

## Fishery resources of spiny lobsters in the Andaman Island, India

T. S. Kumar, Dilip Kumar Jha, S. Syed Jahan, G. Dharani, <sup>1</sup>A. K. Abdul Nazar, <sup>2</sup>M. Sakthivel, <sup>2</sup>K. Alagarraaja, M. Vijayakumaran and \*R. Kirubakaran

National Institute of Ocean Technology, Pallikaranai, Chennai - 600 100, India, \*E-mail: [kiruba@niot.res.in](mailto:kiruba@niot.res.in)

<sup>1</sup>Central Marine Fisheries Research Institute, Mandapam Camp, Tamil Nadu.

<sup>2</sup>Aquaculture Foundation of India, 40, Kapaleeswarar Nagar, Neelankarai, Chennai - 600 041.

### Abstract

The Andaman and Nicobar (A&N) Islands is the largest archipelago in the Bay of Bengal. In spite of availability of diverse lobster resources, there is no organised lobster fishing in the Islands. The main objective of the study was to collect baseline data on the lobster resources of the Andaman Island. Periodic field surveys were carried out at 33 landing centres in the Andaman and data were collected by direct observation and questionnaires. Mechanised and non-mechanised fishing crafts are engaged in lobster fishing in the Island. Lobsters are manually caught by spears, gillnet, shoreseine and hand-picking. Six commercially important species of spiny lobsters, *Panulirus penicillatus*, *P. versicolor*, *P. homarus*, *P. ornatus*, *P. polyphagus* and *P. longipes* are present in the island. Among them, *P. penicillatus* dominated the landings throughout the study period (1999-2000), with maximum catch in January, followed by *P. versicolor*. The total lobster landings in Andaman during the study period were estimated as 3.16 tonnes with maximum landings in south Andaman (Port Blair).

**Keywords:** Spiny lobster, lobster resources, lobster fishing, lobster landings, Andaman Island

### Introduction

The Andaman & Nicobar (A&N) Islands are situated in Bay of Bengal stretching from Myanmar (Burma) in the north and to Sumatra in the south, and consist of about 572 islands and islets, of which 38 are inhabited. The archipelago covers an area of 8249 km<sup>2</sup>. Six spiny lobsters species have been reported in the A&N Islands (Silas and Alagarwami, 1983). Though this region is considered to be a potentially important area for lobster fisheries in India, there are no organised fisheries for lobsters. In the mainland of India, lobsters are mainly caught as bycatch in shrimp trawls in northwest region, whereas gill net is the most common fishing gear in south. The lobsters are also caught with trammel nets, traps and trawl nets in the southwestern and southeastern coasts (Vijayakumaran and Radhakrishnan, 1997). Fishing methods vary between the mainland of India and A&N Islands. Spiny lobsters are primarily caught by spearing using locally made bow and arrow in south Andaman (Wandoor, Guptapara, Burmanallah, Chidiyatappu,

etc.). Spearing is a traditional fishing method learnt by the settlers from the tribal population. As in the mainland, lobsters are also collected by hand-picking in some areas. However, traps made of indigenous materials used to capture lobsters in few parts of the mainland (Meenakumari and Pravin, 2010) are not employed in the Andaman Islands. Hand-picking is the most common method of lobster fishing in the north Andaman Islands. The major lobster landing centres in Andaman are Wandoor (South Andaman) and Aerial Bay (North Andaman). Lobsters are also caught from minor landing centers such as Burmanallah, Chidiyatappu, Guptapara, Sholbay, Amkunj, Nibutala, Panchvati, Smith islands, Kalipur, Paschimsagar, Ramnagar, Hutbay and Havelock. Campbell Bay is one of the lobster landing centres in Nicobar group of Islands (Fig. 1).

*Panulirus polyphagus* (mud spiny lobster), *P. ornatus* (ornate spiny lobster), *P. homarus* (scalloped spiny lobster), *P. penicillatus* (pronghorn spiny lobster), *P. versicolor* (painted spiny lobster) and *P. longipes* (long-legged spiny lobster) are common

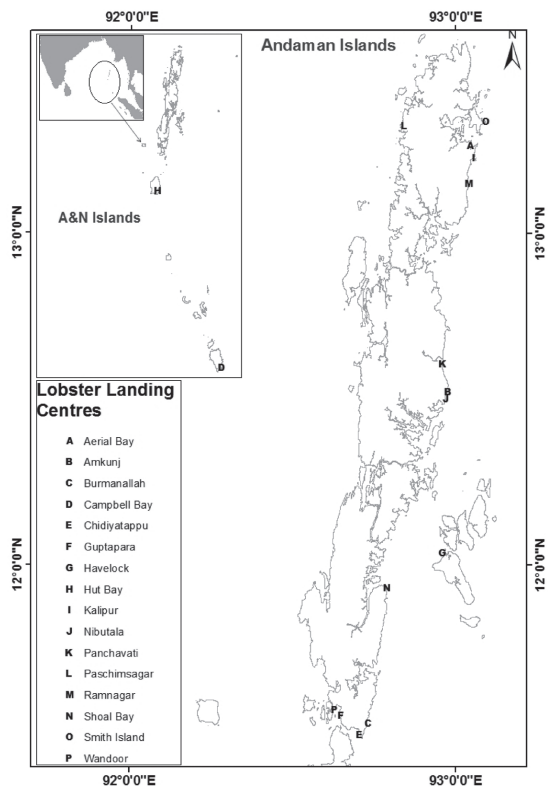


Fig. 1. Map showing the lobster landing centres in Andaman Islands

spiny lobsters reported in A&N waters. *Thenus orientalis* (slipper lobster) is also reported from south Andaman (Shanmugam and Kathirvel, 1983). There are reports of targeted lobster fisheries in A&N Islands during the 1990s. Deep sea lobsters such as *Linuparus sominius* (Ali *et al.*, 1991) and *L. andamanensis* (Mustafa *et al.*, 1990) were reported from Andaman waters. The landings of the *Nephropsis stewarti* (Wood-Mason, 1873) and *Puerulus sewelli* (Vijayakumaran and Radhakrishnan, 1997) were also reported from the Andaman region.

Lobster landings in A&N Islands have fluctuated without any distinct trend during the 1990s. Almost all the lobsters landed in Andamans are exported and the minimum export (0.9 metric tonne) was in 1996-97 and the maximum (10.1 tonnes) was in 1999-2000 with an annual average of 3.8 tonnes. The minimum recorded lobster landings during the

1990s in the mainland of India was 1923 tonnes in 1995 while the maximum was 2887 tonnes in 1997, with an annual average of 2549 tonnes, which accounted for 1.38% of the global landings (NIOT & AFI, 2000). This article aims at describing the fisheries of spiny lobsters during March 1999 to February 2000 in the main island of Andaman.

## Material and Methods

Stratified multistage random sampling method was adopted for survey of lobster resources in Andamans between March 1999 and February 2000. Sampling was conducted at 33 fish landing centres. The lobster landing centres along the Andaman coast are shown in the map (Fig. 1). Of these, three main landing centres, Port Blair (South Andaman), Mayabundar (Middle Andaman) and Diglipur (North Andaman) were selected for detailed study. At every landing centre, boats were randomly selected for five consecutive days to collect data of landings by fishing gear, species, size and sex from which mean daily landing was calculated. The total number of boats that were in operation on the five days of observation was counted and then the mean number of boats fishing on each day of that month was calculated. The total quantity of lobsters caught in each month was then computed by multiplying mean daily catch with mean number of boats operating daily and the total number of days of fishing in a month. The total number of fishing days was found out by enquiring fishers and based on these observations, the total number of fishing days was estimated for each month.

Mechanised and nonmechanised fishing craft operate in Andaman. There is significant difference in the quantity of lobsters caught between these crafts. Fishing was almost continuous throughout the year except when the sea is rough and during festival times. The annual landing of lobsters for the year 1999-2000 was calculated by adding the catches obtained for 12 months from March 1999 to February 2000. The total length (TL) of lobsters was measured from the transverse ridge between the supraorbital horns to the tip of telson, and the carapace length (CL) from the transverse ridge to the posterior margin of the carapace.

**Results**

The lobster landings between March 1999 and February 2000 were estimated as 3.16 tonnes for the Andaman Island. Port Blair contributed the maximum of 2.30 t followed by Diglipur (0.78 t) and Mayabunder (0.09 t). September-October (16,130 units) and January-February (16,897 units) were the peak seasons for gillnet operation. The maximum lobster landings was observed in January (2.30 t) when the giant lobster (*P. penicillatus*) yielded catch per unit effort (CPUE) of 7.2 kg in Port Blair. The contribution in January was 72% followed by May and July (5% each) (Fig. 2).

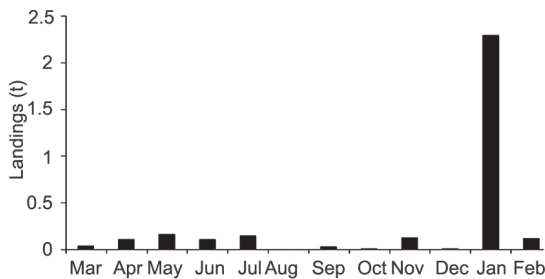


Fig. 2. Monthly lobster landing (tonnes) in the Andaman Islands during March 1999 to February 2000

At Port Blair, *P. penicillatus* dominated the catch (2.12 t) followed by *P. versicolor* (0.12 t), *P. longipes* (0.03 t), *P. polyphagus* (0.02 t) and *P. homarus* (0.01 t). The Port Blair region contributed about 72% to total catch followed by Diglipur (25%) and Mayabunder (3%) (Fig. 3). Diglipur (0.78 t) is considered to be one of major lobster landing centres. Spearfishing (locally called bow and arrow method) contributed the maximum of 2.38 tonne forming 75% of the total lobster landings in Andaman followed by gillnets (0.56 t), hand-picking (0.22 t) and shoreseine (0.01 t) (Fig. 4). The giant lobster (*P. penicillatus*) landings was 2.13 t contributing 67% to the total lobster landings in Andaman coast. *Panulirus versicolor* formed 26% while *P. ornatus* and *P. homarus* contributed 2% each to the catch (Fig. 5).

The sex ratio showed dominance of females. Juveniles in the size group of 50 to 100 mm TL were generally observed during mid November to February in shallow, nearshore waters and berried

females were observed during October-January. Though lobsters were caught throughout the year in Andaman, the peak landing was in January. This trend is slightly different from the mainland where the peak seasons were October-December and April-May (Radhakrishanan et al., 2005).

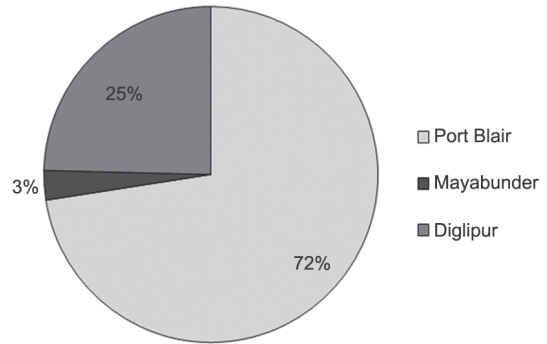


Fig. 3. Contribution of three lobster landing centres to the total landings of the Andaman Islands

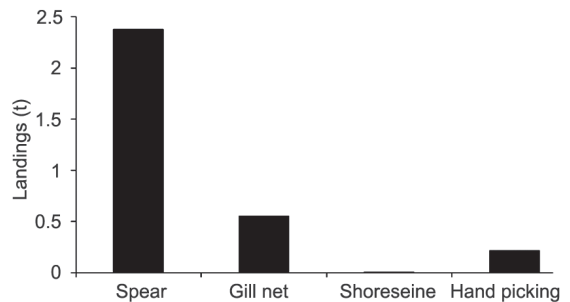


Fig. 4. Lobster landings by fishing gear in the Andaman Islands

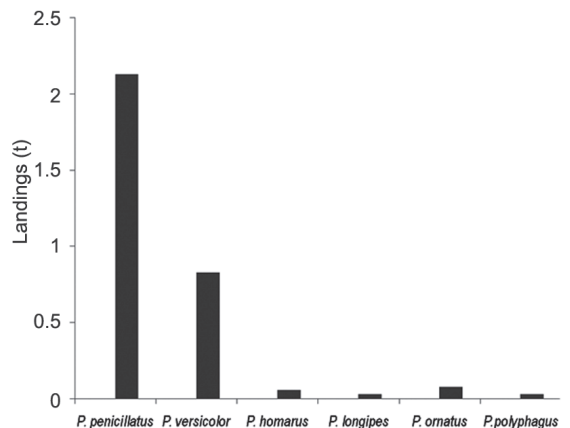


Fig. 5. Lobster landings by species in the Andaman Islands

## Discussion

Commercial exploitation of spiny lobsters in India began in the early 1950s, but reliable data on landings are available only from 1968 (Radhakrishnan *et al.*, 2005). Lobster exports from Andaman Islands during the decade from 1999 to 2009 experienced marked oscillations without any discernible trend.

The Andaman Islands have vast near shore coral reefs and rocky bottoms, which are suitable habitats of spiny lobsters. Hence, hand-picking (Jha *et al.*, 2007) is easily carried out during low tide using torchlight at night but the same could not be carried out during rainy season due to turbidity. The hand-picking of spiny lobster is common in north Andaman Island due rocky substratum with low depth near the coast.

Bottom-set gillnet is being used for lobster collection in middle Andaman Islands. The lobster catch was also observed in shore seine, which is operated mainly for finfishes in north Andaman. Comparing with middle and north Andamans the spearing method is practiced more in south Andaman Island. In south Andaman, the fishermen prefer spearing method for catching lobster over gillnet to avoid damage to the net. In some places the fishermen walk for few meters inside the sea during low tide to fix gillnet for collection of lobsters during the subsequent low tide.

Depending on international demand for adult lobsters, fishermen travel long distances from their hometowns and stay for several days in other islands like Havelock and Hut Bay to catch lobsters by spearing. Large number of juvenile lobsters was observed in the near shore areas and bays of these islands. The coastal areas of Port Blair (South Andaman) are rocky with abundant lobster resources, from where the juveniles of *P. versicolor* are collected and supplied to the hotels.

This study shows that *P. penicillatus* and *P. versicolor* are abundant in the Andaman in shallow rocky bottoms. *P. homarus* is an inshore species with restricted movements (Mohamed and George, 1968) and is caught only in gillnets, which is mainly operated in shallow waters.

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