



# First record of two porcellanid crabs from Gujarat state, India (Crustacea: Decapoda: Porcellanidae)

J. N Trivedi and K. D. Vachhrajani\*

Marine Biodiversity and Ecology Lab, Division of Environment and Toxicology, Department of Zoology, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara-390002, Gujarat, India.

\*Correspondence e-mail: [kauresh@gmail.com](mailto:kauresh@gmail.com)

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## Abstract

Gujarat state of India harbors longest coastline in the country which supports rich marine diversity but the marine crab fauna of the state is poorly studied. In the present study two species of Porcellanid crabs, *Petrolisthes boscii* (Audouin, 1826) and *Petrolisthes lamarckii* (Leach, 1820) were reported for the first time from Gujarat state, India. The taxonomic description of the two species is given in detail.

**Keywords:** Crustacea, Porcellanidae, *Petrolisthes boscii*, *Petrolisthes lamarckii*, Gujarat.

## Introduction

The family Porcellanidae is composed of 230 species distributed in 26 genera worldwide (Heigh, 1960). The species of the family Porcellanidae utilize a wide range of habitat ranging from freshwater to brackish and estuarine waters, marshy habitat of mangroves and crevices of rocky shores (Gore and Lawrence, 1976; Gore *et al.*, 1976). As far as porcellanid fauna of India is concerned a few studies have been carried out in different locations. A Total of 16 species of porcellanid crabs have been identified from the west coast of Indian subcontinent which includes two species, *Polyonyx hendersoni* and *Polyonyx splendidus* which are endemic to the eastern Arabian sea (Sankolli, 1963; Tirmizi *et al.*, 1989).

Gujarat state being the western proximity of India harbors longest coastline in the country and the coastal area are rich in both marine habitat and biodiversity. However, the studies on crustaceans are limited in this area, (Pandya and Vachhrajani, 2010; Trivedi *et al.*, 2012). As far as anomuran crab fauna of Gujarat state is concerned, it is the most neglected and least studied group and represented by only two species of hermit crabs *Clibanarius zebra* and *Clibanarius nathii* (Desai and Mansuri, 1989). No information is available regarding the porcellanid crab fauna of the state. During the study of brachyuran crab fauna of Saurashtra coast of Gujarat state, India (Trivedi and Vachhrajani, 2012); we have collected specimens of porcellanid crabs from the rocky shores of Dwarka and Dhamlej. The crab specimens were identified to the species level and detailed description is presented here.

## Material and methods

Crabs were collected from the rocky shore areas of Dwarka (22° 14' 34" N, lat 68° 57' 19" E long) and Dhamlej villages (20° 46' 29" N lat, 70° 36' 19" E long), located on the coastal region of Jamnagar and Junagadh districts of Saurashtra coast, Gujarat, India, respectively. Hand picking method was adopted for crab collection in which the rocks were turned and crabs present beneath the rocks were collected during low tide. All the specimens were preserved in 10% formalin and brought

to the laboratory. Specimens were identified to species level using different identification keys (Gore, 1982; Hiller *et al.*, 2010). Specimens of both the species were photographed and sketches were prepared for identification purpose. Different morphological measurements were recorded using calibrated instruments (Fig.1). All the specimens of both species were deposited in the Zoology Museum, Department of Zoology, The M. S. University of Baroda, Vadodara. The museum specimen codes were ZL-AR-AN-3 and ZL-AR-AN-4 for *Petrolisthes lamarckii*.

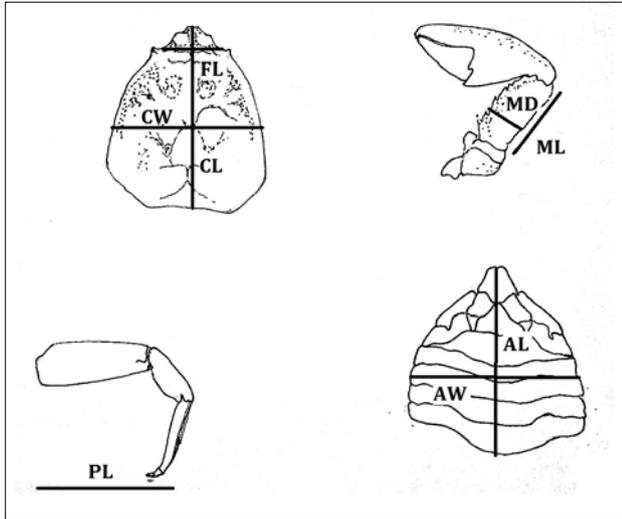


Fig. 1: Morphological measurements of *Petrolisthes* crab. (CL- Carapace length, CW- Carapace width, FL- Frontal length, ML- Merus length, MD- Merus depth, AL- Abdomen length AW- Abdomen width, PL- Periopod length)

## Results and discussion

A total of 8 specimens were collected from the field and two species of porcellanid crabs *Petrolisthes boscii* (Audouin, 1826) and *Petrolisthes lamarckii* (Leach, 1820) belonging to the family Porcellanidae were identified. The detailed description of the species is given below.

### *Petrolisthes boscii* (Audouin 1826) (Fig. 2)



Fig. 2: *Petrolisthes boscii* Audouin 1826

## Synonyms

*Porcellana boscii* Audouin 1826  
*Petrolisthes amakusensis* Miyake and Nakasone, 1943  
*Petrolisthes rugosus* Miers, 1884

## Material examined

Three males and two females were collected from Dhamlej, under rock and rock crevices, in the upper intertidal zone. Morphological measurements are given in Table 1

Table: 1 Morphological measurements of *P. boscii*

(mm)	Male (n= 2) (mm)	Female (n= 2)
Carapace length	9.2 ± 1.58	8.5 ± 1.65
Carapace width	9.1 ± 1.62	8.3 ± 1.75
Frontal length	3.1 ± 1.34	3.0 ± 1.21
Abdomen length	5.1 ± 1.46	5.3 ± 1.77
Abdomen width	7.5 ± 1.84	7.1 ± 1.44
<b>Chelipeds</b>		
Merus length	7.0 ± 1.68	6.1 ± 1.40
Merus width	4.5 ± 1.04	3.7 ± 0.53
Palm length	8.7 ± 2.10	8.2 ± 1.94
Palm depth	5.3 ± 1.34	3.8 ± 2.04
Dactylus length	5.5 ± 1.90	4.7 ± 1.05
Dactylus width	1.6 ± 0.76	1.5 ± 0.69
<b>Pereiopods</b>		
Pereiopod 1 length	12.7 ± 0.69	11.1 ± 1.37
Pereiopod 2 length	15.0 ± 1.22	13.5 ± 1.90
Pereiopod 3 length	17.4 ± 1.71	16.3 ± 1.49
Pereiopod 4 length	10.3 ± 1.34	9.6 ± 1.82

## Description

The carapace is depressed and slightly longer than broad; carapace is rounded in shape along the brachial margins; the surface of the carapace is pubescent and covered with different kinds of flattened granules and striated lines; the front is triangular in shape and apex is deflected downward and concave above; the epibrachial spine is acute; eyes are fairly large and situated in shallow orbits; supraocular spine is present (Fig. 3a).

Chelipeds are almost equal in size; the surface is covered with striated lines; long tooth is present on the distal end of the anterior margin of arm; Three spines are present on the distal margin of arm; carpus is twice as long as broad; the upper surface of the palm is furnished with squamiform granules. The fingers are short in length and no gap is observed between the fingers (Fig. 3b).

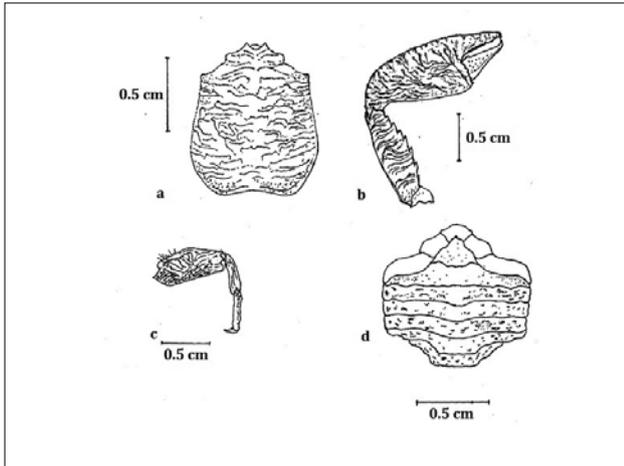


Fig. 3: a. Carapace, b. Cheliped, c. Walking appendages, d. Female abdomen

Walking legs are covered with hair; small spine is present on the merus of 1 and 2 pair of walking leg; no spine is observed on merus of rest of the pairs of walking legs; four spinules are present on the posterior margin of propodus; dactylus is provided with curved claw; three spines are present on the anterior border of the claw (Fig. 3c); seven segments are fused in abdomen (Fig. 3d).

The species is reported from Japan, Indonesia, Thailand, Australia and Red sea region. In Indian subcontinent the species is reported from Bay of Bengal, Goa (Hiller, *et al.*, 2010), Ratnagiri (Sankolli, 1966) and Karanchi (Ahmed and Mustaquim, 1974).

#### *Petrolisthes lamarckii* (Leach, 1820) (Fig. 4)

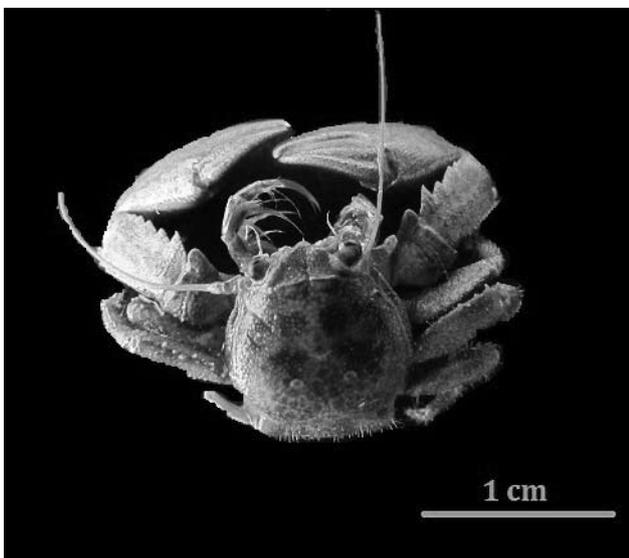


Fig. 4: *Petrolisthes lamarckii* (Leach, 1820)

#### Synonyms

*Pisidia lamarckii*: Leach 1820  
*Petrolisthes lamarckii*: Stimpson, 1858; Borradaile, 1898; Miyake, 1942;  
*Petrolisthes dentatus*: Haswell, 1982; Rathbun, 1910  
*Petrolisthes obtusifrons*: Miyake, 1937  
*Porcellana pulchripes*: White, 1847

#### Material examined

Two males and one female were collected from Dwarka, under rock and rock crevices, in the lower intertidal zone. Morphological measurements are given in Table 2.

Table: 2 Morphological measurements of *P. lamarckii*

	Male (n= 2) (mm)	Female (n=1) (mm)
Carapace length	14.6 ± 2.05	14.2
Carapace width	15.2 ± 1.70	14.3
Frontal length	5.2 ± 1.58	5.3
Abdomen length	7.7 ± 1.00	10.8
Abdomen width	13.1 ± 1.46	13.1
<b>Chelipeds</b>		
Merus length	11.2 ± 1.51	11.1
Merus depth	5.2 ± 1.68	5.4
Palm length	12.3 ± 2.72	12.6
Palm depth	8.6 ± 2.00	8.6
Dactylus length	8.2 ± 1.23	9
Dactylus width	2.6 ± 0.80	2.5
<b>Pereiopods</b>		
Pereiopod 1 length	15.6 ± 2.42	15.3
Pereiopod 2 length	17.5 ± 3.42	17.4
Pereiopod 3 length	16.4 ± 2.31	16.4
Pereiopod 4 length	9.7 ± 1.84	10.3

#### Description

Carapace is depressed, ovate and as broad as long in shape; surface of the carapace is smooth and few irregular ridges are observed on front, gastric and lateral regions; carapace regions are more or less marked; front is broad and triangular in shape and apex is rounded; distinct median furrow is observed on front; epibranchial spine is present but in some cases it may be absent; first segment of antennules is twice or more than twice as broad as long; half ventral surface is granulated; joint is observed between second and third segment of antenna; small tubercles are present on lateral margin of third segment while fourth segment is smooth; Orbits are shallow with large eyes; supraocular spine is not present (Fig. 5a).

Chelipeds are almost equal in shape, robust and surface is covered with minute rugae or granules; surface of merus is

ornamented with rugae with a long tooth on the extreme inner part; carpus is two times as long as broad, covered with lobes; anterior margin contains 3 to 7 teeth; posterior margin ornamented with three teeth; palm broad and covered with granules (Fig. 5b).

Walking legs are rugose with fringes of anterior margins covered with setae; Merus of first three pairs of walking leg

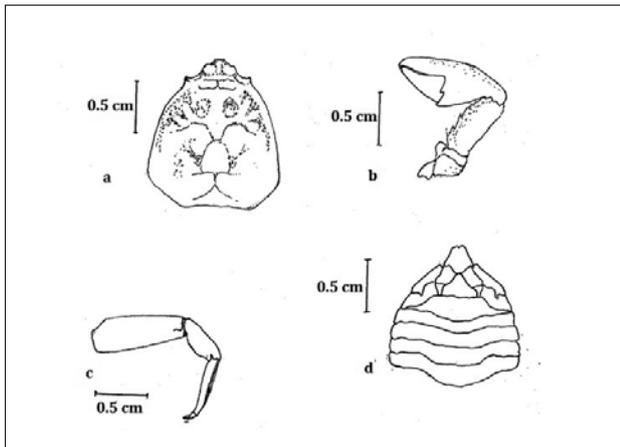


Fig. 5: a. Carapace, b. Cheliped, c. Walking appendages, d. Female abdomen

is ornamented with rows of small, oblique granular ridges; spine is present on the distal posterior margin of merus of first two legs; one spine is also present on the antero distal end of carpus of first leg; three movable spinules are present on the inner border of dactylus; propodus is provided with four spinules on the posterior margins (Fig. 5c); seven segments are fused and middle segment is moderately large in abdomen (Fig. 5d).

The species is widely distributed in Indo West Pacific region; Red Sea (Werding and Hiller, 2007) and Somalia (Lewinsohn, 1979). In Indian subcontinent the species is reported from Goa (Hiller, *et al.*, 2010), Ratnagiri (Sankolli, 1966), Andaman and Nicobar island (Das and Roy, 1989) and Pakistan (Mustaquim, 1972, Siddiqui and Kazmi, 2003).

The porcellanid fauna of west coast of Indian subcontinent contain 16 species and out of which 9 species are endemic to Indian Ocean and 2 species to eastern Arabian Sea (Hiller *et al.*, 2010). They have reported 10 species of porcellanid crab from Goa on the eastern Arabian coast. As far as porcellanid fauna of Gujarat is concerned no specific study has been done related to porcellanid crab fauna and thus present study will help to fill the lacunae of such information.

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