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Periclimenes rectirostris Bruce, 1981 (Crustacea: Decapoda: Palaemonidae): New Host Record and Range Extension

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Abstract A pontoniinid shrimp, *Periclimenes rectirostris* Bruce, 1981, is recorded on the basis of seven specimens captured from Suruga Bay, Honshu, Japan. The host species of this shrimp has not been exactly determined. This study shows the host to be determined a diadematid echinoid, *Chaetodiadema japonicum* Mortensen, 1904, and the first record of *P. rectirostris* from Japanese waters, representing major range extension to north.

Key words: *Periclimenes rectirostris*, sea urchin associate, new host record, range extension, Japan.

Shrimps of the pontoniinid genus *Periclimenes* Costa, 1844, are widely distributed in tropical and subtropical waters worldwide. Most species are associated with several taxa of marine invertebrates (Bruce, 1994). Bruce (1981) described *Periclimenes rectirostris* based on two males and an ovigerous female dredged from NE of Lubang, the Philippines, at depths of 129 to 134 m. Additionally, Bruce (1991, 1996) recorded this species from the deep seas off the Chesterfield Islands and the Philippines. The type specimens of *P. rectirostris* were dredged together with a deep sea diadematid sea urchin, *Eremopyga denudata* (de Meijere, 1904), and thus Bruce (1981, 1985, 1991) suggested that the host of *P. rectirostris* might be *E. denudata*.

One of us (JO) examined a male specimen identifiable with *P. rectirostris* collected by a skillful diver, Mr. R. Minemizu, from Ose-saki, Suruga Bay, Honshu, Japan, in April 1996. The specimen was found to cling to spine of an unidentified diadematid sea urchin, but Mr. Minemizu did not collect the host animal (Minemizu, pers. comm.). Fortunately, in February 2000, one of us (TY) collected additional specimens of *P. rectirostris* with host sea urchin from the same locality. Thus, in this study, the host animal of *P. rectirostris* was exactly identified. Also, these shrimp specimens from Suruga Bay represent the first record of *P. rectirostris* from Japanese waters and a northern range extension.

Materials and Methods

The postorbital carapace length is abbreviated as CL. The identification of the sea urchin followed Shigei (1986). The specimens examined in this study are deposited in the Coastal Branch of Natural History Museum and Institute, Chiba (CMNH) and Muséum National d'Histoire Naturelle, Paris (MNHN).

Taxonomy

Periclimenes rectirostris Bruce, 1981 (New Japanese name: Tanzaku-kakure-ebi)

(Figs. 1, 2)

Periclimenes rectirostris Bruce, 1981: 204, figs. 12-15; Bruce, 1985: 16; Bruce, 1991: 313, figs. 73-74; Chace and Bruce, 1993: 120; Bruce, 1996: 238.

Periclimenes sp. 6.—Minemizu, 2000: 60, unnumbered figs in color.

Material examined. All specimens collected at Ose-saki, Numazu, Izu Peninsula, NE of Suruga Bay, Honshu, Japan (35°02.1'N,

138°47.3′E), with SCUBA gear: 1♂ (CMNH-ZC 00258, 4.2 mm CL), 29 m, 11 Apr. 1996, coll. R. Minemizu, in association with an unidentified diadematid; 1♂ (CMNH-ZC 00317, 4.4 mm CL), 2♂♂, 3♀♀ (CMNH-ZC 00318, 3.2–5.0 mm CL), 10 m, 12 Feb. 2000, coll. T. Yanagisawa, in association with *Chaetodiadema japonicum* (see below).

Comparative material. 1♀ (MNHN-Na 12039, 9.1 mm CL), 22°17.2′S, 159°24.8′E, Chesterfield Islands, 315–320 m, 12 Oct. 1986, coll. MUSORSTOM cruise; 1♂ (MNHN-Na 12040, 6.5 mm CL), 22°25.13′S, 159°24.0′E, Chesterfield Islands, 330 m, 13 Oct. 1986, coll. MUSORSTOM cruise.

Host. Chaetodiadema japonicum Mortensen, 1904 (Echinodermata: Echinoidea: Diadematoida: Diadematidae), CMNH-ZE 00349, shell diameter 69.5 mm.

Distribution. Previously known only from the Philippines and the Chesterfield Islands (Bruce, 1981, 1991, 1996). Suruga Bay is the northernmost record of the known distributional range of this species.

Remarks. The present specimens generally agree with the original description of *P. recti-*

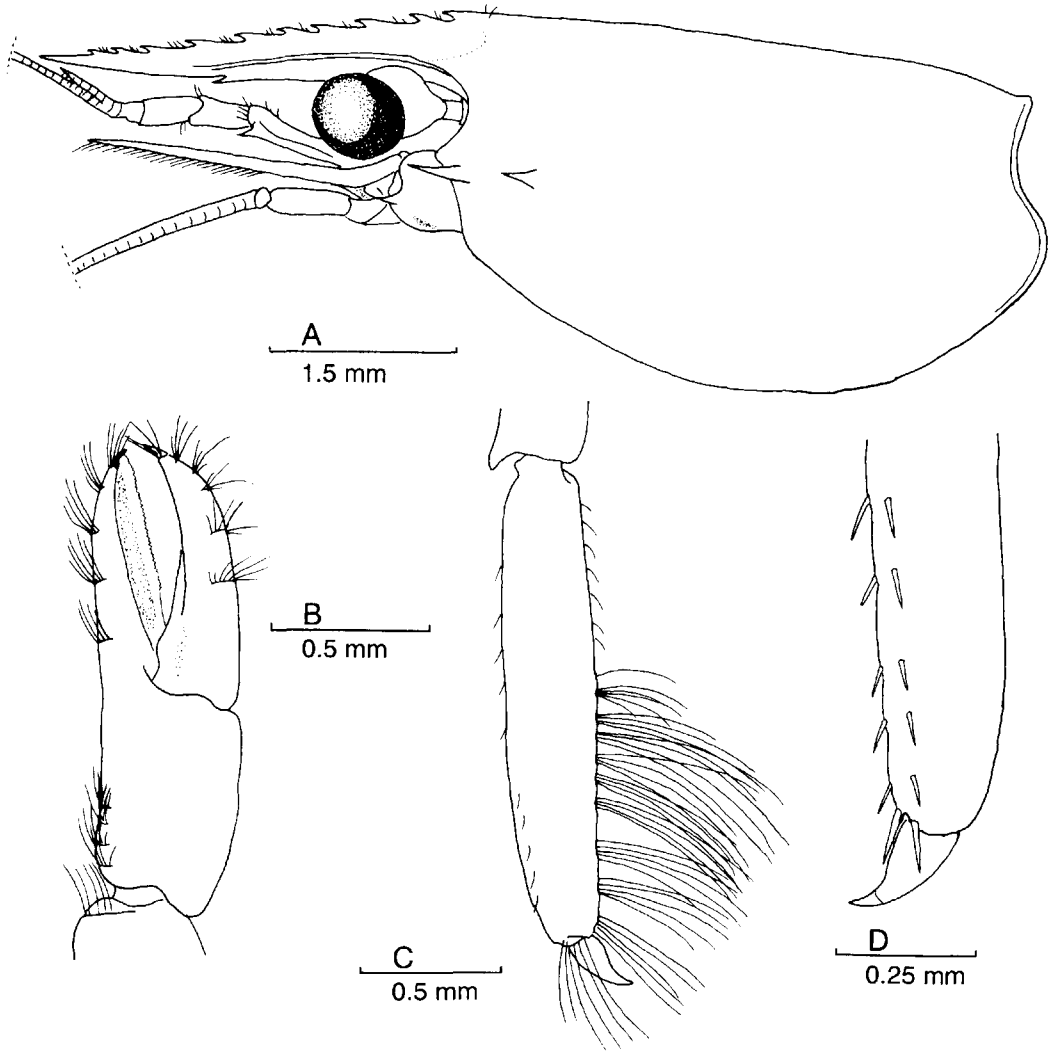

Fig. 1. *Periclimenes rectirostris* Bruce, 1981. Male (CMNH-ZC 00317, 4.4 mm CL). A, carapace and left cephalic appendages, lateral; B, chela of left first pereiopod, lateral; C, propodus of left third pereiopod, lateral; D, same, ventromesial (setae omitted).

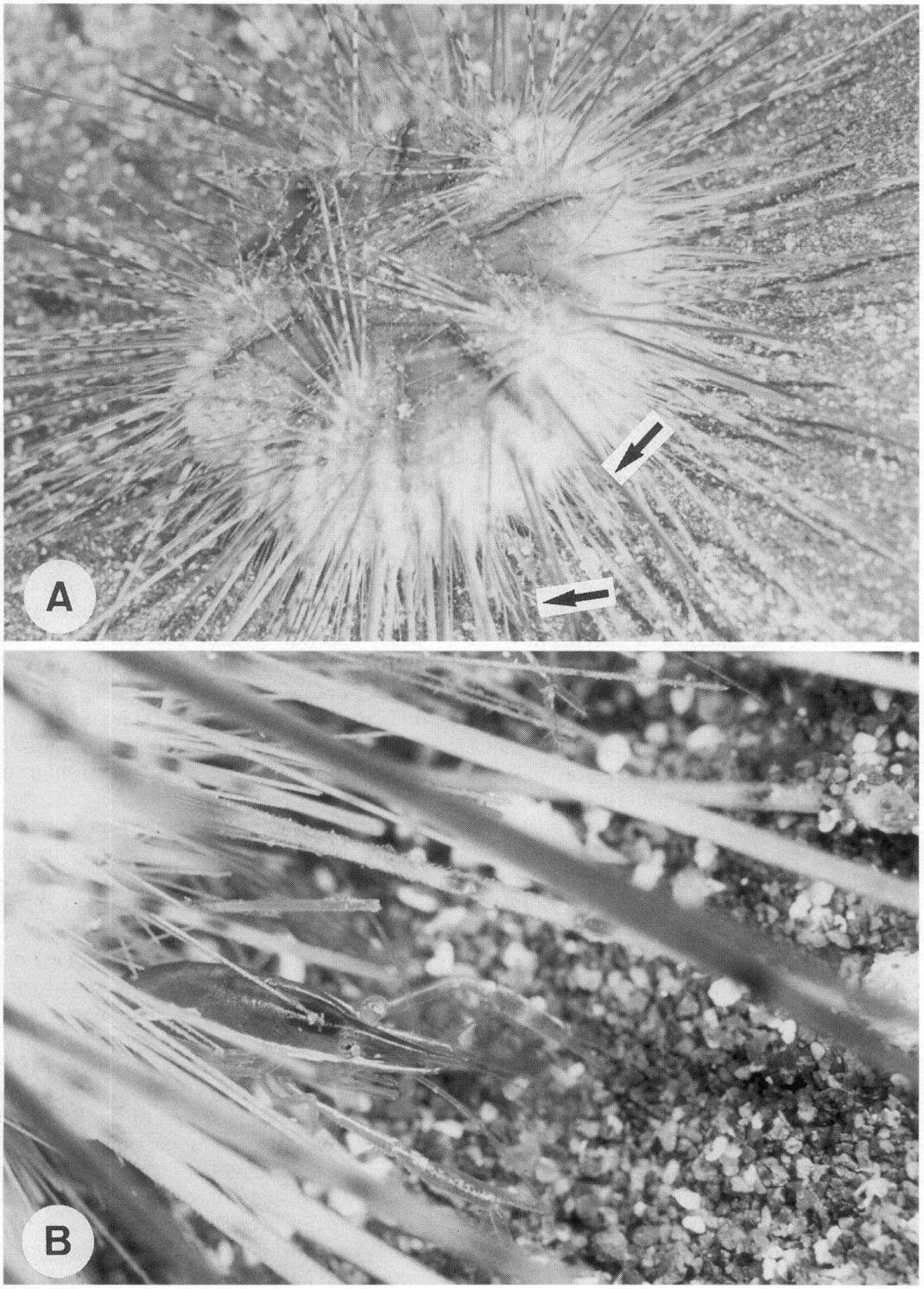

Fig. 2. Association between *Periclimenes rectirostris* Bruce, 1981, and *Caetodiadema japonicum* Mortensen, 1904 in field. Ose-saki, Suruga Bay, Honshu, Japan, 10 m depth, 12 February 2000, photo by T. Yanagisawa. A, whole body of the host animal (CMNH-ZE 00349, arrows indicate *P. rectirostris*); B, close up of *P. rectirostris* (one of the six specimens of CMNH-ZC 00317 and ZC 00318).

rostris in the following major diagnostic features: 1) the general body form is slender, and the integment is not covered with pubescence; 2) the rostrum is almost straight, and overreaches the tip of the scaphocerite (Fig. 1 A); 3) the mesiolateral cutting borders of the first pereiopodal fingers are minutely denticulate (Fig. 1B); 4) the propodi of the third to fifth pereiopods bear two rows of tufts of very long setae ventrolaterally (Fig. 1C), and two rows of small spines on ventral surface (Fig. 1D). In addition, the coloration of our specimens (Fig. 2B) is very similar to that of the subsequently reported specimens from the Chesterfield Islands (Bruce, 1991). However, initial comparison with the previous descriptions of *P. rectirostris* (cf. Bruce, 1985, 1991, 1996) suggested that the present specimens differed from the known specimens in the shorter rostrum (0.83–0.93 times as long as the carapace versus 1.06–1.25 times as long) and the fewer ventral teeth on the rostrum (1–2 versus 2–5). For comparative purpose, we have reexamined 2 specimens (1 male and 1 female) from the Chesterfield Islands reported by Bruce (1991). Despite careful comparison, we could not find any significant morphological difference except for the rostral length between the Japanese specimens and those from the Chesterfield Islands. Although the number of the ventral rostral teeth in the Japanese specimens is apparently less than in the known specimens, it partly overlaps each other, and could be included within a range of individual variations. Therefore, we identify the Japanese specimens with *P. rectirostris* with little hesitation. The differences in the rostral length and the number of the ventral rostral teeth are attributed to intraspecific variation.

Minemizu (2000) recorded an unidentified sea urchin associate as *Periclimenes* sp. 6 from the same locality, where our specimens were collected, with beautiful color photographs. On account of the live coloration and habitat, there is little doubt that Minemizu's photographed individuals are referred to *P. rectirostris*.

Bruce (1981) suggested that *P. rectirostris* might be associated with the diadematid echinoid, *Eremopyga denudata*, because numerous sea urchins were collected together with specimens of *P. rectirostris* by dredge. Both *Chaetodiadema japonicum* and *E. denudata* are deep-water diadematid species (see Shigei, 1986), therefore, our record supports Bruce's suggestion.

According to Shigei (1986), *C. japonicum* usually occurs at the depths from 50 to 135 m. The present sea urchin specimen was collected from a remarkably shallow area. One of us (TY) made SCUBA diving at Ose-saki over 200 times in 1999, but did not find *P. rectirostris* associated with other shallow water diadematids. This suggests that the host specificity of *P. rectirostris* is rather limited. From the shallow area at Ose-saki, Okuno and Minemizu (1998) also recorded the association between *Periclimenes hertwigi* Balss, 1913, and *Araeosoma owstoni* Mortensen, 1904, another case of the deep water pontoniinid shrimp associated with the deep water sea urchin. A geographical feature of the locality may affect the occurrence of these two associations in the shallow area. These collection sites at Ose-saki are the beginning of the continental slope, and, only 1.0 km horizontal distance, reaches the level of 100 m depth at the continental margin (Sato, 1985). The steep slope with rather narrow distance may enable sea urchin to migrate easily in wide vertical range.

Six pontoniinid shrimps are known as associates of diadematid sea urchins in the Indo-Pacific (Bruce, 1982); *Periclimenes cristimanus* Bruce, 1965, *P. hirsutus* Bruce, 1971, *P. zanzibaricus* Bruce, 1969, *Stegopontonia commensalis* Nobili, 1906, *Turearіocaris holthuisi* Hipeau-Jacquotte, 1965, and *T. zanzibarica* Bruce, 1967. Field observation by one of us (TY) and the photographs given by Minemizu (2000) show that individuals of *P. rectirostris* are always directed externally while clinging to the spines of the host, and the symmetrical second pereiopods of the species are also directed outwards, holding parallel to the spines (see Fig. 2B). This may be noteworthy because the well-known diadematid sea urchin associates, *Stegopontonia commensalis* and *Turearіocaris zanzibarica*, always cling to the spines directed inwards (Kamesaki *et al.*, 1988; Maihara and Suzuki, 1993).

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タンザクカクレエビ（新称；甲殻綱，十脚目，テナガエビ科）の宿主の新記録と分布の北限

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Periclimenes rectirostris Bruce, 1981（新称：タンザクカクレエビ）はフィリピンと南西太平洋の Chesterfield Islands から知られていたテナガエビ科カクレエビ亜科のエビである．フィリピン産のタイプ標本が深海性のガンガゼ類と共にドレッヂによって採集されていたため，本種はウニ類と共生する種であることが示唆されていた．しかし，明確に宿主の特定はなされていなかった．最近，駿河湾の水深 10 m から宿主とともに採集された本種の標本を調べた結果，本種がウニ綱ガンガゼ目のヒラタガゼ *Chaetodiadema japonicum* Mortensen, 1904 と共生していることが確認されたため，報告する．同時に，本報告は *P. rectirostris* の日本初記録であり，分布の北限を駿河湾まで大幅に更新した．