

Pair trawl fishery for oil Sardine in Palk Bay

S. Surya, R. Saravanan, A. K. Abdul Nazar, N. S. Jeena, M. Raj Kumar, L. Remya, Ramya Abhijith, B. Johnson, K. Shanmughanathan and S. Selvakumar

Mandapam Regional Centre of ICAR-Central Marine Fisheries Research Institute, Mandapam

Landings of Indian oil sardine, *Sardinella longiceps* were investigated at Rameswaram during November, 2015 - January 2016 period. It was exploited mainly by pair trawlers, which operate a trawl net, locally known as *Rettaimadi*. The oil sardine fishery by pair trawlers initiated was long back (Marichamy *et al.*, 1992, *Mar. Fish. Infor. Serv. T & E Ser.*, 17:18-19) but lack of transportation and absence of marketing avenues for oil sardine did not encourage adoption of this fishing method. However the current trend of neighbouring states to access these landings, encouraged the fishers to operate about 200 pair trawlers during the fishing season of 2015 -16. There were about 12- 13 fishing days in a month as per the government records. The fish merchants and agents from Kerala and Karnataka came to the landing centres with ice and lorries for transporting and marketing oil sardine, both fresh as well as spoiled ones for fishmeal plants. The estimated catch of oil sardine from Palk Bay Rameswaram for the season was 1,03,200 t. The Catch per Unit Effort (CPUE) varied from 5 to 20 tonnes (t).

Pair trawling activity was initiated in Palk Bay area in 1980-81 on an experimental scale under the Bay of Bengal Programme (BOBP) to develop the small scale fisheries sector (Pillai and Sathiadas, 1982, *Mar. Fish. Infor. Serv. T&E Ser.*, 39:1-6). Earlier there was little interest among fishers to operate the pair trawl, because of the necessity of two boats and large quantities of fuel. However, later when catches of highly priced fishes like white pomfrets were obtained, they started pair trawling operations. Pair trawling facilitates harvest of a large volume of small and medium sized fishes which is considered to be to the detriment of fishermen using country boats. The Tamil Nadu Marine Fishing

Regulation Act, 1983, prohibits fishing by pair trawling or purse-seine nets by any fishing vessel/craft (irrespective of whether it is a country craft or mechanised boat), in its territorial waters, as a measure to conserve the fishery resources. The Fisheries Department has also stopped the diesel subsidy and recommended penalty to those fishers who violated the orders. Despite this, the fishers operate pair trawls every year during the peak season even by paying the penalty amount as the profits earned through pair trawling is huge and adequately compensates the fines imposed. Proper governance and control mechanisms are hence a requisite for regulating pair trawling at Rameswaram to sustain the fisheries sector.

Fishing operations

Mechanised units of 14 - 16 m OAL (160 - 180 HP diesel engines) conduct the pair trawling operations. The speed of the boat varies from 5-10 knots. The bottom trawl with an overall length (OAL) of 80 - 84 m is used for exploiting oil sardine. Locally these trawl net are called as 3000 mesh net (*Moovayiram kannivala*) because of the different mesh sizes at wing, belly, and cod end of the gear ranging from 30 mm (cod end) to 3000 mm (wings). The cost of



Fig. 1. Fresh oil sardine landings at Rameswaram

each net is estimated at ₹ 2 lakhs. It is so large in size that it requires two mechanised boats for its operation. The area of operation of pair trawlers is north and northeast off Rameswaram, which is around 80-90 km from shore. The depth of the fishing ground is 3 - 4 metres (m) and the bottom is muddy. They start from shore by 0400 hrs and return by next day morning by 0700 hrs with boats continuing to land up to 1000 hrs. Day - night pair trawling is thus practised at Rameswaram, Palk Bay. Once the operation is complete they return as early as possible to get better returns. Out of the 700 trawlers operating from Rameswaram Landing Centre, around 400 pair trawlers (as a set of 200 units) were targeting oil sardine during the current season.

Fishery

Pair trawling activity which started by November 2015 continued up to February 2016. The catch of oil sardine during recent past from Rameswaram Landing Centre is given (Table 1). Oil sardine constituted 90% of the pair trawler catch and rest was constituted by *Rastrelliger kanagurta*, *Dussumieria acuta*, *Gerres erythrorus*, *Sardinella albella*, *Sardinella gibbosa* and carangids. In addition, occasional bumper catches of *Eubleekeria jonesi* and *Anodontostoma chacunda* was also observed.

Table 1. Oil sardine catch trends

Year	Total Sardine Catch (tonnes)	Contribution of oil sardine to the total catch (%)
2010	58852	62.1
2011	71044	75.4
2012	27224	46.6
2013	113946	89.2
2014	40958	53.8
2015	113428	90.1

Biological aspects

From an analysis of 250 specimens of *S. longiceps* collected from Rameswaram during the period, size composition, sex ratio, maturity stages and feeding intensity were recorded. Their total length ranged from 123 to 215 mm, weighing 11.5 to 81.6 g each.

The fishery in general was supported by 175 - 185 mm size groups. The sex ratio showed females outnumbered males in November, December and January but males dominated in February. The macroscopic appearance of the ovaries indicated that mostly spent recovering stage occurred during November to December and immature stages during January and February. The intensity of feeding determined by eye estimation of the gut contents indicated most of the fishes with poor feeding (Empty guts or traces of food). Only a few numbers showed moderate feeding with half full stomachs. Most of them were lean and showing a starved appearance with the head more prominent than the body (Fig. 2).

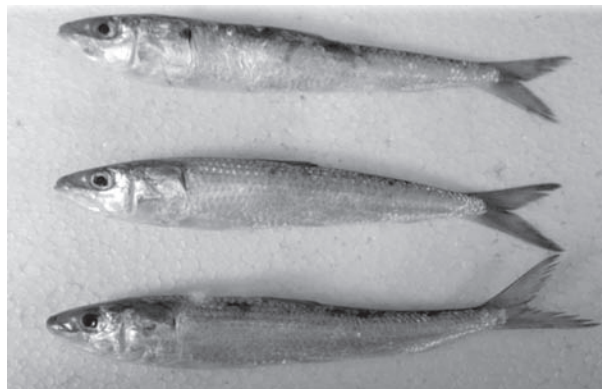


Fig. 2. Lean oil sardine

Catch disposal and Marketing

About 60% of the oil sardines landed by the pair trawlers were in an almost spoiled condition. Catches were weighed in large baskets of 40 - 50 kg capacity (Fig. 3). The fresh specimens were sorted and sold at the rate of ₹ 30 per kg while the decayed ones were disposed at the rate of ₹ 10 - 15 per kg. But, in February, when the catches declined, the price rose to ₹ 40 and ₹ 20 per kg for fresh and decayed categories respectively. A large number of fish traders from Kerala, Karnataka and Tamil Nadu arrived at Rameswaram Landing Centre to collect fresh as well as spoiled sardine in lorries loaded with ice blocks. About 95% of the catch was taken by these traders and less than 5% were sun-dried for selling in the local fish markets at Rameswaram.

The initial operation of pair trawlers in the Palk



Fig. 3. Decayed oil sardine landings used for fish meal production

Bay brought huge quantities of white pomfrets, and the gear became locally known as 'Vaval madi'. Later the catch diversified and in 1992, oil sardines constituted about 71% of total landings (Jayasankar and Bose, 1992, *Mar. Fish. Infor. Serv., T&E ser.*, 118: 17-18). The marked increase in demand for oil sardine from Rameswaram by the neighbouring

states recently has encouraged fishers to focus on the local, seasonal oil sardine fishery. The catch per effort of around 10 - 20 t per fishing day of fishing makes it a highly profitable venture. During the season, the trawlers operated quite near to the shore. Fishers disclosed that oil sardine is highly perishable and can remain fresh only for 3 hours without ice preservation. The lack of demand for oil sardine in the local and neighbouring fresh fish markets, except Kerala and the high cost of ice used for preservation lead the fishers to preserve only about 10% of the catch properly. Remaining catch is dumped as such on the main deck and brought to shore in a spoiled state which is usually purchased only by fish meal plants. Information collected from the boat owners indicate the operational expenditure for a day's fishing is around ₹ 1.25 lakhs with highly fluctuating and uncertain returns on any particular day.