



International Journal of Fisheries and Aquatic Studies

ISSN: 2347-5129

(ICV-Poland) Impact Value: 5.62

(GIF) Impact Factor: 0.352

IJFAS 2016; 4(4): 380-384

© 2016 IJFAS

www.fisheriesjournal.com

Received: 28-05-2016

Accepted: 29-06-2016

Myla S Chakravarty

Department of Marine Living
Resources, Andhra University,
Visakhapatnam – 530 003,
Andhra Pradesh, India

B Shanthi Sudha

Department of Marine Living
Resources, Andhra University,
Visakhapatnam – 530 003,
Andhra Pradesh, India

PRC Ganesh

Department of Marine Living
Resources, Andhra University,
Visakhapatnam – 530 003,
Andhra Pradesh, India

Amarnath Dogiparti

Department of Marine Living
Resources, Andhra University,
Visakhapatnam – 530 003,
Andhra Pradesh, India

Correspondence

Myla S Chakravarty

Department of Marine Living
Resources, Andhra University,
Visakhapatnam – 530 003,
Andhra Pradesh, India.

Some animal associates of the zoanthids, *Palythoa mutuki* (Haddon & Shackleton, 1891) and *Zoanthus sansibaricus* (Carlgen, 1990) along rocky shores of Visakhapatnam, India – A check list

Myla S Chakravarty, B Shanthi Sudha, PRC Ganesh and Amarnath Dogiparti

Abstract

Animal associates of zoanthids- *Palythoa mutuki* and *Zoanthus sansibaricus* of Lawson's Bay rocky shores of Visakhapatnam were recorded in the present study. *P. mutuki* and *Z. sansibaricus* were found distributed along the upper mid-littoral zone of the rocky shores, 21 species and four larval forms belonging to five Phyla (Porifera, Annelida, Arthropod, Mollusca and Echinodermata) were recorded. The diversity of organisms associated with *P. mutuki* was more than with *Z. sansibaricus*.

Keywords: Animal associates, *Palythoa mutuki*, *Zoanthus sansibaricus*

1. Introduction

The zoanthid species are distributed as encrusting mats along the intertidal rocky shores of tropical oceans particularly towards the upper mid-littoral region [1]. They are normally exposed during neap tides and are subjected to the pounding action of the waves. Sand particles, broken shell pieces, sediment etc., are seen attached to the outer walls of the polyps. Since they are distributed on wave beaten rocky shores, they accumulate lot of organic and inorganic particulate matter, micro and macro-organisms, when the tide recedes. They derive nutrition probably from the particulate organic matter coming along with the incoming waves and also from zooxanthellae that harbours the tissues symbiotically. The zoanthids, *P. mutuki* (Haddon & Shackleton, 1891) and *Z. sansibaricus* (Carlgen, 1990) belong to the Class-Anthozoa, Sub-class-Hexacorallia, Order-Zoantharia, Sub order- Brachycnemia. *P. mutuki* has been included in the Family-Sphenopidae and *Z. sansibaricus* in the Family-Zoanthidea. A number of epizoic organisms are seen associated with zoanthids either as epibionts or endobionts, since zoanthids are sedentary in the intertidal regions like hydroids [2-4], gorgonians [5-7], antipatharians [8-9] & scleractinians [10-12] etc., facilitating different relationships such as commensalism, mutualism, symbiosis, parasitism etc.

The other researchers who worked on the faunal associates of zoanthids include Sebens [13], Reed *et al.*, [14], Humes [15], Gleibs and Mebs [16], Perezel *et al.*, [17], Swain [18], Trivedi *et al.*, [19], Rebelo [20] and Pareshpriya *et al.*, [21] The present study is aimed at identifying different fauna associated with *P. mutuki* and *Z. sansibaricus* along the Lawson's Bay rocky coast of Visakhapatnam.

2. Materials and Methods

The sampling area was the mid-littoral of rocky shores of Lawson's Bay colony (17° 43' 23.53" N and 83° 20' 36.31" E) of Visakhapatnam (Fig 1) where the colonies of the two species were distributed. Sampling was carried out at two places, where the two species were found in abundance. The macro-organisms visible to the naked eye were collected along with the Zoanthids from the sampling area to the laboratory and preserved in 4% Formalin. Each polyp of the specimen was separated and agitated in the waters or scraped off with a brush. The organisms thus separated were also fixed in formalin. Different animal associates separated from the two species were identified of standard identification keys [22-27].

3. Results and Discussion

21 species of fauna and four polychaete larvae were reported as animal associates of *P. mutuki* and *Z. sansibaricus* (Table 1). Of 21 species identified Sponge (*Spongia officinalis*) belonging to the phylum Porifera (Fig. 2), polychaetes - *Lepidonotus squamatus*, *Lanice conchilega*, *Nereis pelagica* and polychete larvae (Fig's 3-6) belonging to the phylum Annelida, the crustaceans namely *Charybdis truncate*, *Menippe rumphii*, *Alpheus melabaricus*, Shrimp, *Corophium* sps, and *Eurydice pulchra* of the phylum Arthropoda (Fig's 7-12), gastropods like *Turbo bruneus*, *Thais clavigera*, *Cellana radiata*, *Cypraea tigris*, *Cerithidea* sps. and *Baeolidia palythoae* of the phylum Mollusca (Fig's 13-18), and Echinoderms including Star fish (*Asterias* sps.) Brittle stars like, *Ophiothrix fragilis*, *Ophiocomina nigra*, Sea urchins like *Stomopneustes variolaris* and crinoids (Fig's 19-23) were found in large numbers associating with the colonies of *P. mutuki* and *Z. sansibaricus*. The associated macro faunal community in the colony of *Z. sansibaricus* was found to be fewer than those of *P. mutuki*.

A marine bristle worm, *Hermodice carunculata* has been

reported by Sebens [13] feeding on the colonies of *Zoanthus sociatus*. Nearly 153 gastropod species have been recorded associating with the scleractinian coral *Oculina varicose* by Reed *et al.*, [14]. Humes [15], has reported the Sabelliphilid copepods (*Poecilo stomatoida*) associating with cnidarians. Gleibs and Mebs [16], have observed the occurrence of Chaetodon fish- *Chaetodon capistratus* and *C. sedentaris*, a puffer fish, *Spherooides spengleri* and a damsel fish, *Stegastis* sps. feeding on *Palythoa caribaeorum* polyps. Perezlet *et al.*, [17] have reported 28 associated macro-benthic community associated with the zoanthids, *Palythoa caribaeorum* in the littoral zone of Pernambuco, Brazil. According to Swain [18], the sponges showed mutualism with the zoanthids. 67 species of macro-faunal organisms associated to the patches of *P. mutuki* with arthropods as dominant group have been reported from Saurashtra coast, Gujarat by Trivedi *et al.* [19]. The diversity of zooxanthellae associated with *Palythoa caribaeorum*, *Zoanthus sociatus* and *Protopalythoa variabilis* has been recorded by Rabelo [20]. Nudibranchs such as *Baeolidia palythoae* and *Phidiana militaris* have also been found on the colonies of zoanthids by Pareshpriya *et al.*, [21].

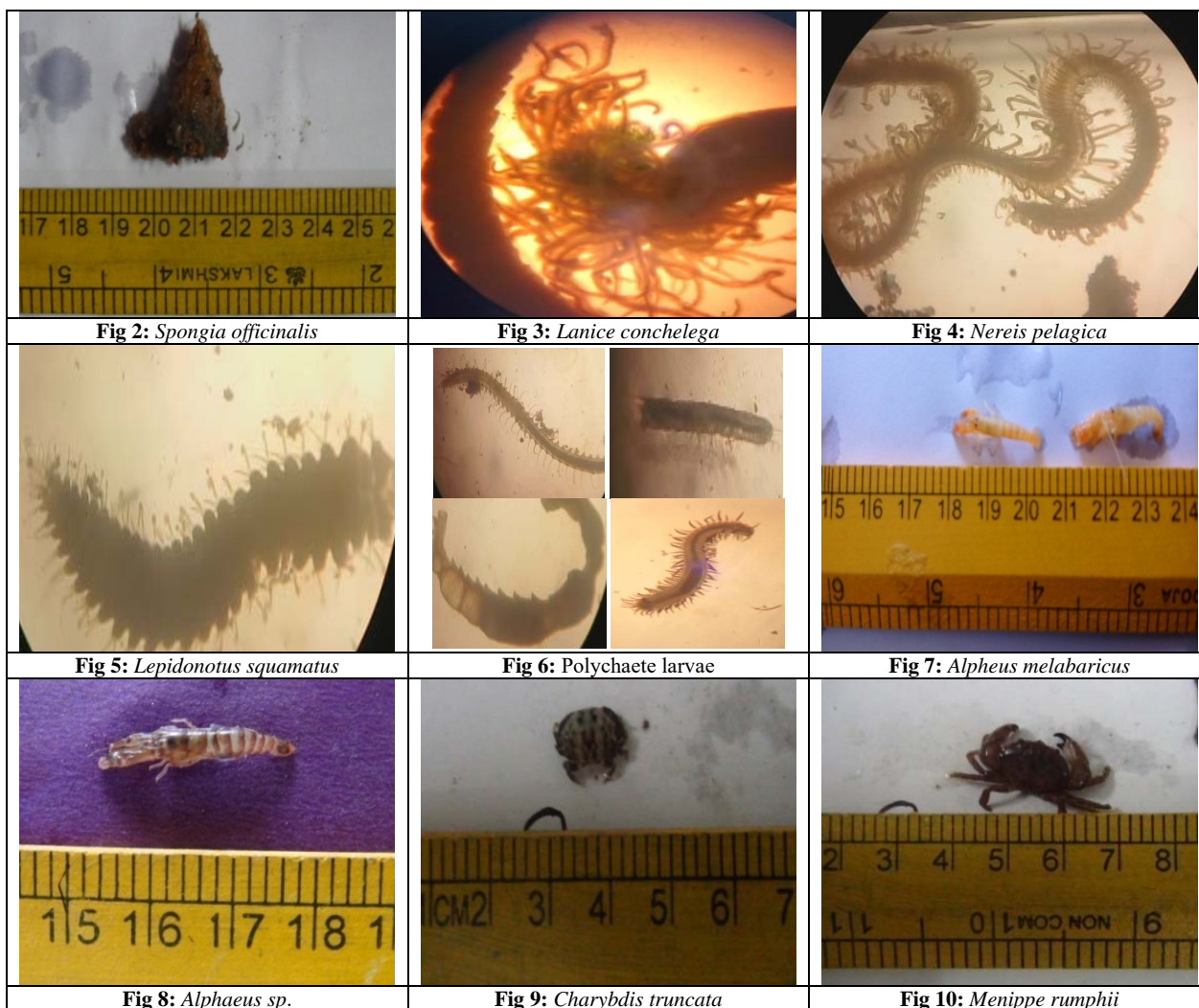
Table 1: List of associates of Zoanthids

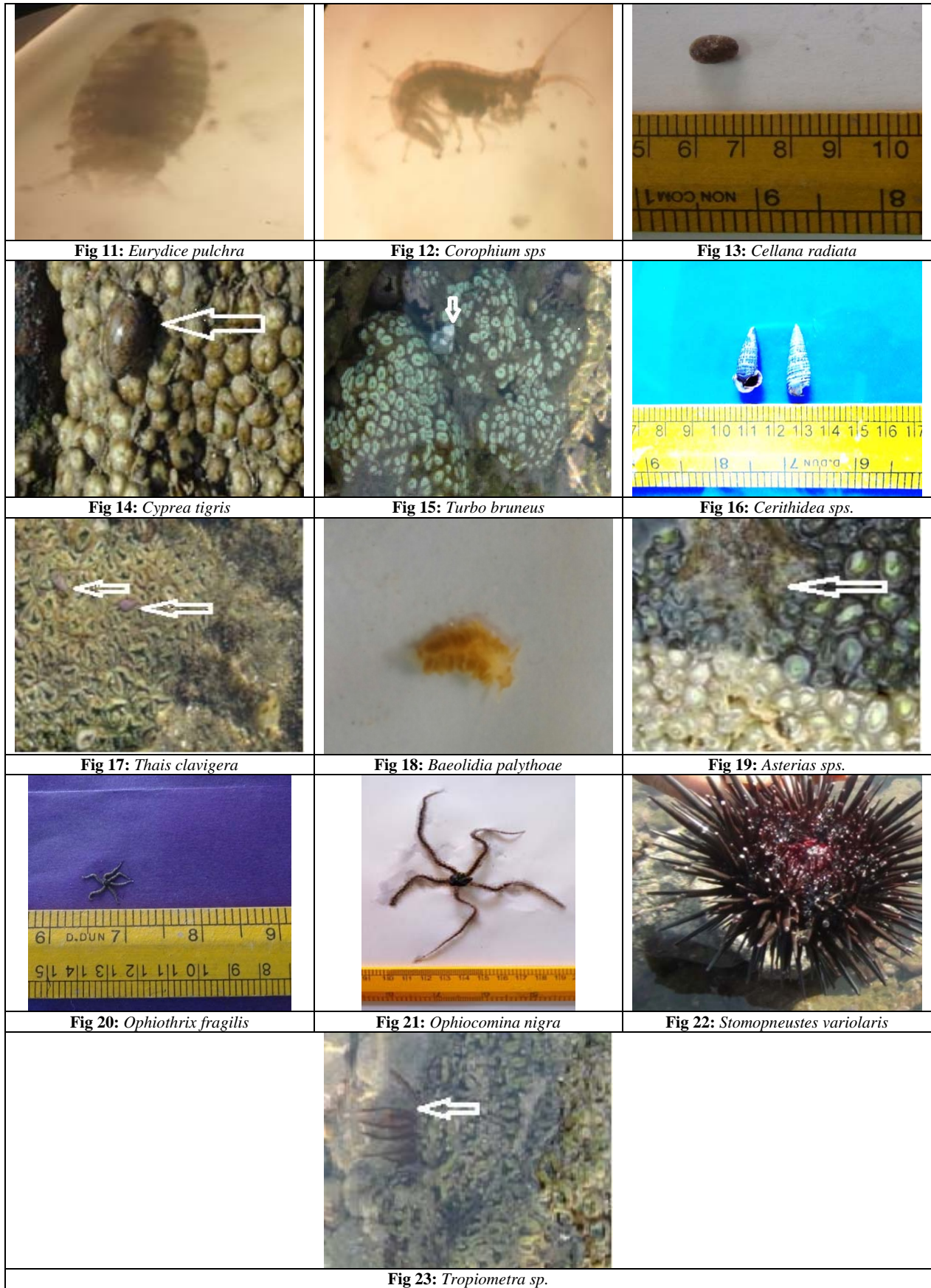
Phylum: Porifera	Superfamily: Cypraeoidea
Class: Desmospongiae	Family: Cypraeidae
Order: Dictyoceratida	Subfamily: Cypraeinae
Family: Spongiidae	Genus: <i>Cypraea</i>
Genus: <i>Spongia</i>	Species: <i>tigris</i> (Linnaeus, 1758) [Fig. 14]
Species: <i>officinalis</i> (Linnaeus, 1759) [Fig. 2]	Superfamily: Trochoidea
Phylum: Annelida	Family: Turridae
Class: Polychaeta	Genus: <i>Turbo</i>
Subclass: Palpata	Species: <i>bruneus</i> (Roding, 1791) [Fig. 15]
Order: Canalipalpata	Superfamily: Cerithioidea
Suborder: Terebellida	Family: Potamididae
Family: Terebellidae	Genus: <i>Cerithidea</i> sps. (Linnaeus, 1758) [Fig. 16]
Genus: <i>Lanice</i>	Superfamily: Muricoidea
Species: <i>conchilega</i> (Pallas, 1766) [Fig. 3]	Family: Muricidae
Order: Phyllodocida	Genus: <i>Thais</i>
Family: Nereidae	Species: <i>clavigera</i> (Roding, 1798) [Fig. 17]
Genus: <i>Nereis</i>	Order: Nudibranchia
Species: <i>pelagica</i> (Linnaeus, 1758) [Fig. 4]	Family: Aeolidiidae
Subclass: Errantia	Genus: <i>Baeolidia</i> (Trinchese, 1877)
Order: Phyllodocida	Species: <i>palythoae</i> (Gosliner, 1985) [Fig. 18]
Family: Polynoioidea	Phylum: Echinodermata
Genus: <i>Lepidonotus</i>	Class: Echinozoa
Species: <i>squamatus</i> (Linnaeus, 1758) [Fig. 5]	Order: Stomopneustoida
Phylum: Arthropoda	Family: Stomopneustidae
Subphylum: Crustacea	Genus: <i>Asterias</i> sps (Linnaeus, 1758) [Fig. 19]
Class: Malacostraca	Subphylum: Asterozoa
Order: Decapoda	Class: Ophiurozoa
Superfamily: Alpheoidea	Order: Ophiurida
Family: Alpheidae	Family: Ophiothricidae
Genus: <i>Alpheus</i>	Genus: <i>Ophiothrix</i>
Species: <i>melabaricus</i> (Fabricus, 1798) [Fig. 7]	Species: <i>fragilis</i> (Adildgard, 1789) [Fig. 20]
Genus: <i>Alpheus</i> sp. [Fig. 8]	Suborder: Ophiurina
Order: Decapoda	Family: Ophiocomidae
Superorder: Pleocyemata	Genus: <i>Ophiocomina</i>
Infraorder: Brachyura	Species: <i>nigra</i> (Adildgard, 1789) [Fig. 21]
Genus: <i>Charybdis</i>	Class: Asterozoa
Species: <i>truncate</i> (Fabricus, 1798) [Fig. 9]	Order: Forcipulatida
Infraorder: Brachyura	Family: Asteridae
Family: Menippidae	Genus: <i>Stomopneustes</i>
Genus: <i>Menippe</i>	Species: <i>variolaris</i> (Lamarck, 1816) [Fig. 22]
Species: <i>rumphii</i> (Fabricus, 1798) [Fig. 10]	Sub phylum: Crinozoa
Genus: <i>Eurydice</i>	Class: Crinozoa
Species: <i>pulchra</i> (Latreille, 1817) [Fig. 11]	Sub class: Articulata

Order: Amphipod	Order: Comatulida
Family: Corophiidae	Genus: <i>Tropiometra</i> sp. [Fig. 23]
Genus: <i>Corophium</i>	
Species: <i>triaenonyx</i> (Stebbing, 1904) [Fig. 12]	
Phylum: Mollusca	
Class: Gastropoda	
Superfamily: Lottiodea	
Family: Nacellidae	
Subfamily: Nacellinae	
Genus: <i>Cellana</i>	
Species: <i>radiata</i> (Born, 1778) [Fig. 13]	



Fig 1: Map showing the location of sampling area





4. Acknowledgements

The authors are grateful to the Head, Department of Marine Living Resources, Andhra University, Visakhapatnam for providing facilities.

5. References

- Nair and Thumphy. A Text book of Marine Ecology, New Delhi, India. The Mac Millon Company. 1990.
- Genzano G. Hydroid epizotes on *Tubularia crocea* (Agassiz, 1862) and *Sertularella mediterranea* Hartlaub, 1901 (Hydrozoa, Cnidaria) from intertidal of Mar del Plata (Argentina). Russian Journal of Marine Biology. 1998; 24:123-126.
- Genzano G. Associated fauna and sediment trapped by colonies of *Tubularia crocea* (Cnidaria, Hydrozoa) from the rocky intertidal of Mar del Plata, Argentina. Biocientificas. 2001; 9:105-119.
- Genzano G. Associations between pycnogonids and hydroids from the Buenos Aires littoral zone, with observations on the semi-parasitic life cycle of *Tanystylum orbiculare* (Ammonotheidae). Scientia Marina. 2002; 66:83-92.
- Thomas JD. Ecology and behavior of *maxillipeds commensalism*, a gorgonophile amphipod from Madang, Papua New Guinea (Crustacea, Amphipoda, Maxillipodiidae), Bulletin of Marine Science. 1996; 58:314-323.
- Heard RW, Spotte S. Pontoniinea shrimps (Decapoda, Caridea, Palaemonidae) of North West Atlantic. *Periclimenes mcllelandi*, a new species, a gorgonian associate from Pine Cay, Turks and Caicos Islands, British West Indies. Proceedings of the Biological Society of Washington. 1997; 110:39-48.
- Goh-Nigel C, Ng PL, Chou LM. Notes on the shallow water gorgonian associated fauna on coral reefs in Singapore. Bulletin of Marine Science. 1999; 65:259-282.
- Humes AG. Sabelliphilid copepods (Poecilostomatoida) associated with cnidarians in the Philippines. Bulletin of Marine Science. 1990; 47:581-597.
- Grange KR. Mutualism between the antipatharian *Antipathes fiordensis* and the ophiuroid *Astrobrachioon constrictum* in New Zealand fjords. Hydrobiologia. 1991; 216:297-303.
- Reed JK, Mikkelsen PM. The molluscan community associated with the scleractinian coral *Oculina varicosa*. Bulletin of Marine Science. 1987; 40:99-131.
- Arvanitides C, Koukouras A. Polychaete fauna associated with the coral *Cladocora caespitosa* (L.) in the eastern Mediterranean. Mémoires du Muséum National d'Histoire Naturelle, Série A (Zoologie). 1994; 162:347-353.
- Nogueira JMM. Anelídios poliquetas associados ao coral *Mussismilia hispida* (Verrill, 1868) em ilhas do litoral do estado de São Paulo. Doctoral Thesis, Univ. de São Paulo. 2000, 265.
- Kenneth Sebens P. Intertidal distribution of zoanths on the caribbean coast of panama: effects of predation and desiccation. Bulletin of marine science. 1982; 32(1):316-335, 982.
- Reed JK, Mikkelsen PM. The molluscan community associated with the scleractinian coral *Oculina varicosa*. Bulletin of Marine Science. 1987; 40:99-131.
- Humes AG. Sabelliphilid copepods (Poecilostomatoida) associated with cnidarians in the Philippines. Bulletin of Marine Science. 1990; 47:581-597.
- Gleibs S, Mebs D. Sequestration of a marine toxin. Coral Reefs. 1998; 17:338.
- Pe'rez CD, Vila-Noval DA, Santos AM. Associated community with the zoanths *Palythoa caribaeorum* (Duchassaing & Michelotti, 1860) (Cnidaria, Anthozoa) from littoral of Pernambuco, Brazil, Hydrobiologia. 2005; 548:207-215.
- Timothy Swain D. Evolution of Host Associations in Symbiotic Zoanthea. A Dissertation Submitted For Ph.D, The Florida State University, College of Arts and Sciences. 2010.
- Trivedi JN, Arya S, Vachhrajani KD. Study of the Macro Faunal Associates of the Littoral Zoanthid *Palythoa mutuki* (Cnidaria, Anthozoa) from Saurashtra Coast, Gujarat, India. International Journal of Marine Science. 2014; 4(34):1-9.
- Emanuelle Fontenele Rabelo, Symbiodinium diversity associated with zoanths (Cnidaria: Hexacorallia) in Northeastern Brazil. Symboisis, 2014; DOI 10.1007/s13199-014-0308-9.
- Pareshporiya, Bhavikvakani, Bhavendrachaudhari, Pradipkachhiya and Rahulkundu Diversity and first record of heterobranch gastropods (opisthobranchs) from the Saurashtra coast of Kathiawar Peninsula, India. 2015.
- Chhapgar BF. Marine Crabs of Bombay State. Contribution No. 1 of the Taraporevala Marine Biological Station. Marine Biological Station, Department of Fisheries, Mumbai, India. 1957.
- Kollimalai Sakthivel, Antony Fernando. Brachyuran crabs diversity in Mudasal Odai and Nagapattinam coast of South east India. 2012; 1(4):136-143.
- De Hortog JC, Vennam J. Some actinaria (Cnidaria: Anthozoa) from the west coast of India. Zoologische Mededelingen, 1993; 67:601-603.
- Apte D. Book of Indian shells. Bombay Natural History Society, Mumbai, India. 1998.
- Marymegan Daly, Mercer R Brugler, Paulyn Cartwright, Allen G Collins, Michael N Dawson, Daphne G Fautin *et al.*, The phylum Cnidaria: A review of phylogenetic patterns and diversity 300 years after Linnaeus. Zootaxa. 2007; 1668:127-182.
- Trivedi JN, Vachhrajani KD. First record of two porcellanid crabs from Gujarat state, India (Crustacea: Decapoda: Porcellanidae). Journal of Marine Biological Association of India. 2013; 55(1):55-58.