Occurrence of live Octocorals in the Trawling Grounds of Veraval Coast of Gujarat, Arabian Sea

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Abstract

The present paper communicates the first record of live octocorals in the sub-tidal region of Veraval. The four genera identified are *Litophyton* sp., *Studeriotes* sp., *Juncella juncea* (Pallas) and *Subergorgia suberosa* (Pallas). The presence of octocorals in the trawling ground with depth of 15-20 m justifies the need to carry out further studies on the impact of bottom trawling on the coral reef ecosystem.

Key words: Octocorals, Veraval, Gujarat, trawling.

Introduction

The present communication is a new record of four genera of live octocorals from Veraval waters. Previous studies carried out by different authors viz., Patel (1978), Patel (1988), Pillai and Patel (1988), Deshmukhe *et al*. (2000) have reported the presence of corals only along the Gulf of Kutch, Gujarat. Raghunathan *et al*. (2004) recorded the patchy distribution of stony corals (*Porites lutea*, *Tubastrea aurea*, *Turbinaria crater*, *Polycyathus verrilli*) and *Gorgonium* sp. at a depth of 2-5 m in the intertidal region of Veraval. This was the first record of corals from Veraval waters. This study conducted by Raghunathan *et al*. (2004) suggested the chances of the presence of coral reefs along the sub-tidal region of Veraval. The present study confirms this possibility by recording the incidence of soft corals and gorgonians from the sub-tidal waters of Veraval.

Materials and Methods

Along Veraval coast, experimental bottom trawling was carried out from MFV Sagarkripa (15.5 m OAL steel trawler) at five transects in commercial fishing grounds. As bottom trawling is not prevailing up to 15 m depth due to the rocky nature of bottom, 15-40 m depth transects parallel to the coast were selected to conduct experimental trawling. A 34 m high opening bottom trawl with 50 mm diamond mesh codend was operated. The gear had 80 kg V-form otter boards, 23 kg sinkers and 7 numbers of 150 mm plastic floats. Five transects of study area are of five depth zones of 15-20 m, 21-25 m, 26-30 m, 31-35 m and 36-40 m (Figure 1). After one hour effective trawling, the epifauna were collected before and after trawling from two stations at each transect monthly for a period of one year (September 2005 – November 2006) excluding the ban period. The trawling intensity was fixed at one tow for the whole year at different depths. The dredge operated was a rectangular dredge of 40 cm height, 90 cm length and 50 cm depth. All the coral specimens were identified upto genera level by following standard references and published literature (Allen and Steene, 1999).

Results

Octocorals were encountered in epifaunal samples collected in the dredge operated at a depth of 15-20 m (lat 20º54'13" N. long 70º20'18" E) in October 2006. The soft corals found were *Litophyton* sp. (Figure 2 a) and *Studeriotes* sp. (Christmas tree soft coral) (Figure 2 b). The gorgonians were young stage of *Subergorgia suberosa* (Pallas) (Figure 3 a) and *Juncella juncea* (Pallas) (Whip coral) (Figure 3 b). This is a unique report of these genera of octocorals from Veraval coast. The sediment was found to be muddy and coralline. The associated fauna and flora are given in Table 1.

Discussion

The works of the past conducted along Gujarat coast have reported Scleractinians (hard corals) (Patel (1978), Patel (1988), Pillai and Patel (1988). The presence of soft corals and gorgonians was reported by Deshmukhe *et al*. (2000). The genera reported by him were *Dendronephthya* sp., *Astromuriacea* sp., *Lophogorgya* sp., *Nephthya* sp., *Lobophytum* sp., *Sclerophytum* sp. and *Sinularia* sp. The genera mentioned in the present study are reported for the first time along Gujarat coast.

In the coastal waters of India intensive otter trawling is going on in shallow water targeting prawns. The decline in landings per trip of different kinds of fishing units, alteration in species, decrease in the fish

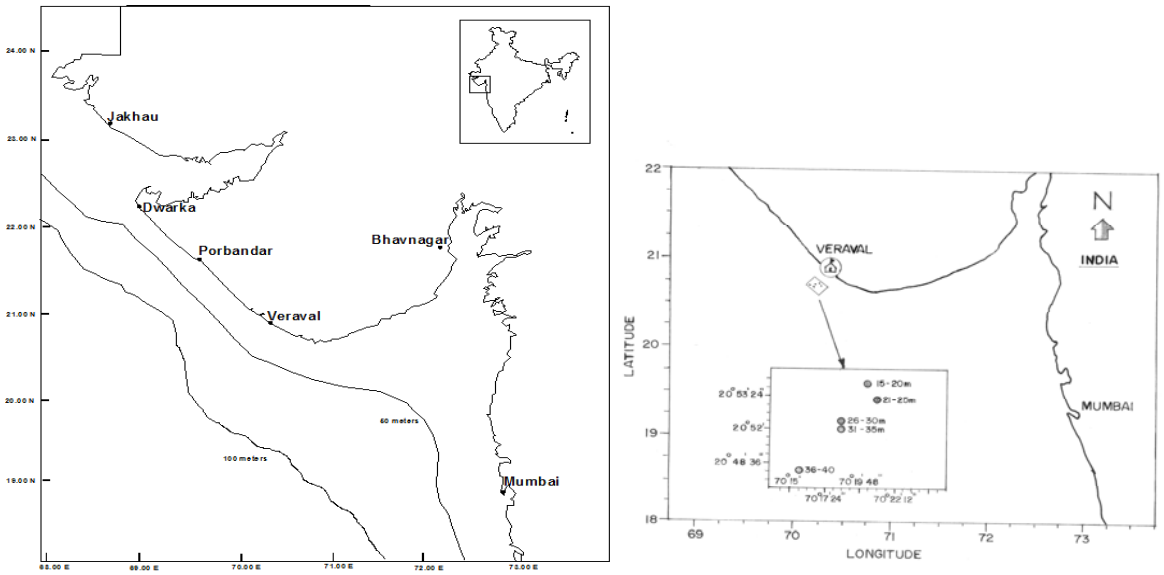

Figure 1. Map showing study sites.

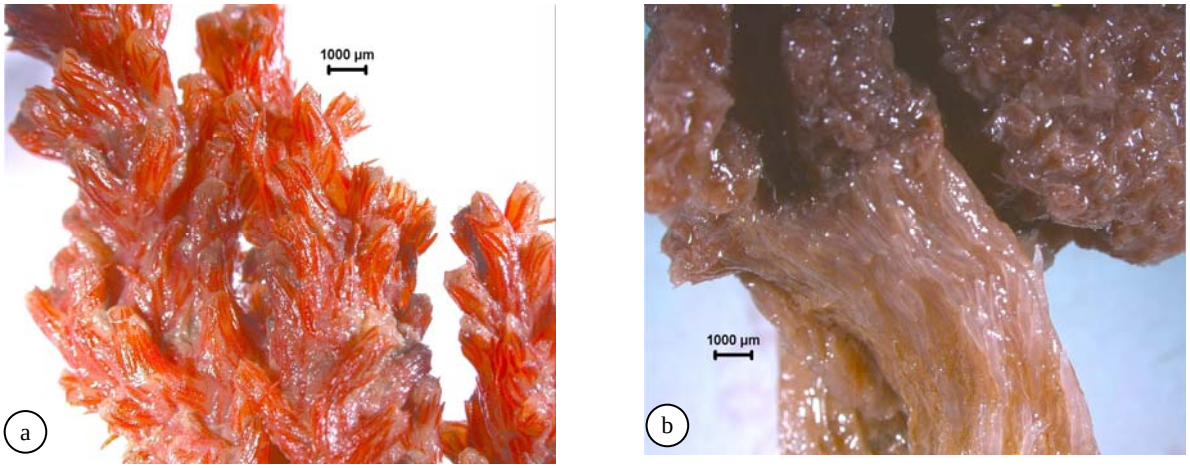

Figure 2. Stereomicroscopic view of soft corals (7x).
a: *Litophyton* sp. b: *Studeriotes* sp.

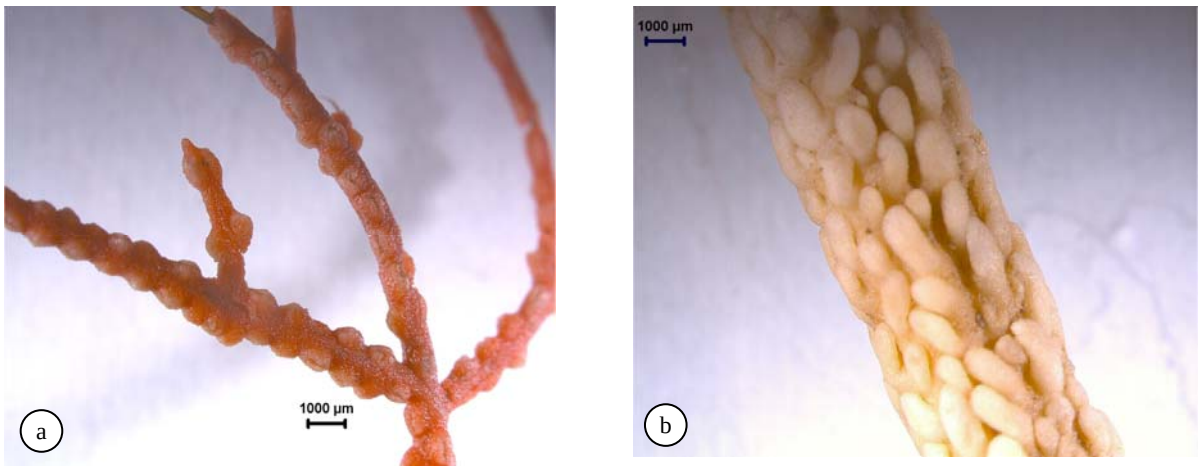

Figure 3. Stereomicroscopic view of gorgonians (7x).
a: *Subergorgia suberosa* (Pallas) b: *Juncella juncea* (Pallas)

Table 1. Associated fauna and flora

Group	Species
Seaweeds	*Hypnea* sp.
Sponges	*Cliona mucronata*
	Samus anonyma
	Suberites sp.
Hydrozoa	*Plumularia* sp.
Crab	*Charybdis lucifeara*
Gastropods	*Architectonica laevigata*
	Babylonia spirata
	Bursa spinosa
	Cancellaria costifera
	Chicoreus brunneus
	Chrysame chrysostoma
	Conus eldredi
	Cymathium aquatile
	Hemifusus cochlidium
	Hexaplex trunculus
	Murex acanthostephes
	Murex sp.
	Nassarius suturalis
	Nassarius thersites
	Pyrene sp.
	Rampana bulbosa
	Thais bufo
	Tibia curta
Bivalves	*Anomia ephippium*
	Marcia sp.
	Paphia textile
	Trisodus tortuosa

size etc. have been attributed to the rise in the number of trawlers (Sathiadas, 1998). Many of the demersal marine finfish of India are on the verge of extinction due to overfishing and irrational bottom trawling demolishing benthic ecosystems (Bensam and Menon, 1994). The presence of octocorals was recorded in the sub- tidal region of Veraval in the month of October, immediately after the closed season (June to August) when the bottom trawling is limited in this region suggests that this area is an abode of corals and a favorable site for coral reef formation. But intense trawling in the succeeding months destroys these valuable entities of ecosystem and the samples were not encountered in the subsequent months.

The bottom trawls are designed to tow along the sea floor, on which its operation indiscriminately smashes everything on their way crushing, killing, burying and exposing to predators the benthic fauna. It causes physical and biological damages that are irreversible, extensive and long lasting (Hall, 1999; Kaiser and de Groot, 2000). The impact of bottom trawling on coral reefs has been well documented (Koslow *et al*., 2001; Fossa *et al*., 2002). Bottom trawling crushed or buried corals, leading to increased mortality of coral populations. The injuries inflicted can lead to microbial infection reducing the well-being of the coral ecosystem (Fossa *et al*., 2002). The destruction of the corals will also affect the associated fauna of fish and invertebrates, which was evident from the complete loss of associated community from the shallow heavily fished sea mounts of Tasmania (Koslow *et al*., 2001). The sessile organisms like sponges and corals decreased considerably at the passage of otter trawl (Lokkeborg, 2005). At sea mounts of Tasmania, the dominant colonial coral, *Solenosmilia variabilis* and its associated fauna were eliminated from the shallow, heavily fished sea mounts (Koslow *et al*., 2001). Kaiser *et al*. (2000) reported off Start Bay, Devon, United Kingdom that the biomass of soft corals was higher in the areas closed to fishing gear than those areas under bottom-fishing pressures even at a small scale.

Veraval Fishing harbour ranks first in marine fish landing out of the 44 fishing harbours of the state. Established in 1986, this port was designed initially for 1,200 fishing trawlers; but 2,793 trawlers that are being operated from this port are now making it the largest concentration of trawlers in Gujarat (Anonymous, 2005). Apart from the bottom trawling, increased siltation and passive gears also pause a threat to the corals of Veraval. The occurrence of octocorals in the sub-tidal trawling ground warrants the need for conducting further studies on the impact of bottom trawling on the reef ecosystem. A comprehensive underwater study needs to be undertaken to bring to light the precise impact. This

will lead to management issues of mapping the areas where corals thrive and limiting or closing bottom trawling in these regions.

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