



NEW REPORT OF THE HERMIT CRABS *DARDANUS LAGOPODES* (FORSKAL, 1775), *PAGURISTES MIYAKEI* FOREST & MCLAUGHLIN, 1998 AND *ONCOPAGURUS MONSTROSUS* (ALCOCK, 1894) (CRUSTACEA: DECAPODA: ANOMURA) FROM THE INDIAN COAST

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INTRODUCTION

Anomuran crabs are best described by having an assortment of adult body shapes from lobster-like to crab-like; markedly reduced fifth pereopods, the articulated or missing eighth thoracic sternite and the cephalothorax that is not fused to the epistome as it is in brachyurans (McLaughlin *et al.*, 2010). Anomura is represented by six superfamilies; Aegloidea, Hippoidea, Lithoidea, Lomisoidea, Paguroidea and Galatheaidea. Superfamily Paguroidea includes hermit crabs and their relatives in the families: Coenobitidae, Diogenidae, Paguridae, Parapaguridae, Pylochelidae and Pylojacquesidae. Hermit crabs of the Family Diogenidae commonly called 'Left-handed hermits' are among the most diverse group represented by about 20 genera (McLaughlin *et al.*, 2010). They have antennules with upper rami of flagellum terminating in tapered filaments and chelipeds equal, sub-equal or unequal with left frequently largest (McLaughlin *et al.*, 2007). Among Diogenidae, genus *Dardanus* has the largest and most widely distributed species of the marine hermit crabs in tropical waters, with rostrum broadly rounded, ocular acicles subtriangular or subquadrate and telson armed with spines or spinules. Dactyls and fixed finger of chelae corneous tipped and opening obliquely (McLaughlin *et al.*, 2007). Genus *Paguristes* is with

nonchelate 4th pereopods, unpaired pleopods 3-5 on left side of abdomen (McLaughlin, 2002). Family Parapaguridae is usually deep water hermit crabs. Members of the Genus *Oncopagurus* is with ocular acicles terminating in a single spine, ventral surface of palm of right cheliped without prominently elevated tuberculate or spinose area medially, carpus of left cheliped with only dorsodistal spine, merus of right third pereopod without several spines on dorsal surface (McLaughlin *et al.*, 2007). This paper records the occurrence of three species of hermit crabs *Dardanus lagopodes*, *Paguristes miyakei* and *Oncopagurus monstrosus*, for the first time from India.

SYSTEMATIC ACCOUNT

Phylum ARTHROPODA
Subphylum CRUSTACEA
Class MALACOSTRACA
Order DECAPODA
Family DIOGENIDAE

1. *Dardanus lagopodes* (Forsk, 1775)

(Fig 1A- 1E)

1775. *Cancer lagopodes* Forskal, Descriptiones Animalium, Avium, Amphibiorum, Piscium, Insectorum, Vermium, p. 93.

1824. *Pagurus sanguinolentus* Quoy & Gaimard, Voyage autour du monde, entrepris par ordre du roi, sous le ministère et conformément aux instructions

- de S. Exc. M. le Viconote du Bouchage, secrétaire d'état au département de la marine, exécuté sur corvettes de S.M. l'Uranie et la Physicieene, pendant le 3, p. 532, pl. 79, fig. 2.
1836. *Pagurus affinis* H. Milne Edwards, Annales des Sciences Naturelle Zoologie, Paris. 2, p. 274.
1852. *Pagurus euopsis* Dana, United States Exploring Expedition, during the years 1838, 1839, 1840, 1841, 1842, under the command of Charles Wilkes, U.S.N. 13, p. 452.
1861. *Pagurus depressus* Heller, Teil. Sitzungs-Berichte der Mathematisch-Physikisch Klasse der Kaiserlichen Akademie der Wissenschafte, Wien., 44, p. 248.
1875. *Dardanus hellrii* Paul'son., Izsledovaniya rakoobraznykh krasnago morya s zametkami otnositel'no rakoobraznykh drugikh morei. Chast' 1. Podophthalmata i Edriophthalmata (Cumacea), S.V. Kul'zhenko, Kiev., p. 90, pl. 12, figs. 4, 4a-c.
1923. *Dardanus euopsis* Maki & Tsuchiya, Monograph of the decapod crustaceans from Formosa, Dept. Agriculture Government Research Institute, Formosa. 3, p. 98, pl. 8, fig. 4.
1956. *Dardanus sanguinolentus* Forest, Bulletin du Muséum national d'Histoire naturelle, 2(25), p. 49
1969. *Dardanus lagopodes* - Lewinsohn, Zoologische Verhandelingen, 104, p. 32, pl. 2, figs. 1, 2.

Materials examined: one specimen, female (total length 45.5 mm), collected from Vizhinjam Bay (08° 22'33" N Lat., 76°15'E long.) from a depth of about 15m. Thiruvananthapuram district, Kerala, India. The reference material is deposited at the Zoological Survey of India (ZSI/WGRC/IR/2117) and museum collections of Department of Aquatic Biology and Fisheries, University of Kerala (AR AN 9), India. The hermit was collected from the gastropod shell of *Tibia insulaechorab curta*.

Diagnosis: Carapace mottled with red and white, anterior portion with purplish-red patch. Ocular peduncles yellowish-brown with yellow band distally near corneas. Antennal and antennular peduncles light blue with antennular flagellum orange. Chelipeds mottled red, brown, maroon and white; Chelae reddish to maroon on fingers and palm, Carpi red-brown with large purplish-blue patch dorsally, meri also red-brown and white. Ambulatory legs reddish-brown to

maroon mottled with patches of pale violet; carpi reddish-brown dorsally with purplish-blue patch on segments. Setae red with cream tips (Fig 1A). Shield longer than broad with rostrum rounded and depressed carapace. Ocular peduncles long, slender, sub-cylindrical and broadened distally, overreaching both antennal and antennular peduncles. Ocular acicle subtriangular or subquadrate with 3-4 spines at distal margin. Antennular peduncle longer than antennal peduncle. Antennal acicle overreaching the proximal margin of the ultimate peduncular segment terminating in a single spine and with 3-4 spines mesially (Fig 1B). Chelipeds subequal, left not appreciably longer than right. Upper and outer surface of palm of left chelae with acute spines (Fig. 1C). Right cheliped also with tubercles on upper surface of chela. Third pereopod with dactyls and propodus of nearly equal length, dorsal and ventral margin of each with row of strong corneous-tipped spines or tubercles. Dactyls with a median longitudinal groove on the lateral face while that of propodus is weakly concave (Fig 1D). Carpi of both pereopods with a strong dorsodistal spine. Chelipeds and ambulatory legs are usually covered with long, stiff setae all over the segments. Telson asymmetrical left lobe larger, each lobe with corneous ventrally directed spines (Fig 1E).

Remarks: *Dardanus lagopodes* is widely distributed in intertidal to shallow subtidal regions of East Africa, Seychelles, Mauritius, Madagascar, Red Sea, Southern India, Thailand, Philippines, Malaysia, New Guinea, Australia, Taiwan, Japan, Samoa, French Polynesia (Gherardi & McLaughlin, 1994; McLaughlin *et al.*, 2007). The present record of this species from the southwest coast of India shows its extended distribution in Indian subcontinent.

2. *Paguristes miyakei* Forest & McLaughlin, 1998

(Fig 2A-2E)

1978. *Paguristes setosus* Miyake, The crustacean Anomura of Sagami Bay, p. 27, fig. 8.
1978. *Paguristes puniceus* Miyake, The crustacean Anomura of Sagami Bay, p. 37, fig. 13.
1998. *Paguristes miyakei* Forest & McLaughlin, *Proc. Biol. Soc. Wash.*, 111, p. 191, figs. 2, 3.

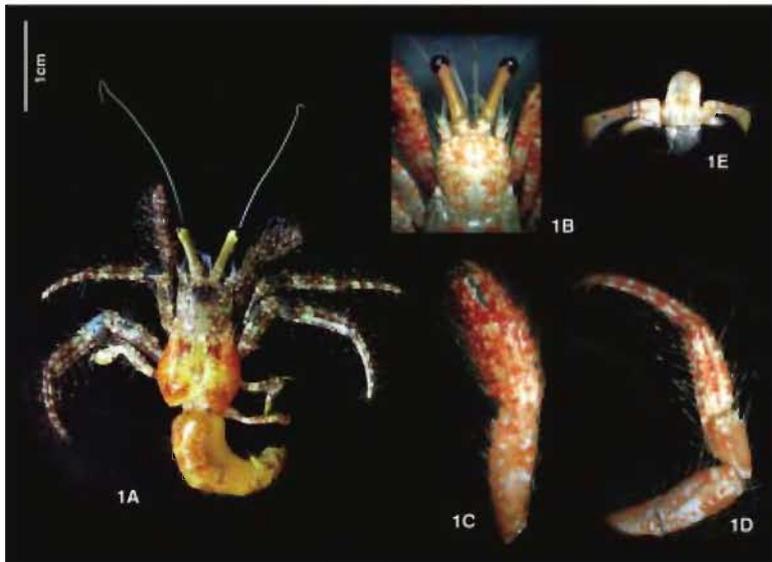


Fig. 1A. *Dardanus lagopodes* (Forsk., 1775) - Entire

Fig. 1B. Shield and cephalic appendages

Fig. 1C. Left cheliped

Fig. 1D. Left third pereopod

Fig. 1E. Telson

Fig. 2A. *Paguristes miyakei* Forest & McLaughlin, 1998 - Entire

Fig. 2B. Shield and cephalic appendages

Fig. 2C. Left cheliped

Fig. 2D. Left second pereopod

Fig. 2E. Telson

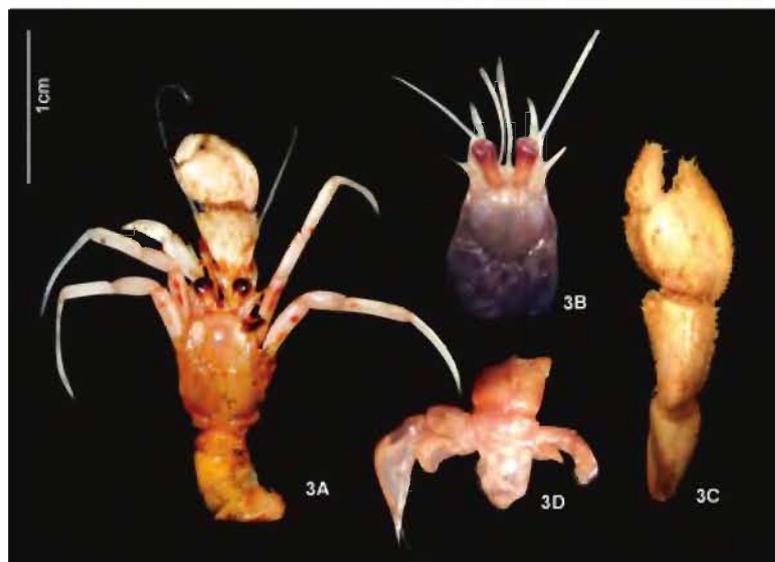


Fig. 3A. *Oncopagurus monstrosus* (Alcock, 1894) - Entire

Fig. 3B. Shield and cephalic appendages

Fig. 3C. Right cheliped

Fig. 3D. Telson

Materials Examined: Seven specimens, 4 males (total length 83-86 mm) and 3 female (total length 52-70 mm) collected from trawl by-catch at Sakthikulangara harbour (08°30' N lat.; 76° 53.3' E long.), Kollam district, Kerala, India. Two voucher specimens are deposited at the Zoological Survey of India (ZSI/WGRC/IR/2118) and museum collections of Department of Aquatic Biology and Fisheries, University of Kerala (AR AN 10, AR AN 11), India. The specimens occupied the shells of *Biplex bozetti*, *Polinices mamilla*, *Xenophora corrugata*, and *Xenophora solaris*.

Diagnosis: Carapace and basal segment of pereopods dark orange brown; the distal portion of pereopods light yellowish-brown. Antennae and antennules reddish-brown, ocular peduncles light yellowish (Fig 2A). Shield longer than broad; rostrum triangular (Fig 2B). Dorsal and anterior margins of branchiostegites with spinules. Ocular peduncles short, slender; corneas not dilated. Ocular acicles each with simple terminal spine. Corneas overreached by both antennal and antennular peduncles. Antennal peduncle slightly overreaching the distal corneal margin, antennular peduncles overreaching by half the length of ultimate segment. second segment with terminal prominent bifid spine, fourth segment with small dorsodistal spine; antennal acicle not overreaching distal margin of ultimate peduncular segment, with simple terminal spine; mesial margin with 4-6 small spines, lateral margin with 3 spines; antennal flagellum thick with several long randomly-set setae. Chelipeds subequal; left slightly larger (Fig 2C); both chelipeds with similar armature; mesial faces of dactyls each with small corneous tipped spines arranged in longitudinal rows; dorsomesial margin of palm with 3-4 large spines; dorsal surface with 4-5 rows smaller spines; dorsolateral face convex and; dorsomesial margin of carpus with 4-5 large spines, two irregular rows of smaller spines on dorsal surface separated from dorsolateral row of acute spines by unarmed longitudinal area. Second pereopods with dactyls longer than propodi; dorsal margin with row of small corneous-tipped spines proximally, mesial

faces unarmed, ventral margins each with row of 22-26 small corneous spines; dorsal margins of propodi and carpi each with 1 or 2 rows of prominent spines, irregular row of small spines on ventral margins (Fig 2D). Dactyls of third pereopod with a row of 24-26 spines on ventral face; 7-8 spines on ventral margin of propodi; carpi each with dorsodistal spine and 1 -2 proximal spinules. Telson with a row of small spines on terminal margin (Fig 2E).

Remarks: *Paguristes miyakei* is widely distributed in Japan, Taiwan, northern Western Australia, (McLaughlin *et al.*, 2007). The present record of this species from the southwest coast of India shows its extended distribution from North Pacific Ocean to Indian Ocean.

Family PARAPAGURIDAE

3. *Oncopagurus monstrosus* (Alcock, 1894) (Fig 3A- 3D)

1894. *Parapagurus monstrosus* Alcock, *Annals and Magazine of Natural History*, 6(13), p. 243.
1896. *Sympagurus monstrosus* Henderson, *J. Asiatic Soc. Bengal*, 65, p. 533.
1905. *Sympagurus arcuatus* var. *monstrosus* Alcock, Anomura. Fasc. I. Pagurides. Catalogue of the Indian decapod Crustacea in the collections of the Indian Museum, 2, p. 104, pl. 10, fig. 5.
1933. *Eupagurus brevimanus* Yokoya, *J. College of Agriculture Tokyo Imperial University*, 12, p. 90, fig. 34.
1982. *Parapagurus monstrosus* Miyake, Japanese crustacean decapods and stomatopods in color. vol. 1. Macrura, Anomura and Stomatopoda, p. 119, pl. 40, fig. 1.
1996. *Oncopagurus monstrosus*- Lemaitre, *Rec. Aust. Mus.*, 48, p. 199, figs. 19, 20.

Materials Examined: Two specimens, male (total length 25-36 mm), collected from trawl by-catch at Sakthikulangara harbour (08°30' N lat.; 76° 53.3' E long.), Kollam district, Kerala, India. The reference materials are deposited at the Zoological Survey of India (ZSI/WGRC/IR/2119) and museum collections of Department of Aquatic Biology and Fisheries, University of Kerala (AR AN 12, AR AN 13), India. The hermits occupied the gastropod shell of *Polinices didyma*.

Description: Carapace creamish-orange. Right cheliped creamy-white with proximal portion of merus and carpus reddish-orange. Left cheliped and ambulatory legs light pink. Lateral faces of merus, carpus and propodus with one or two reddish-orange patches (Fig 3A). Shield as long as broad with weakly calcified dorsal surface; rostrum broadly rounded, with short median ridge (Fig 3B). Ocular peduncles broadened distally, reaching more than half shield length, corneas slightly dilated; ocular acicles terminating in prominent spine. Corneas overreached by both antennular and antennal peduncles, antennular peduncles longer than antennal peduncle. Antennal acicle moderately long, reaching upto or beyond the distal margin of ultimate peduncular segment, mesial margin with 8-17 spines. Epistomal spine prominently curved upward. Chelipeds unequal and somewhat iridescent with moderately dense setation; ventromesial margin of right cheliped concave bordered by upper and lower rows of spines, dorsolateral margins of palm each with row of spines, irregular rows of small spines on dorsal surface; carpus spinulose, dorsolateral margin with a row of 6-8 moderately large spine (Fig 3C). Palm of left cheliped unarmed; carpus with dorsodistal spine. Ambulatory legs similar with dactyls longer than propodi, a row of 5-15 small corneous spines on the ventromesial face, dorsal and dorsomesial faces obscured by rows of long setae; carpi each with a dorsodistal spine;

merus of third right pereopod unarmed. Telson with posterior lobes separated by moderately deep median cleft, irregular single or double row of corneous spines on terminal margin of each lobe (Fig 3D).

Remarks: *Oncopagurus monstrosus* was reported from Bay of Bengal, Gulf of Aden, Australia, Indonesia, Philippine Islands, Taiwan, and Japan. The present record of this species from the southwest coast of India shows its extended distribution in the western Indian Ocean, from the east coast of Africa to India.

SUMMARY

Present paper records the occurrence of three species of hermit crabs, *Dardanus lagopodes*, *Paguristes miyakei* and *Oncopagurus monstrosus*, for the first time from Indian coast. *D.lagopodes* was collected from Vizhinjam Bay, Thiruvananthapuram district, Kerala while *P.miyakei* and *O.monstrosus* was collected from trawl by-catch at Sakthikulangara harbour, Kollam district, Kerala.

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