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## UNUSUAL FISHERY FOR OIL SARDINES ALONG THE WEST SAURASHTRA COAST\*

### Introduction

The Indian oil sardine *Sardinella longiceps* Valenciennes is the most important pelagic fishery wealth of the southwest coast of India and occasionally contributes as much as quarter of our marine fish landings. Normally the landings fluctuate between 10-18% of the total marine fish catches. In the past several decades, the oil sardine fishery has shown remarkable fluctuations both spatially and seasonally. Since 1981-'82 oil sardine fishery has been showing a declining trend.

Year		Oil sardine landings
1981-'82	...	2,55,644 tonnes
1982-'83	...	2,01,625 ..
1983-'84	...	1,80,081 ..
1984-'85	...	1,65,537 ..

Oil sardines though formed one of the major pelagic resources on the west coast, have never formed a fishery along the Saurashtra coast. They have been only once reported from east coast at Pondicherry during October to December, 1983. (Srinivasarengan and Chidambaram, *Mar. Fish. Infor. Serv. T & E Ser.*, 61, 1985). Part of west Saurashtra coast (from Lat. 21°08' N, Long. 70°14'E to Lat. 22°14'N, Long. 60°01'E) observed heavy landings of oil sardines for the first time during winter months of 1986-87, and the present report gives brief account of its fishery and biology.

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### Fishery

An estimated 352 tonnes of oil sardine were landed during mid November to February end. Peak landings were observed during 16th December to 31st January. Total period for oil sardine fishery can be conveniently divided into three distinct phases.

- Phase 1. --- 15th Nov. '86 to 15 Dec. '86
- Phase 2. --- 16th Dec. '86 to 31st Jan. '87
- Phase 3. --- 1st February '87 to 28th Feb. 87.

Only stray catches of oil sardine were landed during the first phase and therefore didn't contribute much to its fishery. Second phase marked the period of bumper catches particularly at Miani, Porbandar and Navibandar landing centres and also at Madhavpur to a certain extent. At Navibandar and Miani it formed more than 90% of fish landing during this phase. An estimated total of 332 tonnes of oil sardine were landed with a CPUE of 277.21 kg/boat. Third phase marked the declining of fishery and only 20 tonnes of oil sardines were reported with CPUE of 80-100 kg/boat from all the three major landing centres.

The oil sardine shoals were caught by cast nets at depths of 6 to 8 m and within 800 m range from the shore. During January, dense shoals, close to the shore were seen frequently by fishermen at Navibandar. These shoals were so dense that they changed the colour of water near the bank. The shoals were caught from



Fig. 5. 'Savala vada' and bread 'pakora' in a sea shore tea shop.

### Nutritional status of pre-school children

The weight of 100 school children collected from two *balawadis* plotted against the standard UNICEF curve for Indian children is presented (Fig. 1). Nearly upto the age of three years the weights are found to be within the standards and then show a decline. Allergic bronchitis, asthma due to coastal climate, worm infestation, anaemia and dental caries are the health disorders commonly found among children. The coastal villages fall victim to gastro-enterites during monsoon due to lack of adequate sanitation.

### Remarks

One of the major problems encountered in the development of fishermen community has been their low nutrient intake. Rajammal and Nirmala (*Proc. Seminar on Small-scale Fish. and Coastal Aquacul. in Inte. Rural Development, CMFRI, 63-68, 1978*) observed that there was conspicuous gap in the vital data about the nutritional status of the fishing community.

However, the information available on district averages show that the nutritional intake of low income groups in coastal Kerala and the anthropometric measurements of fishermen children are found to be below the required standards. The present study on food consumption pattern and nutritional status of artisanal fishermen community in Vypeen also confirms the above findings.

The average nutrient intake for coastal Kerala (Rajammal and Nirmala, 1978 (*op. cit.*) and the rural Kerala (National Nutrition Monitoring Bureau, ICMR, Hyderabad, 1984) has indicated adequate intake of calcium and vitamin C coming from food stuffs like millets and vegetables. But in the present study the intake of vitamin C is found to be low since vegetables and fruits are almost absent in the diets of fishermen in this area. The high incidence of malnutrition of this particular community can mainly be attributed to two factors namely low purchasing power and non-availability of protective foods like leafy and other vegetables in the coastal areas. Lack of alternative sources of protein mainly results from low purchasing power. The major reason contributing to low purchasing power is uneven distribution of income over the year due to high seasonality of occupation. The fishermen are caught in a vicious circle of borrowing and paying back money which results in low savings and heavy debts. The most important step in the upliftment of the community is to increase the purchasing power by increasing the income from fisheries and introducing supplementary occupations, so that at least the requirements for protein and calories are met.

Another step in mitigating malnutrition will be increasing the production of animal protein and pro-



Fig. 6. Mobile tea shops managed by women are popular in the sea shore. Tea and snacks are served here.



Fig. 1. Harvested *Sardinella longiceps* at Navibandar.



Fig. 2. Salt curing in progress at Porbandar.

dugout canoes and fibre glass boats using cast nets of mesh size 21-27 mm.

Price of oil sardine fluctuated from 40 paise to Re. 1 per kg. They were dried in the sun after salting. After drying the price was fixed at Rs. 80-90 per 20 kg.

#### Biological observations

A total of 125 randomly selected specimens were studied for length-weight relationship, sex, maturity stages, feeding condition *etc.*. The fish caught by cast net ranged from 123 to 163 mm in total length with a modal length of 138 mm and average length of 137.6 mm. As the dominant size was around 138 mm, it can be presumed that the shoals belonged to 1 year class. The females constituted 96% of the total oil sardine population. All females studied were in immature stage. 98% of stomachs studied were empty and the rest were partially filled. Food items mainly consisted of green algae and diatoms indicating its surface feeding planktivorous nature. The length-weight relationship followed regression equation as

$$W = -30.8796 + 0.41699L$$

Where W and L are the weight and length of the fish respectively.

#### Discussion

Enquiries from local fishermen revealed that oil sardines were of frequent occurrence during winter

months and were caught along with miscellaneous catch since last 8-10 years. In the past, oil sardines could not attract fishermen's attention because of their failure to fetch good price in the local market.

Probably, economic stress in the absence of other fishery during this winter season would have led the fishermen to catch this fish. They seem to be ignorant about the utility of oil sardines in oil industries. Their ignorance resulted in the use of oil sardine as poultry feed and fish meal.

According to fishermen oil sardines do show their presence during winter months every year along the west Saurashtra coast. These shoals can either be migrating from southwest coast of India or from the offshore. Several oceanographic as well as biological factors are responsible for oil sardine migrations. The wind driven surface currents of the west coast may be one of the main factors which influence the pelagic shoals of oil sardines (Murty, *Jour. mar. biol. Ass. India*, 16 (2): 520-522, 1974). The sea water temperature and salinity also appear to significantly influence the oil sardine migrations (Suresh & Reddy, *Indian J. Fish.*, 27 (1 & 2): 1-9, 1980). To understand the proper causes and course of migration, a well planned study along the Saurashtra coast is required.

