

Distribution of Macro Fouling Community in the Coastal Region of Pondicherry, India

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Abstract: The study was undertaken to investigate the macro fouling fauna in the coastal area of Puducherry, India. A total of 8 species belong to different groups such as barnacles, mussels, *Oysters* and *Tubicolous polychaetes*. Barnacles made larger contribution followed by mussels, *Tubicolous polychaetes* and Oyster. *Balanus balanus*, *Balanus amphitrite*, *Chthamalus stellatus*, *Lepas anatifera*, *Perna viridis*, *Crassostrea madrasensis*, *Tubicolous polychaetes*, *Modiolus* and *Oysters* were the prevalent macro foulers encountered in our coastal area. The rapid growth of macro fouling community in the coastal area giving an alarming signal of its capacity to cause potential biodiversity losses and ecosystem damages. Hence an urgent attention must be taken to control the fouling community in coastal area of Pondicherry.

Keywords: Barnacles, macro fouling, mussels, oyster, Pondicherry coast

INTRODUCTION

Marine fouling is a common but complex succession of processes which involves settling, interaction and subsequent accumulation of organic materials, both living and non living on a submerged solid surface. Studies on different aspects of fouling such as, biology, physiology, succession, recruitment, etc., (Oshurkov, 1992; Kocak, 2007; Litulo, 2007; Tremblay *et al.*, 2007) have been carried out. These communities are amenable to manipulation and replication, facilitating the interpretation of community dynamics. It affects various maritime activities including shipping, oil and gas industries, fishing and aquaculture equipments, cooling systems of power plants, etc. (Callow and Callow, 2002). New, effective and environmentally compatible options are needed to control fouling. There are reports on the fouling community in India nonetheless; no reports are found pertaining to the macro fouling community in Pondicherry. Hence presently an attempt has been made. The study scope also provides a warning to prevent the massive growth and settlement of macro fouling community in Pondicherry coastal region.

MATERIALS AND METHODS

Fresh samples were collected on a month intervals during November 2011 to April 2012 to periodically record the macro fouling fauna in the coastal region of Pondicherry, south east coast of India. The samples were collected from the piers, jetty, boats, floating ropes, stones, shells, outboard motors and harbours in

the coastal zone of Pondicherry. The collected samples were immediately transferred to laboratory. The animals were washed, sorted and examined fresh with a dissecting microscope, preserved in 5% seawater formalin. The identified foulers were given under four categories-barnacles, mussels, *Oysters* and *Tubicolous polychaetes*.

RESULTS AND DISCUSSION

The starting point of the fouling community development on unoccupied substrate is the recruitment of larvae to that substrate Sutherland and Karlson (1977). In the present investigation, a total of eight species of fouling organisms were recorded from the coastal zone of Pondicherry (Table 1). The identified foulers were belonging to diverse groups such as Barnacles (*Balanus balanus*, *Balanus amphitrite* and *Chthamalus stellatus*), Goose barnacle (*Lepas anatifera*), Mussels (*Perna viridis* and *Modiolus* sp.), *Oysters* (*Crassostrea madrasensis*) and *Tubicolous polychaetes* (*Serpulids* sp.) (Fig. 1). Barnacles were found to be the most dominant group in the study followed by mussels, *Tubicolous polychaetes* and oyster and (Fig. 2) The variations in abundance and continuity of settlement of each species are that the pattern of succession will vary depending on the time when a bare surface becomes available for colonizing (Chalmer, 1982). Barnacles such as *Balanus balanus* and *Balanus amphitrite* was probably the most inferior primary space competitor in jetty, boats, boat yard and outboard motors like shafts and propellers. Moreover, it was also found on boulders on the Pondicherry coasts. Though *Balanus* were settled rapidly and abundantly

Table 1: List of fouling organisms in the coastal area of Pondicherry

Species	Occurrence									
	H	B	BY	S/P	ST	SH	AS	FW	FR	WW
<i>Balanus balanus</i>	*	*	*	*	*			*	*	
<i>Balanus amphitrite</i>	*	*		*	*	*	*	*	*	
<i>Lepas anatifera</i>										*
<i>Perna viridis</i>			*		*					
<i>Modiolus</i>			*		*	*				
<i>Crassostrea madrasensis</i>					*					
<i>Chthamalus stellatus</i>					*	*				
<i>Serpulids sp.</i>		*	*	*		*				

H: Harbor; B: Boats; BY: Boat yard; S/P: Outboard motors shaft/propeller; ST: Stones; SH: Shells; AS: Animal surfaces; FW: Floating wood; FR: Floating ropes; WW: Washed woods

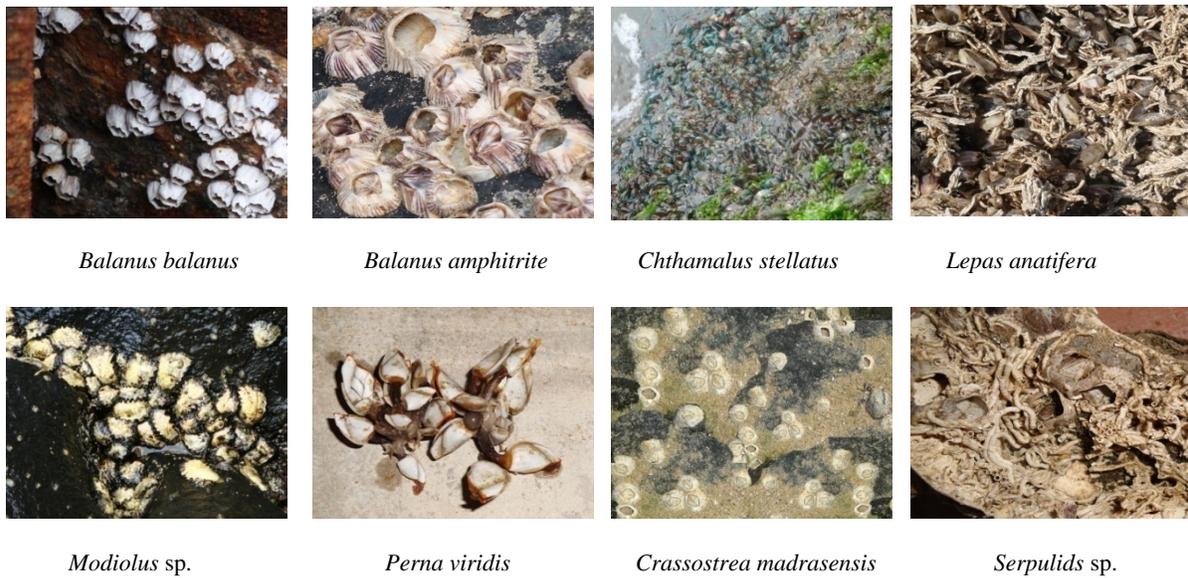


Fig. 1: Different macro fouling organisms recorded in Pondicherry coastal region

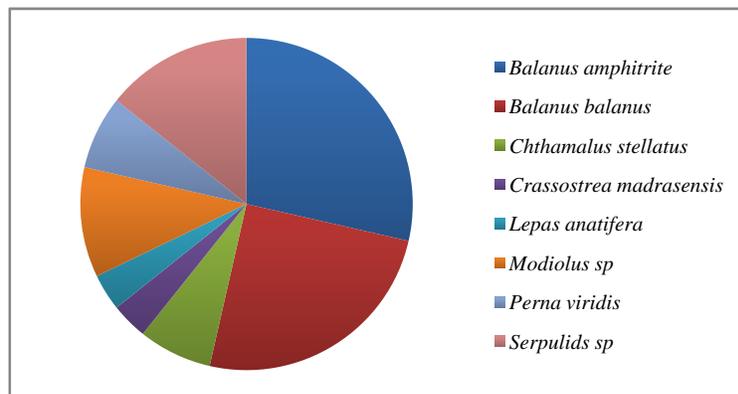


Fig. 2: Composition of macro fouling organisms in the study area

(Chalmer, 1982) however we found the growth was relatively low density in harbour areas. The sub lethal concentrations of pollutants in harbor might have reduced the rate of their settlement (Moran and Grant, 1993). Goose barnacle, *Lepas anatifera* was found to be attached on the eroded surface of driftwoods and discarded ropes. Mussels, *Perna viridis* and *Modiolus*

sp were strongly attached to submerged stony surfaces. In the present observation the *Modiolus* species were found richer in the boat yard, growing along with *Tubicolous polychaetes*. *C. Madrasensis* were commonly found on the rocky surface in the coastal areas. The settlement frequently implies a hydrodynamically favourable position (Keough, 1984,

1986; Oswald and Seed, 1986) as water movement increases with distance away from a solid surface (Butman, 1987). *Tubicolous polychaetes* were found in submerged boats, boat yard and outboard motors. The distribution of *Tubicolous polychaetes* was vast in shafts and in propellers. It was also be found on mollusc shells and crab shells. The benefits and dangers of fouler on a living substratum may compensate one another (Wahl, 1989). Foulers being attach in huge numbers and slow down the speed of the fishing vessel in our coastal area, thereby increasing the fuel consumption. Hence, an urgent action should be takeover to control the macro fouling community, in order to prevent the overgrowth.

ACKNOWLEDGMENT

Authors thank the Head of the Department Ecology and Environmental Sciences, Pondicherry University for providing facilities. The authors gratefully acknowledge CAS in marine biology, Annamalai University for identification of fouling organisms.

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