

A New Species of the '*Periclimenes aesopius* Species Group' (Decapoda: Palaemonidae: Pontoniinae) Associated with Sea Anemone from Pacific Coast of Honshu, Japan

Junji Okuno¹⁾ and Keiichi Nomura²⁾

¹⁾Coastal Branch of Natural History Museum and Institute, Chiba
123 Yoshio, Katsuura, Chiba 299-5242, Japan
E-mail: okuno@chiba-muse.or.jp

²⁾Kushimoto Marine Park Center, 1157 Arita, Kushimoto,
Wakayama 649-3514, Japan

Abstract A new species of the pontoniid shrimp, *Periclimenes kobayashii* is described and illustrated from Pacific coast of southern Honshu, Japan. The new species is a member of the '*P. aesopius* species group'. It is associated with the sea anemone, *Dofleinia armata*, as well as being a reef fish cleaner. Morphologically, it differs from the close relative, *P. tenuirostris*, in the arched rostrum falling short of the distal margin of the antennular peduncle and the chelae of the first and second pereopods with fingers shorter than the palms. In the coloration in life, the new species is distinguishable from other species of the species group by the arrangement of the white patch and red stripe on the tergum of the third abdominal somite.

Key words: Decapoda, Palaemonidae, Pontoniinae, *Periclimenes*, *P. kobayashii* sp. nov., sea anemone associate, fish-cleaner, Japan.

Periclimenes Costa, 1844, the largest genus in the subfamily Pontoniinae, contains over 115 species from the Indo-West Pacific, and many species are associated with various taxa of marine invertebrates (Chace and Bruce, 1993; Bruce, 1994; Li, 2000). The general morphology of *Periclimenes* species appears to be diverse, and some distinct species groups have been recognized in this genus (Kemp, 1922; Bruce, 1987, 1989, 1990).

One of the groups, the '*Periclimenes aesopius* species group', is characterized by the similar second pereopods with unarmed meri and carpi, the strongly produced inferior orbital margin with a reflected inner flange, the ophthalmic somite usually with a 'bec ocellaire', and the posterodorsally produced third abdominal somite (Bruce, 1991a). Currently, seven species are assigned to this species group: *P. aesopius* (Bate, 1863); *P. holthuisi* Bruce, 1969; *P. longicarpus* Bruce and Svoboda, 1983; *P. magnificus* Bruce, 1979; *P. tenuirostris* Bruce, 1991; *P. tosaensis* Kubo, 1951, and *P. venustus* Bruce, 1990. Bruce (1990) mentioned that the characteristic coloration in life is useful for species

recognition of the *P. aesopius* species group and suggested the existence of undescribed species based on underwater photographs taken in various localities in the Indo-West Pacific region. Among some Japanese popular publications (Takeda, 1986, 1994; Nomura, 1992; Masuda, 1999, Kobayashi, 2000; Minemizu, 2000), there is found one of the undescribed species photographed mainly at Izu Peninsula, the most popular diving site for Japanese divers. Its coloration in life primarily differs from those of the previously described species. Our collections with SCUBA equipment from southern coast of Honshu made available the specimens of this species for study. Careful examination showed that the undescribed species was separated from the other members of the species group not only in the unique coloration, but also in certain morphological features. In this paper, it is described as new to science, *Periclimenes kobayashii*.

Materials and Methods

Specimens of the new species were recently collected from the sublittoral zone in

southern coast of Honshu. The illustrations were made with the aid of a drawing tube mounted on a LEICA MZ12 stereomicroscope. The postorbital carapace length is abbreviated as CL in the text. The specimens examined in this study are deposited in the Coastal Branch of Natural History Museum and Institute, Chiba (CMNH), Muséum National d'Histoire Naturelle, Paris (MNHN), Nationaal Natuurhistorisch Museum, Leiden (RMNH) and Natural History Museum and Institute, Chiba (CBM).

For comparative purpose, the following specimens were examined:

Periclimenes tenuirostris Bruce, 1991: MUS-ORSTOM 4, stn DW 187, New Caledonia, 19°08.3' S, 163°29.3' E, 65–120 m, 19 Sep. 1985, 1 ovig. ♀, 4.7 mm CL, MNHN-Na 12047; SMIB 5, stn DW 81, Norfolk Ridge, 22°38.2' S, 167°34.8' E, 110 m, 9 Sep. 1989, 1 ovig. ♀, 4.1 mm CL, MNHN-Na 12048.

Taxonomy

***Periclimenes kobayashii* sp. nov.**
(Japanese name: **Hakusen-akahoshi-kakure-ebi**)
(Figs. 1–5)

Periclimenes holthuisi—Suzuki and Hayashi, 1977: 197 (in part); Takeda, 1986: 117, unnumbered fig.; Takeda, 1994: 225, unnumbered fig. Not *Periclimenes holthuisi* Bruce, 1969.

Periclimenes sp.—Nomura, 1992: 242, unnumbered fig.; Masuda, 1999: 45, unnumbered fig.; Kobayashi, 2000: 173, unnumbered fig.

Periclimenes sp. 3—Minemizu, 2000: 53, unnumbered figs.

Material examined. Holotype: Off Akazawa, Ito, Izu Peninsula, Honshu, Japan, 34°51.2' N, 139°05.5' E, 32 m, 15 Jan. 2000, coll. Y. Kobayashi, ♂, 3.7 mm CL, CMNH-ZC 00536.

Paratypes: Boso Peninsula. Hasama, Tateyama, 34°58.6' N, 139°47.1' E, 16 m, 14 June 2001, coll. J. Okuno, 1♂, 4.0 mm CL, CMNH-ZC 00538. Izu Peninsula. Izu Oceanic Park, Ito, 34°52.7' N, 139°08.2' E, 35 m, 25 Aug. 1995, coll. J. Okuno and M. Yokota, 1♂, 5.0 mm CL, CMNH-ZC 00514, 1 ovig. ♀, 5.9 mm CL, CMNH-ZC 00515, 1♀, 4.0 mm CL, RMNH-D 49194; same data as holotype, 1♀, 4.7 mm CL, CMNH-ZC 00537. Kii Peninsula,

Kushimoto. Myoga-jima Islet, 33°27.5' N, 135°48.0' E, 40 m, 17 Apr. 1992, coll. K. Nomura, 1♂, 4.0 mm CL, 1♀, 4.9 mm CL, CBM-ZC 6190; same locality as CBM-ZC 6190, 30 m, 26 Mar. 1993, coll. K. Nomura, 2♂♂, 3.7, 4.0 mm CL, 1 ovig. ♀, 6.1 mm CL, 2♀♀, 5.8, 6.6 mm CL, CBM-ZC 6191; Kii-Oshima, Kanayama, 33°28.6' N, 135°48.8' E, 20 m, 21 Dec. 1993, coll. K. Nomura, 1♂, 3.0 mm CL, 1♀, 3.6 mm CL, CBM-ZC 6192; Hashikui-iwa, 33°28.6' N, 135°48.0' E, 18 m, 4 Dec. 1996, coll. K. Nomura, 2♀♀, 6.9, 7.6 mm CL, CBM-ZC 6193.

Other material: Suruga Bay. Ose-saki, Numazu, 35°01.5' N, 138°47.6' E, 60 m, 21 Apr. 1996, coll. J. Okuno, 1♂, 4.1 mm CL, CMNH-ZC 00527.

Host. *Dofleinia armata* Wassilieff, 1908. The single male from Tateyama, Boso Peninsula (CMNH-ZC 00538) was associated with *Entacmaea* sp. [possibly *Entacmaea actinostoloides* (Wassilieff, 1908) sensu Uchida (2001)].

Diagnosis. A medium sized pontoninid shrimp with subcylindrical body form. Carapace with a single epigastric spine. Rostrum slender, arched, dentate on dorsal margin. Posterior half of third abdominal somite with strongly elevated, distinctly compressed median carina. Ophthalmic somite with minute 'bec ocellaire'. Antepenultimate segment of third maxilliped with 1 (rarely 2) distolateral spine. Fingers of first and second pereopods shorter than palms. Dactylus and fixed finger of second pereopod with cutting borders usually dentate mesially. Second pereopod with carpus distinctly shorter than chela. Ambulatory pereopods with dactyli slender, biunguiculate, propodi each with short spines on ventral surface. In life, posterior region of carapace with narrow, transverse white band, tergum of third abdominal somite with semiquadrate white patch fringed posteriorly with oblique, short red stripe.

Description. Carapace (Fig. 1) smooth, glabrous, lacking supraorbital spine; orbit feebly developed, inferior orbital angle strongly produced, acute, with inner ventral flange; antennal spine well developed, slender, submarginal, arising distinctly ventral to orbital angle; hepatic spine large, arising distinctly

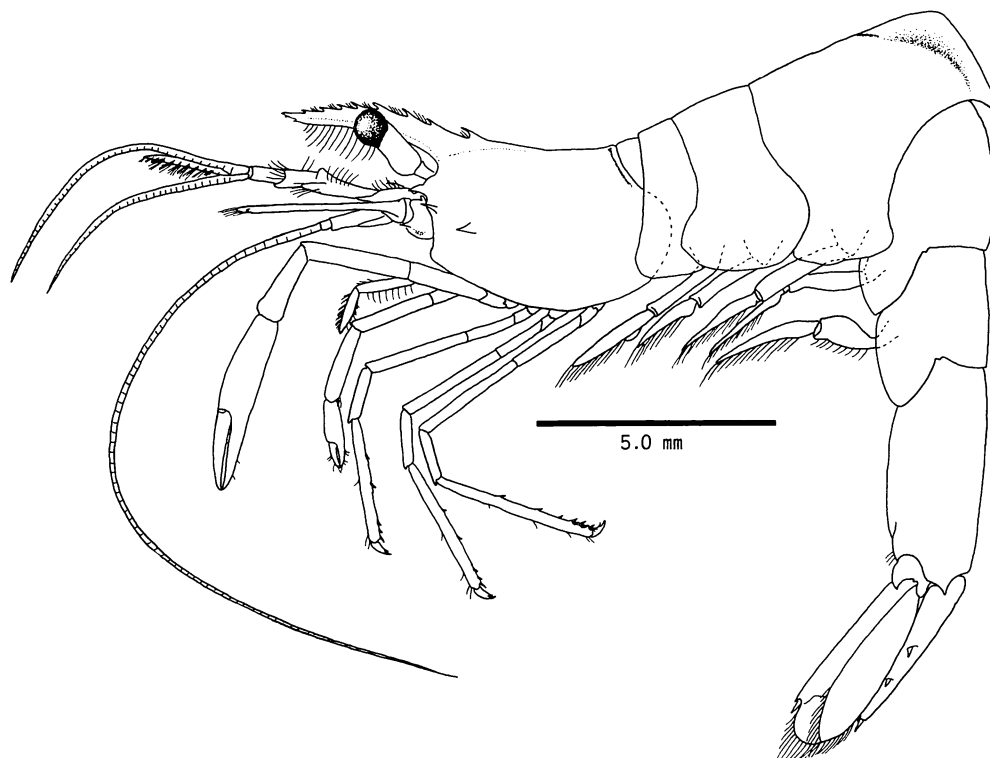


Fig. 1. *Periclimenes kobayashii* sp. nov. Holotype male (CMNH-ZC 00536). Entire animal in lateral view.

ventral to level of antennal spine; epigastric spine present; pterygostomial margin bluntly angular.

Rostrum (Fig. 2B) slender, weakly arched, 0.80–1.03 times as long as carapace, falling slightly short of level of distal margin of antennular peduncle; dorsal blade low, with 6–8 (usually 7) equidistant, small, acute teeth, interspaced by short setae; ventral blade poorly developed, with row of long setae, subterminally with 1–3 (usually 2) small, acute teeth.

Fourth thoracic sternite without finger-like median process; fifth sternite with pair of semiquadrate lobes posteriorly; posterior sternites unarmed.

Abdomen (Fig. 1) smooth, glabrous; pleura of first to third somites broad, rounded, those of fourth and fifth posteriorly produced, but blunt; posterodorsal margin of third somite produced posteriorly, posterior half of tergum with strongly elevated, distinctly compressed median carina; sixth somite 0.90–1.30 times as long as carapace, 1.01–1.24

times as long as telson, posterolateral process acute, posteroventral margin produced, but blunt. Telson (Fig. 2D) tapering posteriorly, posterior margin (Fig. 2E) convex, with 3 pairs of spines (lateral and intermediate spines simple, intermediate spines longest, mesialmost spines plumose); 2 pairs of small, subequal dorsolateral spines at midlength and posterior third length respectively.

Ophthalmic somite with minute 'bec ocellaire' (Fig. 2C). Eye (Fig. 2A) with large, globular cornea, bearing small ocellus; stalk distinctly longer than corneal diameter, becoming slightly narrower distally, maximum width subequal to maximum corneal diameter.

Antennular peduncle (Fig. 2F) with proximal segment distinctly longer than distal two segments combined; distolateral margin strongly produced, reaching level of midlength of intermediate segment, with row of setae, lateral margin straight, terminating distally in small acute tooth; ventromesial margin armed with small acute

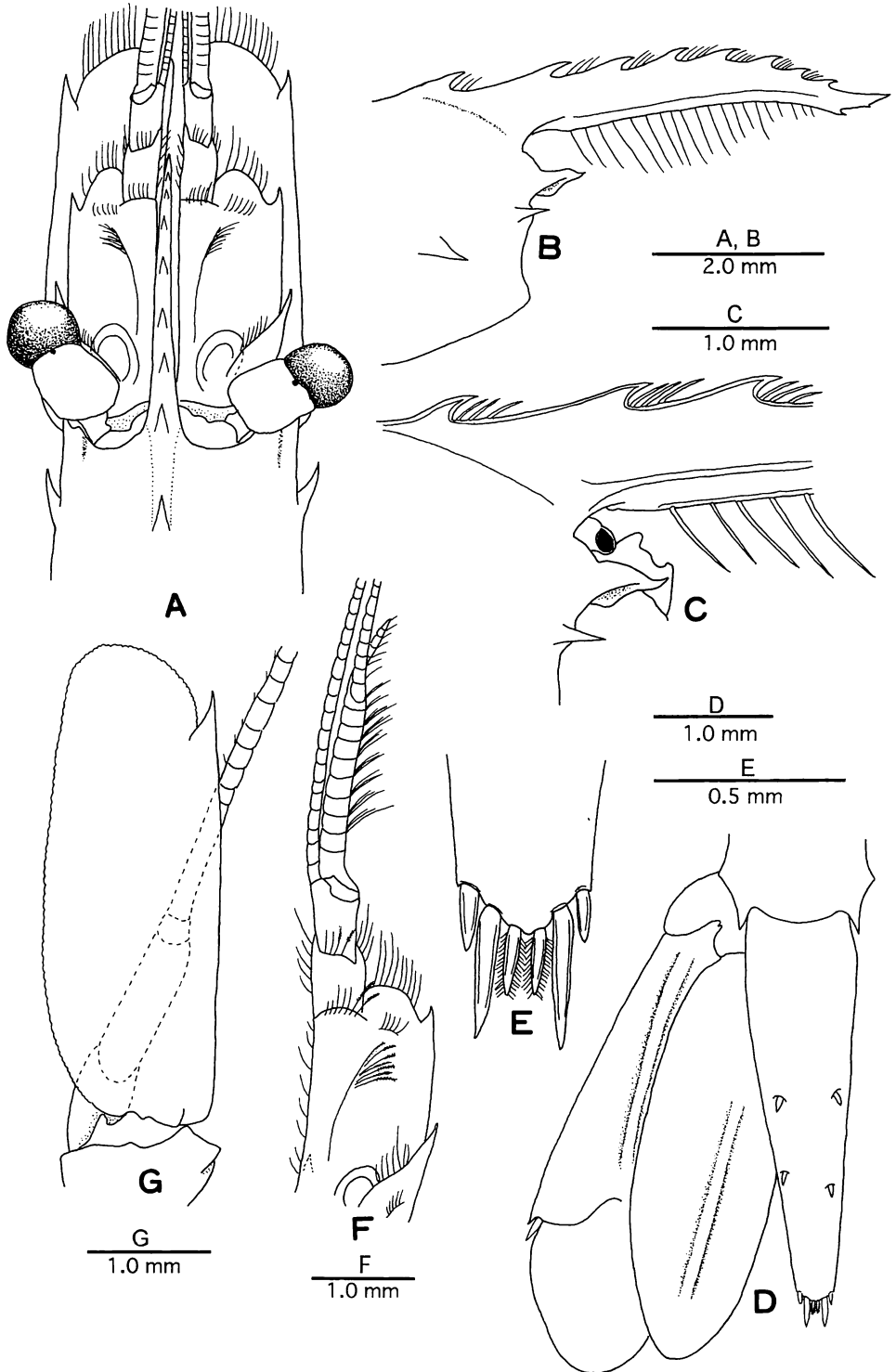


Fig. 2. *Periclimenes kobayashii* sp. nov. Holotype male (CMNH-ZC 00536). A, anterior carapace, rostrum and cephalic appendages, dorsal; B, anterior carapace and rostrum, lateral; C, orbital region of carapace and ophthalmic somite, lateral; D, telson and left uropod, dorsal; E, posterior part of telson, dorsal; F, right antennular peduncle, dorsal; G, right antenna, dorsal. D, G, setae omitted.

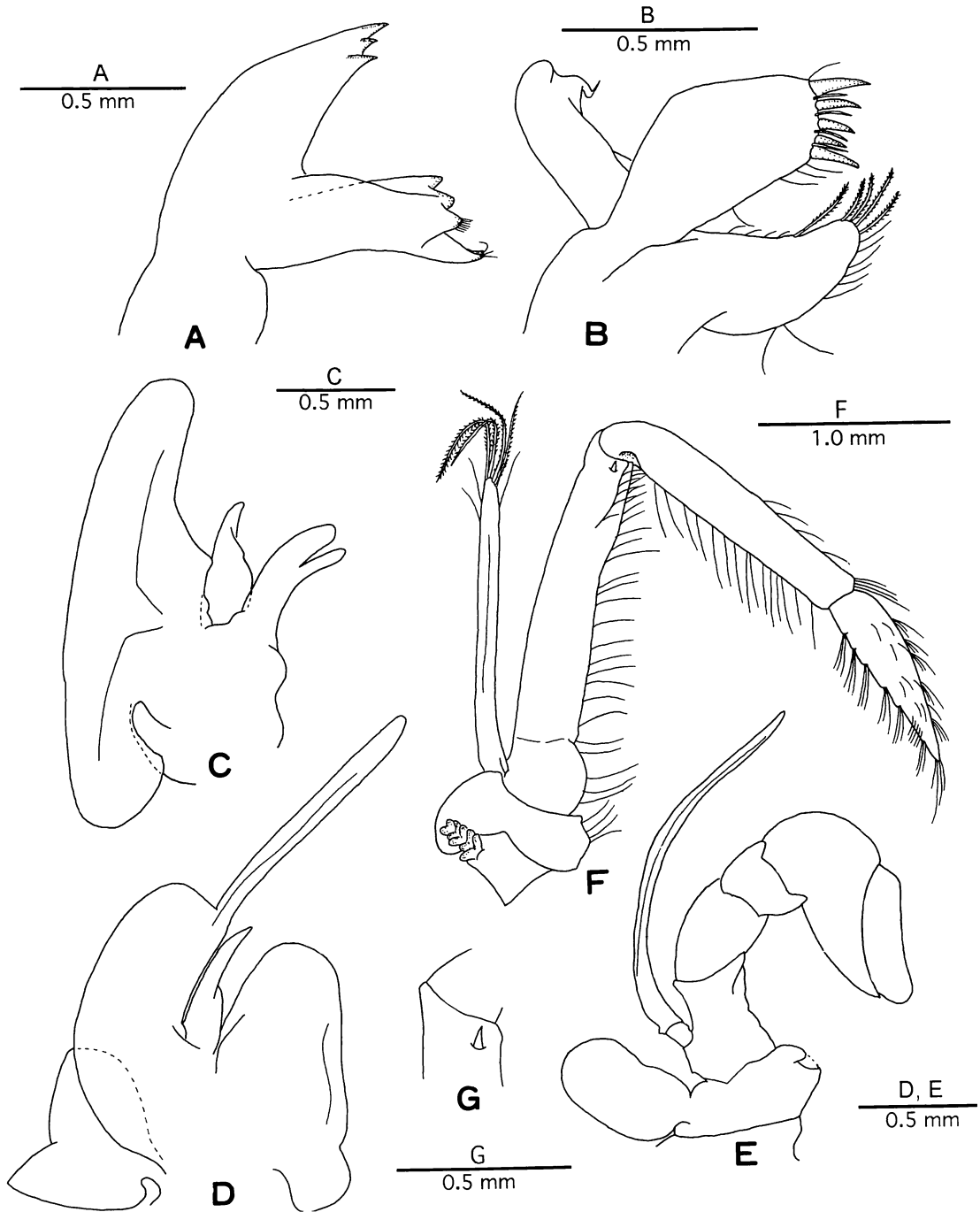


Fig. 3. *Periclimenes kobayashii* sp. nov. Female paratype (CMNH-ZC 00537). A, right mandible, external; B, right maxillule, external; C, right maxilla, external; D, right first maxilliped, external; E, right second maxilliped (coxa somewhat broken mesially), external; F, right third maxilliped, lateral; G, same, distal part of antepenultimate, lateral. C-E, G, setae omitted.

tooth; stylocerite short, slender, acute, falling slightly short of level of midlength of proximal segment; statocyst well develop-

ed, rounded; intermediate segment slender, about half of proximal segment length, feebly lobed laterally, slightly obliquely

articulated with distal segment; distal segment subequal to intermediate segment in length, slender, non-setose. Upper flagellum biramous, proximal 8–10 segments fused, shorter free ramus 5–6 segmented; lower flagellum slenderer than upper flagellum.

Antenna (Fig. 2G) with stout basicerite armed ventrolaterally with acute tooth, dorsal margin with small raised lobe; scaphocerite overreaching antennular peduncle, 2.36–3.93 times as long as maximum width, lateral margin straight, terminating in strong tooth falling short of distal margin of strongly produced lamella; carpocerite reaching proximal third of scaphocerite.

Epistome unarmed.

Mandible (Fig. 3A) robust, without palp; molar process obliquely truncated distally, with 4 large, blunt teeth; incisor process tapering distally, with 3 acute distal teeth. Maxillule (Fig. 3B) with feebly bilobed palp, internal lobe with small distal protuberance with short, curved inferior seta; upper lacinia broad, distal margin truncated, with about 5 simple spines and sparse, short spiniform setae; lower lacinia tapering distally, with some serrulate setae distally. Maxilla (Fig. 3C) with palp slender, tapering distally; distal endite developed, narrow, deeply bilobed, with sparse, simple setae distally; proximal endite obsolete, mesial margin feebly sinuous; scaphognathite well developed, posterior lobe short, distal half of anterior lobe narrow. First maxilliped (Fig. 3D) with long, slender, simple palp; distal endite with mesial margin bearing 2 rows of sparse setae, rounded distally; proximal endite small, rounded, separated from distal endite by shallow notch; caridean lobe broad; exopod with well-developed flagellum; epipod large, subtriangular, feebly bilobed. Second maxilliped (Fig. 3E) with normal endopod; dactylus broad, mesial margin slightly concave; propodus with anteromesial margin broadly rounded; carpus with distinct ventromesial process; merus about twice as long as carpus; ischium and basis completely fused; exopod with well developed flagellum; coxa inflated mesially; epipod oval, without podobranch. Third maxilliped (Fig. 3F) with endopod slender, slightly overreaching distal margin

Table 1. *Periclimenes kobayashii* sp. nov.
Branchial formula.

	Maxillipeds			Pereiopods				
	I	II	III	I	II	III	IV	V
Pleurobranchs	—	—	—	1	1	1	1	1
Arthrobranchs	—	—	1	—	—	—	—	—
Podobranchs	—	—	—	—	—	—	—	—
Epipods	1	1	—	—	—	—	—	—
Exopods	1	1	1	—	—	—	—	—

of antennal carpocerite, ischiomerus and basis feebly articulated, mesially with a small notch at junction; ultimate segment tapering distally, mesially with about 7 transverse rows of short setae, laterally with sparse setae; penultimate segment 1.18–1.71 times as long as ultimate segment, with tufts of spiniform setae mesially, long simple setae dorsodistally; antepenultimate segment with 1 (rarely 2) small distolateral spine (Fig. 3G), ventral margin sparsely setose; exopod with well developed flagellum, distally with long plumose setae; coxal plate oval; small arthrobranch present.

Branchial formula as in Table 1.

First pereiopod (Fig. 4A) moderately slender, overreaching distal margin of scaphocerite by length of dactylus and half of palm. Chela (Fig. 4B) 0.36–0.51 times as long as carapace, 0.80–1.20 times as long as carpus; palm subcylindrical, slightly compressed, 1.11–1.33 times as long as dactylus, with 4 transverse rows of short serrulate glooming setae proximally; fingers each terminating in small, hooked unguis, cutting edges situated laterally, entire. Carpus 0.45–0.48 times as long as carapace, slightly widened distally, with longitudinal row of serrulate glooming setae distally. Merus unarmed, 1.11–1.22 times as long as carpus. Coxa with small, setose ventral process.

Second pereiopods (Fig. 4C) well developed, similar, overreaching distal margin of scaphocerite by length of chelae. Chela slightly bowed, 0.95–1.15 times as long as carapace, 1.90–2.57 times as long as carpus; palm 1.10–1.45 times as long as dactylus, slightly compressed; dactylus (Fig. 4D) terminating in hooked, acutely pointed unguis, cutting edge situated laterally, armed proximally with 0–5 (usually 1) small, acute, re-

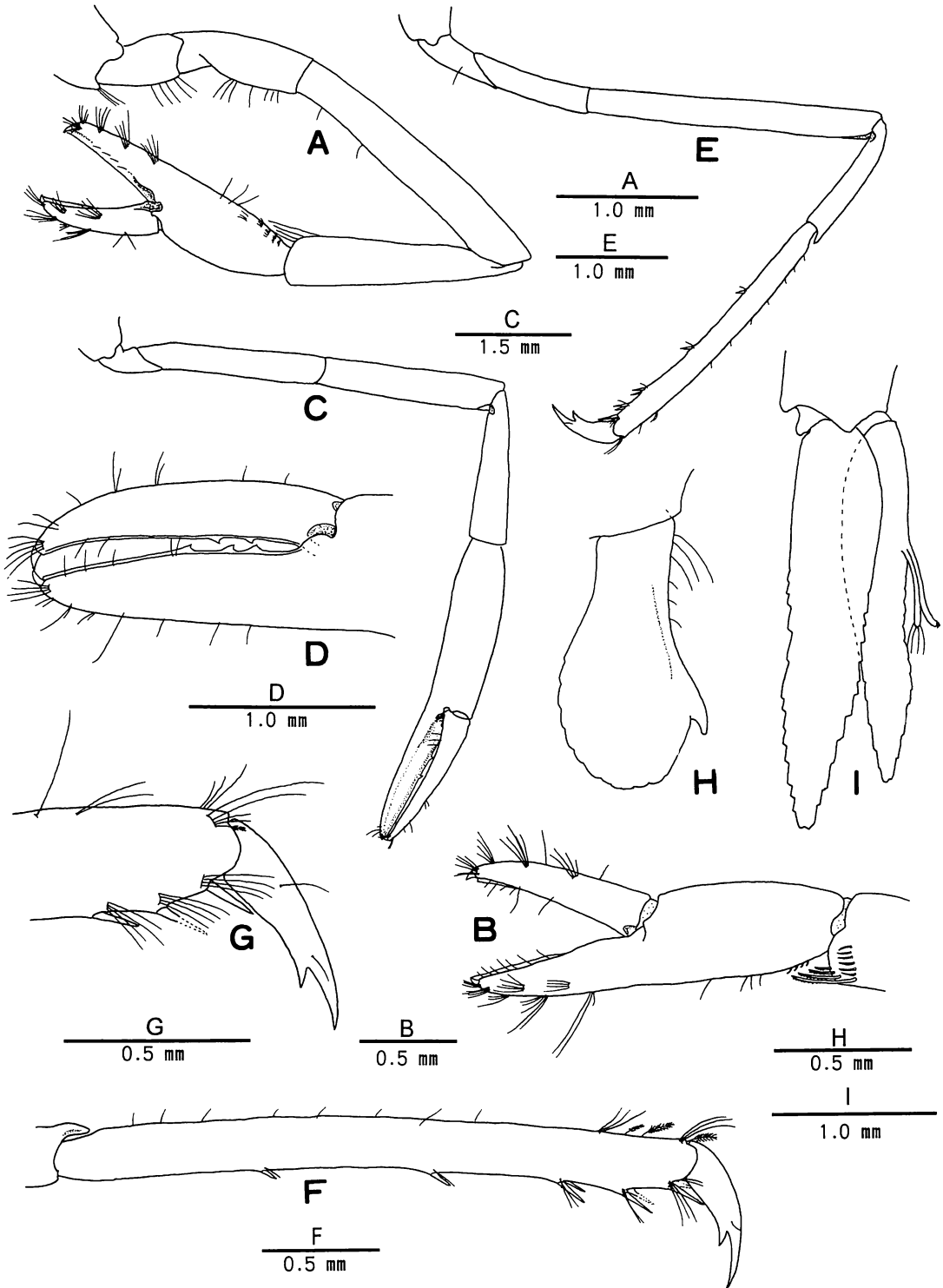


Fig. 4. *Periclimenes kobayashii* sp. nov. Holotype male (CMNH-ZC 00536). A, right first pereiopod, lateral; B, same, chela, mesial; C, right second pereiopod, lateral; D, same, fingers, mesial; E, right third pereiopod, lateral; F, same, propodus and dactylus; G, dactylus of right fifth pereiopod, lateral; H, endopod of right first pleopod, dorsal; I, right second pleopod, dorsal. H, I, marginal setae omitted.

curved teeth, remaining part entire, sharply edged; fixed finger (Fig. 4D) generally similar to dactylus, armed proximally with 2–6 (usually 3–4) small, acute, recurved teeth. Carpus slender, unarmed, slightly widened distally. Merus slender, unarmed, 1.00–1.43 times as long as carpus. Ischium slender, unarmed, 0.88–1.21 times as long as carpus.

Third pereopod (Fig. 4E) slender, overreaching distal margin of scaphocerite by length of dactylus and distal part of propodus. Dactylus (Fig. 4F) 0.22–0.28 times as long as propodus, compressed laterally, dorsal margin convex, ventral margin with 1 subdistal accessory tooth, unguis not clearly demarcated. Propodus (Fig. 4F) 2.10–2.25 times as long as carpus, with 2 long distoventral spines and spaced set of 2–3 spines on ventral surface, dorsal surface with few short setae. Carpus unarmed. Merus 2.00–2.42 times as long as carpus, unarmed. Fourth pereopod similar to third. Fifth pereopod with propodus bearing 1 distal spine and 2 subdistal spines on ventral surface and tufts of setae (Fig. 4G), and widely spaced set of 3–4 spines posterior to distal series of spines.

Endopod of male first pleopod (Fig. 4H) short, generally oval, distally expanded, with small but distinct appendix interna. Endopod of male second pleopod (Fig. 4I) with appendices interna and masculina arising from proximal two-fifths of mesial margin; appendix interna slender, slightly overreaching tip of appendix masculina, with few distal cincinnuli; appendix masculina slender, with four long spiniform setae distally.

Uropod (Fig. 2D) with protopodite posterolaterally produced, but blunt; exopod broad, overreaching posterior margin of telson, broadly rounded distally, lateral margin nearly straight, terminating in small acute tooth, with larger, mobile spine just mesial to distolateral tooth; endopod oval, falling slightly short of posterior margin of exopod.

Coloration (Fig. 5). Body and appendages generally transparent. Lateral part of carapace with sparse red spots. Transverse, narrow white band running across posterior part of carapace. Third abdominal somite with oblique, semiquadrate white patch over

posterior half of dorsal carina, posterior margin of patch fringed with oblique, short red stripe, midlength of carina with longitudinal, short red stripe at a distance from white patch. Pleura of first to fifth abdominal somites with red spots at base of first, third and fifth pleopods, white spots at the base of second and fourth pleopods. Posterior margin of sixth somite with transverse red stripe. Telson white. Eyestalks white, ophthalmic somite with longitudinal white stripe anterodorsally. First and second pereopods with chelae largely white, more or less mottled, with hinge region and finger tips purple; distal half of carpi purple, proximal half white; meri white, with distal and proximal purple rings. Uropods white, with purple rounded patch at distal half of exopods.

Etymology. This new species is named in honor of a Japanese underwater photographer, Mr. Yasumasa Kobayashi. He supported eagerly our study in various aspects, as providing us with the type material, underwater photograph and information on ecology of this new species.

Distribution. Known only from Boso Peninsula, Izu Peninsula and Kii Peninsula on the Pacific coast of southern Honshu, Japan.

Ecological notes. At the collecting sites of the specimens examined, *P. kobayashii* was nearly always found around the tentacles of the host sea anemone, *Dofleinia armata*. One to seven individuals of *P. kobayashii* lived around a single host sea anemone, and they were usually hovering a short distance from the tentacles. The shrimps may be killed by the heavy nematocysts of *D. armata* if they touch with the tentacles for a long time. Moreover, *P. kobayashii* has been observed by us and some divers to clean reef fishes. The process of the cleaning behavior between the shrimp and fishes is as follows: 1) a fish approaches a sea anemone associated with the shrimp; 2) the shrimp begins to sway its body and rapidly wave the second pereopods; 3) the fish standstills in front of the sea anemone, and 4) the shrimp moves to the fish body and cleans various part of the fish (see Fig. 5B). Similar symbiotic relationship between the pontoniid cleaner shrimp and sea anemones is known in the western

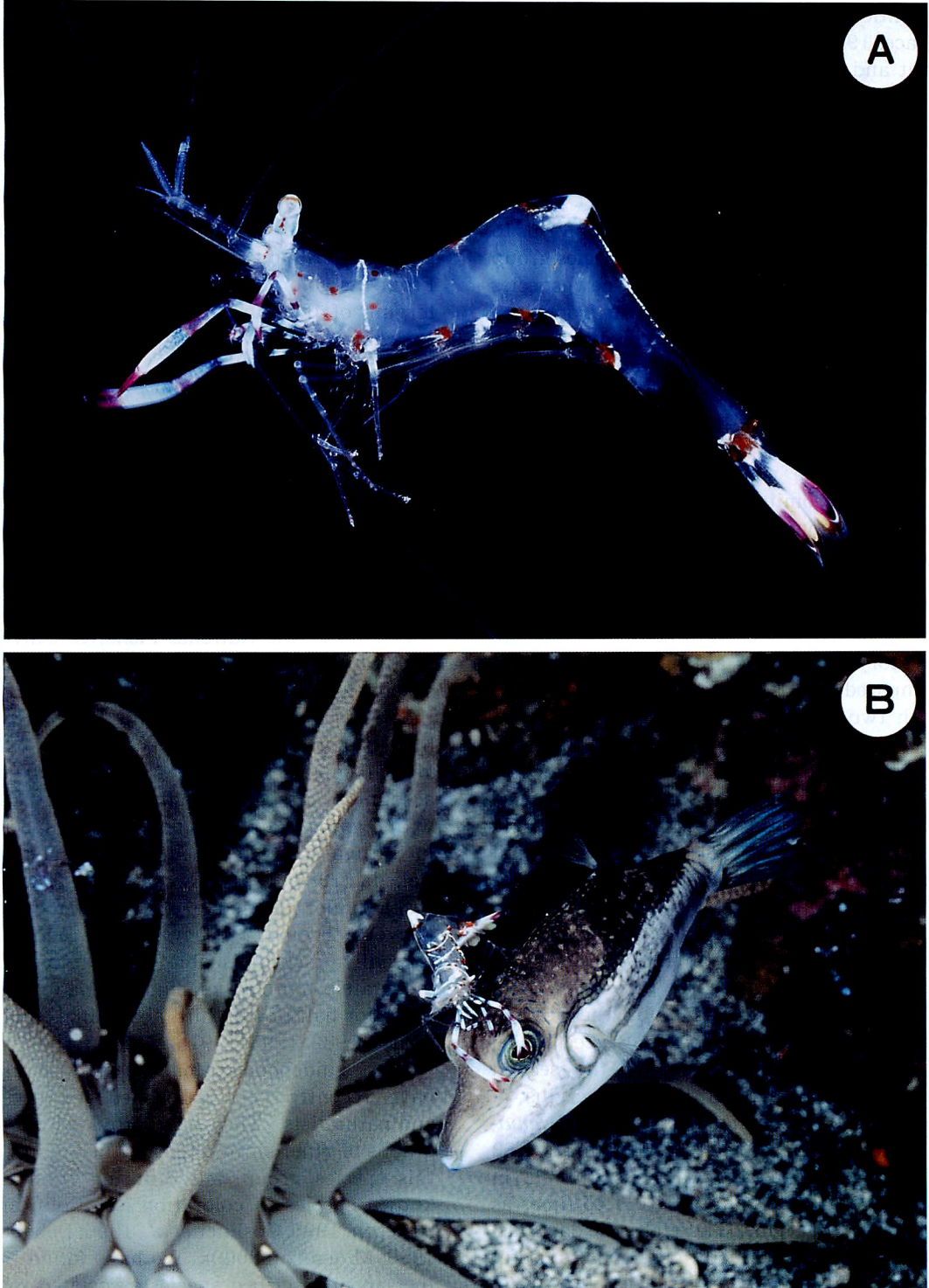


Fig. 5. *Periclimenes kobayashii* sp. nov. A, male paratype from Tateyama, Boso Peninsula (CMNH-ZC 00538), fresh specimen, lateral view (photo by J. Okuno); B, *Periclimenes kobayashii* cleaning a sharpnosed puffer, *Canthigaster rivulata* (Temminck and Schlegel, 1850) at Izu Oceanic Park, Ito, Izu Peninsula (photo by Y. Kobayashi).

Atlantic congeneric species, *P. pedersoni* Chace, 1958 (see Limbaugh *et al.*, 1961; Sargent and Wagenbach, 1975, as *Periclimenes anthophilus* Holthuis and Eible-Eibesfeldt, 1964; Gwaltney and Brooks, 1994; Spotte, 1999).

Discussion

Periclimenes kobayashii closely conforms to the definition of the *P. aesopius* species group given by Bruce (1991a). The new species resembles *P. tenuirostris*, known from deep waters off New Caledonia (Bruce, 1991a, b), in the following features: 1) the dorsal carina of the carapace is armed only with a single epigastric spine; 2) the 'bec ocellaire' of the ophthalmic somite is minute; 3) the median carina on the posterior half of the third abdominal somite is dorsally elevated and distinctly compressed; 4) the antepenultimate segment of the third maxilliped is armed distolaterally with spine; 5) the carpus of the second pereopod is distinctly shorter than the chela; 6) the dactyli of the ambulatory pereopods are biunguiculate. We compared the specimens of *P. kobayashii* with two topotypic ovigerous females of *P. tenuirostris* reported by Bruce (1991b). *Periclimenes kobayashii* is readily distinguished from *P. tenuirostris* in having the arched rostrum falling short of the distal margin of the antennular peduncle, and the first pereopod with the palm longer than the dactylus. In contrast, *P. tenuirostris* has a straight rostrum slightly overreaching the distal margin of the antennular peduncle, and the palm of the first pereopod being shorter than the dactylus. In the original description of *P. tenuirostris*, Bruce (1991a) mentioned that the palm of the second pereopod is subequal to the dactylus in length. In one of the specimens of *P. tenuirostris* (MNHN-Na 12048), the palm is 0.83 times as long as the dactylus. While in *P. kobayashii*, the palm is 1.10–1.45 times as long as the dactylus. Therefore, the dactylus-palm ratio of the second pereopod is useful in distinguishing the two species.

Except for *P. tenuirostris*, the colorations in life have been described for the known members of the *P. aesopius* species group (Bruce, 1990). The color pattern of the tergum of

the third abdominal somite is reliable to recognize the species of the species group in life (Bruce, 1990, 1991a). As mentioned above, *P. kobayashii* has the subquadrate white patch fringed with a short red stripe at the posterior margin only. This pattern differs from those of the six related species (see Bruce, 1990). Moreover, *P. kobayashii* is characterized by having the transverse white band and brilliant red spots on the carapace. From the coloration in life and form of the tergum of the third abdominal somite, the *Periclimenes* species illustrated in the Japanese popular publications (Takeda, 1986; 1994, as *P. holthuisi*; Nomura, 1992; Masuda, 1999; Kobayashi, 2000, as *Periclimenes* sp.; Minemizu, 2000, as *Periclimenes* sp. 3) is with little doubt identified with *P. kobayashii*.

Suzuki and Hayashi (1977) identified an associate of *Dofleinia armata* from Uchiura, Suruga Bay, with *Periclimenes holthuisi*. We examined many specimens of *Periclimenes* studied by Suzuki and Hayashi (1977) in the collection of the National Fisheries University, Shimonoseki, but could not find the specimen associated with *D. armata* among them. Nevertheless, we suggest that the Suzuki and Hayashi's specimen from *D. armata* might represent *P. kobayashii* on account of its rather high host specificity with *D. armata*, and abundance of the species in Suruga Bay (R. Minemizu, pers. comm.). Takeda (1986, 1994) also reported *P. kobayashii* under the name of *P. holthuisi* (see above). From *P. kobayashii*, *P. holthuisi* is readily distinguishable by having the moderately humped median carina on the posterior half of the third abdominal somite (Bruce, 1982, 1990, 1991a).

Many guidebooks of marine invertebrates have recently been published for divers and naturalists. They have provided photographs of other shrimps clearly belonging to this species group, but differing from the known species in coloration (see Colin and Arneson, 1995; Gosliner *et al.*, 1996; Debelius, 1999; Minemizu, 2000). We have found further an undescribed species associated with various taxa of sea anemones incorrectly identified as *P. holthuisi* in some Japanese publications (Miyake, 1975, 1982; Kamesaki *et al.*, 1988; Kobayashi, 2000). This species

is rather closely related to *P. venustus* than *P. holthuisi*. It will be described as new in a separate paper.

Acknowledgements

We sincerely thank Y. Kobayashi for providing us the specimens from Izu Peninsula, his beautiful underwater photograph and information on ecology of the new species. Our thanks go to H. Arakawa, R. Minemizu and M. Yokota for kindly supporting to collect the specimens by one of us (JO). We are indebted to K.-I. Hayashi for providing us with the *Periclimenes* specimens studied by Suzuki and Hayashi (1977), and N. Ngok-Ho for sending us the comparative material on loan. Cordial thanks are extended to A. J. Bruce, K.-I. Hayashi and T. Komai, for kindly reviewing the manuscript and giving us valuable suggestions.

References

- Bate, C. S. 1863. On some new Australian species of Crustacea. Proc. Zool. Soc. Lond. 1863: 498–505, pls. 40–41.
- Bruce, A. J. 1969. Preliminary descriptions of sixteen new species of the genus *Periclimenes* Costa, 1844 (Crustacea, Decapoda, Natantia, Pontoniinae). Zool. Meded., Leiden 43(20), 253–278.
- Bruce, A. J. 1979. Notes on some Indo-Pacific Pontoniinae, XXXI. *Periclimenes magnificus* sp. nov., a coelenterate associate from the Capricorn Islands (Decapoda, Palaemonidae). Crustaceana suppl. 5: 195–208, 1 pl.
- Bruce, A. J. 1982. The pontoniine shrimp fauna of Hong Kong. In Morton, B. and C. K. Tseng (eds.), Proceedings of the First International Marine Biological Workshop: The Marine Flora and Fauna of Hong Kong and Southern China, 1, Introduction and Taxonomy, pp. 233–284. Hong Kong University Press, Hong Kong.
- Bruce, A. J. 1987. Re-descriptions of two little-known Indo-West Pacific palaemonid shrimps, *Periclimenes calmani* Tattersall and *P. delagoae* Barnard. J. Nat. Hist. 21: 1415–1432.
- Bruce, A. J. 1989. *Periclimenes gonioporae* sp. nov. (Crustacea: Decapoda: Palaemonidae), a new coelenterate-associated shrimp. The Beagle, Rec. North. Territ. Mus. Arts Sci. 6(1): 149–156.
- Bruce, A. J. 1990. A new cnidarian-associated palaemonid shrimp from Port Essington, Cobourg Peninsula, Australia. Indo-Malayan Zool. 6: 229–243.
- Bruce, A. J. 1991a. Shallow-water palaemonid shrimps from New Caledonia (Crustacea: Decapoda). In Richer de Forges, B. (ed.), Le Benthos des Fonds Meubles des Lagons de Nouvelle-Calédonie, 1. Études et Thèses, pp. 221–279. ORSTOM, Paris.
- Bruce, A. J. 1991b. Crustacea Decapoda: Further deep-sea palaemonid shrimps from New Caledonian waters. In Crosnier, A. (ed.), Résultats des Campagnes MUSORSTOM, 9. Mém. Mus. Nat. Hist. Nat. Paris (A) 152: 299–411.
- Bruce, A. J. 1994. A Synopsis of the Indo-Pacific Genera of the Pontoniinae (Crustacea: Decapoda: Palaemonidae). 172 pp. Koeltz Scientific Books, Königstein.
- Bruce, A. J. and A. Svoboda. 1983. Observations upon some pontoniine shrimps from Aqaba. Jordan, Zool. Verh. Leiden 205: 1–44.
- Chace, F. A., Jr. and A. J. Bruce. 1993. The caridean shrimps (Crustacea: Decapoda) of The Albatross Philippine Expedition 1907–1910 Part 6: Superfamily Palaemonoidea. Smiths. Contr. Zool. 543: 1–152.
- Colin, P. L. and C. Arneson. 1995. Tropical Pacific Invertebrates: A Field Guide to the Marine Invertebrates Occurring on Tropical Pacific Coral Reefs, Seagrass Beds and Mangroves. 296 pp. Coral Reef Press, Beverly Hills.
- Costa, O. G. 1844. Su due nuovi generi di Crostacei decapodi Macrouri. Nota. Ann. Acad. Aspir. Nat. Napoli 2: 285–290. (not seen)
- Debelius, H. 1999. Crustacean Guide of the World. 321 pp. IKAN-Unterwasserarchiv, Frankfurt.
- Gosliner, T. M., D. W. Behrens and G. C. Williams. 1996. Coral Reef Animals of the Indo-Pacific. 314 pp. Sea Challengers, Monterey.
- Gwaltney, C. L. and W. R. Brooks. 1994. Host specificity of the anemoneshrimp [sic] *Periclimenes pedersoni* and *P. yucatanicus* in the Florida Keys. Symbiosis 16: 83–93.
- Kamesaki, N., K. Nomura, T. Hamano and H. Misaki. 1988. Illustrated Marine Organisms in Okinawa Islands, Vol. 8, Crustacea (Macrura and Anomura). 232 pp. Shinsei-Tosho Publication, Urasoe. (In Japanese)
- Kemp, S. 1922. Notes on Crustacea Decapoda in the Indian Museum. XV. Pontoniinae. Rec. Indian Mus. 24: 113–288, pls. 3–9.
- Kobayashi, Y. 2000. Yama-kei Pocket Guide no. 16, Seashore Animals. 281 pp. Yama to Keikokusha, Tokyo. (In Japanese)
- Kubo, I. 1951. Some macrurous decapod crustacea found in Japanese waters, with descriptions of

- four new species. *J. Tokyo Univ. Fish.* 38(2): 259-289.
- Li, X.-Z. 2000. Catalog of the Genera and Species of Pontoniinae Kingsley, 1878 (Decapoda, Palaemonidae). 319 pp. Xueyuan Press, Beijing.
- Limbaugh, C., H. Pederson and F. A. Chace, Jr. 1961. Shrimps that clean fishes. *Bull. Mar. Sci. Gulf. Carib.* 11(2): 237-257.
- Masuda, H. 1999. Guide Book to Marine Life. 404 pp. Tokai University Press, Tokyo. (In Japanese)
- Minemizu, R. 2000. Marine Decapod and Stomatopod Crustaceans mainly from Japan. 344 pp. Bunnichi-Sogo Shuppan, Tokyo. (In Japanese)
- Miyake, S. 1975. Macrura and Anomura. *In* F. Uchinomi (ed.), *The Aquatic Lower Animals of Japan*, pp. 98-119. Gakushu-kenkyusha, Tokyo. (In Japanese)
- Miyake, S. 1982. Japanese Crustacean Decapods and Stomatopods in Color, vol. I, Macrura, Anomura and Stomatopoda. 261 pp., 56 pls. Hoikusha, Osaka. (In Japanese)
- Nomura, K. 1992. Pontoniinids. *In* Takeda, M. (ed.), *The Earth for Animals*, no. 68, Invertebrates 8, Macrura, Anomura and others, pp. 242-243. Asahi Shinbun Press, Tokyo. (In Japanese)
- Sargent, R. C. and G. E. Wagenbach. 1975. Cleaning behavior of the shrimp, *Periclimenes anthophilus* Holthuis and Eible-Eibesfelt (Crustacea: Decapoda: Natantia). *Bull. Mar. Sci.* 25: 466-472.
- Spotte, S. 1999. Possible synonymy of the western Atlantic anemone shrimps *Periclimenes pedersoni* and *P. anthophilus* based on morphology. *Bull. Mar. Sci.* 65: 407-417.
- Suzuki, K. and K.-I. Hayashi. 1977. Five caridean shrimps associated with sea anemones in central Japan. *Publ. Seto Mar. Biol. Lab.* 24(1-3): 193-208, pls. 1-2.
- Takeda, M. 1986. Arthropoda. *In* Masuda, H., M. Hayashi, K. Nakamura and Y. Kobayashi (eds.), *Marine Invertebrates*, pp. 99-146. Tokai University Press, Tokyo. (In Japanese)
- Takeda, M. 1994. Stomatopoda, Cirripedia and Natantia. *In* Okutani, T. (ed.), *Coral Reef Animals*, pp. 219-232. Yama to Keikoku-sha, Tokyo. (In Japanese)
- Uchida, H. 2001. Sea Anemones in Japanese Waters. 157 pp. TBS-Britannica, Tokyo. (In Japanese)

(Accepted 28 November 2001)

南日本産ホンカクレエビ属アカホシカクレエビ種群 (十脚目: テナガエビ科: カクレエビ亜科) の 1 新種

奥野 淳兒¹⁾・野村 恵²⁾

¹⁾ 千葉県立中央博物館 分館海の博物館
〒299-5242 千葉県勝浦市吉尾 123
E-mail: okuno@chiba-mose.or.jp

²⁾ 串本海中公園センター
〒649-3514 和歌山県西牟婁郡串本町有田 1157

房総半島, 伊豆半島, および紀伊半島で採集された標本に基づいて, ホンカクレエビ属アカホシカクレエビ種群の 1 新種, *Periclimenes kobayashii* sp. nov. を記載する. 本種は頭胸甲の背中線上に 1 胃上棘のみを有すること, 'bec ocellaire' が小さいこと, 第 3 腹節後半の背正中線が背方に突出し, 側扁すること, 第 3 顎脚の antepenultimate segment の外面末端部に 1 (稀に 2) 小棘を有すること, 第 2 胸脚の腕節が鉗部よりも短いこと, 第 3~5 胸脚の指節が二叉することにおいて, ニューカレドニアから知られている *P. tenuirostris* に類似する. しかし, 額角が弓なりを呈し, 第 1 触角柄部の末端に届かないこと, および第 1 胸脚の指節が掌部よりも短いことで識別される. 本種は主に刺胞動物のスナイソギンチャク *Dofleinia armata* を宿主とし, 魚類との清掃共生も観察されている. 本種はレジャーダイバーにはよく知られたエビで, 水中写真の被写体になることが多く, 一般向けの書籍では“ハクセンアカホシカクレエビ”, “ドフライニアシュリンプ”と表記されている. そこで, ここに本種の標準和名を改めてハクセンアカホシカクレエビとすることを提案する.