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DIVERSITY OF DECAPOD FAUNA FROM MANGROVE ECOSYSTEM OF URAN (RAIGAD), NAVI MUMBAI, MAHARASHTRA, WEST COAST OF INDIA

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ABSTRACT

Healthy mangrove forests provide a critical habitat for many species of decapods in intertidal and estuarine areas and are key to a healthy marine ecology. Mangroves are the most suitable feeding, breeding and nursing grounds for the decapods. With continuing degradation and destruction of mangroves, there is a critical need to understand the biodiversity of the mangrove ecosystems. Data on species diversity of decapods in mangrove ecosystem of Uran revealed presence of 26 species representing 18 genera and 12 families of the recorded species, 50.00 % belonged to crabs, 42.31 % to Prawns and shrimps and 3.85 % each to lobsters and squilla.Fiddler crab (*Uca annulipes*) and hermit crab (*Pagurus prideaux*) are abundant at both sites. Species like *Scylla serrata* and *Leptodius exaratus* were common whereas occasional distribution of *Portunus sanguinolentus*, *P. pelagicus*, *Charybdis cruciata* was noted. *Penaeus monodon*, *P. semisculatus*, *Metapenaeus affinis* and *Acetes indicus* were common whereas *Panulirus polyphagus* and *Squilla mantis* were rare at both sites. At present, mangroves of Uran supports moderate density of decapods. Since no earlier reports are available, data presented here can be taken as a baseline data in knowing the status of decapods in mangroves of Uran.

KEY WORDS: Mangroves, Decapods, species diversity, JNPT, Uran, Navi Mumbai

Mangrove habitats harbour much of the world's tropical biodiversity and 50% of the world's mangrove forests have been lost as a result of clearing and alteration of coastlines. Mangroves are one of the biologically diverse ecosystems in the world, rich in organic matter and nutrients and support very large biomass of flora and fauna. The total number of mangrove-inhabiting faunal species in Indian mangroves is 3,111, which includes prawns, crabs and mollusks, fish, fish parasites, insets, reptiles, amphibian and mammals (Kathiresan and Quasim, 2005). Knowledge on species diversity of an ecosystem would help maximizing resource utilization in a sustainable manner besides preserving biodiversity (Biju and Deepthi, 2009; Vannucci (2002) reported that with continuing degradation and destruction of mangroves, there is a critical need to understand the biodiversity of the mangrove ecosystems.

The order Decapoda comprises of commercially important species of prawns / shrimps, crabs and lobsters. Mangrove waters serve as an essential nursery ground for juveniles of many species of decapods. In India as many as 26 species of lobsters, 162 species of hermit crabs, 705 species of brachyuran crabs and 84 species of prawns/ shrimps have been recorded so far (Venkataraman and Wafar, 2005). Kathiresan (2000) have reported a total of 48 prawn species in the Indian mangrove ecosystem, of which 34 in the mangrove rich east coast, 16 in the Bay islands and 20 in the mangrove poor west coast. Ravichandran and Kannupandi (2007) have reported 46 species of crabs from five different stations in the Pichavaram mangroves.

Till now extensive scientific research on ecological aspects of decapod fauna from mangroves has been carried out in India, data on species diversity of decapods from mangroves of Uran (Raigad), Navi Mumbai is not available; hence, the present study is undertaken.

MATERIALS AND METHODS

Study Area

Geographically, Uran with the population of 23,251 is located along the eastern shore of Mumbai harbour opposite to Coloba. A creek called 'Uran creek/ Sheva creek' (Lat. 18^0 50' 20" N and Long. 72^0 57' 5" E) encircles Uran city towards the north side and is continuous with the Panvel creek and Thane creek. Creek namely Dharamtar creek (Lat.18^0 50' 5" N and Long. 72^0 57' 10" E) encircles Uran city towards the south side and is continuous with the Karanja creek and Pen Khopoli creek. On the west side, Uran is encircled by Arabian Sea (Fig. 1). Both creeks have rocky shore towards the seaward side where as remaining part of the creeks is marshy and of mud flats. Both Uran creek and Dharamtar creek are uniformly deep with 10 meters range and have moderate cover of mangroves with mud flats and low lying marshy areas on

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their sides. Although both creeks are under anthropogenic pressure, still they support major fisheries of true fin-fishes and shell fishes, mainly of molluscs and crustaceans.

The coastal environment of Uran has been under considerable stress since the onset of industries like Oil and Natural Gas Commission LPG Distillation Plant, Grindwell Norton Ltd., MSEB Gas Turbine Power Station, Bharat Petroleum Corporation Ltd., Jawaharlal Nehru Port Trust (JNPT), Nhava-Seva International Container Terminal (NSICT), Container Freight Stations (CFS) etc.

An international port called 'Jawaharlal Nehru Port Trust (JNPT)' was established in 1989 near the Uran creek. JNPT is one of the busiest ports among 11 Major Indian Ports and handles about 60% of the total National Marine Transport of cargos. JNPT supports a variety of maritime activities; as a result, the area of Uran creek became the ground for hectic activities of Container Freight Stations (CFS). These activities affect the ecology of fauna and flora of mangroves. Hence this area has been identified for the ecological assessment

Species Diversity of Decapods

For present investigation, 2 study sites separated approximately by 10 km were selected along the coastal line of Uran i. e. Sheva Creek and Dharamtar Creek. Along the selected sites where the mangroves vegetation is present, were visited monthly from April 2009 to March 2011 for assessment of species diversity the decapods.

Crabs were hand-picked from the intertidal and sub tidal regions. The burrowing crabs were collected by digging as well as by pouring dilute formalin inside the burrows. Prawns, shrimps and lobsters were collected directly from the net and other types of gears used along Uran coast. Specimens were carried to the laboratory in icebox and are preserved in 5% seawater buffered formalin. For correct identification, standard keys of Chhapgar (1957), Chan (1998) and Kathiresan (2000) were followed.

RESULTS AND DISCUSSION

A total of 26 species of decapods representing 18 genera and 12 families were recorded from mangroves of the Uran coast. Of the recorded species, 50.00 % belonged to crabs, 42.31 % to Prawns and shrimps and 3.85 % each to lobsters and squilla. The total number of species, in alphabetical order of families is given in Table 1. 13 species of crabs representing 11 genera and 8 families were recorded from both sites. Fiddler crabs of family Ocypodidae and hermit crabs of Paguridae are abundant at both sites. Species like *Scylla serrata* and *Leptodius exaratus* were common whereas occasional distribution of *Portunus sanguinolentus*, *P. pelagicus*, *Charybdis cruciata* was noted.

11 species of Prawns and Shrimps representing 5 genera and 2 families were recorded from both sites. One species each of lobster, *Panulirus polyphagus* (Family - Palinuridae) and squilla, *Squilla mantis* (Family Squillidae) were also recorded from both sites. *Penaeus monodon*, *P. semisculatus*, *Metapenaeus affinis* and *Acetes indicus* were common whereas *P. polyphagus* and *S. mantis* were rare at both sites.

Biodiversity and community structures are now recognized to be important determinants of ecosystem functioning (Raghukumar and Anil, 2003). Monitoring of species diversity is a useful technique for assessing damage to the system and maintenance of good species diversity is a positive management objective. Decapod crustacean forms a significant portion of aquatic food resources of the world and conservation of these resources is important from commercial as well as ecological point of view (Dineshbabu et al., 2011). Bandekar et al., (2011) reported 15 species of crabs in Karwar mangrove environment and have shown that population of commercially important mangrove crabs are declining day by day due to indiscriminate fishing of berried females and fishing of undersized crabs.

The coastal environment of Uran has been under considerable stress since the onset of other industries and JNPT since 1989. Hectic activities of Container Freight Stations (CFS), urbanization, industrialization and reclamation in the stretch of creek around Uran, result in the loss of mangrove biodiversity. Several incidences of coastal pollution occur because of leakage/discharge of transporting materials along with industrial effluents.

Disposal of domestic wastes and untreated or partially treated industrial effluents in coastal region of Uran, Navi Mumbai have depleted coastal resources, public health risk and loss of coastal and marine biodiversity.

Sighting of dead fish surfacing in creeks of Mumbai and Navi Mumbai (Panvel creek, Vashi creek, Belapur creek etc.) is common from last few years affecting the livelihood of fishermen. Dumping of industrial effluents, untreated sewage and unchecked encroachment along the coastal line have resulted in deterioration of water quality and incidences of industrial pollution are common in creeks of Mumbai and Navi Mumbai. Slaughtering of mangroves from Navi Mumbai region due to over exploration, unsustainable demand and reclamation have resulted in destruction of marine life (Pawar, 2011).

At present, ecological conditions in mangroves of Uran supports moderate density of decapods. Since no earlier reports are available, data presented here can be taken as a baseline data in knowing the status of decapods in mangroves of Uran and effect of industrial development on it.

Fig. 1: General Map of Study Area

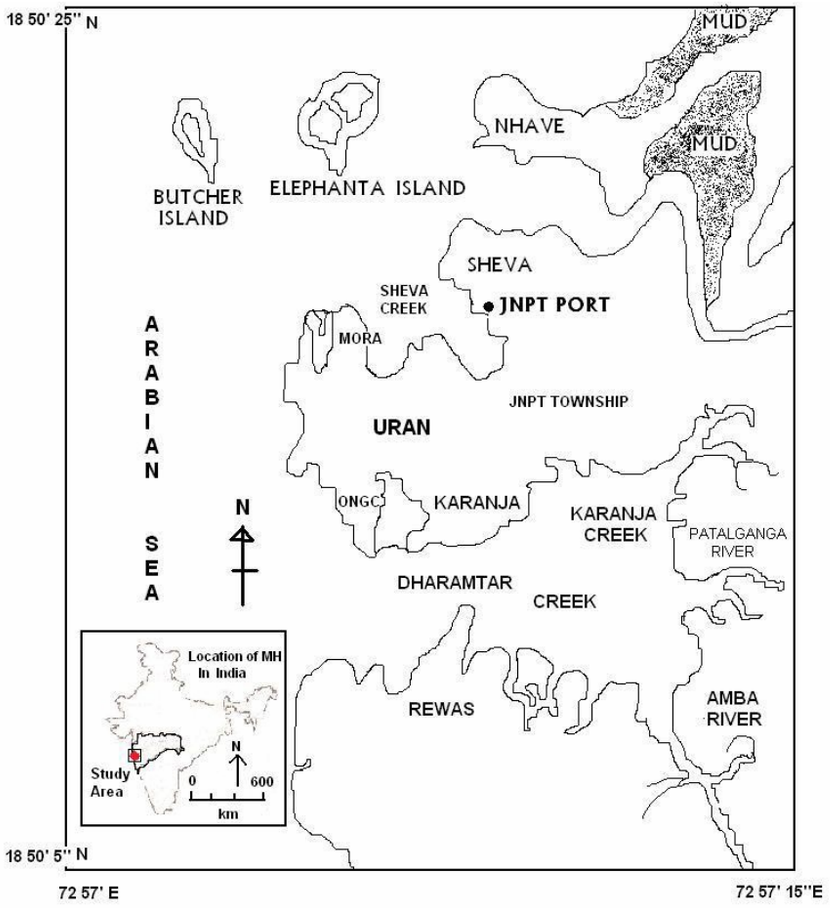

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Table 1: Species diversity of decapods in mangroves of Uran (Raigad), Navi Mumbai

No.	Suborder	Family	Species
1	Dendrobranchiata	Penaeidae	*Fenneropenaeus indicus* (H. M. Edwards, 1837)
2	Dendrobranchiata	Penaeidae	*Penaeus monodon* (Fabricius, 1798)
3	Dendrobranchiata	Penaeidae	*Penaeus penicillatus* (Alcock, 1905)
4	Dendrobranchiata	Penaeidae	*Penaeus semisculatus* (De Haan, 1844)
5	Dendrobranchiata	Penaeidae	*Penaeus merguiensis* (de Man, 1888)
6	Dendrobranchiata	Penaeidae	*Metapenaeus affinis* (H. M. Edwards, 1837)
7	Dendrobranchiata	Penaeidae	*Metapenaeus dobsoni* (Miers, 1878)
8	Dendrobranchiata	Penaeidae	*Metapenaeus stridulans* (Alcock) 1905)
9	Dendrobranchiata	Penaeidae	*Parapenaeopsis sculptilis* (Heller, 1862)
10	Dendrobranchiata	Penaeidae	*Parapenaeopsis stylifera* (H. M. Edwards, 1837)
11	Dendrobranchiata	Sergestidae	*Acetes indicus* (H. M. Edwards, 1830)
12	Palinura	Palinuridae	*Panulirus polyphagus* (Herbst, 1793)
13	Stomatopoda	Squillidae	*Squilla mantis* (Linnaeus, 1758)
14	Brachyura	Geryonidae	*Charybdis cruciata* (Herbst, 1789)
15	Brachyura	Grapsidae	*Grapsus albolineatus,* (Lamarck, 1818)
16	Brachyura	Grapsidae	*Pseudograpsus intermediatus,* (Chhapgar, 1957)
17	Brachyura	Grapsidae	*Varuna litterata,* (Fabricius, 1798)
18	Brachyura	Matutidae	*Matuta planipes* (Fabricius, 1798)
19	Brachyura	Menippinae	*Myomenippe hardwickii*, (Gray, 1831)
20	Brachyura	Ocypodidae	*Uca annulipes* (H. M. Edwards, 1837)
21	Brachyura	Portunidae	*Scylla serrata* (Forsskål, 1775)
22	Brachyura	Portunidae	*Portunus sanguinolentus* (Herbst, 1796)
23	Brachyura	Portunidae	*Portunus pelagicus* (Linnaeus, 1758)
24	Brachyura	Portunidae	*Charybdis orientalis* (Dana, 1852)
25	Brachyura	Xanthidae	*Leptodius exaratus* (H. M. Edwards, 1834)
26	Anomura	Paguridae	*Pagurus prideaux* (Leach, 1815)

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