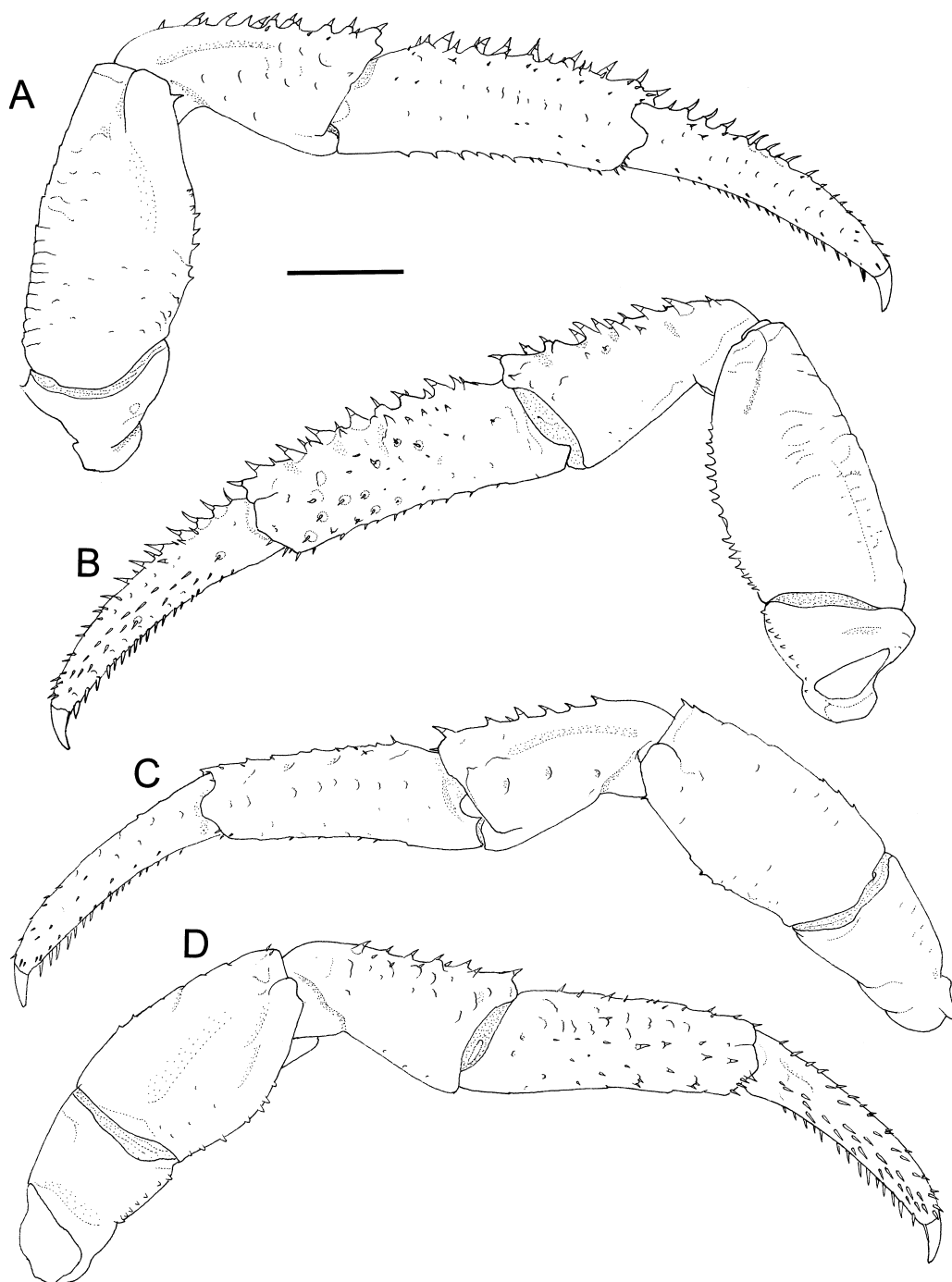


Fig. 7. *Stratiotes nigroapiculus* sp. nov. Holotype, male (sl 14.4 mm), CBM-ZC 4843, Akahama, Ohtsuchi, Iwate Prefecture. Ambulatory legs (setae omitted); A, right second pereopod, lateral view; B, same, mesial view; C, left third pereopod, lateral view; D, same, mesial view. Scale bar: 5 mm.

corneous claw or plate fused with distal corneous teeth. Carpi slightly shorter than meri, each with 4 or 5 strong, corneous-tipped spines on dorsomesial margin; dorsal surface with scattered small to moderately small, corneous-tipped spines, dorsodistal margin produced, with several small, corneous-tipped spines; dorsolateral margin not delimited, sloping to lateral surface bearing scattered small, corneous-tipped spines or spinulose tubercles; mesial surfaces nearly smooth; tufts of long stiff setae on dorsal and lateral surfaces. Meri each with small subdistal spines overhanging transverse groove and few denticles on bluntly ridged dorsal margin, dorsodistal margin with some small corneous-tipped spines; lateral surfaces nearly smooth, each with slight rugosity dorsally, and with very small corneous spinules ventrally in large specimens, ventrolateral margins each with row of small, corneous or corneous-tipped spines; mesial surfaces nearly smooth, each ventromesial margin with row of moderately small, corneous-tipped spines over entire length; tufts of stiff setae on dorsal margins and ventral surfaces. Ischia each with row of small spines on ventromesial margin and with few small spines on lateral surface ventrally.

Second pereopods (Figs. 7A, B; 8A) moderately stout, subequal in length to third pereopods, left and right pereopods with similar armature. Dactyli 1.1-1.3 times longer than propodi, 4.5-5.5 times longer than wide, weakly curved; dorsal margins each with row of small, corneous-tipped or corneous spines (corneous tips slender, sometimes elongate) becoming smaller distally, partially obscured by tufts of setae; lateral surfaces each with rows of stiff setae and with row of minute corneous spinules adjacent to ventral margin in large specimens; mesial surfaces each with scattered setae, and with row of minute corneous spinules adjacent to ventral margin in large specimens; ventral margins each with 12-20 corneous spinules increasing in size distally. Propodi longer than carpi, each with dorsal row of about 10 large, corneous-tipped spines, and with additional row of smaller corneous-tipped spines or corneous spinules in large specimens; lateral surfaces each with rows of tufts of setae and corneous spinules dorsally and ventrally in large specimens; mesial surfaces each with scattered tufts of setae and small, corneous-tipped spines or corneous spinules; ventral margins each with row of coronus spinules including 1 or 2 on ventrodistal margin. Carpi 0.7-0.8 times as long as meri, each with dorsal row of corneous-tipped spines (occasionally arranged in double row); lateral surfaces convex, with shallow longitudinal sulcus dorsal

to midline, and with few corneous spinules in large specimens; mesial surfaces each with tiny tubercles or small, corneous-tipped spines dorsodistally or dorsally; tufts of long stiff setae on dorsal margins and lateral surfaces. Meri with row of low protuberances (small specimens) or short transverse ridges (large specimens) on dorsal margins; lateral surfaces nearly smooth; ventral surfaces each with 2 rows of tiny, occasionally corneous-tipped spines, ventrolateral distal margin with 1 or few small spine; numerous tufts of long, stiff setae on dorsal and ventral margins. Ischia each with small dorsodistal spine; ventral margins each with row of minute spines mesially.

Third pereopods (Figs. 7C, D; 8B) similar from left to right, and similar to second pereopods in setation and proportion. Dactyli each with row of corneous spinules on dorsal surfaces mesially; lateral surfaces nearly smooth in small specimens or with several minute, corneous spinules in large specimens; mesial surfaces each with few corneous spinules adjacent to dorsal margin and single row of corneous spinules ventral to midline in small specimens, with numerous scattered corneous spinules in large specimens; ventral margins each with row of 10-16 corneous spinules. Propodi unarmed in small specimens; in large specimens, dorsal margin with single or double row of corneous spinules, mesial surfaces with irregular longitudinal rows of corneous spinules or corneous-tipped spinules. Carpi each with moderately small corneous-tipped dorsodistal spine in small specimens, with row of corneous-tipped spines in large specimens; lateral surfaces convex, each with shallow longitudinal sulcus dorsal to midline. Meri and ischia without conspicuous armature in small specimens; in large specimens, dorsal margin with low transverse ridges or minute spines, ventral surfaces each with 2 rows of small spines. Ischia unarmed in small specimens, armed with ventral row of spinules in large specimens.

Fourth pereopods (Fig. 5F) each with slender preungual process; dactyli each with row of 3-5 corneous spines on ventral margin laterally, dorsal margin unarmed (small specimens) or armed with short transverse row of minute corneous spinules subterminally (large specimens); propodi unarmed on dorsal margins, each rasp consisting of 3-6 irregular longitudinal rows of minute corneous scales; carpi unarmed on dorsal margins; numerous tufts of long, stiff setae on margins and surfaces of segments.

Male first pleopod (Fig. 8C-G) moderately stout; inferior lamella moderately narrow, rounded, marginally and submarginally with some minute spinules

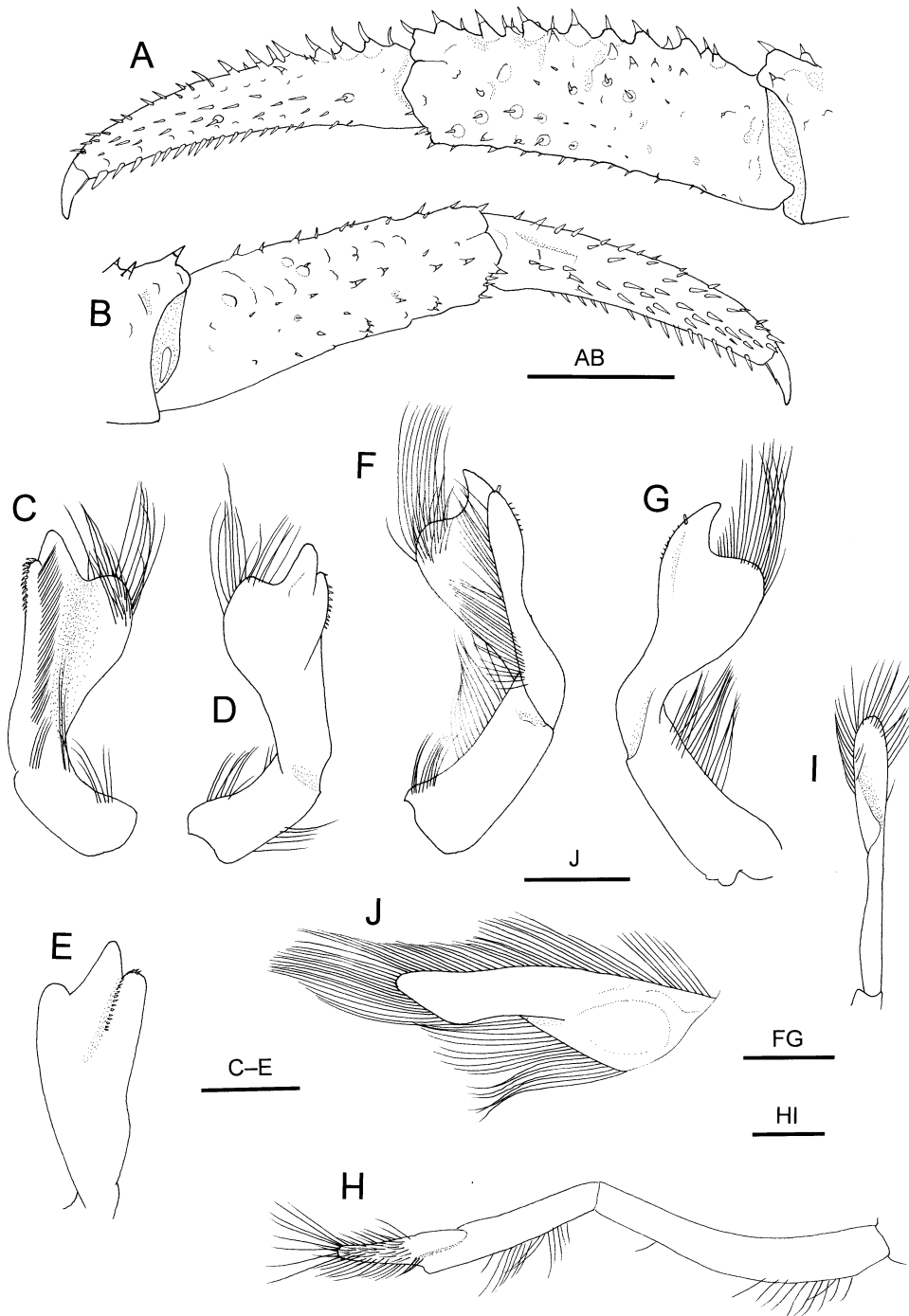


Fig. 8. *Stratiotes nigroapiculus* sp. nov. A, B, F-H, holotype, male (sl 14.4 mm), CBM-ZC 4843, Akahama, Ohtsuchi, Iwate Prefecture; C-E, paratype, male (sl 4.8 mm), CBM-ZC 9522, off Ohmu, Hokkaido, Sea of Okhotsk; J, paratype, ovigerous female (sl 4.2 mm), same lot. A, dactylus and propodus of right second pereopod, mesial view (setae omitted); B, dactylus and propodus of left third pereopod, mesial view (setae omitted); C, F, first pleopod, ventromesial view (C, left; F, right); D, G, same, dorsolateral view; E, same, lateral view; H, left second pleopod, ventral view; I, endopod and appendix masculina of left second pleopod, mesial view. Scale bars: 5 mm for A, B; 1 mm for F-I; 0.5 mm for C-E.



distally (spinules becoming fewer and more widely spaced with increasing body size); external lobe extending far beyond inferior lamella, separated from inferior lamella by moderately deep notch, tip rounded; internal lobe broadly convex, with numerous stiff setae arising marginally or submarginally on inner face. Male second pleopod (Fig. 8H, I) slender, distal segment subequal in length to basal segment; endopod with well delineated distomesial angle; appendix masculina slightly twisted, subspatulate, subovately elongate in mesial view, with numerous stiff setae on lateral surface, mesial face slightly concave. Female brood pouch (Fig. 8J) relatively small, elongate subtriangular, with setae on margins. Eggs relatively small, diameter 0.5–0.6 mm in non-eyed stage.

Telson (Fig. 5G) with slightly to somewhat asymmetrical posterior lobes, left lobe larger than right lobe; cleft separating two lobes moderately narrow and deep; terminal margins each with row of small, occasionally corneous-tipped, curved spines, extending onto lateral margin on either side; lateral margins of anterior lobes unarmed.

*Coloration.* In life (Fig. 17B). Carapace generally light brown, shield with tinge of brick red laterally. Ocular peduncle purplish-brick red, without conspicuous markings; ocular acicle brown. Antennular peduncle generally dark purplish-brown; flagellum paler. Antennal peduncle and flagellum yellowish-brown. Chelipeds generally brick red, with darker tint on proximal portion of carpi. Ambulatory legs also brick red in general, but dactyli and propodi becoming paler distally; central portions of meri also paler; meri each with white spots distally. Corneous tips of spines on chelipeds and ambulatory legs black. Setae on chelipeds and ambulatory legs yellowish-brown. Fourth and fifth pereopods brick red. Pleon light yellow.

*Distribution.* Hokkaido to Sagami Bay on the Pacific side, to Akita Prefecture on Sea of Japan side, Peter the Great Bay; subtidal to 140 m.

*Remarks.* This new species can attain large size, up to 14.0 mm in the shield length, and shows considerable growth-related variation in various structures. The corneal diameter clearly decreases with increased length of the ocular peduncle. Although all the smaller specimens (sl 2.5–4.7 mm) have spine development on the palms of the chelipeds and dorsal surfaces of the dactyli to carpi of the ambulatory legs, the number and prominence of corneous spines or spinules is correlated to animal size. The number and eminence of corneous spines or corneous tips

increase appreciably in the larger specimens (sl > 5.0 mm). In particular, the corneous tips of spines on the chelipeds and ambulatory legs are more darkly pigmented and sharper in larger specimens (sl > 5.0 mm). Corneous spinules on the inferior lamella of the male first pleopod seem to become fewer and sparser with increasing the body size.

*Stratiotes nigroapiculus* sp. nov. most closely resembles *S. japonicus*, and in particular, differentiation of small specimens (sl < 5.0 mm) may be difficult. These two species are characterized by a suite of the following characters: rostrum triangular, distinctly overreaching lateral projections; ocular peduncles elongate in large specimens; ocular acicles bifid or multifid; antennular peduncles overreaching distal corneal margins, with ultimate segment distinctly longer than penultimate segment; antennal flagellum longer than shield, stout, each article bearing pair of long setae on distal margin ventrally. As mentioned above, *S. nigroapiculus* attains much larger size than *S. japonicus* does (maximum sl 14.0 mm versus 4.4 mm), and possible diagnostic characters are influenced by size-related variation. When small specimens (sl < 5.0 mm) are compared, *S. nigroapiculus* is best distinguished from *S. japonicus* by the different armature of the mesial faces of the dactyli of chelipeds. In the new species, the mesial face of the dactylus bears a single row of some corneous-tipped spines on the midline and a few additional corneous spinules ventrally (Fig. 6C). In contrast, in *S. japonicus*, there is a covering of small, numerous, corneous-tipped tubercles (Fig. 2B). Furthermore, the marginal or submarginal spines on the inferior lamella of the male first pleopods are much fewer, arranged in a single row in *S. nigroapiculus* (Fig. 8C–E), rather than in a double row in *S. japonicus* (Fig. 4A–C). With regard to large specimens (sl > 6.0 mm), *S. nigroapiculus* is easily recognizable by having well-developed, darkly pigmented corneous tips of spines or corneous spinules on the chelipeds and ambulatory legs, including dorsal rows on the carpi of the third pereopods, and numerous corneous spines on the mesial faces of the ambulatory dactyli.

Considerable similarities are also seen between *Paguristes sinensis* and *Stratiotes nigroapiculus*, as well as *S. japonicus*. Nevertheless, in the original description of *P. sinensis*, corneous tips of spines on the chelae and ambulatory legs are not so prominent and spines themselves are not acute as in *S. nigroapiculus*, although the size of the illustrated specimen is about 5.8 mm in the shield length. Furthermore, the presence of more than one row of corneous spinules on

the inferior lamella of the male first pleopod is clearly illustrated in the original description of *P. sinensis* (Tung and Wang, 1966, fig. 5). As mentioned above, in *S. nigroapiculus* corneous spines on the inferior lamella are much fewer and are arranged in a single row.

As previously noted, the allotype (NSMT-CrR 1753) and one of the paratypes (NSMT-CrR) of *Stratiotes japonicus* actually represent the present new species. Komai (2001) examined ten of the 16 lots referred to *Paguristes puniceus* by Prof. S. Miyake, and noted that four of them reported in Miyake (1978) represented an undescribed species, which corresponds to the present new species. Petryashov and Kornienko (2006) reported *Paguristes ortmanni* from Vostok Bay, located on the continental coast of the Sea of Japan, as the first representative of *Paguristes* known from Far East Russia. Subsequent to the publication of the paper by Petryashov and Kornienko (2006), Drs. O. Korn and E. S. Kornienko sent the author some specimens identified as *P. ortmanni* for confirmation of the identification. These Russian specimens actually have been found to represent *S. nigroapiculus*. They are included here in the type series.

***Stratiotes orbis* sp. nov.**  
(Figs. 9·12, 17C)

*Material examined.* Holotype: CBM-ZC 9531, male (sl 6.7 mm), TRV *Shin 'yo-maru*, 1996 research cruise, stn 2, Hyotan-se Bank, Izu Islands, 34 °21.80 N, 139 °04.75 E, 135·150 m, 22 October 1996, dredge, coll. T. Komai.

Paratypes: CBM-ZC 9569, 1 male (sl 3.6 mm), TRV *Shin 'yo-maru*, 2002 research cruise, stn 33, Sagami Sea, 34 °42.17 N, 139 °00.19 E, 124·126 m, 24 October 2002, dredge, coll. T. Komai; CBM-ZC 9532, 1 male (sl 6.2 mm), 1 ovigerous female (sl 4.7 mm), RV *Tansei-maru*, KT 07-31 cruise, stn L3-100, N of Toshima Islands, Izu Islands, 34 °33.11'N, 139 °17.41'E to 34 °33.65'N, 139 °17.67'E, 170-190 m, sand and rock, 27 November 2007, chain bag dredge, coll. T. Komai; NSMT-Cr S 205, 2 females (sl 4.0, 4.0 mm), stn L3-200, similar locality, 34 °34.46'N, 139 °18.37'E to 34 °33.56'N, 139 °17.80'E, 198-152 m, sand and volcanic pebble, 27 November 2007, chain bag dredge, coll. T. Komai; NSMT-Cr S 206, 1 female (sl 5.5 mm), stn L3-300, similar locality, 34 °36.95'N, 139 °15.80'E to 34 °36.70'N, 139 °16.36'E, 316-330 m, pumice rock, 27 November 2007, chain bag dredge, coll. T. Komai.

*Description.* Biserial phyllobranchiae. Shield (Fig.

9A) 1.1·1.3 times longer than broad; rostrum triangular, overreaching lateral projections, reaching midlength of ocular acicles; lateral projections obtusely triangular, usually with submarginal spinule; anterior margin between rostrum and lateral projections evenly concave; anterolateral margins sloping, occasionally with spinules posteriorly; lateral margins convex; dorsal surface with scattered small spines or spiniform granules and several tufts of moderately short to long setae laterally; gastric elevations rugose; pair of short, obliquely longitudinal ridges anterior to gastric elevations. Branchiostegites each with row of small spines on dorsal margin in distal half.

Ocular peduncles (Fig. 9A) moderately slender, equal in length, 0.6·0.8 times as long as shield, somewhat inflated basally, without transverse row of setae near base; corneas not dilated, slightly narrower than basal width, corneal diameter about 0.2 of peduncular length; ocular acicles triangular, each terminating in simple spine. Antennular peduncles (Fig. 9A, B) with tips of ultimate segments reaching distal corneal margins; basal segment with small spine on distolateral margin of statocyst lobe and with small spine at each distolateral and ventrodiscal angles; penultimate segment unarmed in large specimens, or armed with small spine arising at midlength of ventral surface in small specimens; ultimate segment short, subequal to or shorter than penultimate segment; dorsal flagellum longer than ultimate segment. Antennal peduncles (Fig. 9A, C) short, reaching distal 0.2·0.3 of ocular peduncles; fifth segment relatively slender, unarmed; fourth segment with simple spine at distolateral angle; third segment with strongly produced, sharply pointed ventromesial distal angle; second segment with dorsolateral distal angle produced, terminating in prominent bifid or trifold spine, subdistal spine(s) frequently present on lateral margin, dorsomesial distal angle with small spine, mesial half of dorsal surface distinctly elevated; first segment with small laterodistal spine, ventromesial distal angle produced; antennal acicle relatively slender, falling short of distal margin of fifth peduncular segment, terminating in bifid spine, mesial margin with 1 spine proximally, lateral margin with 1 spine subdistally; antennal flagellum (Fig. 9A) shorter than shield, consisting of less than 20 articles (articles longer than wide), each article with some short setae on distal margin.

Third maxilliped (Fig. 9D) moderately stout; carpus with small dorsodistal spine; merus with row of 3 or 4 small spines on ventrolateral margin and

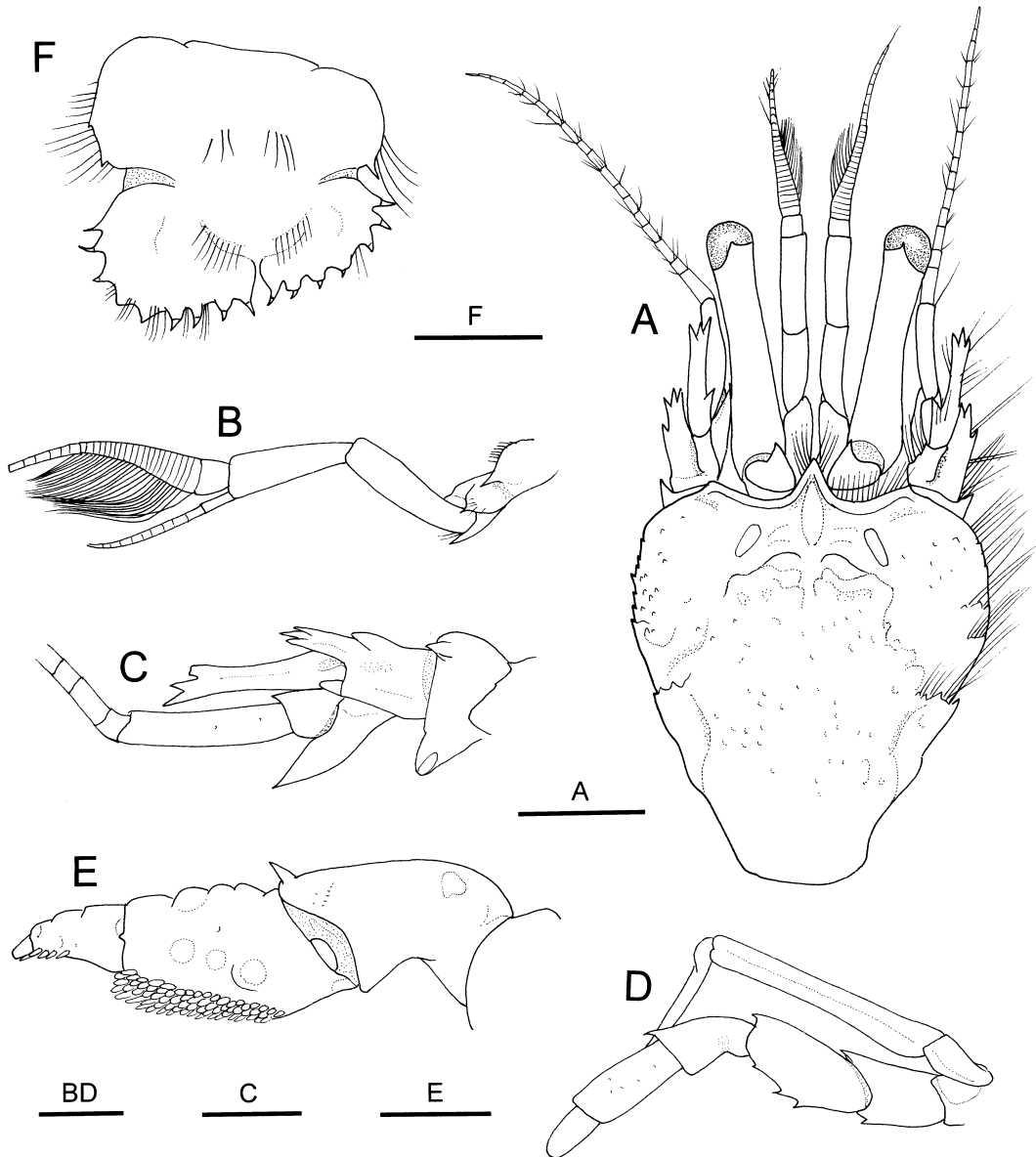


Fig. 9. *Stratiotes orbis* sp. nov. Male (sl 6.7 mm), holotype, CBM-ZC 9531, Hyotan-se Bank, Izu Islands. A, shield and cephalic appendages, dorsal view (setae on left side omitted); B, left antennule, lateral view; C, left antenna, ventral view (setae omitted); D, left third maxilliped, lateral view (setae omitted); E, distal 3 segments of left fourth pereopod, lateral view (setae omitted); F, telson, dorsal view. Scale bars: 2 mm for A; 1 mm for B-F.

with small dorsodistal spine; ischium with dorsodistal and ventrodistal spinules, and with well-developed crista dentata consisting of row of sharp triangular corneous teeth.

Spines on chelipeds and ambulatory legs usually corneous-tipped, but these tips not particularly elongate or darkly pigmented.

Chelipeds (Fig. 10A-E) subequal or slightly une-

qual with left larger, similar in armature. Chelae generally subtriangular in dorsal view, about 1.7 times longer than broad. Dactyli about 1.6 times longer than palm; dorsal surfaces each with 2 irregular rows of small, corneous-tipped spines and scattered tufts of stiff setae, dorsomesial margin with single or double row of small, corneous-tipped spines; mesial surfaces each with numerous, small corneous-tipped tubercles

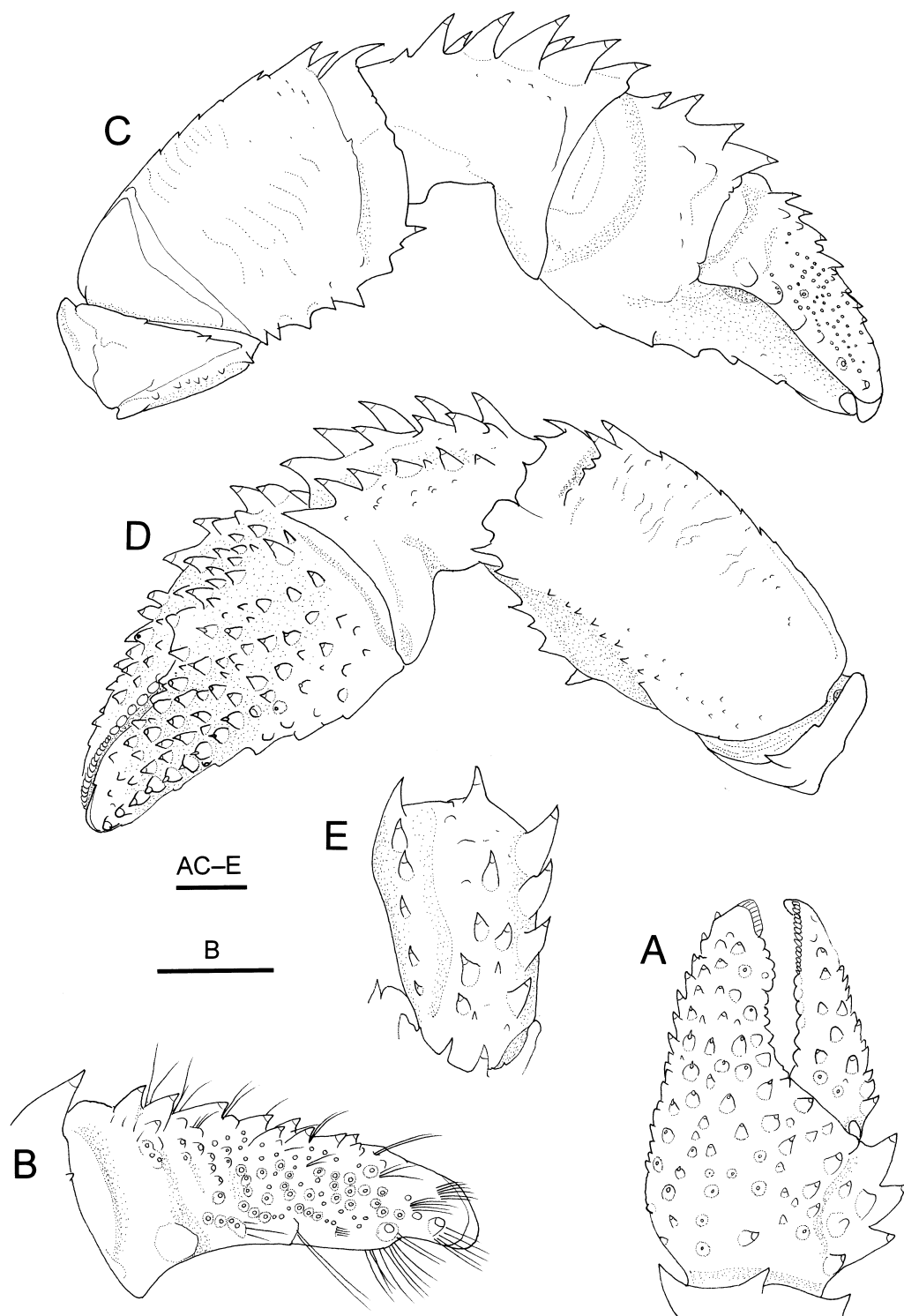


Fig. 10. *Stratiotes orbis* sp. nov. Male (sl 6.7 mm), holotype, CBM-ZC 9531, Hyotan-se Bank, Izu Islands. Left cheliped (setae omitted): A, chela, dorsal view; B, dactylus, mesial view; C, entire left cheliped, mesial view; D, same, lateral view; E, carpus, dorsal view. Scale bars: 1 mm.

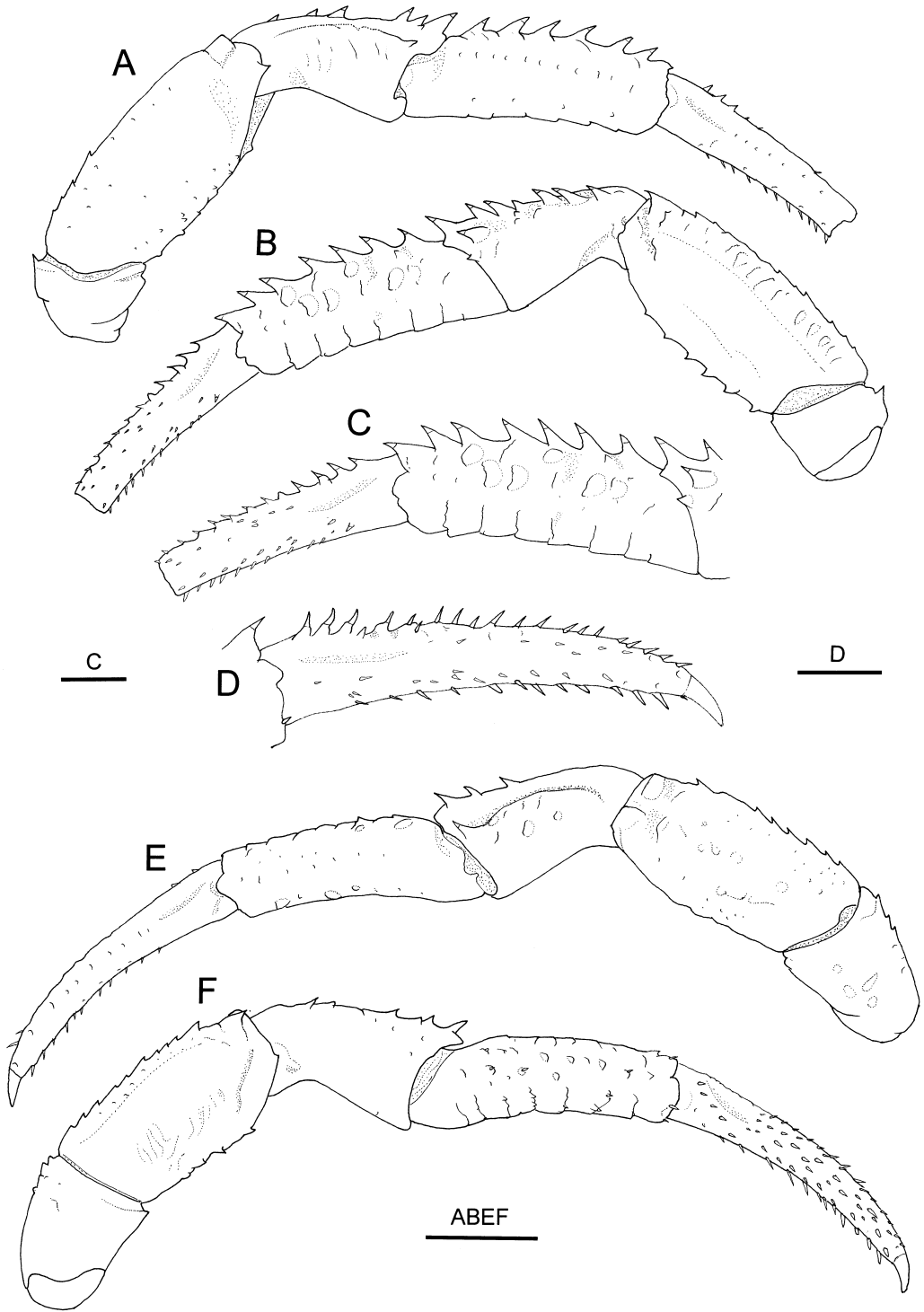


Fig. 11. *Stratiotes orbis* sp. nov. Male (sl 6.7 mm), holotype, CBM-ZC 9531, Hyotan-se Bank, Izu Islands. Ambulatory legs (setae omitted): A, right second pereopod, lateral view (distal part of dactylus broken off); B, same, mesial view; C, same, dactylus and propodus, mesial view; D, dactylus of left second pereopod, mesial view; E, left third pereopod, lateral view; F, same, mesial view. Scale bars: 2 mm for A, B, E, F; 1 mm for C, D.

or granules and low protuberances adjacent to ventral margin; ventral surface nearly smooth, with scattered tufts of stiff setae; cutting edges each with small, blunt calcareous teeth in proximal half, row of small corneous teeth in distal half, terminating in moderately strong corneous claw. Palms shorter than carpi, dorsomesial margins each with 3 or 4 strong, corneous-tipped spines; dorsal surfaces each with numerous, scattered, moderately small to small, corneous-tipped spines, and with tufts of long stiff setae partially obscuring armature; dorsolateral margin not clearly delimited; mesial surfaces each with few low protuberances dorsally and tufts of setae, otherwise nearly smooth; ventral surfaces convex, each with row of small spinulose tubercles, extending onto fixed finger, tuft of setae at base of each tubercle; cutting edges each with row of blunt calcareous teeth in proximal 0.7-0.8, fused corneous teeth in distal 0.2-0.3, terminating in moderately strong corneous claw. Carpi shorter than meri, each with 4 or 5 strong, corneous-tipped spines on dorsomesial margin; dorsal surface with row of moderately small spines on midline, dorsodistal margin slightly produced, with prominent spine medially; dorsolateral margin delimited by row of 5 or 6 small to moderately small spines; lateral surface with few tiny tubercles dorsally; mesial surface nearly smooth; ventral surface with deep transverse groove; tufts of long stiff setae on dorsal and lateral surfaces. Meri each with 1 or 2 moderately small dorsal spines on subdistal transverse ridge, followed by row of tiny spines on dorsal margin, dorsodistal spine strongest; distal margin with 1 or 2 additional spines laterally; lateral surfaces slightly rugose dorsally, otherwise nearly smooth, ventrolateral margin with 1 or 2 moderately small spines at distal angle and with tiny spines in large specimens; mesial surfaces nearly smooth, each ventromesial margin with row of moderately small to large spines over entire length; tufts of stiff setae on dorsal margins and ventral surfaces. Ischia each with row of small spines on ventromesial margin; distomesial margin occasionally with few spinules; ventrolateral distal angle with 1 small spine.

Second pereopods (Fig. 11A · D) moderately stout, subequal in length to third pereopods, left and right pereopods with similar armature. Dactyli 1.2 · 1.3 times longer than propodi, 5.0 · 6.0 times longer than wide, weakly curved; dorsal margins each with row of slender, corneous-tipped or corneous spines, spines becoming smaller distally, partially obscured by tufts of stiff setae; lateral surfaces each with rows of stiff setae; mesial surfaces each with row of corneous

spinules adjacent to dorsal and ventral margins and tufts of short stiff setae partially obscuring armature; ventral margins each with 12 · 16 small corneous spines increasing in size distally. Propodi longer than carpi, each with dorsal row of about 7 large, corneous-tipped spines; lateral surfaces each with rows of tufts of setae; mesial surfaces each with 2 rows of low, moderately large protuberances dorsally and short vertical ridges extending onto ventral surface, these protuberances and ridges bearing tufts of stiff setae; ventral surfaces occasionally with few corneous spinules. Carpi 0.7 · 0.8 times as long as meri, each with dorsal row of corneous-tipped spines (occasionally arranged in double row); lateral surfaces convex, with shallow longitudinal sulcus dorsal to midline, and with marginal or submarginal spine distally; mesial surfaces each 1 prominent corneous-tipped spine dorsodistally; tufts of long stiff setae on dorsal margins and lateral surfaces. Meri each with short row of tiny spines in proximal half and with small dorsodistal spine; lateral surfaces slightly rugose dorsally and ventrally, with few tiny spinulose tubercles ventrally; ventral surfaces each with row of small spines, ventrolateral distal margin with 1 small spine; numerous tufts of long, stiff setae on dorsal and ventral margins. Ischia each with small dorsodistal spine; ventral margins unarmed.

Third pereopods (Fig. 11E, F) similar from left to right, and similar to second pereopods in setation and proportions. Dactyli each with row of corneous spinules on dorsal surface mesially; lateral surfaces with tufts of stiff setae; mesial surfaces each with scattered corneous spinules; ventral margins each with row of 10 · 16 small corneous spines and tufts of short stiff setae. Propodi each with low protuberances or short transverse ridges on dorsal surface; mesial surfaces each with irregular longitudinal rows of small spinulose tubercles or corneous-tipped spines and short, occasionally denticulate, vertical ridges ventrally. Carpi each with row of small, corneous-tipped spines on dorsal margin; lateral surfaces convex, each with shallow longitudinal sulcus dorsal to midline and 1 small subdistal spine. Meri each with row of tiny, corneous-tipped spines on dorsal margin; ventral margin with few small spines distally and low protuberances proximally. Ischia each with row of tiny spines on dorsal margin, unarmed on ventral margin.

Fourth pereopods (Fig. 9E) each with slender preungual process; dactyli each with row of 3 · 5 corneous spines on ventral margin laterally, dorsal margin with few low protuberances; propodi each

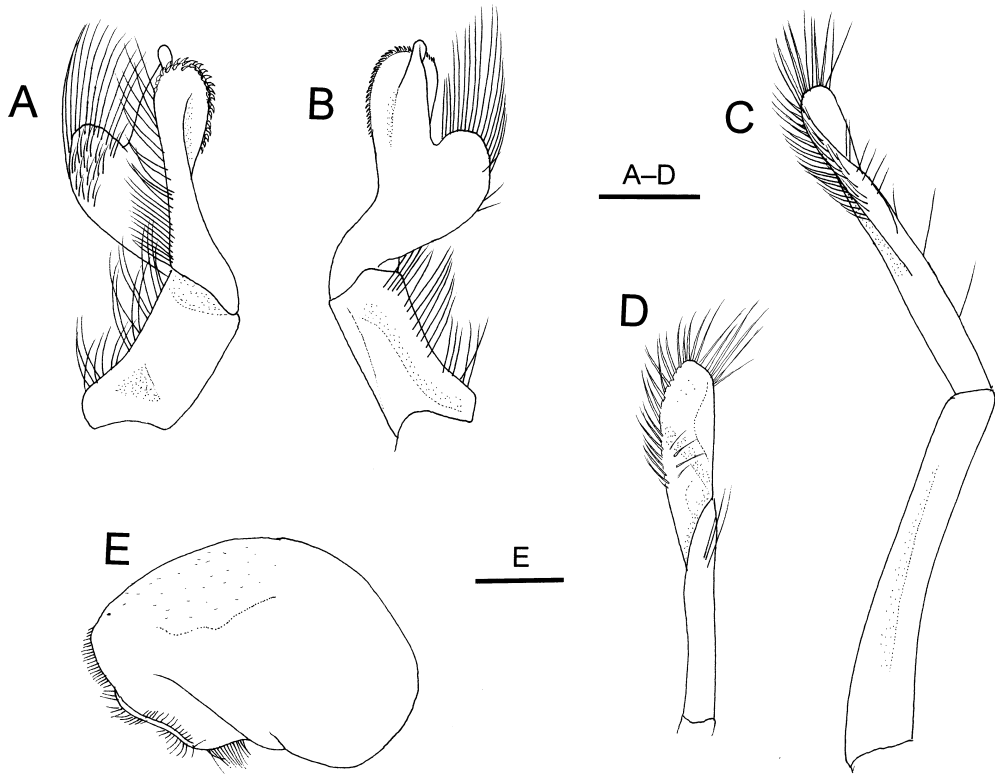


Fig. 12. *Stratiotes orbis* sp. nov. A - D, holotype, male (sl 6.7 mm), CBM-ZC 9531, Hyotan-se Bank, Izu Islands; E, paratype, ovigerous female (sl 4.7 mm), CBM-ZC 9532, N of Toshima Island, Izu Islands. A, left first pleopod, ventromesial view; B, same, dorsolateral view; C, left second pleopod, dorsal view; D, endopod and appendix masculina of left second pleopod, mesial view; E, brood pouch, outer view. Scale bars: 2 mm for E; 0.5 mm for A - D.

with some low protuberances on dorsal surface, propodal rasp consisting of 4 or 5 irregular longitudinal rows of small corneous scales; carpi each with dorsodistal spine; numerous tufts of long, stiff setae on margins and surfaces of segments.

Male first pleopod (Fig. 12A, B) moderately stout; inferior lamella moderately broad, rounded, with double row of curved corneous spinules on margin; external lobe extending slightly beyond inferior lamella, narrowed distally, separated from inferior lamella by moderately deep notch, tip rounded; internal lobe broadly rounded, with numerous stiff setae arising marginally or submarginally on inner face. Male second pleopod (Fig. 12C, D) slender, distal segment subequal in length to basal segment; appendix masculina somewhat twisted, subspatulate, subovately elongate in mesial view, with numerous stiff setae on lateral surface; mesial face slightly concave, with obliquely longitudinal row of stiff setae. Female brood pouch (Fig. 12E) large, generally ovate, with fringe of short setae on margin, largely enclosing

eggs attached to second to fourth pleopods; surface with sparsely scattered, minute setae. Eggs relatively large, diameter of non-eyed stage 1.0-1.2 mm.

Telson (Fig. 9F) with markedly asymmetrical posterior lobes, left lobe larger than right lobe; cleft separating two lobes moderately narrow and deep; terminal margins each with row of small, corneous-tipped spines (many spines curved), extending onto lateral margin on either side; lateral margins of anterior lobes each with 1 small spine at posterolateral angle, left margin occasionally with 1 or more additional spinules.

*Coloration.* In life (Fig. 17C). Shield generally orange, posteromedian part whitish; posterior carapace generally white, with tinge of orange on either side of posteromedian plate. Ocular peduncle white with red band occupying proximal 0.20 of peduncular length, and with red spots dorsally at bases of corneas; ocular acicle orange in distal part and white in basal part. Antennular peduncle with ultimate segment having subdistal red band, otherwise white;

penultimate segment entirely red; dorsal and ventral flagella white. Antennal peduncle generally orange-red, basal part of fifth segment and middle portion of antennal acicle white; flagellum white. Chelipeds and ambulatory legs generally orange, propodi of ambulatory legs each with red spot proximally; fourth pereopods also orange.

In preservative. Orange-red color faded away, but transverse bands on ocular peduncle and antennular peduncles still preserved after one year.

*Distribution.* So far known only from Izulands and Sagami Sea, 151-330 m.

*Remarks.* *Stratiotes orbis* sp. nov. is morphologically similar to *S. breviantennatus*, *S. ngochoae* and *S. taenia*. Shared characters include the simple ocular acicles, relatively short antennular peduncles, which do not reach the distal corneal margins, the short antennal flagellum being shorter than the shield and lacking paired long setae on the ventral surface, and the meri of the ambulatory legs armed with small spines on the dorsal and ventral margins. Differences among the four species are summarized in Table 2. In addition to the morphological characters, the coloration in life is quite different between *S. orbis* and *S. taenia* (cf. Fig. 17C and Fig. 17D).

*Etymology.* From the Latin *orbis* (= ring), in reference to the color pattern of the ocular and antennular peduncles.

***Stratiotes taenia* (Komai, 1999) comb. nov.**  
(Figs. 13-16, 17D)

*Paguristes taenia* Komai, 1999 : 11, figs. 5-7.

*Material examined.* Holotype: CBM-ZC 4836, female (sl 2.8mm), TRV *Shin'yo-maru*, 1997 research cruise, stn 13, Chichi-jima Island, Ogasawara Islands, 27°11.21'N, 142°05.32' E, 151-154 m, 16 October 1997, dredge, coll. T. Komai.

Other material: CBM-ZC 9520, 1 males (sl 4.8 mm), TRV *Toyoshio-maru*, 1996-5 cruise, stn 9, N of Yakushima Islands, Ohsumi Islands, 30°27.80'N, 30°35.30'E, 95m, coarse sand and coral rocks, 3 June 1996, sledge, coll. T. Komai; CBM-ZC 9530, 2 males (sl 3.2-4.4 mm), TRV *Toyoshio-maru*, 1996-5 cruise, stn 10, Kuroshima Bank, Ohsumi Islands, 30°42.00'N, 130°06.20' E, 133 m, coarse sand and coral rocks, 3 June 1996, sledge, coll. T. Komai; CBM-ZC 9521, 3 (sl 2.5-3.1 mm), RV *Tansei-maru*, KT02-03 cruise, stn A5, Hirase Bank, Ohsumi Islands, 30°09.29'N, 130°05.27'N, 130-247 m, coral sand and rock, dredge, coll. T. Komai.

*Redescription.* Biserial phyllobranchiae. Shield 1.1-1.3 (Fig. 13A) times longer than broad; rostrum

triangular, overreaching lateral projections, reaching midlength of ocular acicles, margins with numerous setae obscuring ocular acicles; lateral projections obtusely triangular, with or without submarginal spinule; anterior margin between rostrum and lateral projections evenly concave; anterolateral margins sloping; lateral margins convex; dorsal surface with few spinules or spiniform granules and numerous moderately short to long setae laterally; gastric elevations slightly rugose; pair of short, obliquely longitudinal ridges anterior to gastric elevations. Branchiostegites each with row of small spines on dorsal margin in distal half.

Ocular peduncles (Fig. 13A) moderately slender, equal in length, 0.6-0.7 times as long as shield, weakly inflated basally, without transverse row of setae near base; corneas not dilated, narrower than basal width, corneal diameter about 0.2 of peduncular length; ocular acicles triangular, terminating in simple spine. Antennular peduncles (Fig. 13A, C, D) with tips of ultimate segments falling slightly short of or reaching distal corneal margins; basal segment with small spine on distolateral margin of statocyst lobe and with small spine at each distolateral and ventrodorsal angles; penultimate segment with small ventral spine arising at about midlength; ultimate segment short, subequal to or shorter than penultimate segment; dorsal flagellum distinctly longer than ultimate peduncular segment. Antennal peduncles (Fig. 13A, D) short, reaching distal 0.3-0.4 of ocular peduncles; fifth segment relatively slender, unarmed; fourth segment with simple spine at distolateral angle; third segment with strongly produced, sharply pointed ventromesial distal angle; second segment with dorsolateral distal angle produced, terminating in prominent bifid spine, subdistal spine(s) frequently present on lateral margin, dorsomesial distal angle with small spine, mesial half of dorsal surface distinctly elevated; first segment with small laterodistal spine, ventromesial distal angle produced; antennal acicle relatively slender, falling short of distal margin of fifth peduncular segment, terminating in bifid spine, mesial margin with 1 spine proximally, lateral margin with 1 spine subdistally; antennal flagellum (Fig. 13A) shorter than shield, consisting of less than 20 articles, each article longer than wide, with some short setae on distal margin.

Third maxilliped (Fig. 13E) moderately stout; carpus with prominent dorsodistal spine; merus with 3 small spines on ventrolateral margin and with small dorsodistal spine; ischium with dorsodistal and ventrodorsal spines, and with well-developed crista



dentata consisting of row of sharp corneous teeth.

Spines on chelipeds and ambulatory legs usually corneous-tipped, but these tips not particularly elongate or darkly pigmented.

Chelipeds (Fig. 14A-E) subequal or slightly unequal with left larger, similar in armature; setae thickly plumose. Chelae generally subtriangular in dorsal view, about 1.5 times longer than broad. Dactyli about 1.6 times longer than palms; dorsal surfaces each with row of small, corneous-tipped spines on midline and with scattered tufts of setae, particularly numerous in proximal half, masking armature; dorsomesial margin with single or double row of moderately small to small, corneous-tipped spines; mesial surfaces each with numerous, small corneous-tipped tubercles or granules (tips usually subtruncate) and short stiff setae; ventral surface nearly smooth, with scattered tufts of stiff setae; cutting edges each with obtuse calcareous teeth in proximal half and row of small corneous teeth in distal half, terminating in moderately strong corneous claw. Palms shorter than carpi, dorsomesial margins each with 4 strong, corneous-tipped spines; dorsal surfaces each with numerous, scattered, moderately small to small, corneous-tipped spines, and with tufts of moderately short plumose setae masking armature; lateral margin delimited by row of small corneous-tipped spines extending nearly to tip of fixed finger; mesial surfaces each with few low protuberances dorsally and tufts of setae, otherwise nearly smooth; ventral surfaces slightly convex, each with longitudinal row of small to moderately small spines extending onto fixed finger, tuft of setae at base of each spine; cutting edges each with row of blunt calcareous teeth in proximal 0.7-0.8, fused corneous teeth in distal 0.2-0.3, terminating in moderately strong corneous claw. Carpi shorter than meri, each with 3 or 4 strong, corneous-tipped spines on dorsomesial margin; dorsal surface with irregular row of small spines mesial to midline, dorsodistal margin not produced, with some spines; dorsolateral margin delimited by spines increasing in size distally; lateral and mesial surfaces nearly smooth; ventral surface with deeply concave; tufts of moderately short to long, plumose setae on dorsal surface, partially obscuring armature. Meri each with prominent subdistal spine followed by row of spinules and sparsely plumose setae on dorsal margin, dorsodistal margin with 1 or 2 spines; lateral surfaces with scattered granules, ventrolateral margins each with 1 moderately small spines at distal angle and with row of tiny, spinulose tubercles; mesial surfaces nearly smooth, each ventromesial margin with

row of moderately small spines over entire length (some spines hooked). Ischia each with row of small spines on ventromesial margin, but otherwise unarmed.

Second pereopods (Fig. 15A, B) moderately stout, subequal in length to third pereopods, left and right pereopods with similar armature; dorsal and ventral margins of dactyli to ischia with numerous, long, thickly plumose setae masking armature or surface structure. Dactyli 1.2-1.3 times longer than propodi, 5.0-6.0 times longer than wide, slightly curved; dorsal margins each with short row of spinules proximally; lateral surfaces each with few tufts of plumose setae; mesial surfaces each with several minute corneous spinules ventrally; ventral margins each with about 12 small corneous spines increasing in size distally. Propodi longer than carpi, each with dorsal row of 7 or 8 large, corneous-tipped spines; lateral surfaces each with low protuberances dorsally and row of tufts of short plumose setae medially; mesial surfaces each with short, occasionally denticulate, vertical ridges ventrally, these ridges extending onto ventral surface, all bearing thickly plumose setae. Carpi 0.7-0.8 times as long as meri, each with dorsal row of corneous-tipped spines arranged in double row; lateral surfaces convex, each with shallow longitudinal sulcus dorsal to midline, and with submarginal spine distally. Meri each with small dorsodistal spine mesially, but otherwise unarmed on dorsal margin; lateral surfaces slightly rugose dorsally, with few tiny spinulose tubercles ventrally; ventral surfaces each with double row of small spines, ventrolateral distal margin with 1 small spine. Ischia each with small dorsodistal spine; ventral margins unarmed.

Third pereopods (Fig. 15C-E) similar from left to right, and similar to second pereopods in setation and proportion. Dactyli unarmed on dorsal margins; lateral surfaces each with sparse row of tufts of short plumose setae medially; mesial surfaces each with scattered corneous spinules; ventral margins each with about 10 small corneous spines. Propodi each with dorsal row of tiny, simple or corneous-tipped spines; mesial surfaces each with row of small spines or tubercles dorsally and 5 or 6 short, spinose vertical ridges ventrally, these spines and ridges masked by tufts of thickly plumose setae. Carpi each with dorsal row of small, corneous-tipped spines; lateral surfaces convex, each with shallow longitudinal sulcus dorsal to midline and 1 small subdistal spine or tubercle. Meri each with dorsal row of small spines; ventral margin also with row of tiny spines mesially, ventrolateral distal margin with small tubercle. Ischia

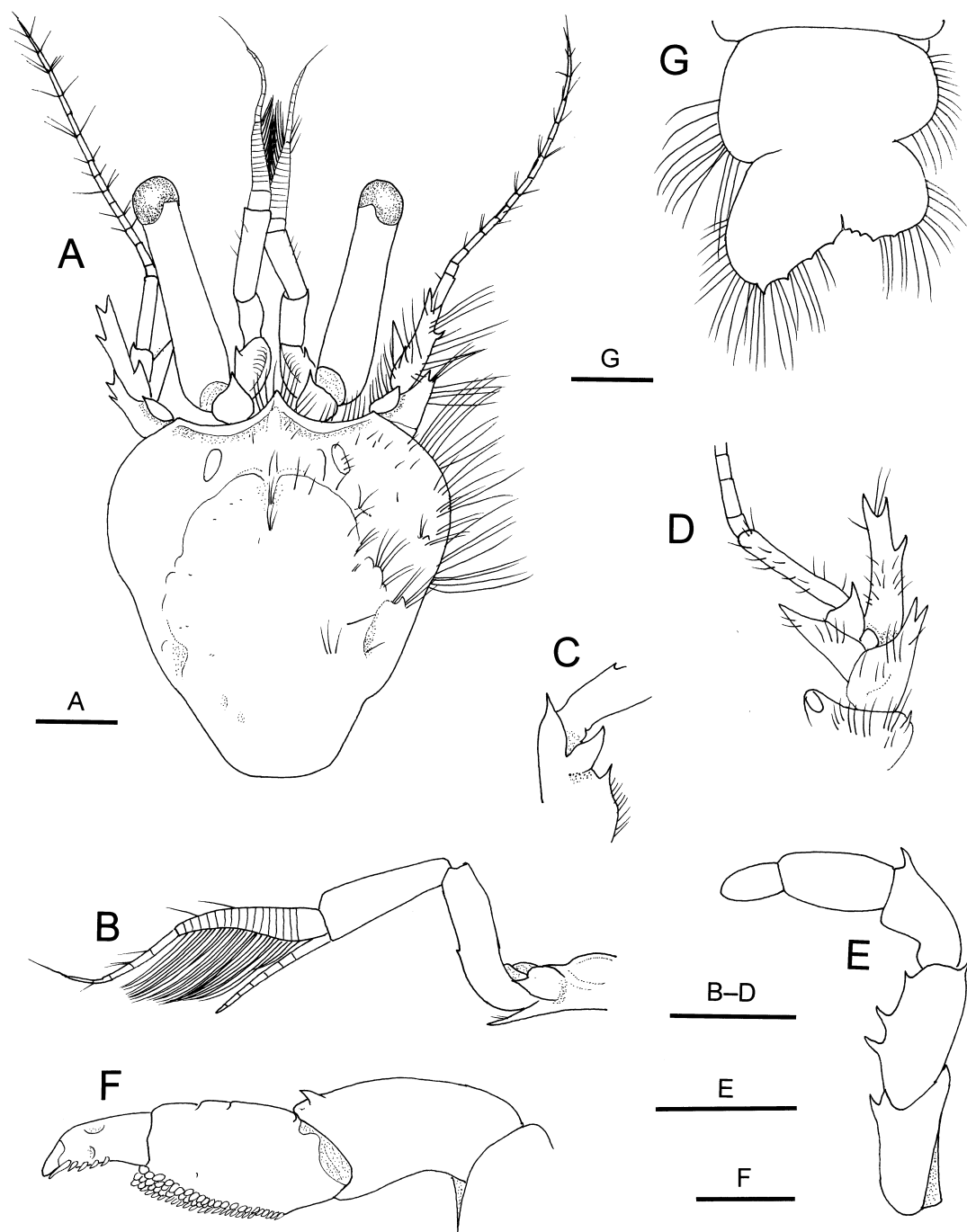


Fig. 13. *Stratiotes taenia* (Komai, 1999) comb. nov. Male (sl 4.8 mm), CBM-ZC 9520, N of Yakushima Island. A, shield and cephalic appendages, dorsal view (setae on left side omitted); B, left antennule, lateral view; C, basal segment of left antennular peduncle, ventral view; D, left antenna, ventral view; E, left third maxilliped, lateral view (exopod broken off; setae omitted); F, distal 3 segments of left fourth pereopod, lateral view (setae omitted); G, telson, dorsal view. Scale bars: 1 mm for A, B-E; 0.5 mm for F, G.

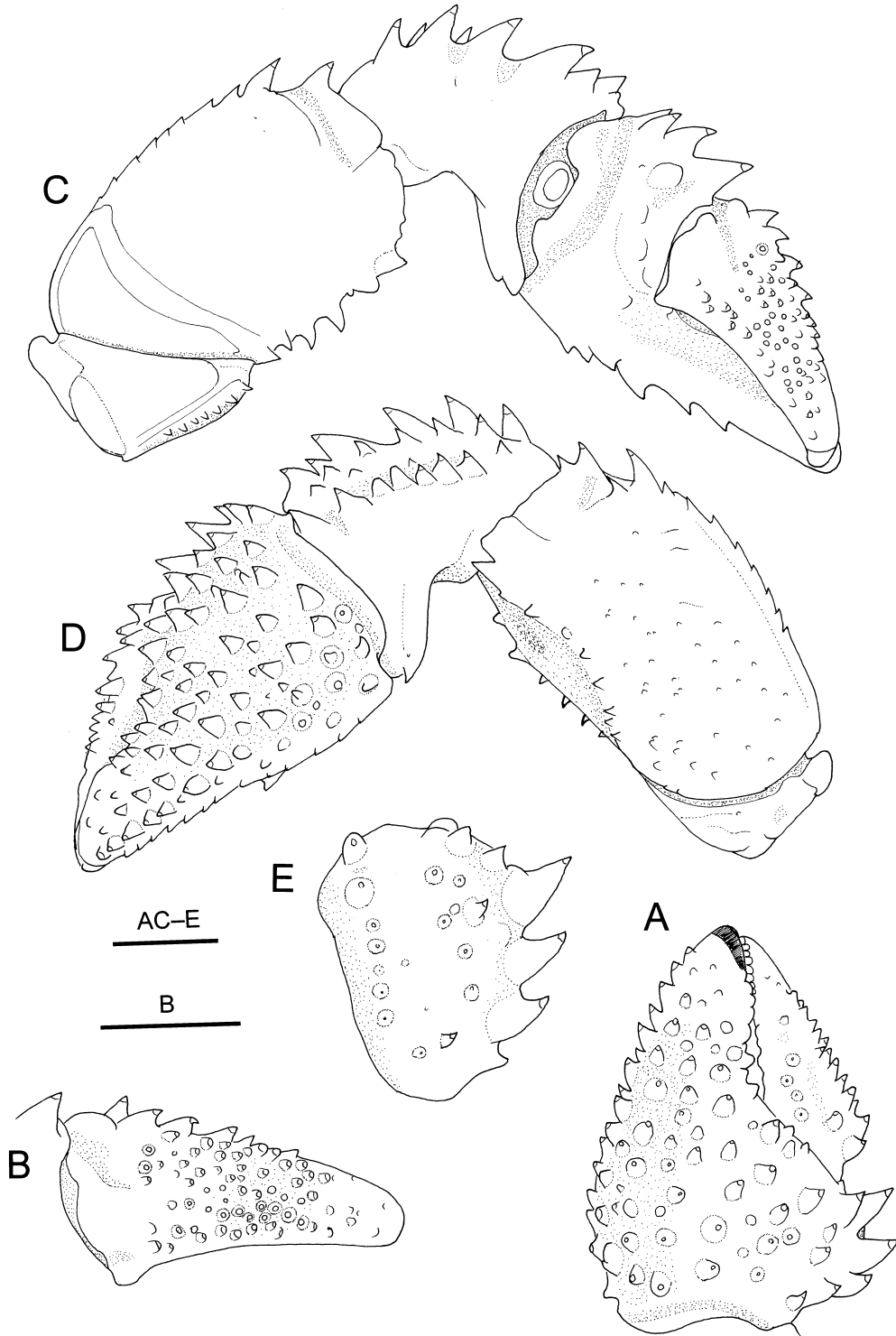


Fig. 14. *Stratiotes taenia* (Komai, 1999) comb. nov. Male (sl 4.8 mm), CBM-ZC 9520, N of Yakushima Island. Left cheliped (setae denuded): A, chela, dorsal view; B, dactylus, mesial view; C, entire left cheliped, mesial view; D, same, lateral view; E, carpus, dorsal view. Scale bars: 1 mm.

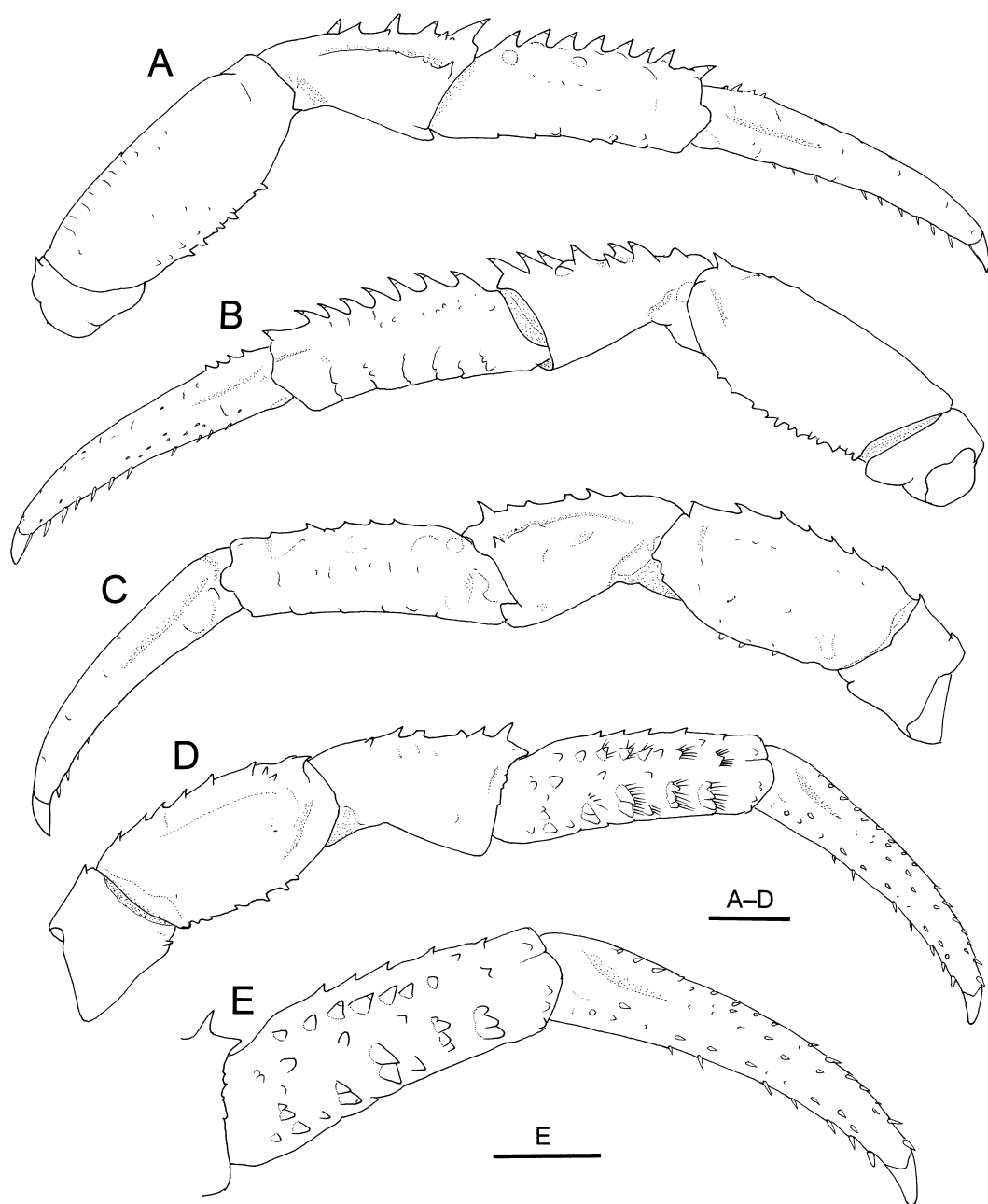


Fig. 15. *Stratiotes taenia* (Komai, 1999) comb. nov. Male (sl 4.8 mm), CBM-ZC 9520, N of Yakushima Island. Ambulatory legs (setae denuded): A, right second pereopod, lateral view; B, same, mesial view; C, left third pereopod, lateral view; D, same, mesial view; E, dactylus and propodus of left third pereopod, mesial view. Scale bars: 1 mm.

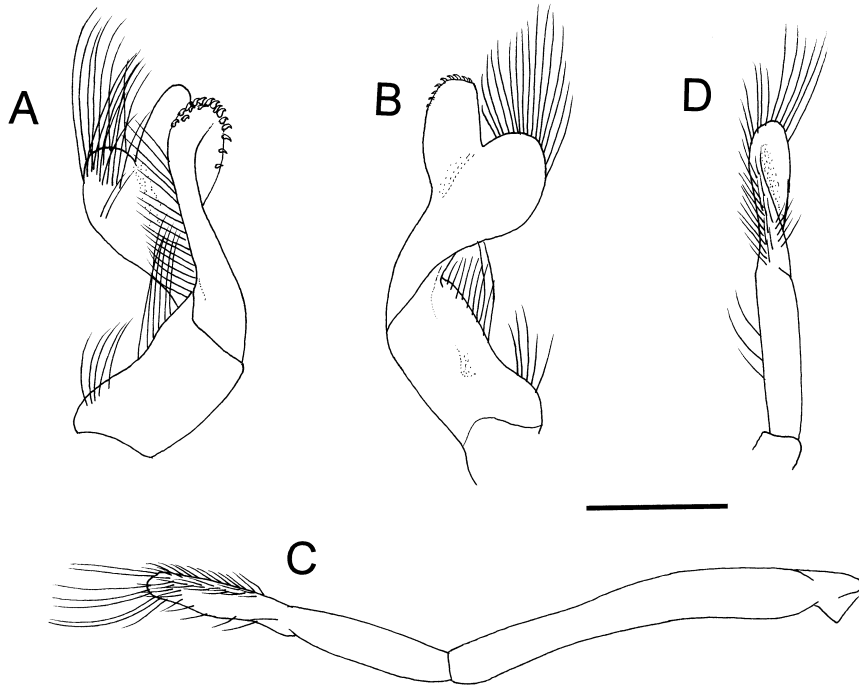


Fig. 16. *Stratiotes taenia* (Komai, 1999) comb. nov. Male (sl 4.8 mm), CBM-ZC 9520, N of Yakushima Island. A, left first pleopod, ventromesial view; B, same, dorsolateral view; C, left second pleopod, ventral view; D, endopod and appendix masculina, mesial view. Scale bar: 0.5 mm.

each tiny dorsodistal and ventrodistal spines.

Fourth pereopods (Fig. 13F) each with slender preungual process; dactyli each with row of 3·5 corneous spinules on ventral margin laterally, dorsal margin nearly smooth; propodi each with few low protuberances on dorsal surface, propodal rasp consisting of 3 or 4 irregular rows of small corneous scales; carpi each with dorsodistal spine; numerous tufts of long, thickly plumose setae on margins and surfaces of segments.

Male first pleopod (Fig. 16A, B) moderately stout; inferior lamella moderately broad, rounded, with double row of curved corneous spinules on margins; external lobe extending as far as inferior lamella, rounded, separated from inferior lamella by moderately deep notch; internal lobe broadly rounded, with numerous stiff setae arising marginally or submarginally on inner face. Male second pleopod (Fig. 16C, D) slender, distal segment slightly shorter than basal segment; appendix masculina somewhat twisted, subspatulate, subovately elongate in mesial view, with numerous stiff setae on lateral surface; mesial face slightly concave, with obliquely longitudinal row of stiff setae. Females unknown.

Telson (Fig. 13G) with markedly asymmetrical

posterior lobes, left lobe larger than right lobe; cleft separating two lobes narrow and moderately deep; terminal margins each with row of small, corneous-tipped spines, extending onto lateral margin on left side; lateral margins of anterior lobes unarmed.

*Coloration.* In life (Fig. 17D). Shield generally white, with tinge of orange-brown anteriorly and laterally; posterior carapace nearly colorless, with pair of brown spots either side of posteromedian plate. Ocular peduncle purple in distal 0.8, red in proximal 0.2; ocular acicle red. Ultimate segment of antennular peduncle purple, basal two segments red, dorsal flagellum white. Antennal peduncle generally orange-brown. Chelipeds generally orange-brown, with tinge of red on lateral and mesial faces of meri. Ambulatory legs generally light orangish-brown; dactyli white in distal 0.8, red in proximal 0.2; meri each with red blotch proximally; plumose setae on chelipeds and ambulatory legs dirty brown. Pleon white.

*Distribution.* Known only from Ogasawara Islands and Ohsumi Islands, northern part of Nansei Islands, southern Japan; 95·133 m, possibly to 247 m.

*Remarks.* *Stratiotes taenia* was originally described on the basis of a small female holotype (as *Paguristes*). The present material, containing six additional

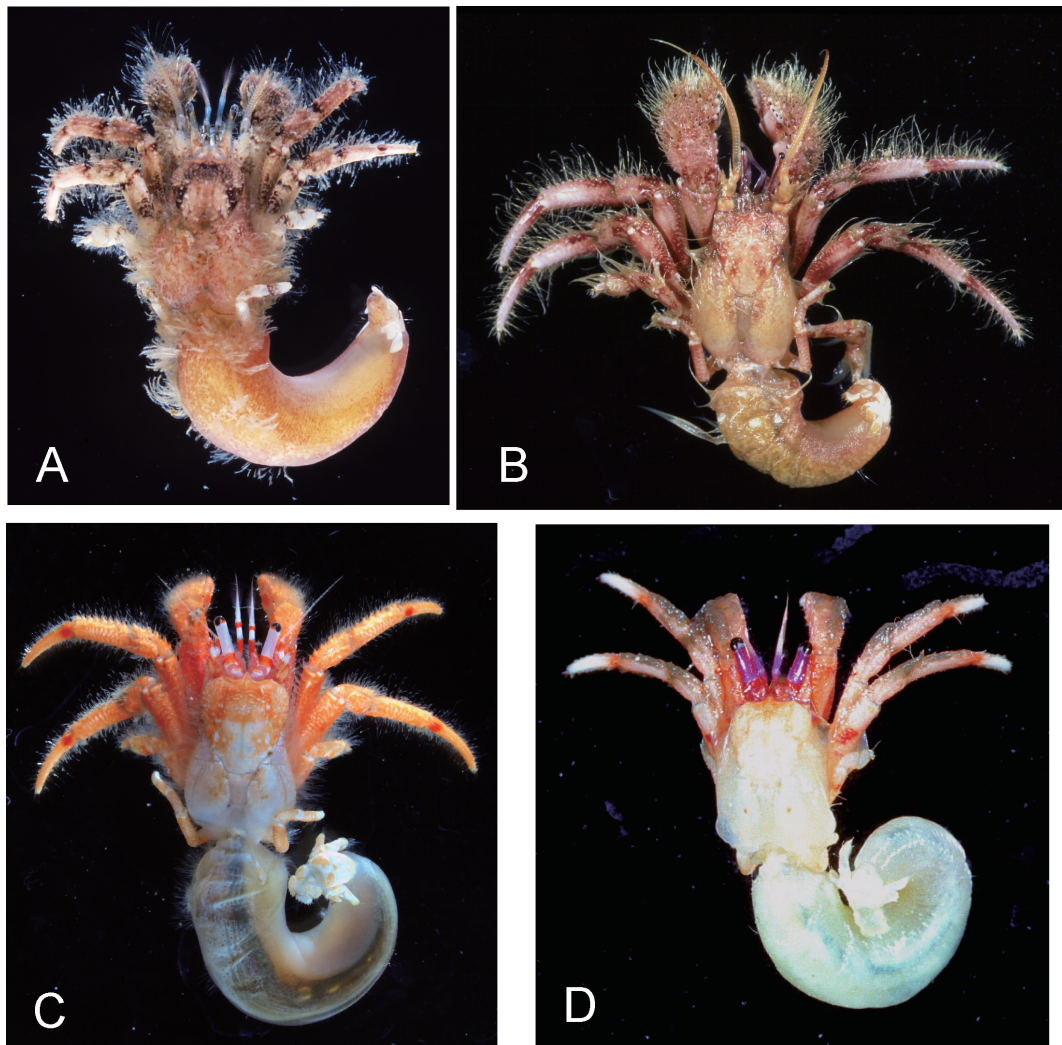


Fig. 17. Photographs showing coloration in life. A, *Stratiotes japonicus* (Miyake, 1961), male (sl 3.8 mm), CMNH-ZC 662 (photo by J. Okuno); B, *S. nigroapiculus* sp. nov., paratype, male (sl 7.4 mm), NSMT-Cr S; C, *S. orbis* sp. nov. male (sl 6.2 mm), CBM-ZC 9532; D, *S. taenia* (Komai, 1999) comb. nov. male (sl 3.1 mm), CBM-ZC 9521.

specimens, enabled me to access morphological variation of the species. The number and prominence of small spines on the chelipeds and of cornuous spinules on the ambulatory legs seem to increase fairly in larger specimens. The ocular peduncles seem to become more slender with increase of animal size. In the female holotype, the brood pouch was not fully developed (Komai, 1999. fig. 5H).

As mentioned previously, *Stratiotes taenia* is morphologically similar to *S. breviantennatus*, *S. ngochoae* and *S. orbis* sp. nov. Morphological differences among the four species are summarized in Table 2. Similarly, the coloration in life is also diagnostic.

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Table 2. Summary of morphological differences among *Stratioles taenia*, *S. breviantennatus*, *S. ngochoae* and *S.orbis* sp. nov.

Characters/species	<i>S. taenia</i>	<i>S. breviantennatus</i>	<i>S. ngochoae</i>	<i>S. orbis</i> sp. nov.
Antennal peduncle	reaching 0.7 of ocular peduncle.	not reaching distal 0.7 of ocular peduncle.	reaching distal 0.7 of ocular peduncle.	reaching distal 0.7 of ocular peduncle.
Antennal flagellum	each article with some short setae distally.	naked.	each article with some short setae distally.	each article with some short setae distally.
Mesial face of dactylus of cheliped	with numerous, closely-set, corneous-tipped tubercles.	with relatively few, widely-spaced corneous spinules.	with numerous, closely-set spinules.	with numerous, closely-set, corneous-tipped tubercles.
Carpus of cheliped	with dorsolateral row of small spines.	without distinct row of spines dorsolaterally.	with dorsolateral row of small spines.	with dorsolateral row of small spines.
Merus of cheliped	with dorsal row of small spines.	with 1 subdistal dorsal spine.	with dorsal row of small spines.	with dorsal row of small spines.
Dactylus of second pereopod	each with dorsal row of spines not extending to midlength.	each with dorsal row of spines not extending to midlength.	each with dorsal row of spines extending beyond midlength.	each with dorsal row of spines extending beyond midlength.
Setation of chelae and ambulatory legs	consisting of thickly plumose setae partially or completely masking armature.	consisting of thickly plumose setae partially or completely masking armature.	consisting of simple stiff and weakly plumose setae, partially obscuring armature.	consisting of simple stiff and weakly plumose setae, partially obscuring armature.
Terminal margins of telson	each with row of 4 or 5 tiny spines not extending onto lateral margin.	each with row of tiny spines extending onto lateral margin.	each with row of large spines extending onto lateral margin.	each with row of large spines extending onto lateral margin.

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**西部北太平洋産ヒメヨコバサミ属 (十脚目：異尾下目：ヤドカリ科) の再検討 .II .  
ブチヒメヨコバサミ属 (新称) に移される種の再記載と2新種の記載**

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最近の研究により, 従来*Paguristes* (ヒメヨコバサミ属) に帰せられていた種において, 鰓の数の変異があることがわかってきた。これまで本属は 13 対の鰓を持つものとして記載されてきたが, 種によっては 12 対あるいは 8 対しかないものが存在し, 鰓の減少が一般的には派生状態と考えられる。鰓が 8 対の種群は *Pseudopaguristes* McLaughlin, 2002 (ミギキキヨコバサミ属) に移され, 12 対の種群についてはこれまで *Paguristes* のシノニムとされてきた *Stratiotes* Thomson, 1899 が適切な有効属として認められた。本研究では, 従来ヒメヨコバサミ属に帰せられてきた日本産種についてその帰属を再検討した。その結果, 2 種 *Paguristes japonicus* Miyake, 1961 (ブチヒメヨコバサミ) と *Paguristes taenia* Komai, 1999 (リングヒメヨコバサミ) が実際には 12 対の鰓を持つことが明らかとなった。属の定義に従い, これら 2 種を *Stratiotes* 属に移すことを提唱する。さらに, 本属に帰属する 2 新種を記載した。*Stratiotes nigroapiculus* sp. nov. (新称: クロトゲヒメヨコバサミ) はブチヒメヨコバサミに近縁であると考えられ, 実際, 過去の文献ではブチヒメヨコバサミに誤同定されていた例も多く認められるが, 鉗脚指節内面の状態, 鉗脚や歩脚の棘の形状, 雄の第 1 腹肢の形態, 生時の色彩などで識別される。*Stratiotes orbis* sp. nov. (新称: アカオビヒメヨコバサミ) は *S. breviannatus* Rahayu, 2005, *S. ngochoae* Rahayu, 2005, およびリングヒメヨコバサミに形態的に類似するが, 第 2 触角鞭の構造, 鉗脚および歩脚の棘の配列や発達などの形態形質や生時の色彩で識別される。*Stratiotes* の和名については, 日本産種としては最も古参のブチヒメヨコバサミを受け, ブチヒメヨコバサミ属 (新称) を提唱する。本論文で取り扱われた 4 種を含め, 現時点で本属には 22 種が帰属する。