Available online at: www.mbai.org.in doi: 10.6024/jmbai.2016.58.1.1909-12

First record of two goneplacid crabs off Devi estuary, Odisha coast, India (Crustacea: Decapoda: Goneplacidae)

Biswaprajna Mohanty, Dipti Raut*, Malay Kanti Dev Roy[1], Akkur V. Raman[2] Lipika Patnaik, Aswini Nayak, Sonali Sanghamitra Rout and Bhagyashree Dash

Environmental Science Laboratory, Department of Zoology, Ravenshaw University, Cuttack-753 003, Odisha, India.
[1]Formerly in Crustacea Section, Zoological Survey of India, 27 Jawaharlal Nehru Road, Kolkata-700 016, India.
[2]Marine Biology Laboratory, Andhra University, Visakhapatnam - 530 003, AP, India.

*Correspondence e-mail: raut.dipti2@gmail.com

Received: 17 Mar 2016, Accepted: 25 Jun 2016, Published: 30 Jun 2016

Short Communication

Abstract

Two species of goneplacid crabs, *Carcinoplax longimana* and *C. longipes*, are recorded for the first time from Odisha coast off Devi estuary, northeast coast of India. This finding is indicative of a range extension in the distribution of the species northwards along the east coast. Considering the lack of information on brachyuran crabs from Odisha, this communication is an attempt in contributing to a database on this ecologically significant group of benthos.

Keywords: *brachyuran crabs; Carcinoplax longimana; Carcinoplax longipes; Devi estuary*

Introduction

Checklists for zoogeographic regions ease biodiversity studies in particular habitats, and offer insights into the organization of food chains, the relative abundance of species, and number of species or total number of organisms of assorted physical sizes (May,1992). In addition to providing comparative figures for biodiversity studies, they also serve as an important tool in defining extension of protected areas, inferring potential impact of anthropogenic activity, complexity of communities, and estimating availability of living resources (Hendrickx, 1995). With growing importance of Devi estuary, Odisha on the east coast of India as the 'arribada' of Olive Ridley turtles, the need towards exploration for hitherto undocumented faunal groups of the region is essential. During one of the surveys (October, 2014) on the benthos of Devi estuary two specimens of brachyuran crabs of the genus *Carcinoplax* were observed. Genus *Carcinoplax H. Milne Edwards*, 1852 (Goneplacidae) is represented by 18 species (Castro, 2007) from the Indo-Pacific and West Pacific regions including the four species, namely, *Carcinoplax longimana*, *C. longipes*, *C. indica* and *C. verdensis* from India (Wood Mason, 1891; Alcock, 1900; Doflein, 1904; Selvaraj and Kathirvel, 1980; Dev Roy and Bhadra, 2005; Krishnamoorthy, 2005; Murugan *et al.*, 2011). There is none howsoever from Odisha coast. The main objective of this article is to provide information on the occurrence of *C. longimana* and *C. longipes* from the Devi estuary. The distinctive characters of genus *Carcinoplax* include the shape of carapace, rectangular crossways, or quadrilateral, to some extent broader than long and the front which is much narrower than the greatest breadth of carapace, weakly notched or with a longitudinal groove along

the mid line. Chelipeds are stretched out, heavy and sub equal, longer in male than female. Legs are usually slender, lean and unarmed. The abdomen has seven distinct segments.

Material and methods

The material under report was collected from the mouth off Devi estuary, the largest tributary of River Mahanadi on the east coast of India and trawl landings at Nuagarh fishing harbour (19°58′ 27.62″N, 86°20′ 20.38″E), Astarang, Odisha (Fig.1). A significant proportion of the world's Olive Ridley population migrates every winter to the Devi estuary area for 'arribada'. Hence, permission for carrying out faunistic studies in the study area was obtained from the office of the Principal CCF (Wildlife) and Chief Wildlife Warden, Odisha. During routine monitoring (October, 2014), we came across two mature male specimens of *Carcinoplax* sp. which were later identified using available literature (Alcock, 1900; Sakai, 1976; Dev Roy and Bhadra, 2005) and the marine species identification portal website (www.species-identification.org.com). The specimens were measured to the nearest 0.1 mm using Vernier callipers, preserved in 10% neutralised formaldehyde and deposited in the Environmental Science Laboratory museum (Reg. No. RZEV CB-1 for *C. longimana* and RZEV CB-2 for *C. longipes*), Department of Zoology, Ravenshaw University, Cuttack, Odisha, India.

Results and discussion

Systematic account

Genus *Carcinoplax* H. Milne Edwards, 1852

Type species: *Cancer (Curtonotus) longimanus* De Haan, 1835, subsequent designation by Glaessner 1929.

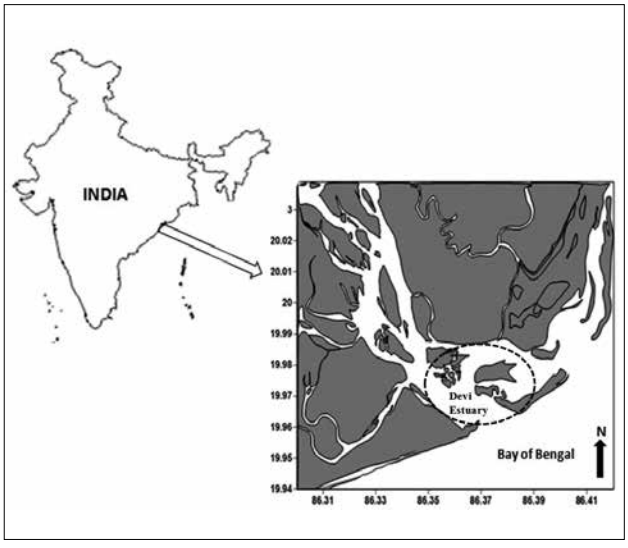

Fig. 1. Location maps showing the Devi estuary and environs Astarang, east coast of India

1. Carcinoplax longimana (De Haan, 1835) (Fig. 2a-d; Table 1)

Cancer (Curtonotus) longimanus De Haan, 1835: 50-51. Type locality : Japan.

The carapace is reddish brown in colour in fresh specimens, with perceptible granules, sub-quadrilateral in shape and almost spotless. In dimensions, it is a little longer than broad, with the anterolateral borders arched with three teeth of which the first two are obsolescent, the third sharp and dentiform. The orbits appear shallow with the front region broad and weakly jagged in the middle, its' free edges grooved longitudinally. Chelipeds differ in length, with massive sub-equal chela extremely stretched out in the specimen observed. Upper surface of the arm bears a tooth distally and one each on either corner of wrist. Fingers whitish in colour and crossing each other, pointed at the tips, their opposed margins dentate (Fig. 2d). Palm is longer in males than females with a blunt ridge traversing the inner surface of palm. Morphometric measurements of female specimen examined was given in Table 1.

C. longimana (De Haan, 1835) was found inhabiting sandy sediments at a depth of ~ 25 m with a salinity of 34 psu. The distribution of this species extends to the coasts of Dar es Salaam, South Africa, Japan, China Sea, Philippines, Thailand, Taiwan, Korea and India (Andaman Sea, Andhra Pradesh and Odisha). The previous reports of the species are from Japan (De Haan, 1835; Alcock, 1900; Balss, 1922) and South Africa (Stebbing, 1905), followed by China Sea (Gee, 1925), Dar es Salaam (Sankarankutty and Subramaniam, 1976), Philippines (Serene and Vadon, 1981), Taiwan (Ho, 1996), Korea (Ng *et al.*, 2001), Thailand (Ng and Davie, 2002) and Gulf of Martaban (Alcock, 1900). In the Indian waters, the earliest records of

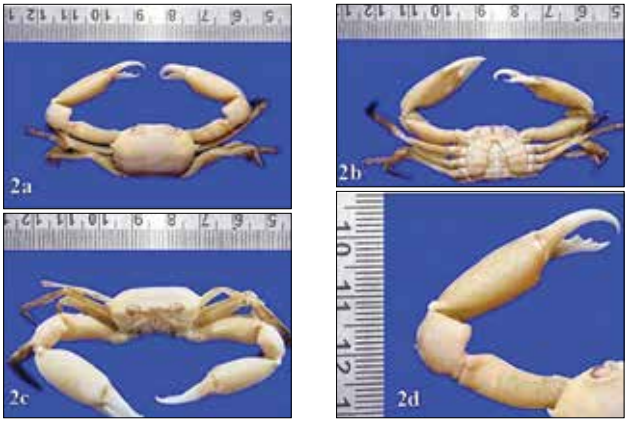

Fig. 2a-d. *Carcinoplax longimana* (De Haan, 1835) 2a: Dorsal view. 2b: Ventral view. 2c: Frontal view. 2d: Cheliped of male specimen

Table 1. Morphometric measurements of female *Carcinoplax longimana* (De Haan, 1835).

Morphometric parameters	Measurements (mm)
Carapace width	22
Carapace length	28
Frontal width	8
Abdominal width	8
Abdominal length	9
Sternum width	5
Cheliped	21
Propodus length	12
Dactyl length	15
Merus length	5

C. longimana were from the Andaman Sea (Alcock, 1900), coasts of Tamil Nadu (Krishnamoorthy, 2005) and Andhra Pradesh (Dev Roy and Bhadra 2005). Thus, the present record constitutes the first report of *C. longimana* off Devi estuary, Odisha, India.

2. *Carcinoplax longipes* (Wood-Mason in Wood-Mason and Alcock, 1891) (Fig. 3a–d, Table 2).

Nectopanope longipes Wood-Mason in Wood-Mason and Alcock, 1891: 262-263. Type locality : Andaman Sea, "Investigator" Station 56, off the west coast of Andaman between North and South Sentinel Islands, 240–220 fathoms (= 436.8–400.4 m).

The carapace is virtually rectangular with four unusually shaped, roughly squarish, circular red spots on the dorsal surface, finely granular with tiny hairs in pits. Antero-lateral margin has been cut into two teeths, behind the outer orbital angle; The first tooth appears broad while second prominent and sharp. Front is conspicuous, a little raised, weakly winding with free edges grooved longitudinally. Chelipeds sub-equal smooth, inner border of arm with two tubercles distal and spiniform. The palm is compressed with the upper border shorter than dactylus, finely granular; fingers very long, lightly coloured along the length. The carpus has a serrulated tooth at the inner angle (Fig. 3d). The ambulatory legs are long, more than twice the length of carapace, merus unarmed (Guinot and Bouchard, 1998). Morphometric measurements of one male specimen examined is given in Table 2. *C. longipes* (Wood-Mason in Wood-Mason and Alcock, 1891) was observed to inhabit in sandy mud textured sediments (depth ~20 m; salinity of 34 psu). The distribution of this species is limited to India (Andaman Sea, Kerala, Andhra Pradesh and Odisha), China and Japan.

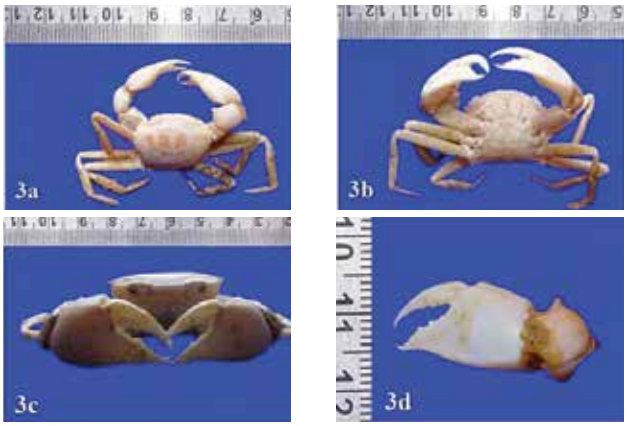

Fig. 3a-d. *Carcinoplax longipes* (Wood-Mason 1891) 3a: Dorsal view 3b: Ventral view 3c: Frontal view. 3d: Single Cheliped of male specimen

Previous records of *C. longipes* from Indian waters are Andaman Islands (Wood-Mason and Alcock, 1891) Great Nicobar (Doflein, 1904), Kerala (Alcock, 1900) and later from Andhra coast (Dev Roy and Bhadra, 2005). A stray occurrence of the species with the trash fish in the Gulf of Mannar region (Murugan *et al.*, 2011) is also on record. The present study is the first report of *C. longipes* from the waters off Devi estuary, Odisha, India.

The outcome of basic biodiversity studies to ecological understanding and to the formulation of conservation policies is decisive. In this context, considering the paucity of information on the Brachyuran diversity from the coast of Odisha, the present finding as a first report, on the incidence of *C. longimana* and *C. longipes* extending their range of distribution from the Gulf of Mannar farther northwards (about 420 km) from coast of Andhra Pradesh to Devi estuary, Odisha is vital. The present work is an attempt for creating a database on brachyuran crabs from the near pristine, unexplored regions of Devi estuary.

Table 2. Morphometric measurements of male *Carcinoplax longipes* (Wood-Mason, 1891)

Morphometric parameters	Measurements (mm)
Carapace width	22
Carapace length	25
Frontal width	6
Abdominal width	8
Abdominal length	9
Sternum width	5
Cheliped	21
Propodus length	13
Dactyl length	23

Acknowledgements

The authors gratefully acknowledge the financial support in the form of a project grant (260/OBB, dated 06th September, 2014) by Odisha Biodiversity Board, Bhubaneshwar and Laboratory facilities and logistic support provided by the Department of Zoology, Ravenshaw University, Cuttack, Odisha are appreciated.

References

Alcock, A. 1900. The Brachyura Catometopa or Grapsoidea. Materials for a carcinological fauna of India. No.6. *J. Asiat. Soc. Bengal.,* 69: 279-456. http://dx.doi.org/10.5962/bhl.title.15344

Balss, H. 1922. Die Brachyrhynchen (Cancridea), Ostasiatische Decapoden, IV. Archiv für Naturgeschichte, 88A: 94-165, 2 pls. http://biodiversitylibrary.org/page/45179231

Castro, P. 2007. A reappraisal of the family Goneplacidae MacLeay, 1838 (Crustacea, Decapoda, Brachyura) and revision of the subfamily Goneplacinae, with the description of 10 new genera and 18 new species. *Zoosystema,* 29 (4): 609-774.

De Haan, W. 1833-49. Crustacea. In: Siebold, P. F. de (Ed.). Fauna Japonica, XV1+XXX1+234 pp. Lugduni Batavorum.

Dev Roy, M. K. and S. Bhadra. 2005. Marine and Estuarine Crabs (Crustacea: Decapoda: Brachyura). State Fauna Series 5, *Fauna of Andhra Pradesh* (Part 5), Zoological Survey of India, p. 357-535.

Doflein, F. 1904. Brachyura. Wissenschaftliche Ergebnissedes Deutschen Tiefsee-Expedition auf dem Dempfer"Valdivia" 1898-1899, vol. 6. Gustav Fischer, Jena, xiv + 314 p.; Atlas: pls 1-58. http://www.BioLib.de

Gee, N. G. 1925. Tentative list of Chinese decapods Crustacea including those represented in the collections of the United States National Museum (marked with an*) with localities at which collected. *Lingnaam Agrl. Rev.,* 3:156-165. http://crust.biota.biodiv.tw/node/2156

Glaessner, M. F. 1929. Crustacea Decapoda. In: Pompeckj, J. F. (ed.) Fossilium Catalogus I: Animalia Pt. 41. Berlin: W. Junk. Pp. 1- 464.

Guinot, D. and J. M Bouchard. 1998. Evolution of the abdominal holding systems of brachyuran crabs (Crustacea, Decapoda, Brachyura). *Zoosystema.,* 20(4): 613-694, figs 1-27.

Hendrickx, M. E. 1995. Checklist of brachyuran crabs (Crustacea: Decapoda) from the eastern tropical Pacific. *Bull. K. Belg. Inst. Nat. Wet,* 65: 125-150. http://www.jpi-oceans.eu/

Ho, P. H. 1996. Crabs, in Shao K. C. (ed.), [Common Seafood of Taiwan]. Part 1. Taiwan Fisheries Department, Taipei: 71-90 (in Chinese). http://crust.biota.biodiv.tw/node/1258.

Krishnamoorthy, P. 2005. Brachyura. *Fauna of Chennai coast. Mar. Eco. Ser.,* 1: 83-109. Zoological Survey of India.

Marine Species Identification Portal developed by ETI Bioinformatics.www.species-identification.org.Com.

May, R. M. 1992. How many species inhabit the earth? *Scientific American,* 267(4): 18-24. http://www.jstor.org/stable/1702670

Milne Edwards, H. 1852. Observations sur les affinities zoologiques et la classification naturelle des Crustacés. *Annales des Sciences naturelles,* (3)18: 109–166, pls. 3, 4. [Mélanges carcinologiques: 73–104].

Murugan, A., S. Dhaniya, A. B. Sarcar, V. Naganathan, S. Rajagopal and T. Balasubramanian. 2011. Fishery biology demography of three spotted seahorse *Hippocampus trimaculatus* inhabiting Gulf of Mannar region, south east coast of India. *Indian J. Geomarine Sci.,* 40(3): 411-423. NISCAIR online periodical repository (NOPR).

Ng, P. K. L., C. H. Wang, P. H. Ho, and H. T. Shih. 2001. An annotated checklist of brachyuran crabs from Taiwan (Crustacea: Decapoda). *Natl. Taiwan Mus. Spec. Publ. Ser.,* 11: 1-86.

Ng, P. K. L. and P. J. F. Davie. 2002. A checklist of the brachyuran crabs of Phuket and Western Thailand, in Bruce N. L., Berggren M. & Bussawarit S. (eds), Biodiversity of Crustacea of the Andaman Sea, Proceedings of the International Workshop on the Biodiversity of Crustacea in the Andaman Sea, Phuket Marine Biological Center, 29 November-20 December 1998. *Phuket Mar. Biol. Center Sp. Pub.,* 23 (2): 369-384.

Sakai, T. 1976. Crabs of Japan and the Adjacent Seas. Kodansha, Tokyo, vol. 1 (English text), xxix+ 773 p., 379 figs, 3 maps; vol. 2 [Japanese text], 461 p., 2 figs; vol. 3 (plates), 16 p. + 251 pls.

Sankarankutty, C. and S. Subramaniam. 1976. Taxonomic notes on Crustacea Decapoda collected by deep sea trawling off Dar es Salaam. *Univ. Sc. J, (Dar es Salaam University),* 2 (2): 17-24.

Selvaraj, G. S. D. and M. Kathirvel. 1980. *Carcinoplax verdensis* Rathbun (Decapoda: Brachyura: Goneplacidae) – a new record from Indian waters. *J. Mar. Biol. Ass. India,* 22(1-2): 159-161.

Serène, R. and C. Vadon. 1981. Crustaces decapodes: brachyoures. Liste preliminaire, description de forms nouvelle setremarquestaxonomiques, in *Resultats des campagnes MUSORSTOM I. Philippines (18-28 mars 1976)*, volume 1. Mémoires ORSTOM (Paris) 91: 117-140.

Stebbing, T. R. R. 1905. South African Crustacea, Part III. Marine Investigations in South Africa, 4:21-123, pls 5-16.

Wood-Mason, J. and A. Alcock. 1891. Natural History Notes from H.M. Indian Marine Survey Steamer *Investigator,* Commander R.F. Hoskyn, R.N., commanding. No. 21. Note on the results of the last season's deep-sea dredging. *Ann. Mag. Nat. Hist.,* (6) 7(39): 258-272, fig. 5. http://biodiversitylibrary.org/page/19243194