Sea urchin diversity and its resources from the Gulf of Mannar

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Introduction

Gulf of Mannar is the richest marine biodiversity hotspot along the Southeast coast of India, encompassing the territorial waters from Dhanushkodi in the north to Kanyakumari in the south. It has a chain of 21 islands, located 2 to 10 km from the mainland along the 140 km stretch between Thoothukudi and Rameswaram. The area of Gulf of Mannar under the Indian EEZ is about 15,000 km^2 where commercial fishing takes place only in about 5,500 km^2 and that too only up to a depth of 50m. This marine ecosystem holds nearly 117 species of corals, 441 species of fin-fishes, 12 species of sea grasses, 147 species of seaweeds, 641 species of crustaceans, 731 molluscan species (Kumaraguru, 2006). There are around 950 species of sea urchin in class Echinoidea which comes under two subclasses found around the world's oceans.

Materials and methods

For the quantification of sea urchin landing from trawl net and bottom set gill net, weekly sampling was carried out in Pampan and Vedalai landing centres during the study period from October 2013 to May 2015. The landing characteristics were analyzed for quantifying sea urchin mostly from the non-edible biota, because sea urchins are not currently traded along this coast for any purpose. Ten percent of the boats in a day were selected to calculate effort. This value was multiplied by the total number of boats fishing on the particular day of observation to obtain daily estimate. The collected data were pooled and multiplied by the number of fishing days in the month to obtain the monthly catch estimates for both the landing centres and the fishing gears. During the study period from October 2013 to May 2015.

Results

The composition of these two species of sea urchins in the landing was 70:30 for *S. virgulata* and *T. toreumaticus* respectively. The area of operation of trawl fleet from Pampan is larger than the area of operation of bottom set gill net which is mostly restricted to the surrounding of the islands in the Gulf of Mannar. This might be the reason for the difference in the landing quantity. In trawl more than 700 kg *S. virgulata* was observed during the month December-2014 and March-2015 in by-catch, similarly for *T. toreumaticus* the peak maximum landing coincided with this period with more than 300 kg in landing from Pampan landing centre. The bottom set gill net landing of Vedalai showed a peak in landing of both the species of sea urchin in the month of October- 2014. The average monthly landing of *S. virgulata* in trawl and bottom set gill net was 402 kg and 157kg respectively. Whereas, the average monthly landing of *T. toreumaticus* was 172kg and 67 kg respectively in bottom set gill net landings.

Conclusion

Among the 24 varieties of sea urchin recorded from the Gulf of Mannar, only 16 species were collected from the commercial landing of gill nets and trawl nets of Pampan and Vedalai landing centres. *S.virgulata* is the dominant species landed in the commercial catch as bycatch. As such sea urchins are not directly involved in any trade, however their test is of considerable importance in souvenir industry and the gonads of *Stomopneustes variolaris* is a delicacy among certain fishers along the Gulf of Mannar. Further studies on the edibility and suitability of sea urchin species from this ecosystem should be undertaken to assess their ecological role as well as to develop a potential species of sea urchin for aquaculture purposes.

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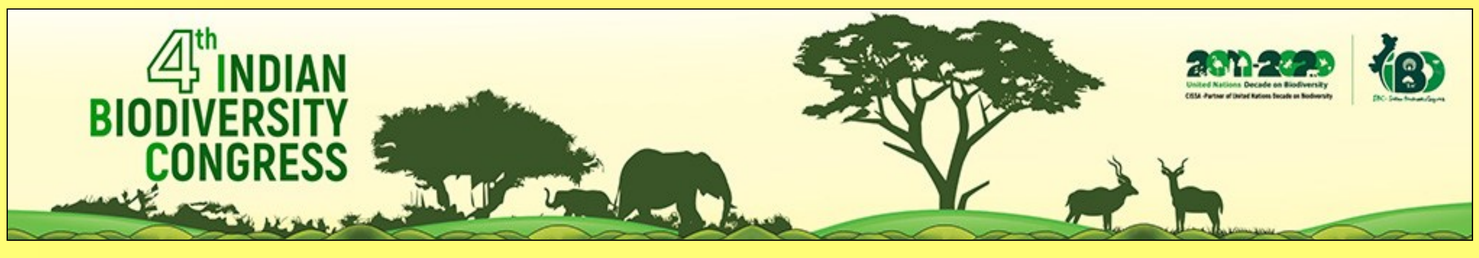


Table. 1 Sea urchin diversity in Gulf of Mannar

Cidaridae	**Echinometridae**
Prionocidaris baculosa (Lamarck, 1816)	*Echinostrephus molaris* (Blainville, 1825)
Eucidaris metularia (Lamarck, 1816)	*Echinometra mathaei* (Blainville, 1825)
Phyllacanthus imperialis (Lamarck, 1816)	*Heterocentrotus mamillatus* (Linnaeus, 1758)
	Heterocentrotus trigonarius (Lamarck, 1816)
Temnopleuridae	*Colobocentrotus (Podophora) atratus*
Temnopleurus toreumaticus (Leske, 1778)	(Linnaeus, 1758)
Salmacis bicolor typica Mortensen, 1904	
Salmacis virgulata L. Agassiz in L. Agassiz &	Diadematidae
Desor, 1846	*Astropyga radiata* (Leske, 1778)
Salmaciella dussumieri (L. Agassiz in L. Agassiz	*Diadema setosum* (Leske, 1778)
& Desor,1846)	*Diadema savignyi* (Audouin, 1829)
Mespilia globulus (Linnaeus, 1758)	*Echinothrix calamaris* (Pallas, 1774)
	Echinothrix diadema (Linnaeus, 1758)
Toxopneustidae	
Tripneustes gratilla (Linnaeus, 1758)	Stomopneustidae
Tripneustes depressus A. Agassiz, 1863	*Stomopneustes variolaris* (Lamarck, 1816)
Nudechinus scotiopremnus H.L. Clark, 1912	
Pseudoboletia maculata Troschel, 1869	
Toxopneustes pileolus (Lamarck, 1816)	

Fig.1 Comparison of the estimated landings of the two species of sea urchin from Pampan landing centre (in kg)

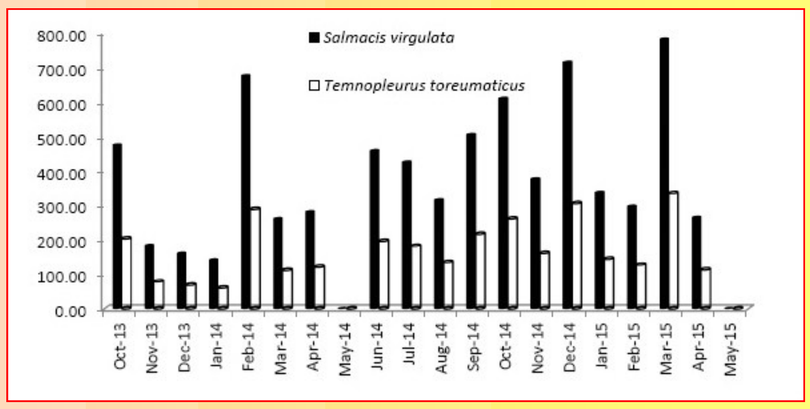
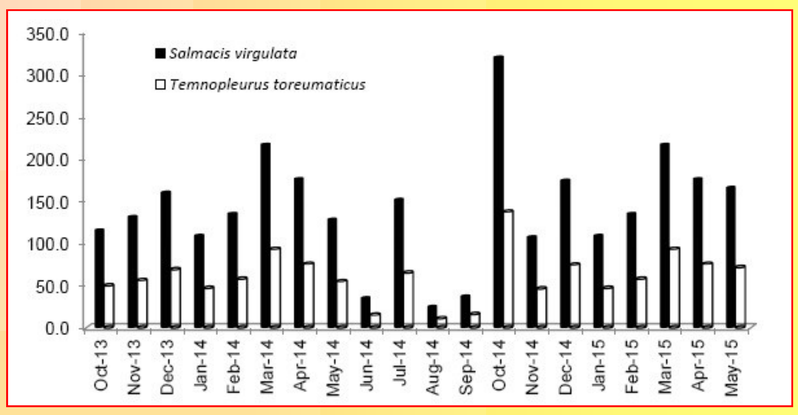


Fig.2 Comparison of the estimated landings of the two species of sea urchin from Vedalai landing centre (in kg)



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