

By-catch Landing of Lambis Gastropods in Gulf of Mannar Coast, Tamil Nadu

Lidwin Annamary* and J. Mohanraj

Department of Advanced Zoology and Biotechnology, Kamaraj College, Tuticorin – 628003, Tamil Nadu, India; lidwin2014@gmail.com, jmohanrajathir@gmail.com

Abstract

A field survey was carried out to assess the availability of *Lambis* species in by-catches of four fish landing centres (Tuticorin, Velapatti, Vembar and Ramanathapuram) in Gulf of Mannar coasts. At each centre, by-catch trash from 10 fishing vessels were screened for 15 days randomly between April and May 2012. Five species of *Lambis* namely *L. lambis*, *L. chiragra*, *L. crocata*, *L. scorpius* and *L. truncate* were recorded from the by-catches. Among the species, *L. crocata* was more commonly observed shells in by-catch survey and high number of *Lambis* species turnover was recorded in Vellapatti landing centre. The results indicate that indiscriminate collections of prohibited species are still underway in the Gulf of Mannar coasts.

Keywords: Gastropod, *Lambis*, By-catch Survey, Gulf of Mannar, Tamilnadu

1. Introduction

The molluscs constitute a natural resource of sizable magnitude in many parts of the world. They are a group of great diversity in size, distribution, habitat and utility. Oysters, mussels, clams, pearl oysters and chank are the important molluscs, exploited in Indian coast from time immemorial. Gastropod and bivalve fisheries are of sustenance nature when they are harvested for edible purpose, but they are unsustainable when they are used as source of lime, as decorative shells or for industrial purpose. The molluscs sustain regular and very productive fisheries in Indian waters. Among the molluscs, the *Lambis* genus is one of the diverse group of gastropods (Mesogastropoda) in terms of species number as well as their wide range of distribution. The shells of *Lambis* gastropods show a wide variety of forms ranging from small sized shells to large and elaborately ornamented with strongly flatted outer lip with radiating spines¹. Rao² has compiled detailed information on gastropod resources in Gulf of Mannar region with identification keys. So far about six species of species *Lambis* gastropods namely *L. chiragra*, *L. crocata*, *L. lambis*, *L. millepeda*, *L. scorpius* and *L. truncate* were

recorded from Gulf of Mannar coasts. Among the species *Lampis millepeda* is quite rare and less abundance in Gulf of Mannar coasts²⁻⁴.

Earlier gastropod collection are considered as a by-catches of shrimp and lobster fishery in Gulf of Mannar coast and later the situation has changed, the molluscan fishery are intensified due to market driven demand⁵. *Lambis* species are long being commercially exploited from the sea for food, medicine, tools and ornaments. So far, these resources are largely looked as a source of commercial products which has resulted in overexploitation rather than appreciating their ecological values. Moreover, human activities such as multiplication of mechanized boats, indiscriminate collection of seaweeds, improper fishing methodology, indiscriminate harvesting of young ones, trawl net operation, coastal developments and discharge of industrial effluents have caused considerable decline in population during the last decades. In order to conserve and protect the species from commercial exploitation, all *Lambis* species of India were protected under the Indian Wildlife Protection Act 1972³. As a result the natural harvesting of protected marine gastropods was stopped in Gulf of Mannar coasts.

* Author for correspondence

However, these shells are often available in the fish landings as part of incidental catches of various net operations. In this background a survey was conducted between April and May 2012 to understand the availability of *Lambis* species in fishery by-catches in Gulf of Mannar coasts.

2. Materials and Methods

The Gulf of Mannar Biosphere Reserve is one of the important Marine Protected areas in India, established in 1989. It covers an area of 10,500 sq km, including 21 uninhabited islands and surrounded coastline running southwards and parallel to the mainland coastline to a distance of about 300 km including National Park area of 560 sq km as core area and 10 km wide buffer zone. In the present study four major landing centres were selected for by-catches survey, they are: Tuticorin fishing harbour, Vellapatti village, Vembar and Ramanathapuram

(Figure 1). All landing centres are periodically visited between April and May 2012 and *Lambis* shells present in by-catches (locally called 'kalasal') were screened. At each centre by-catch trash from 10 fishing vessels were screened randomly for fifteen days. The identification of different species of *Lambis* shells were followed the hand book on Indian shells⁶. In addition to that informal interview was conducted with fishermen from different vessels. During the interaction the information on fishing methods, type of gears used and knowledge about protected species were recorded. Every survey number of *Lambis* species encountered and their numbers were recorded. Based on the by-catch survey, frequency distributions of respective landing centre were generated for making interpretation (Figure 1).

3. Results

A total of 468 *Lambis* shells belonging to five species

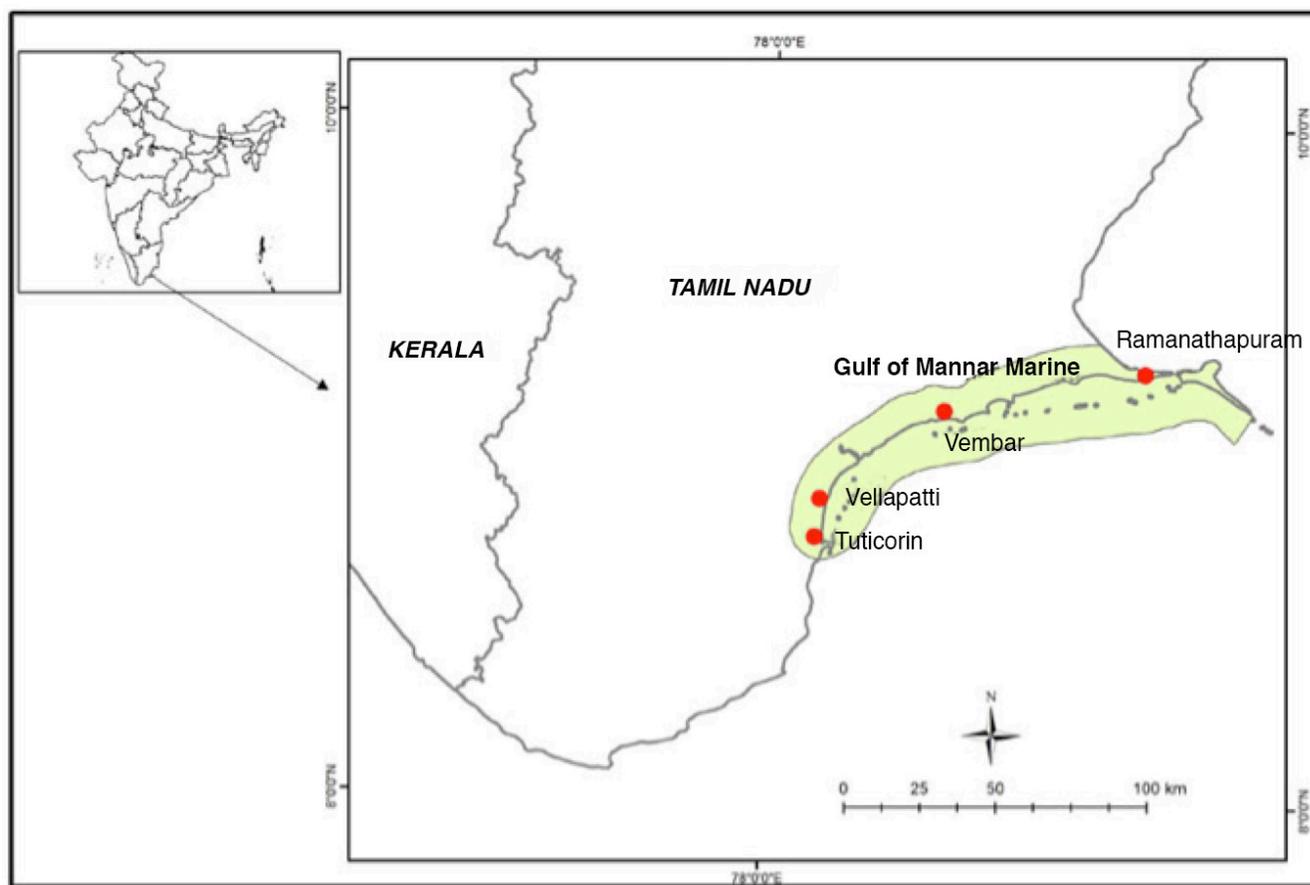


Figure 1. Map showing the sampling locations in Gulf of Mannar coast, Tamil Nadu.

were recorded from four landing centres during the study period. They are: *Lambis lambis*, *L. chiragra*, *L. crocata*, *L. scorpius* and *L. truncate* (Figure 2). Among the species *L. crocata* was the most frequently cited species in by-catches of all landing centres surveyed. Maximum numbers of *L. crocata* were recorded from the Vellapatti landing centre, where a total of 124 shells were recorded in 150 by-catch sample (10 by-catch samples x 15 days). Meantime *L. chiragra* species had less encounter rate in the by-catch sample. During the study period only 7 individuals of *L. chiragra* was recorded from the study area. Species wise record of *Lambis* species from

different landing centres are given in Table 1. Based on the survey it is found that the *Lambis* gastropod landing was more frequent in Vellapatti region and less frequent in Ramanathapuram (Table 1). Based on the information gathered from fishermen through informal interview, it is inferred that the incidental catches of gastropod shells were very common in shrimp and lobster net operation in the shallow habitats.

4. Discussion

Lambis gastropod shells are very popular and highly priced

Table 1. Number of *Lambis* shell recorded in by-catch sample from different landing centres in Gulf of Mannar coast between April and May 2012

	Tuticorin	Vellapatti	Vembar	Ramanathapuram	Total
<i>Lambis lambis</i>	24	34	12	6	76
<i>Lambis chiragra</i>	2	3	2	0	7
<i>Lambis crocata</i>	83	124	85	32	324
<i>Lambis scorpius</i>	8	32	12	0	52
<i>Lambis truncate</i>	4	9	3	0	16
	121	202	112	38	468

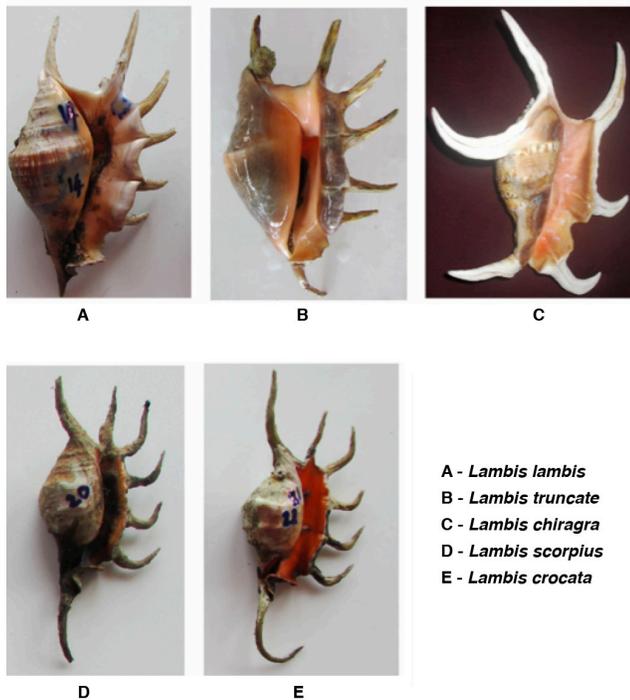


Figure 2. *Lambis* species recorded from by-catches of four landing centres in Gulf of Mannar coasts, Tamil Nadu.

ornamental shells in marine curio. Once these species were highly exploited species from the Gulf of Mannar Coasts. More than 1000 fishermen were actively engaged for molluscan fishery. Later due to introduction of the stringent Wildlife Protection Act, the gastropod fishery in the Gulf of Mannar region has reduced drastically and most of the area it has been completely stopped. Even though high level of gastropod shells are happening as part of incidental catches in the bottom net operation. The availability of different species of *Lambis* in the by-catch material is quite evidence that these threatened species are being exploited indirectly by means of various net operations. Further it is also observed that the occurrences of *Lambis* species are more prevalent in by-catch materials of lobster net, locally called *chingi valai*. It is well established fact that the destructive net operations in the coastal area is one of the major causes for decline of bottom dwelling organism in Gulf of Mannar coasts⁵. Many studies have described the impacts of bottom net operation on the structure of benthic marine communities⁷⁻¹⁰. This activity changes in the relative abundance of different species in the benthic community, especially large filter-feeding molluscs, are more vulnerable to bottom trawling disturbance than others⁹.

Though these species are protected under Indian Wildlife Protection Act, the availability of these scheduled species in the by-catch is a serious concern. The State Fisheries Department in collaboration with the State Forests should take initiative to reduce such incidental catches of molluscs and proper awareness programmes need to be given to the fisherfolk for conservation of these threatened fauna.

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6. References

1. Latiolais JM, Taylor MS, Roy K, Hellberg ME. A molecular phylogenetic analysis of strombid gastropod morphological diversity. *Molecular Phylogenetics and Evolution*. 2006; 41:436–44.
2. Rao NVS. The Mollusca. In: *Faunal Diversity in India*. Envis Publication. 1998; Zoological survey of India, Calcutta. p. 426.
3. Melkani VK, Edward JKP, Murugan A, Naganathan A. Capacity building in identification of marine Scheduled Animals: Training cum information manual. Gulf of Mannar Biosphere Reserve Trust Publication. 2009(8); 82.
4. Ramesh R, Nammalwar P, Gowri VS. Database on coastal information of Tamilnadu. Envis Publication. 2008; Institute for Ocean Management, Anna University, Chennai. p.132.
5. Patterson JK. Resource management and socio-economic value in Gulf of Mannar coral reef ecosystem, south east coast of India Proceedings 9th International Coral Reef Symposium. 2000 October 23–27. Bali, Indonesia. p.1–4.
6. Apte D. *The Book of Indian Shells*. 1998. Bombay Natural History Society. p.115.
7. Knieb RT. Indirect effects in experimental studies of marine soft sediment communities. *Marine Fisheries Information Zoology*. 1991; 31: 874–85.
8. Dayton PK, Thrush SF, Agardy MT, Hofman RJ. Environmental effects of marine fishing. *Aquatic Conservation of Marine and Freshwater Ecosystem*. 1995(5): 205–32.
9. Lindeboom HJ, de Groot SJ. The effects of different types of fisheries on the North Sea and Irish Sea benthic ecosystems. 1998. Netherlands Institute of Sea Research, Texel.
10. Kaiser MJ, de Groot SJ. The effects of fishing on non-target species and habitats: biological, conservation and socio-economic issues. 2000. Blackwell Science, Oxford.