Vol 5 Issue 1 July 2015

ISSN No :2231-5063

International Multidisciplinary Research Journal

Golden Research Thoughts

Welcome to GRT

RNI MAHMUL/2011/38595 **ISSN No.2231-5063**

Golden Research Thoughts Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial board.Readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

International Advisory Board

Editorial Board

Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.aygrt.isrj.in

Golden Research Thoughts
ISSN 2231-5063

Impact Factor : 3.4052(UIF)
Volume - 5 | Issue - 1 | July - 2015

A SURVEY OF GASTROPODS FROM TUTICORIN COAST

S. Jesily[1] and R. Rooslin[2]

Abstract

Gastropod molluscs are represented by chank, top shells, turbo shell and a variety of ornamental species contribute to the marine fisheries . The present investigation is an attempt to assess the diversity of gastropods and their utilization in Tuticorin coast. In the present study 37 species of gastropods belong to 21 families, including 12 edible species were recorded. The gastropods species Xancus pyrum, Babylonia spirata, Babylonia zeylanica, Chicoreus ramosus, Chicoreus virgineus, Lambis lambis, Lambis truncata and Cypraea tigris were recorded as the most abundant species. After extraction of the muscle for food the chank shells are cleaned and marketed and form the basis for the shell craft articles.

Keywords : *Tuticorin coast, fisheries, species, marine gastropods, ornamental shell, handicrafts.*

Short Profile

S. Jesily is working as an Associate Professor of Zoology at St. Mary's College (Autonomous), Thoothukudi. She Has Completed M.Sc. and M.Phil. She Has Professional Experience 30 Years.

INTRODUCTION

Phylum Mollusca constitutes dominant groups of animals and includes a variety of most conspicuous, animals such as clams, oysters, snails, squids and octopods (Kotpal, 1989). Most of the molluscs are very beneficial to the mankind. The molluscs are a great source of human food in various parts of the world and the shells are used for making ornaments and jewellery (Jordan and Verma, 2005).

Venkatraman and Wafar (2005) reported that about 5070 species of molluscs are present in India of which 3370 species are inhabiting marine waters. Subha rao (2003) has compiled detailed information on gastropod resources and identification keys in Gulf of Mannar region. So far about 484 species of molluscs were reported from this region, out of which 260 species were gastropods (Kannaiyan and Venkatraman, 2008). Among molluscs gastropods represent the highest number with 1650 genera. Devaraj (1998) recorded 100 species of gastropods while Annadurai (2006) recorded 115 species of gastropods in the region of the Gulf of Mannar.

Some notable contributions on molluscs include Pillai et al. (2000) on the edible and ornamental gastropod resources along the Indian Coast; Arjunan Babu et al. (2011) on the molluscan fishery resources of India; Anbuselvi *et al*. (2009) on bioactive compounds from molluscs; Chellam *et al.* (2009) on medicinal uses of molluscs; Anand et al. (2010) on nutrients in molluscs, Venkatesan (2010) on marine ornamental molluscs of Mandapam coast, Mohanraj *et al*. (2010) on coral reef associated gastropods in Tuticorin coast of Gulf of Mannar, Anandraj *et al*. (2012) on biodiversity of marine molluscs of Thanjavur District and Chelladurai *et al*. (2013) on marine gastropods of Tuticorin

[1]Associate Professor of Zoology, St. Mary's College (Autonomous),Thoothukudi.
[2]M.Sc., Zoology, St. Mary's College (Autonomous),Thoothukudi.

coast.

Gastropods are one commercially important organism exploited from the coast for food, extraction of lime, preparation of ornamental goods and it also serves as medicine to some extent. Now molluscs have assumed greater significance in industrial, technological and aesthetic aspects of life.

The over-exploitation and over fishing of some molluscan species as a source of food has led the gradual decline of the species. And that has brought them under the shade of endangered species. In addition to that various destructive fishing operations in the shallow coastal region of these species make facing several threats. As a result, many of the species listed in the scheduled species of Indian Wildlife Protection Act (Melkani *et al*., 2009). Details on specific aspects of Gastropods management, their relation to economic, public and ecosystem health are of paramount importance.

The present investigation is to assess the diversity of gastropods and their utilization from Tuticorin coast.

MATERIALS AND METHODS

Tuticorin is located in the central region of Indian coast of the Gulf of Mannar extending about 48km. The materials for the present study, the gastropod molluscs were collected from three landing centres Therespuram, Tharavai kulam and old harbour located along the Tuticorin coast from September 2014 to February 2015. The gastropods were obtained from regular fish landings, a wide variety of shells form a portion of the by catch in trawl nets operated for shrimps and finfish. Apart from that samples have also been collected by hand picking. The samples were brought to the laboratory and they were rinsed, adhering debris removed, sorted out species and then transferred to 4% formalin. The shell characters such as shape, spire length and shape, mouth opening, opercula shape, umbilicus shape and size, colour and ornamentation of the shell are used mainly for the identification of gastropods (Subba Rao, 2003).

RESULTS AND DISCUSSION

The gastropod fisheries are of sustenance, nature and used for edible purpose, source of lime, as decorative shells or for industrial purpose. Gastropoda is the largest molluscan class with about 35,000 species (Narasimham, 2005). Presently, over 20,000 tones of gastropods are exploited from Indian waters (Mohamed, 2006). Anandaraj *et al*. (2012) revealed a biodiversity study of the marine molluscs of Thanjavur district in Tamil Nadu, reported about 20 species of class gastropoda. Devdatta *et al*.(2011) recorded 14 species of gastropods from Rangaon beach, Maharashtra. Chelladurai *et al*.(2013) recorded 20 species of gastropods from Tuticorin coast. Presently, about 37 gastropod species were collected from the study area (Table.1& Fig. 1).

Table. 1. List of gastropods collected from Tuticorin Coast

S.No	Species	Family	Common name	Vernacular Name
1	*Architectonica perspectiva*	Architectonicidae	Clear sundial shell/ Painted sundial shell	
2	*Babylonia spirata spirata*	Buccinidae	Turnips Rapa	Puramuttai
3	*Babylonia zeylanica*	Buccinidae	Indian Babylon(or) Srilankan Babylon	Puramuttai
4	*Bursa crumena*	Bursidae	Purse frog shell	
5	*Conus amadis*	Conidae	Amadis cone	Vazhi poo

6	*Conus araneosus*	Conidae	Cobweb cone	Vazhi poo
7	*Cymatium perryi*	Cymatiidae	Perry's triton	Pillayarsanku
8	*Cymatium spp*	Cymatiidae		
9	*Cymatium spp*	Cymatiidae		
10	*Cypraea ocellata*	Cypraeidae	Ocellated cowry	Sozhi/Mani
11	*Cypraea tigris*	Cypraeidae	Tiger cowry	Sozhi/Mani
12	*Erosaria erosa*	Cypraeidae	Cowries	Sozhi/Mani
13	*Lyncina vitellus vitellus*	Cypraeidae		Sozhi/Mani
14	*Harpulina lapponica*	Volutidae		
15	*Ficus variegata*	Ficidae		
16	*Fusinus nicobarica*	Fasciolariidae	Nicobar spindle	Vellaichaval
17	*Harpa major* (*Harpa conoidalis*)	Harpidae	Harp snail	Sarpakoodu
18	*Hemifusus cochlidium*	Melongenidae	Spiral melongena	Sanku
19	*Lambis crocata*	Strombidae	Common spider	
20	*Lambis lambis*	Strombidae	Common spider	Arivalsanku
21	*Lambis truncata*	Strombidae	Giant spider	
22	*Laevistrombus canarium*	Strombidae	Dog conch	
23	*Strombus marginatus*	Strombidae	Marginate conch	
24	*Strombus bulla*	Strombidae		
25	*Chicoreus ramosus*	Muricidae	Romosa murex	Kata sanku
26	*Murex virgineus*	Muricidae	Virgin murex	
27	*Murex virgineus var ponderosa*	Muricidae	Virgin murex	
28	*Murex trapa*	Muricidae	Rare-spined murex	
29	*Murex ternispina*	Muricidae	Shallow sandy bottoms	
30	*Natica marochiensis*	Naticidae	Moroccan moon	
31	*Oliva caerulea caerulea*	Olividae		Kovanchu
32	*Phalium glaucum*	Cassidae	Grey bonnet	
33	*Trochus radiatus*	Trochidae	Top shell	
34	*Turritella attenuata*	Turritellidae	Screw shell	
35	*Tonna galea*	Tonnidae	Giant tun	
36	*Xancus pyrum*	Turbinellidae	Sacred chank	Sanku
37	*Xenophora corrugata*	Xenophoridae	Xenophoriidae	

Figure. 1 Gastropods Species Collected From Tuticorin Coast

Harpulina lapponica ***Oliva caerulea*** ***Murex ternispina*** ***Erosaria erosa***




Xancus pyrum

Lyncina vitellus

Turritella attenuata

Strombus bulla

Murex trapa

Trochus radiatus

Architectonica perspectiva

Bursa crumena

Conus amadis

Cymatium sp

Cymatium sp

Cypraea ocellata

Tonna galea

Fusinus nicobarica

Natica marochiensis

Lambis corcata

Strombus marginatus

Lambis truncata

Lambis lambis

Xenophora corrugata

Babylonia spirata

Babylonia zeylanica

Conus araneosus

Chicoreus virgineus

Chicoreus ramosus

Cypraea tigris

Murex virgineus var ponderosa

Hemifusus cochlidium

Cymatium perryi

Harpa conoidalis

Laevistrombus canarium

Phalium glaucum

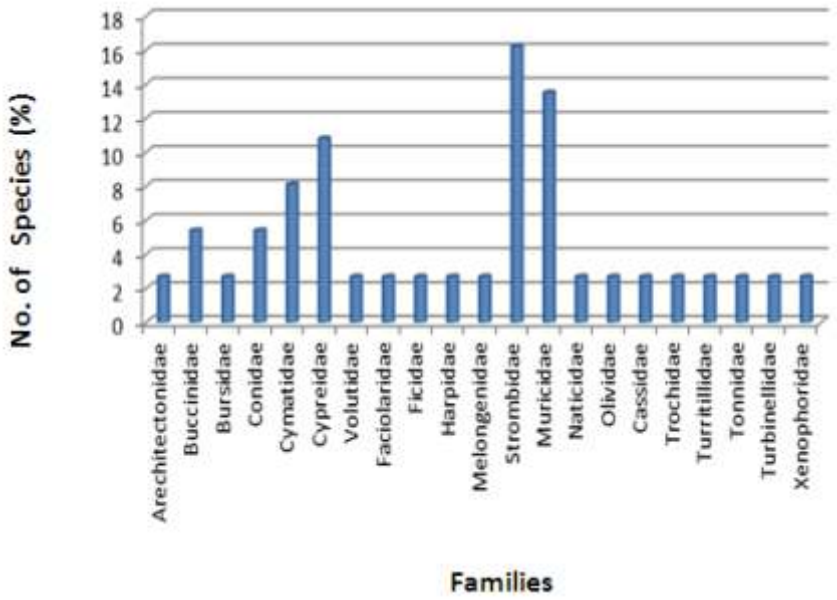
Ficus variegata

These gastropods are classified under 21 families (Table.2 and Fig.2).

Table -2 Gastropod Families Recorded

S.No	Family	Species recorded	Percentage
1	Architectonicidae	1	2.70
2	Buccinidae	2	5.41
3	Bursidae	1	2.70
4	Conidae	2	5.41
5	Cymatiidae	3	8.11
6	Cypraeidae	4	10.81
7	Volutidae	1	2.70
8	Faciolariidae	1	2.70
9	Ficidae	1	2.70
10	Harpidae	1	2.70
11	Melongenidae	1	2.70
12	Strombidae	6	16.22
13	Muricidae	5	13.51
14	Naticidae	1	2.70
15	Olividae	1	2.70
16	Cassidae	1	2.70
17	Trochidae	1	2.70
18	Turritellidae	1	2.70
19	Tonnidae	1	2.70
20	Turbinellidae	1	2.70
21	Xenophoridae	1	2.70
Total		**37**	

Figure 2 Gastropod Families Recorded



Among them the species belongs to families Strombidae, followed by Conidae, Cypraeidae, Cyamatiidae and Muricidae were maximum observed. The families Buccidae, and Conidae are represented by two species each and the remaining 13 families are represented by each one species. During the study period, 12 species of edible gastropods were recorded and are presented in Table.3

Table-3 List of Edible Gastropods Collected From Tuticorin Coast

S.No	Name of the species	Family
1	*Babylonia spirata spirata*	Buccinidae
2	*Babylonia zeylanica*	Buccinidae
3	*Bursa crumena*	Bursidae
4	*Cypraea ocellata*	Cypraeidae
5	*Cypraea tigris*	Cypraeidae
6	*Ficus variegata*	Ficidae
7	*Hemifusus cochlidium*	Melongenidae
8	*Lambis crocata*	Strombidae
9	*Lambis truncata*	Strombidae
10	*Chicoreus ramosus*	Muricidae
11	*Murex virgineus*	Muricidae
12	*Xancus pyrum*	Turbinellidae

Pillai and Menon (2000) stated that among the several species of gastropods that are exploited from the intertidal and shallow waters of the east and west coasts of India, Lakshadweep and Andaman and Nicobar Islands, only 12 Species are edible. Presently the edible gastropods observed maximum were *Xancus pyrum, Babylonia spirata, Babylonia zeylanica, Hemifusus pugilinus, Ficus variegate, Chicoreus ramosus, Chicoreus virgineus, Lambis lambis and Cypreae tigris.*

Nayar and Mahadevan (1973) have dealt with the chank fisheries and the industrial uses of the shells along Tuticorin coast. The scale of international trade in ornamental shell has recently become a subject of considerable concern. Abbot (1980) estimated that some 5000 molluscs species are involved in the ornamental shell trade.The ornamental gastropods collected presently and some uses of these shells are listed in Table. 4 and Fig.3.

Table- 4 Some uses of gastropod shells

	examples of molluscs	out lets/products
Ornamental shells	Mostly large, colourful, relatively, cheap, plentiful, mostly gastropods, some bivalves including giant clams *Babylonia spirata spirata* *Babylonia zeylanica* *Bursa crumena* *Cymatium perryi* *Cypraea tigris* *Ficus variegata* *Harpa major* *Hemifusus cochlidium* *Lambis lambis* *Phalium glaucum* *Xancus pyrum*	Whole shells used as a souvenirs and decorations
"Rare" or specimen shells	Few in trade; expensive; mostly narrow endemics &/or deep water gastropods *Babylonia spirata spirata* *Babylonia zeylanica* *Harpulina laponica* *Hemifusus cochlidium* *Lambis lambis* *Lambis truncata* *Murex virgineus* *Murex virgineus var pondersosa* *Phalium glaucum* *Trochus radiatus*	Collector's items
Shell crafts	*Conus* spp *Xanchus pyrum* *Babylonia* spp *Strombus* spp *Cyprea* spp *Lambis* spp *Olivs* spp.	Necklaces, ear drops, beats for the neck, hair pin ,fantency flower Flower vases, shell screens for windows and door curtains Table lamps Lamp shapes Chains, necklaces Gods, Pen stand, bangles.

Fig. 3. Some uses of gastropod shells

Several species of shell animals which occur in Tuticorin coast contribute raw materials for ornamental shell industry at Kealakarai, Rameswaram and Kaniyakumari.

The chank fishery has been well documented, The gastropod *Xancus pyrum* seldom used as food but the shell is commonly sold, in souvenir shops. The chank shells are used to make bangles which are quite popular in West Bengal. *Harpa conoidalis* the whole shell is rather polished, and is one of the most attractive of the marine shells from the South east coast of India. In this respect the gastropod shells rank first fetching good prices.

Babylonia spirata and *B .zeylanica*, locally known as pravumutta chank and commonly known as whelks, from Japan there is a good demand for frozen meat and shell of whelk.

Wing shells are moderately large gastropods with finger lobe projection on the shell margin.The five fingered Chank *Lambis lambis* is found on east and west coast and are fished for making lamps, bathi stands and other items. The scorpion shell *Lambis crocata*, the sacred chank Xancus pyrum and the tun-shell Tonna galea are the important large ornamental molluscs.

Patterson et.al. (1994) reported that there is a good landing of *Chicoreus ramosus* and *Pleuroploca trapezium* in the Gulf of Mannar and Palk Bay coast. Much demand exists for the shell meat and the operculum of these species. About 75 to 100 tonnes of these species are collected annually from this coast.

The cowries are shells of good commercial value. Several species of cowries are found on our coasts. This cowry is ptirchased in dozens by people in India for dice-playing. The tiger cowry *C.tigris* covered with large brown spots are beautiful, glossy shells that are used for interior decoration on tables and shelves. Shells like olives *(Oliva caerulea), Strombus canarium, Laevis strombus canarium* are made into toys and dolls as figures of birds, human beings etc. by gluing the shells together. Some utility articles are also made from some gastropod shells. By boring an opening at the top of the spire of the chank *Xancus*, baby milk feeders and blowing conches are made. Ash trays are made by mounting shells of *Xancus on wooden* bases. Large shells of *Murex* are used as lamp shades and ash trays. Rings made out of shells of *Srtombus canarium* are worn on fingers by some people in Tamil Nadu and in chains in Malabar and Karnataka.

The operculum of gastropods popularly known as ''Fish nail'' is exported. Merchants collect the opercula of all species, cleaned it in fresh water, sun dried and send them for exporting. The current price of 1 kg of

operculum varies from Rs. 350-400.100 Kg of gastropod shells usually yield, 1 Kg of opercula.

CONCLUSION

For the protection and sustainable fishery of marine gastropods in Gulf of Mannar Biosphere Reserve, absolute information on biology and distribution is indispensable. Since most of the marine gastropods are very intimately connected with coral reef ecosystem either for food, shelter or reproduction, it is greatest significant to save the coral reef ecosystem which in turn conserves the gastropods. The precise biology of most of the gastropods apart from few, their function and relation to the food chain or food web, how the exhaustion influences the other species is not yet obviously known. Therefore, the species which are already in the list of scarce and in jeopardy species or fall under the Wildlife Protection Act require particular concentration. Severe rules and regulation should be applied so such species will be protected from destroyed. Scientific technologies have been innovated for the conservation and development of natural stocks such as transplantation and sea ranching. Transplantation is cost effective but it is hard to find out the brood stock of a meticulous species and its additional collisions on the other systems on that scrupulous area. Thus gastropods inward bound considerable attention in current years due to great demand for meat and as an ornamental shell for shell handicrafts.

BIBLIOGRAPHY

1.Abbot, R.T. 1980. The Shell Trade in Florida: Status Trade and Legislation Special Report 3, TRAFFIC (USA), Washington, DC.

2.Anandaraj, T., Balasubramanian, V., Murugesan, P. and Muthuvelu, S. 2012. Biodiversity of Marine Molluscs in East Coastal area of Thanjavur district, Tamil Nadu, India. Pharma and Biol. Archives. 3(1): 131-133.

3.Anbuselvi, S., Chellam,C., Jonesh.S., Jayanthi,A. and J.K.P. Edward. 2009. Bioactive potential of coral associated gastropods, Trochus tentotium of Gulf of Mannar, Southeastern India. Journal of Medicinal Science 9 : 240-244.

4.Annadurai, D.2006. Gastropods diversity of the Gulf of Mannar. Marine Biosphere Reserve, Tamil Nadu, India. J. Aqua. Biol. 21 (1) : 49-52.

5.Arjunan Babu, VellathiVenkatesan and Santhanam Rajagopal. 2011. Contribution to the Knowledge of Ornamental Molluscs of Parangipettai, Southeast Coast of India. Advances in Applied Science Research , 2(5): 290-296.

6.Chelladurai,G., Mohanraj J. and Sasirakhamani. 2013 . Distribution of Marine gastropods in TuticorinCoast . Gulf of Mannar, India. International Journal of Pharmalcutical & Biological Archives 4 (2) : 371-374.

7.Chellam, C. and J.K.P. Edward.2009. Invivoanti- inflammatory bustle of reef associated mollusc, Trochus tentorium. Advanced Biotech (June) 9 : 32-34.

8.Chellam, C. and J.K.P Edward.2009. Antinociptive assets of coral associated Gatropods, Drupa margariticola. International Journal of Pharmacology 5: 236-239.

9.Devaraj, M.1998. Conservation and Sustainable management of the marine living resource of the Gulf of Mannar. Marine Biosphere Reserve. Proc. Tech. Workshop held at Chennai Feb 10-11, pp. 128-149.

10.Devdatta Gopal Lad and Shashikantpatil. 2011. Seasonal Variation of Gastropoda and Bivalvia Fauna from Ranganon Beach, Vasai in Maharashtra, India. The Ecoscan 5(3&4) : 185-187, 2011.

11.Jordan, E. L. and Verma, P.S. 2005. Invertebrate zoology, S. Chand and Company Ltd, pp.517-518.

12.Kannaiyan, S. and Venketraman, K. 2008. Biodiversity conservation in Gulf of Mannar Biosphere Reserve, National Biodiversity Authority Publ., Chennai. pp:484.

13.Kotpal, R. L. 1989. Mollusca, Rastogi Publications, 1.

14.Melkani. V.K., J.K.P. Edward, Murugan, A. and

A. Naganathan .2009. Capacity building in identification of marine scheduled Animals: Training cum information manual. Gulf of Mannar Biosphere Reserve Trust Publi. No. 8 pp : 82.

15.Mohamed, K. S. 2006. Mollucan Fisheries, In: Handbook of Fisheries and aquaculture, Ayyapan S. (ed) Indian Council of Agricultural Research, New Delhi, pp: 116-134.

16.Mohanraj, J., J.A Johnon, RakeshRajan, LidwinJohnon, Uma Pandi and T. Shunmugaraj. 2010. Coral reef associated gastropods in Tuticorin coast of Gulf of Mannar biosphere reserve, India. Indian Journal of Science and Technology Vol 3 No.2 ,

17.Narasimham, K. A. 2005. Molluscan Fisheries of India. B. K. Publication, New Delhi, pp. 348.

18.Nayar, K.N and S. Mahadevan.1974. Chank and Industrial use of chank. The commercial molluscs of India. CMFRI Bulletin No. 25:122-140.

19.Pillai,V.N. and N.G.Menon. 2000. Edible and Ornamental resource gastropods. Marine Fisheries Research and Management 34:525-535.

20.Subba Rao, N.V. 2003. Indian Seashells (part 1): Polyplacoptera and Gastropod. Zoological Survey of India. pp: 426.

21.Venkataraman, K. and Wafar, M. 2005. Coastal and marine biodiversity of India. Indian J. Mar. Sci., 34 (1) : 57 – 75.

22.Venkatesan, V. 2010. Marine Ornamental Molluscs. National Training programme On Marine Ornamental Fish culture at Mandapam CMFRI. pp 27-32.

S. Jesily
Associate Professor of Zoology, St. Mary's College (Autonomous), Thoothukudi.

R. Rooslin
M.Sc., Zoology, St. Mary's College (Autonomous),Thoothukudi.

Publish Research Article
International Level Multidisciplinary Research Journal
For All Subjects

Dear Sir/Mam,

We invite unpublished Research Paper,Summary of Research Project,Theses,Books and Book Review for publication,you will be pleased to know that our journals are

Associated and Indexed,India

- International Scientific Journal Consortium
- OPEN J-GATE

Associated and Indexed,USA

- EBSCO
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Databse
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database
- Directory Of Research Journal Indexing

Golden Research Thoughts
258/34 Raviwar Peth Solapur-413005,Maharashtra
Contact-9595359435
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com
Website : www.aygrt.isrj.in