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Decapod Crustaceans of Dokdo Island, Korea

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Thirteen decapod crustaceans of Dokdo Island were identified and classified based on samples collected around Dokdo Island from May 1999 to November 2004. Of the 13 species, 7 were unrecorded from Dokdo Island: *Axiopsis princeps, Pagurus angustus, Pagurus japonicus, Pagurus nigrivittatus, Pagurus spina, Portunus trituberculatus,* and *Hemigrapsus penicillatus.* Of these 7 species, *Pagurus nigrivittatus* and *Pagurus spina* were new to the Korean decapod fauna. However, *P. spina* was only reported as the type series from the Pacific coast of northern Japan. Its geographic range now extends to the East Sea. To date, 25 decapod crustaceans (1 caridean, 1 thalassinidean, 11 anomurans, and 12 brachyurans) have been reported from Dokdo Island.

Key words: Crustacea, Decapoda, Dokdo Island, East Sea, New records

Introduction

To date, 18 marine decapods (1 caridean, 7 anomurans, and 10 brachyurans) have been reported from the rocky shores of Dokdo Island (Kim, 1960, 1963, 1973, 1978; Kim and Choe, 1981; Hong, 1982; Kim et al., 1996; Oh, 1999, unpublished report; KORDI, 2000). Recently, the National Fisheries Research and Development Institute (NFRDI) conducted a number of expeditions to investigate the fisheries resources around Dokdo Island. During tidal and subtidal sampling in 1999-2004, 13 decapod species were collected. Of these, seven were unrecorded from Dokdo Island, including two that were new to the Korean fauna. A total of 25 decapods (1 caridean, 1 thalassinidean, 11 anomurans, and 12 brachyurans) have been reported from Dokdo Island to date.

Here, we provide morphological descriptions for the 2 decapod species new to the Korean fauna, and describe the geographical distributions of the 13 decapod species.

Materials and Methods

The specimens were sampled from eight sites around Dokdo Island (37°14′18″N, 131°52′33″E; Fig. 1) between 13 May 1999 and 2 November 2004. Samples were taken by SCUBA diving from the subtidal area to approximately 20 m in depth, and with a gill net below 20 m in depth. Some specimens were caught by hand on rocks and boulders on the shore. For anomurans, shield length (sl) was measured from the tip of the rostrum to the midpoint of the posterior margin of the shield. For brachyurans, carapace length (cl) was measured from the midpoint of the frontal margin to the midpoint of the posterior margin of the carapace, and carapace width (cw) was the widest position on the carapace. For *Portunus trituberculatus*, cw was measured at the widest position on the carapace, excluding epibranchial spines. Specimens examined in this study were deposited in the Laboratory of Invertebrate Zoology, Department of Marine Biology, Pukyong National University (PUIZ), Korea.

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Systematic Accounts

Order Decapoda
Infraorder Thalassinidea
Family Axiidae
Axiopsis princeps (Boas, 1880)
(Fig. 3A)

Material examined

One female (cl 28.5 mm), rocky and bouldery shore, by gill net at 10-15 m depths, 23 February

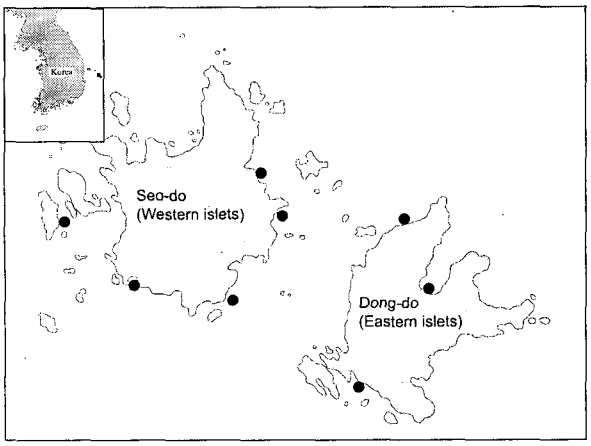

Fig. 1. Location of the eight sampling sites around Dokdo Island, Korea.

2002, PUIZ 202.

Distribution

Korea (southern coast of East Sea) and Japan (Hokkaido to Sagami Bay).

Infraorder Anomura
Family Paguridae
Pagurus angustus (Stimpson, 1858)
(Fig. 3B)

Material examined

One female (sl 8.5 mm), rocky and bouldery shore, by SCUBA diving at 5 m depth, 30 November 2004, PUIZ 164.

Distribution

Korea (Jeju Island and Dokdo Island) and Japan (Kikaiga-shima, Okinawa).

Pagurus japonicus (Stimpson, 1858)
(Fig. 3C)

Material examined

One female (sl 8.9 mm), rocky and bouldery shore, by SCUBA diving at 10-m depth, 30 November 2004, PUIZ 165.

Distribution

Korea (East Sea, Strait of Korea, southern coast of Korea, Jeju Island, and southern coast of Yellow Sea) and Japan (western coast of Aomori-ken and Tokyo Bay, southward to southern Kyushu in both the Pacific and East Sea).

Pagurus nigrivittatus Komai, 2003
(Fig. 3D)

(New Korean name: *Keumeun-Julmuni-Chamjipge*)
Restricted synonymy; full synonymy by Komai (2003b)

Pagurus pilosipes - Miyake and Imafuku, 1980: 60, pl. 2 - fig. 5; Miyake, 1982: 132, pl. 44 - fig. 5; Takeda, 1986: 126, unnumbered fig.; Miyake, 1991: 132, pl. 44 - fig. 5; Minemizu, 2000: 148, unnumbered fig.

Pagurus dubius - Matsukubo, 1999: 170, unnumbered fig., 284.

Pagurus nigrivittatus Komai, 2003b: 141, tables 157, 162, fig. 16-19, 24D, 25B.

Material examined

One female (sl 3.0 mm), rocky and bouldery shore, by SCUBA diving at 10-m depth, 2 November 2004, PUIZ 166.

Description

Rostrum is triangular, overreaching lateral projections of the shield. Ocular peduncles are moderately slender, shorter than the antennal peduncle. Chelipeds and ambulatory legs with moderately long setae. Right cheliped is larger than the left; dactylus with rows of small spines on the dorsal surface; palm with six to eight irregular rows of spines on the dorsal surface; carpus with one to two rows of small spines on dorsomesial margin. Left cheliped; palm with two irregular rows of small spines on the dorsal surface and dorsolateral margin with small spines or tubercles; carpus with a row of large spines on the dorsolateral and dorsomesial margins. The second and third pereopods are slender; dactyli with five to seven short corneous spines on the ventral margins; propodi with three to four short corneous spines on the ventral surface. Telson with four to five large spines and a few small spinules on the posterior lobes.

Remarks

Recently, Komai (2003b) reviewed the taxonomic status of *Pagurus pilosipes* (Stimpson, 1858) and its related species: *P. insulae* Asakura, 1991, *P. nigrivittatus*, and *P. erythrogrammus* Komai, 2003b. The present specimens agree well with Komai's (2003b) original description of *P. nigrivittatus* in having four or five large spines on the terminal margin of the telson and three dark brown stripes on the ambulatory legs.

Distribution

Korea (Dokdo Island), Japan (Pacific coast of Japan and Mikuni, Fukui Prefecture, East Sea), and northeast of Taiwan.

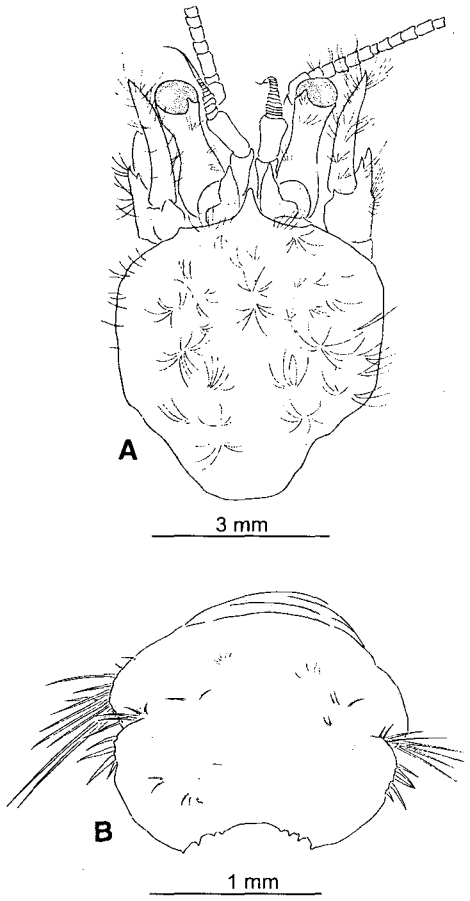

Fig. 2. *Pagurus spina* Komai, 1994 (sl 5.9 mm, PUIZ 169), Korea. A) shield and cephalic appendages, dorsal; B) telson, dorsal.

Pagurus pilosipes (Stimpson, 1858)
Restricted synonymy; full synonymy by Komai (2003b)

Eupagurus pilosipes Stimpson, 1858: 249 (87).
Pagurus pilosipes - Oh, 1983: 101 (key), 106, pl. 1, fig. 3, 4, pl. 2; Komai, 2003b: 117, fig. 1-5, 24-25, table 1.

Material examined

One ovig. female (sl 2.1 mm), rocky and bouldery shore, by SCUBA diving at 10 m depth, 13 May 1999, PUIZ 167.

Remarks

In Korea, this species was first recorded in Mara Islet, Jeju Island (Oh, 1983). Komai (2003b), who reviewed the taxonomic status of *P. pilosipes* and related species, reported that Oh's (1983) specimens represented *P. nigrivittatus* by having the following characteristics: the second pereopod had six or seven ventral spines on the dactylus and only three ventral spines on the propodus; the color pattern of his specimen as illustrated (Oh, 1983, pl. 3, figs. 3, 4) was similar to that of *P. nigrivittatus*. However, these characteristics of the second pereopod are common in both *P. pilosipes* and *P. nigrivittatus*. Furthermore, Oh (1983) reported that his specimens had three or four red stripes on the ambulatory legs. This color pattern is consistent with *P. pilosipes*, not *P. nigrivittatus*. Therefore, Oh's (1983) specimen seems to be *P. pilosipes*.

Distribution

Korea (Mara Inlet, Jeju Island, and Dokdo Island) and Japan (Okinawa Island and Ryukyu Islands).

Pagurus rubrior Komai, 2003
(Fig. 3E)
(New Korean name: *Bulgeun-Eoruk-Chamjipge*)
Restricted synonymy; full synonymy by Komai (2003a)

Eupagurus japonicus - Ortmann, 1892: 309, pl, 12, fig. 16.
Pagurus similis - Kim, 1973: pl. 7, fig. 39; Park and Choi, 2001: 139, unnumbered fig.
Pagurus rubrior Komai, 2003a: 401, 12-15, fig. 6.

Material examined

One male (sl 7.0 mm), rocky and bouldery shore, by SCUBA diving at 10 m depth, 30 November 2004, PUIZ 168.

Remarks

To date, this species has been recorded as *Pagurus similis* from Korea (Kim, 1973; Park and Choi, 2001) Komai (2003a) reviewed the taxonomic status of *P. similis* s.l., and the Korean species was synonymized with *P. rubrior*.

Distribution

Korea (East Sea, Strait of Korea, southern coast of Korea, Jeju Island, and southern coast of Yellow Sea) and Japan (Pacific coast of Japan, southward from Boso Peninsula to Kyushu; East Sea coast of southern part of mainland Honshu).

Pagurus spina Komai, 1994
(Fig. 2)
(New Korean name: *Gasi-Dari-Chamjipge*)
Pagurus spina Komai, 1994: 23 figs. 1-3.

Material examined

One ovig. female (sl 5.9 mm), rocky and bouldery

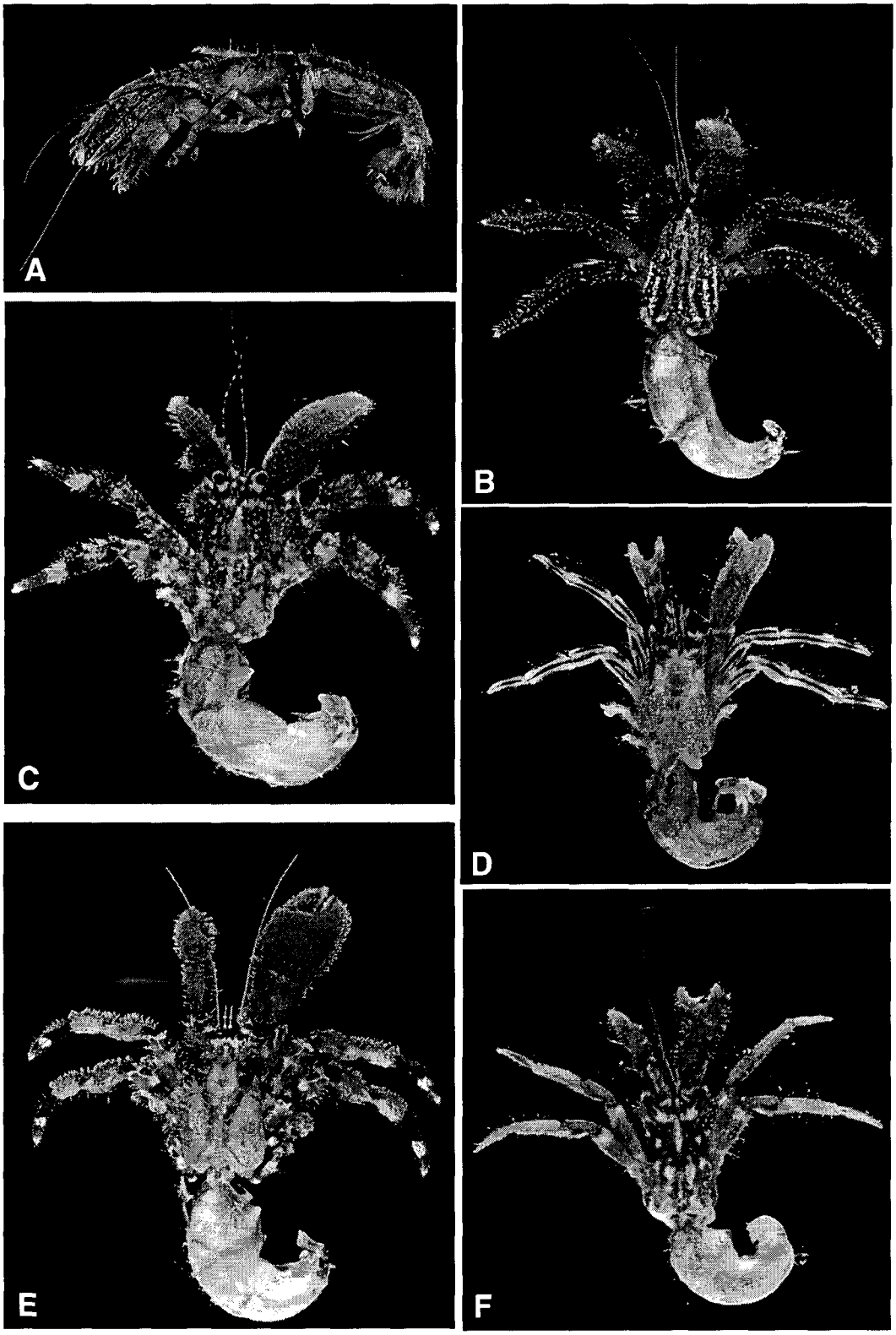

Fig. 3. A) *Axiopsis princeps* (Boas, 1880), male (cl 28.5 mm, PUIZ 202); B) *Pagurus angustus* (Stimpson, 1858) female (sl 8.5 mm, PUIZ 164); C) *Pagurus japonicus* (Stimpson, 1858), female (sl 8.9 mm, PUIZ 165); D) *Pagurus nigrivittatus* Komai, 2003, female (sl 3 mm, PUIZ 166); E) *Pagurus rubrior* Komai, 2003, male (sl 7.0 mm, PUIZ 168); F) *Parapagurodes imaii* (Yokoya, 1939), male (sl 5 mm, PUIZ 170).

shore, by SCUBA diving at 10 m depth, 13 May 1999, PUIZ 169.

Description

Rostrum is strongly produced, overreaching lateral projections of the shield. Ocular peduncles are shorter than the antennal peduncle (Fig. 2A). Chelipeds and ambulatory legs with long setae. The right cheliped is larger than the left one; palm with irregular rows of strong spines; carpus with rows of strong spines on the dorsomesial margin; ischium with a strong spine on the ventrolateral distal angle. Left cheliped; palm with a median row of spines; carpus with two rows of strong spines on the dorsolateral and dorsomesial margins; ischium with a strong spine on the ventrolateral distal angle. Telson with minute spines on posterior lobes divided by a shallow median cleft (Fig. 2B).

Remarks

Pagurus spina was described only from the type locality, the Pacific coast of northern Japan (Miyako, Iwata Prefecture; Komai, 1994). The present specimens agree well with the original description by Komai (1994) in having a spine at the ventrolateral distal corner in the ischium of a cheliped and a spinulose anterior lobe in the sternite of the third pereopod. This is the first record from Korea, as well as from the East Sea (Sea of Japan). Particularly, this finding confirms that the geographic range of *Pagurus spina* extends from the Pacific coast of northern Japan to the East Sea in the coastal water of Dokdo Island.

Distribution

Korea (Dokdo Island) and Pacific coast of northern Japan (Miyako, Iwate Prefecture).

Parapagurodes imaii (Yokoya, 1939)
(Fig. 3F)

Material examined

One female (sl 5 mm), rocky and bouldery shore, by SCUBA diving at 10-m depth, 30 November 2004, PUIZ 170.

Remarks

This taxon was recently transferred from the genus *Pagurus* to the genus *Parapagurodes* (see Komai, 1999).

Distribution

Korea (Dokdo Island) and the Pacific coast of northern Japan (Onagawa Bay, Miyagi Prefecture).

Infraorder Brachyura
Family Dromiidae
Dromia wilsoni (Fulton and Grant, 1902)

Material examined

One male (cl 23.9 mm, cw 32.5 mm), rocky shore, by gill net at 15-20 m depths, 2 November 2004, PUIZ 171.

Remarks

This taxon was recently transferred from the genus *Petalomera* to the genus *Dromia* (see McLay, 1993).

Distribution

Korea (East Sea), Japan, Australia, New Zealand, and South Africa.

Family Portunidae
Portunus trituberculatus (Miers, 1876)

Material examined

One male (cl 44.5 mm, cw 74.5 mm), by gill net at 10-15 m depths, 2 November 2004, PUIZ 172.

Distribution

Korea (East Sea, Strait of Korea, southern coast of Korea, Jeju Island, and southern coast of Yellow Sea), Japan (Hakodate, Hokkaido to Kyushu), China, and Taiwan.

Family Xanthidae
Gaillardiellus orientalis (Odhner, 1925)

Material examined

One male (cl 10.9 mm, cw 20.0 mm), one female (cl 18.5 mm, cw 25 mm), rocky shore, by gill net at 10-15 m depths, 13 May 1999, PUIZ 173.

Distribution

Korea (East Sea and Jeju Island), Japan, and China.

Family Grapsidae
Hemigrapsus penicillatus (De Haan, 1835)

Material examined

Three males (cl 10.9-13.2 mm, cw 8.5-9.7 mm), rocky shore, by hand, 7 July 2000, PUIZ 175.

Distribution

Korea (East Sea, southern coast of Korea, and southern coast of Yellow Sea), Japan (Hokkaido to Kyushu and Okinawa), China, and Hawaii.

Pachygrapsus crassipes Randall, 1839

Material examined

Four males (cl 7.2-33.5 mm; cw 8.5-40.5 mm), two ovig. females (cl 25.9-26.1 mm, cw 30.2-33.5 mm), rocky shore, by hand, 7 July 2000, PUIZ 176.

Distribution

Korea (East Sea, southern coast of Korea, Jeju Island, and Yellow Sea), Japan, China, and Hawaii.

Acknowledgments

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References

Asakura, A. 1991. A new hermit crab (Decapoda: Paguridae) from rocky shores of the Ogasawara (Bonin) Islands. Proc. Biol. Soc. Wash., 104, 793-799.

Boas, F.E.V. 1880. Studier over Decapodernes slaegtskabsforhold. K. Danske Vidensk. Selsk. Skr., 6, 26-210.

Fulton, S.W. and F.E. Grant. 1902. Some little known Victorian decapod Crustacea with descriptions of new species, No. II. Proc. Roy. Soc. Victoria, 15, 59-68.

Haan, W., de. 1833-1850. Crustacea. De Siebold, Fauna Japonica, 1-244, 55 pls.

Hong, J.S. 1982. Underwater observation on the distribution pattern of marine benthos in the shallow waters of Dogdo islets. Special Report. Conserv. Nat. Nat. Resour., 19, 229-236.

Kim, H.S. 1960. The crabs and hermit-crabs from Ulreung Is. and Dogdo Is. J. Kor. Cult. Res. Inst. Ewha Womans Univ., 1, 341-344.

Kim, H.S. 1963. On the distribution of anomuran decapods of Korea. J. Sung Kyun Kwan Univ., 8, 287-311.

Kim, H.S. 1973. Anomura and Brachyura. Illustrated Encyclopedia of Fauna and Flora of Korea, Vol. 14. Samhwa Publishing Co. Ltd, Seoul, 1-694.

Kim, H.S. 1978. Faunistic study of Arthropods on Dokdo Island in Korea. Rep. Kor. Assoc. Conserv. Nat., 13, 13-15.

Kim, H.S. and B.L. Choe. 1981. The fauna of marine invertebrate in Ulreung Is. and Dogdo Is. Special Report. Conserv. Nat. Resour., 19, 193-200.

Kim, W., C.B. Kim and S.J. Song. 1996. Marine decapods of Ulung and Dokdo Island. Report on survey of natural environment in Korea. No. 10. The Ulung and Dokdo Island. Conserv. Nat. Resour., 10, 414-437.

Komai, T. 1994. *Pagurus spina*, a new species of hermit crab (Decapoda: Anomura: Paguridae) from Japan. Crust. Res., 23, 23-31.

Komai, T. 1999. Reexamination of the type material of *Pagurus sagamiensis* Miyake (Decapoda: Anomura: Paguridae). Nat. Hist. Res., 2, 79-92.

Komai, T. 2003a. Identities of *Pagurus japonicus* (Stimpson, 1858), *P. similis* (Ortman, 1892) and *P. barbatus* (Ortmann, 1892), with description of a new species (Crustacea, Decapoda, Anomura, Paguridae). Zoosystema, 25, 377-411.

Komai, T. 2003b. Reassessment of *Pagurus pilosipes* (Stimpson), supplemental description of *P. insulae* Asakura, and descriptions of three new species of *Pagurus* from East Asian waters (Crustacea: Decapoda: Anomura: Paguridae). Nat. Hist. Res., 7, 115-166.

KORDI (Korean Oceanography and Research Development Institute). 2000. The primary research of Dokdo Island. Ministry of Maritime Affairs and Fisheries, 1-1033.

Matsukubo, K. 1999. Seashore Creatures of Japan. Field Guide. Vol. 20. Shogaku-kan, Tokyo, pp. 300.

McLay, C.L. 1993. Crustacea Decapoda: The sponge crabs (Dromiidae) of New Caledonia and the Philippines with a review of the genera. In: Resultats des Campagnes MUSORSTOM, 10, Crosnier, A. ed. Mem. Mus. Natn. Hist. Nat., 156, 111-251.

Miers, E.J. 1876. Description of some new species of Crustacea, chiefly from New Zealand. Ann. Mag. Nat. Hist., 17, 218-229.

Minemizu, R. 2000. Marine Decapod and Stomatopod Crustaceans Mainly from Japan. Bun-ichi Sogo Publishing Co., Tokyo, 1-344.

Miyake, S. 1982. Japanese Crustacean Decapods and Stomatopods in color, Vol. 1. Hoikusha, Osaka, 1-261.

Miyake, S. 1991. Japanese Crustacean Decapods and Stomatopods in Color, Vol. 1: Macrura, Anomura and Stomatopoda. Second printing. Hoikusha, Osaka, 1-261.

Miyake, S. and M. Imafuku. 1980. Hermit crabs from Kii Peninsula II. Nankiseibutu, Nanki Biol. Soc., 22, 59-64.

Odner, T. 1925. Monographiete Gattungen der Krabbenfamilie Xanthidae. I-Göteborgs Kungl. Vet.-och Vitterh. Samh. Handle, 4. följd, 29, 1-92.

Oh, S.C. 1983. Taxonomical studies on the hermit crabs (Decapoda, Anomura) from Mara Islet, Cheju Island. J. Sci. Educ. Cent., Cheju Teachers Coll., 7, 97-124.

Oh, S.C. 1999. The study on hermit crabs of Tokdo Island (2). Unpublished (http://my.netian.com/~osach/)

Ortmann, A. 1892. Die Decapoden-Krebse des Strassburger Museum, Teil 5, Hippidea, Dromiidae und Oxystomata. Zool. Jahrb., Syst. Bd., 6, 532-588.

Park, H.S. and S.S. Choi. 2001. Guide Book to Marine Life

of Korea. Poondgeung Publishing Co., Seoul, 1-290.

Randall, J.W. 1839. Catalogue of the Crustacea brought by Thomas Nuttall and J.K.Townsend, from the west coast of North America and the Sandwich Islands. Acad. Nat'l. Sci. Philadelphia, J. 8, 106-147.

Stimpson, W. 1858. Prodromus descriptionis animalium evertebratorumm quae in expeditione ad oceanum Pacifium septentrionalem, a Republica Federata missa, Cadwaldaro Ringgold et Johanne Rodgers ducibus, obervavit et descripsit. VII. Proc. Acad. Nat'l. Sci. Philadelphia, 1858, 225-252.

Takeda, M. 1986. Anomura. In: Marine Invertebrates. Masuda H., K. Hayashi, K. Nakamura and Y. Kobayashi, eds., Tokai University Press, Tokyo, 104-209.

Yokoya, Y. 1939. Macrura and Anomura of decapod Crustacea found in neighborhood of Onagawa, Miyagi-ken. Sci. Rep. Tohoku Imp. Univ., 4, 261-289.

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