

## Research Article

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# First record of goneplacid crab, *Carcinoplax haswelli* (Decapoda: Brachyura: Goneplacidae) from the Indian Ocean

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## Abstract

A single male specimen of Goneplacid crab, *Carcinoplax haswelli* (Miers, 1884) is recorded for the first time from the Indian Ocean. The crab specimen was collected from the trawl bycatch landing of the commercial demersal trawler operated between 30 and 150 m depth along the Gujarat coastal region, Northwest coast of India. This *C. haswelli* is previously recorded from northern Australia and Taiwan to South China Sea. Until now, *C. haswelli* is not observed or recorded from the Indian Ocean. In the present study, detailed information regarding the taxonomic identification and previous distribution of the goneplacid crab, *C. haswelli* is described.

## Introduction

The crustaceans hold the 4<sup>th</sup> position in the case of the highly diversified animal group (Sureandiran *et al.*, 2023a). In the world, the total estimated number of crustacean species was between 50,000 and 67,000 species which includes the major groups such as shrimp, crab, lobster, etc. (Webber *et al.*, 2010). The infraorder Brachyura commonly called the true crabs is regarded as the rich group among the decapods, with 7683 species belonging to 107 families (De Grave *et al.*, 2023). The family Goneplacidae shows a wide range of variation in the distribution of the species as they are found from the shallow sub-tidal area to 1300 m in the bathypelagic zone (Castro, 2007). These goneplacid crabs consist of 36 valid genera (DecaNet, 2024). The genus *Carcinoplax* can be differentiated from its family members through transverse rectangular-shaped carapace; rounded sub-orbital border, both consist of a blunt inner tooth that is not visible from the dorsal region (Castro, 2007; Ng and Castro, 2007). Globally, the genus *Carcinoplax* comprises of 45 valid species (DecaNet, 2024). From the Indian coast, six species were reported viz., *Carcinoplax fasciata* Ng & Kumar, 2016, *C. indica* Foflein, 1904, *C. longimanus* (De Haan, 1833), *C. longipes* (Wood-Mason & Alcock, 1891), *C. specularis* Rathbun, 1914 mentioned in the monograph of Trivedi *et al.* (2018) and recently, Ng and Mitra (2019) described a new species from the Bay of Bengal *C. mistio*.

During a regular visit to the Veraval fishing harbour, Gujarat, a single male specimen of *Carcinoplax haswelli* (Miers, 1884) was collected from the trawl bycatch of the crustacean landing. The present study reports the first record of *C. haswelli* from the Indian coast. Further, detailed taxonomical notes of the species and its global distribution were deliberated.

## Materials and methods

On 22 January 2023, a single specimen of goneplacid crab, *C. haswelli* was collected from the trawl bycatch landing of Veraval fishing harbour (20°50'N and 70°28'E), Gujarat, Northwest coast of India (Figure 1). The specimen was caught through the demersal trawler targeted for the commercial group of crustaceans and the trawler was operated at an actual depth of 30–150 m. The collected specimen was identified as *C. haswelli* (Figure 2) by referring to taxonomic literatures (Castro, 2007; Ng and Mitra, 2019; Ng and Castro, 2020). The morphometric measurements of the specimen was made using the Vernier caliper with an accuracy of 0.1 mm and the photographs of the crab were captured using the Nikon D-5300 camera. The G1 and G2 images were captured using the Leica microscope. The specimen examined was preserved using 10% formalin (Figures 3 and 4) and deposited in the Museum of the College of Fisheries Science, Veraval, Gujarat, India (KU/COF/CH.1). The abbreviations CW and CL denote carapace width and carapace length, respectively.

## Results

### Systematics

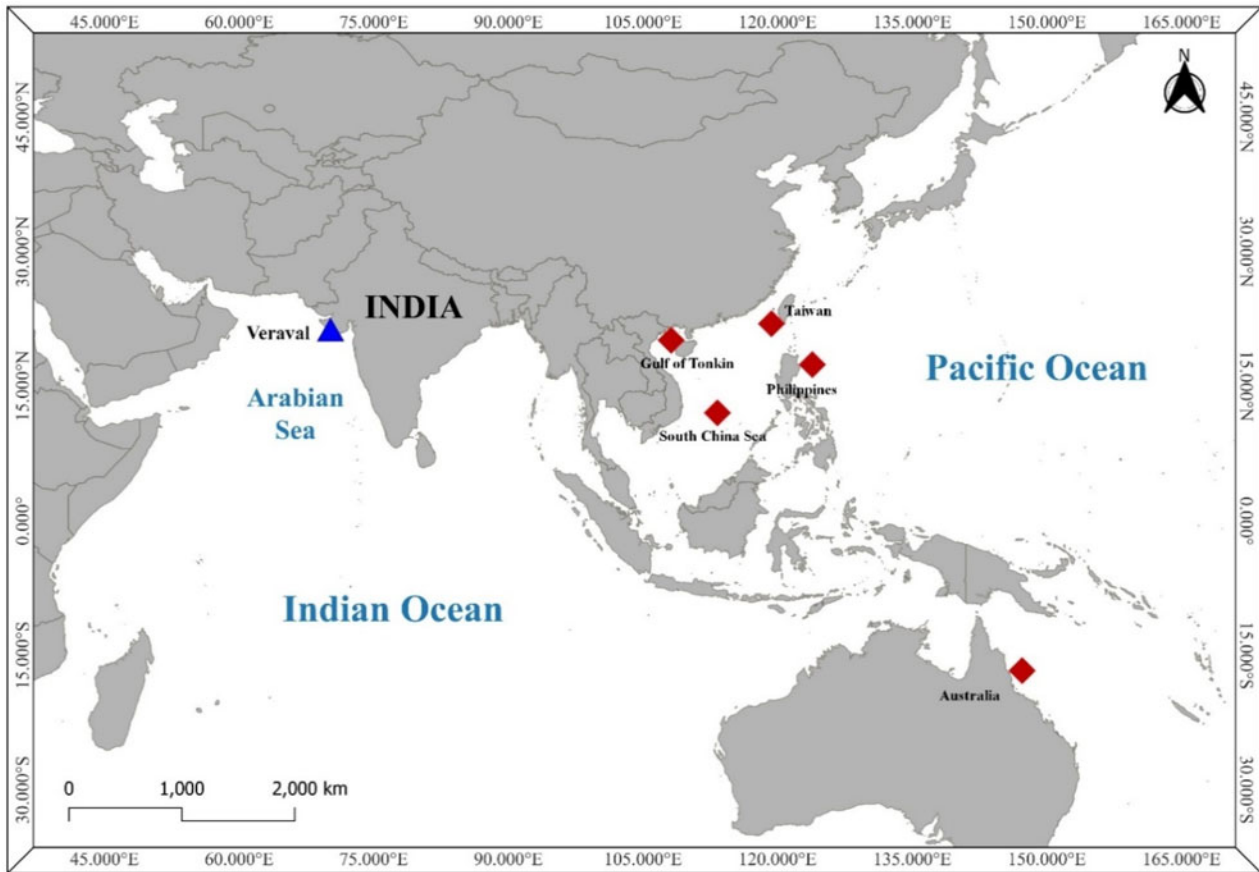
Order: Decapoda Latreille, 1802

Family: Goneplacidae MacLeay, 1838

Genus: *Carcinoplax* H. Milne Edwards, 1852

Species: *Carcinoplax haswelli* (Miers, 1884)





**Figure 1.** Map representation of the study area Veraval fishing harbour, Gujarat, Northwest coast of India, Indian Ocean (note: blue marking indicates the present study area and red marking indicates the previous report globally).



**Figure 2.** Dorsal view of Goneplacid crab, *Carcinoplax haswelli* (Miers, 1884) (fresh specimen) collected from the Veraval fishing harbour, Gujarat, Northwest coast of India, Indian Ocean.

#### Synonymy

*Pseudorhombila vestita* var. *sexdentata*: Miers, 1884: 184, 240, pl. 24.

*Pseudorhombila haswelli*: Miers, 1884: 241.

*Honoiplax haswelli*: Rathbun, 1914: 146; Tesch, 1918: 190, pl. 10, fig. 1; Serène, 1968: 91; Davie, 2002: 374; Ng *et al.*, 2008: 189; Poore *et al.*, 2008: 73; Ng *et al.*, 2022: 3, fig. 1, 4 fig. 2, 5 fig. 3, 6 fig. 4, 7 fig. 5.



**Figure 3.** Dorsal view of Goneplacid crab, *Carcinoplax haswelli* (Miers, 1884) (10% formalin preserved specimen) collected from the Veraval fishing harbour, Gujarat, Northwest coast of India, Indian Ocean.

*Carcinoplax sinica*: Chen, 1984: 190, 197, 200, fig. 2, pl. 1, figs. 6, 10; Chen, 1998: 270, 310, fig. 3; Dai *et al.*, 1986: 366, figs. 190–2 to 190–4, pl. 53, fig. 5; Guinot, 1989: 285–287, figs. 12a–d, 13a, b, 14a, b, pl. 5a–I; Dai and Yang, 1991: 395, figs. 190–2 to 190–4, pl. 53, fig. 5; Hsueh and Huang, 2002: 126, figs. 8D; Castro, 2007: 610 (list), 625, 639, 640; Ng and Mitra, 2019: figs. 4, 5, 6 E to H, fig. 7 C, D, E, F, K, L, figs. 8K, M, N, C, figs. 9 E, F, C; Ng and Castro, 2020: 281. *Carcinoplax haswelli*: Ng *et al.*, 2022: figs. 1–5.

#### Material examined

1 Male (KU/COF/CH.1); CW, 35 mm; CL, 24 mm; coll. B. Surendiran; 22 January 2023, trawl net, 30–150 m



**Figure 4.** Ventral view of Goneplacid crab, *Carcinoplax haswelli* (Miers, 1884) (10% formalin preserved specimen) collected from the Veraval fishing harbour, Gujarat, Northwest coast of India, Indian Ocean.

depth, Veraval fishing harbour, Gujarat, Northwest coast of India (20°50'N and 70°28'E).

#### Diagnosis

Carapace diagonally hexagonal; dorsal region of carapace smooth without any markings or spots, lateral surface closely packed, granules rounded; epigastric region short but visible; post-orbital region not well defined; frontal margin plain, smooth, lamellar, shorten, bilobed consists of small median notch, supra-orbital part low, not visible simply, defined by groove, not noticeably projecting on the lateral area; 1st teeth blunt not spinous but long; 2nd teeth also blunt not spinous, long and facing little away from carapace (Figure 5). Dorsal margin of cheliped palm rounded in shape, smooth; carpus mesial margin protruding, tooth low and rounded, lateral margin of carpus consists of a little

single spine; merus elongated with low rounded tooth present on distal 1/3rd of dorsal margin (Figure 5). Pleopod 1–5 slender and long; upper region of thoracic sternum enclosed with many small, rounded, closely packed granules; male pleon triangular in shape, lateral margin moderately convex; shape of the telson triangular with unique concave lateral margins (Figure 6). In male, G1 comparatively slender; distal part widening little, laterally flattened; G2 longer than G1, distal part with flagellate-like structure (Figure 7).

#### Colour

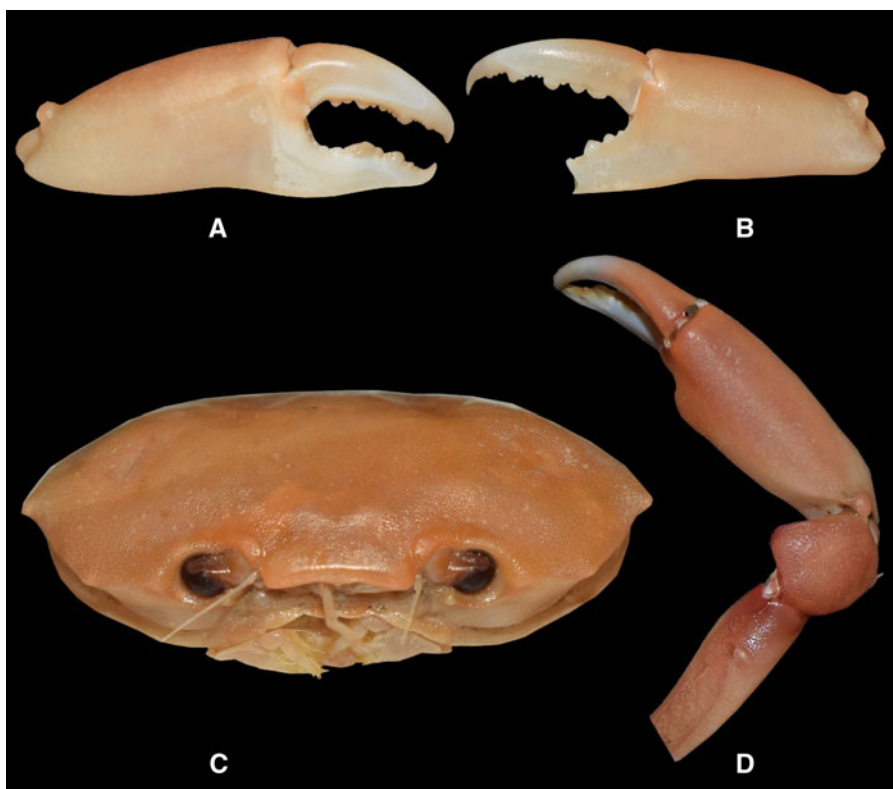
Fresh specimen – carapace bright orange, without spots; ambulatory legs tip slightly yellow to white; ventral surface white (Figure 2). Formalin preserved specimen (10%) – pale orange; ambulatory legs pale orange, tip pale yellow; ventral surface white (Figures 3 and 4).

#### Known distributions

*Carcinoplax haswelli* previously reported from Gulf of Tonkin, Northern Australia, South China Sea, Taiwan, Western Philippines (Ng *et al.*, 2022) (Figure 1).

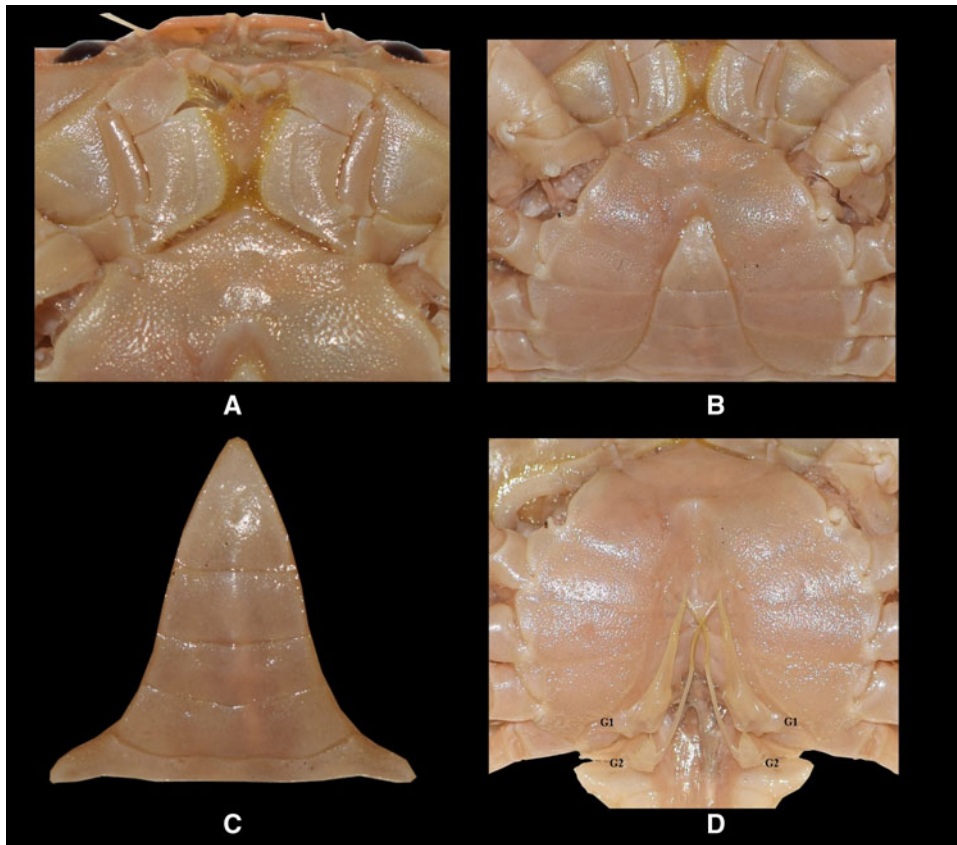
#### Remarks

Macley (1838) provided the differentiating character of the genus *Carcinoplax* from the congeners by slim and flattened upside down G1; sternal suture incomplete 6/7. Guinot (1989) mentioned that *C. sinica* shows contrasting characteristics with *C. purpurea* more accurately; they can be differentiated by the morphology of the 2nd frontal-lateral tooth which is a hook structure in *C. sinica* when compared with *C. purpurea*. Further, the reddish carapace colour pattern in *C. sinica* makes it to differ from the closest species *C. purpurea* (Guinot, 1989). Ng and Mitra (2019) recently described a new species, *Carcinoplax mistio* from the Bay of Bengal region. They stated that *C. mistio* superficially looks like *C. sinica*, particularly the transverse-shaped carapace and 2nd prominent front-lateral tooth spiniform and mildly curved; in G1 of *C. sinica* two-third of distal part is straight and the tip is round and short (Figure 7), on the other hand in *C.*

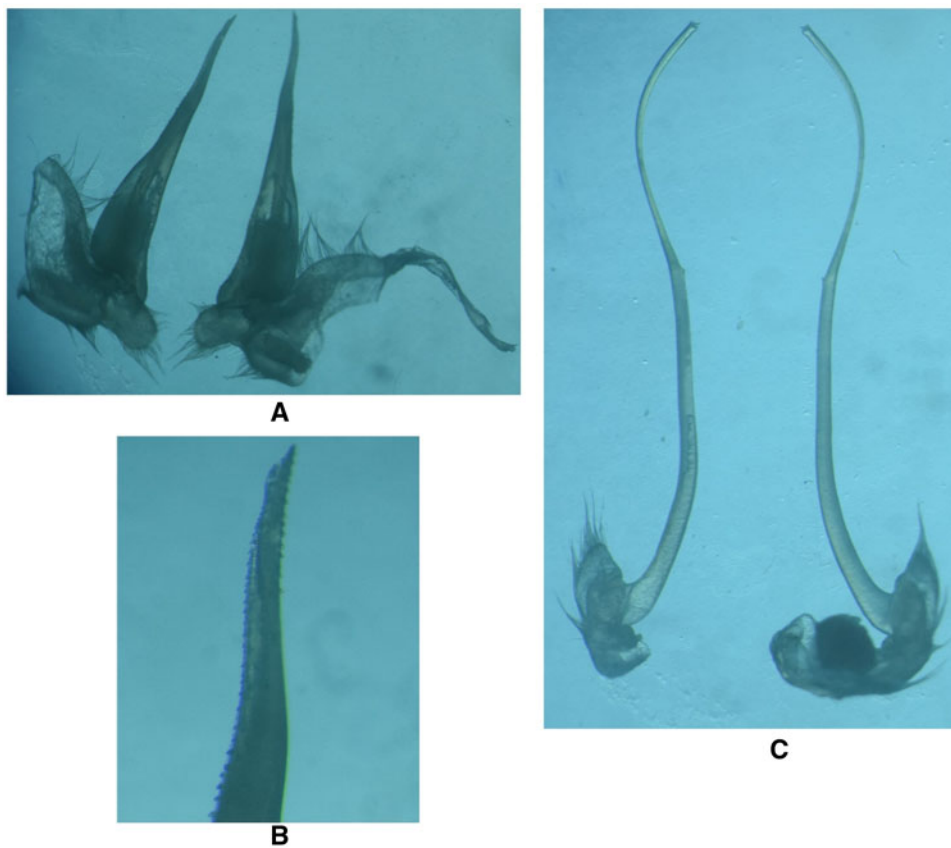


**Figure 5.** Goneplacid crab, *Carcinoplax haswelli*: (A) frontal view of right chela, (B) frontal view of left chela, (C) frontal view of cephalothorax, (D) dorsal view of right cheliped.





**Figure 6.** Goneplacid crab, *Carcinoplax haswelli*: (A) view of left and right third maxilliped, (B) view of the anterior thoracic sternum, pleonal somites, (C) view of male pleon, (D) view of male gonopods (G1 and G2).



**Figure 7.** Goneplacid crab, *Carcinoplax haswelli*: (A) microscopic view of left and right G1, (B) microscopic view of left G1 tip, (C) microscopic view of left and right G2.

*mistio* two-third of distal part is curved and the tip is elongated; this was observed from the holotype male (29.2 × 19.0 mm, ZSI Reg. No. C7123/2). Moreover, the inner angle of the male carpus tooth on the cheliped is longer in *C. sinica* and shorter in *C. mistio*. They also stated that crab specimens deposited as *C. sinica* in the Persian Gulf are *C. mistio*. As per the re-description work done by Ng *et al.* (2022) on *Homoioplax haswelli*, the genus *Homoioplax* shares all the characteristics with the genus *Carcinoplax*; hence, they considered *Homoioplax* as the junior subjective synonym. While referring to DecaNet (2024) for valid taxonomic status, it was mentioned that *H. haswelli* is regarded as the synonymised name and the accepted name was *C. haswelli* and *C. sinica* was unaccepted and regarded as junior subjective. Ng *et al.* (2022) compared the taxonomy characters of *C. haswelli* and *C. sinica* and concluded that both species were indistinguishable.

## Discussion

The species belonging to the genus *Carcinoplax* are distributed from the sub-temperate to Indo-West Pacific region (Castro, 2009). The present study specimen (KU/COF/CH.1) clearly agrees with the taxonomy characters of the lectotype male specimen (10.2 × 7.3 mm, NHM 1882.7) described from Arafura Sea, Australia (Ng *et al.*, 2022). The goneplacid crab, *C. haswelli* was listed as Not Evaluated (NE) on the IUCN Red List of Threatened Species (IUCN, 2022). Because of poor appearance and very low meat-yielding of the goneplacid crabs, they are mostly used in the preparation of animal feed rather than for human consumption. The presence of the goneplacid crabs in the fishery is not common; mostly, they are caught through deep-sea trawlers. Because of seasonal fluctuations and temperature variations, *C. haswelli* may be migrated from the Pacific Ocean to Indian Ocean (Sureandiran *et al.*, 2023b, 2023c).

## Conclusion

The occurrence of *C. haswelli* in the Indian coast may be due to the dynamic water circulation pattern between the Indian Ocean and Pacific Ocean, and other physical factors such as water current, salinity gradient, wind pattern, etc., may also lead to the distribution and range extension of this goneplacid crab. The present study observation can be considered as evidence for the presence and distribution of *C. haswelli* from the Indian Ocean.

**Data availability.** The authors confirm that the data supporting the findings of this study are available within the article.

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**Authors contributions.** B. Sureandiran: collected the crab specimen, preparation of the manuscript, software analysis and image preparation. T. H. Dave: supervision of the study. N. K. Suyani: review and editing of manuscript, photography of the crab and microscopic examination. K. Karuppasamy: taxonomic advice and conceptualisation.

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**Competing interest.** None.

**Ethical standards.** The authors declare that the work did not involve experiments with vertebrates. The work was carried out within local guidelines without causing damage to the environment.

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