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Research Article

Diversity of the Brachyuran Crab Families (Calappidae, Matutidae, Carpillidae) off Visakhapatnam and Kakinada Coast, Bay of Bengal, India

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Abstract: Andhra Pradesh coastal zone provides very potential habitat for several varieties of marine and estuarine crabs. In the present study, a total of 165 brachyuran crabs belonging to three genera and three families were recorded from Visakhapatnam and Kakinada. The Systematic taxonomic accounts for all the species with their detailed distribution were recorded. Six brachyuran crab species belonging to three families Calappidae, Matutidae, Carpillidae were recorded.
Keywords: Diversity, Visakhapatnam, Brachyuran crabs.

Introduction

India has a long coastline of about 8118 km along West Bengal, Odisha, Andhra Pradesh, Tamil Nadu and Pondicherry on the East Coast; along Gujarat, Maharashtra, Goa, Karnataka, and Kerala along the West Coast. India has an exclusive economic zone (EEZ) area of 2.02 million square km and 0.53 million square km. of continental shelf area, a prospective source for marine fisheries (Maheswarudu, 2013).

India is bestowed with a wealthy fauna of edible crustaceans some of them supporting the commercial fisheries (Suseelan, 1996). During the past 3-4 decades, utilization of edible crabs along the Indian coast has increased so also the pull due to their sustainable demand in the global markets.

Brachyuran crabs belong to order Decapoda, infraorder Brachyura, the most diverse group of crustaceans alive today (Melo, 1996). Brachyuran crabs or the true crabs are characterized by a hard exoskeleton and a reduced abdomen, which is most often referred to as its short tail, which is entirely hidden under the thorax. Hence, they got the name Brachyura, which means short-tailed. They are armed with a single pair of massive chelae, which is often used for prey capture, communication, mating, defense and offense. They vary in size from a few millimeters width as in the pea crabs to 4 meters leg span (13 feet) as in the Japanese spider crab (Lakshmi Devi, 2015).

Brachyuran crabs play a very dominant role in the marine food web. These crabs and their larvae feed on lower organisms like algae, molluscs and other crustaceans and the crab larvae are in turn preyed upon by larger predators like omnivorous fishes. Thus they play a vital role in the transfer of energy through the food chain. The Box crabs belonging to the family Calappidae are morphologically and ecologically diverse group; lives in shallow water. The large box crab *Calappa japonica* (Ortmann, 1892) is one of the most distinctive members of

the genus, with its large size, highly convex carapace and unique color pattern. *C. Japonica* was collected from trawler bycatches; reported from Visakhapatnam and Kakinada fishing harbors. The crabs reported from Japan on the basis of two males and one female from Tokyo Bay (Ortmann 1892; Komai, 1999), it was also reported from China, Taiwan, Philippines, Australia, New Caledonia and Vanuatu, as well as the Indian coast of the Bay of Bengal, Pakistan, Gulf of Oman, Red Sea and Gulf of Aden (Galil, 1997; Ng *et al.*, 2001; Ng, 2003; Spiridonov and Apel 2007; Galil and Ng 2010), *Calappa lophos* was formed unique with small surface rows of widely spaced spots on posterior surface. This species was found in almost all the major stations of the present study. The other species, *Calappa pustulosa* appear prominent, convex, sub-circular, surface minutely granulate. This species was available from trawlers by-catches of Kakinada, Machilipatnam, and Krishnapatnam.

The moon crabs belong to the family Matutidae (De Haan, 1835). Flower moon crab *Matuta planipes* inhabitant's shallow sandy beach between high and low tide marks to a depth of 10-15 meters. This species is signified by carapace rounded with 2 long, well developed lateral spines, anterolateral margins unevenly serrated. This crab was collected almost all the seasons of a year.

The spotted moon crab *Matuta victor* signifies with lots of little maroon dots all over the upper part of the body, their paddle like legs and all legs flattened are for swimming and digging. It was found to be more active at night and is rarely seen in daytime, it normally burrows just below the surface during the day.

Spotted reef crab *Carpillus maculates* (Guinot, 1968) belongs to the family Carpillidae is cream to pink ground color, with eleven large median red spots on the dorsal surface of carapace, two on the posterior region, two on anterolateral region and 4 around orbits. This species occasionally collected by traditional boats, in Visakhapatnam, Kakinada. The species distributed to the Indo Pacific region, East Coast of Africa, Red Sea. Lakshadweep Islands, Gulf of Mannar, Andaman and Nicobar islands. India.

Materials and Methods

Study area

Crab specimens were collected from the fish landing centers which is, Visakhapatnam (17°.729" N, 83°.219" E), Bheemunipatnam (17º.8390 N, 83º.6973 E) located on the northeast coast of Pradesh. It has a long coastline that stretches about 132 km and has significant economic activity yielding out of the fisherman population, and Kakinada fishing harbor (16°5877 N, 82°1691 E) is located about 6 km from Kakinada town. The fishing harbor came into operation from 1988. An average estimated landing per day being 15 tones of fishes 5 tones of prawns and 8 tones of crabs.

Specimen Preservation and Identification

After collecting, the crabs were brought to the laboratory in a live condition. The specimens were photographed and preserved in 4% formalin for further identification. The collected specimens were then identified up to species level using standard keys. The identification keys provided by Chhapgar (1957), Sakai (1976) and Ng *et al.*, (2008) were referred for the identification of marine species.

The mangrove crabs were identified referring to the keys and descriptions provided by Sethuramalingam and Ajmal Khan (1991), Jayabaskaran *et al.*, (1999) and Ajmal Khan and Ravichandran (2009).

Results and Discussion

A total of 165 crab specimens were examined during the present study consisting of three genera and three families were recorded. Family Calappidae was represented by *Calappa japonica, Calappa lophos, Calappa pustulosa.* Family Matutidae was represented by *Matuta planipes, Matuta victor* and the Family Carpillidae was represented by *Carpillus maculates*.

The present study reveals that the study area provides a very potential habitat for several verities of marine and estuarine crabs. The number of crab species collected from three different locations which are Visakhapatnam, Bheemunipatnam, and Kakinada.

***Calappa japonica,* dorsal and ventral view**

***Callapa lophos*, dorsal and ventral view**

***Calappa pustulosa,* dorsal and ventral view**

***Matuta planipus*, dorsal and ventral view**

***Matuta victor*. dorsal and ventral view**

***Marpillus maculates*, dorsal and ventral view**

Although, there are lots of works being carried out on the crab diversity in the Andhra Pradesh coastal waters. A comprehensive study of the brachyuran crabs has not been attempted. Some of the previous works reported that the Andhra Pradesh coastal waters support a low diversity of crabs. Roy and Nandi (2007) documented the checklist of brachyuran crab resources from coastal areas of Andhra Pradesh. Diversity of brachyuran crabs were studied and observed 15 species from Tekkali creek of Andhra Pradesh (Chakravarty *et al.*, 2016). Gatreddi Srinu (2018) studied on morphology and DNA divergence of selected crabs from coastal waters of Andhra Pradesh.

Table 1. Distribution and abundance of brachyuran crabs

S. No	Species name	Visakhapatnam	Bheemunipatnam	Kakinada
1	*Calappa japonica*	3	-	5
2	*Calappa lophos*	11	6	17
3	*Calappa pustulosa*	16	-	14
4	*Matuta planipes*	5	18	7
5	*Matuta victor*	7	14	6
6	*Carpillus maculates*	23	0	18

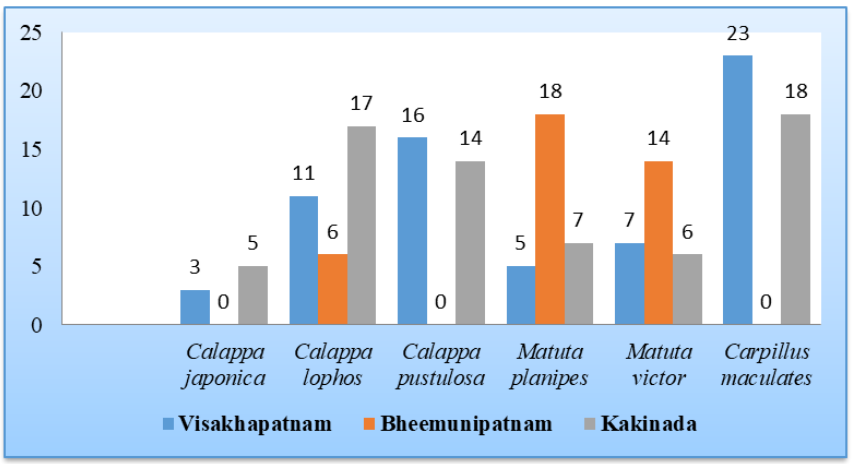

Figure 1. Distribution and abundance of brachyuran crabs

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Conflicts of interest
The authors declare no conflicts of interest.

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