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The Oil Sardine

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In the marine fisheries map of India pelagic fishes dominated by clupeoids undoubtedly occupy an important place by virtue of the relative magnitude of their fishery. Clupeoids, in general, constitute about a third of the marine fish caught in India and within this group oil sardine (*Sardinella longiceps* Valenciennes) known as "Mathi" in Malayalam "Boothai" in Kannada and "Tarali" or "Haid" in Marathi, ranks first. Out of a total of 815,120 tonnes of marine fishes landed in 1965, oil sardine alone accounted for 253,302 tonnes forming 31.69%.

The oil sardine fishery is known for the worst set backs it has suffered for over two or three decades from the twenties to the forties except for certain slight improvements in the catches during the 1922-24, 1925-26 and 1933-34 seasons. That the oil sardine fishery has had a phenomenal revival during the last decade is apparent from the high percentage it has been constituting in the total marine fish production from 1957 onwards (Table I). During the last 15 years, the average oil sardine catch of about 30,200 tonnes in the 1950-55 period appears to have had almost a fourfold increase during the 1956-60 and a sixfold increase in the 1960-65 periods. Such an improvement in this fishery which is practically the mainstay of economy of the fishermen along the Kerala and Mysore coasts sounds a very encouraging note especially during these years of critical shortage of food in general and protein rich food in particular.

TABLE I

Year	Total oil sardine landings in India. (in tonnes)	Percentage of oil sardine in the total.
1950	34,420	5.9
1951	17,240	3.4
1952	13,895	2.5
1953	51,831	8.9
1954	33,952	5.8
1955	30,447	5.1
1956	7,412	0.1
1957	1,91,467	21.9
1958	1,23,730	16.4
1959	69,234	11.8
1960	1,89,016	21.5
1961	1,67,884	24.6
1962	1,10,229	17.1
1963	63,647	9.6
1964	2,74,333	31.9
1965	2,53,302	31.7

The oil sardine, known to occur along the coasts of Arabia, Iran, Pakistan, Ceylon, Andamans and Java and in Bali straits, is one of the important species of commercial importance occurring extensively in the inshore waters along the west coast of India, the region of maximum abundance being from Ratnagiri in the north to Quilon in the south. However, during certain years stray catches of oil sardine have also been made along the coasts of Madras and Andhra states in the east coast. From very early times this fishery has been exploited by the indigenous craft and gear which naturally set a limitation on the region fished and the duration of fishing. This fishery, without having any impact of mechanisation on it so far, continues to be restricted to a narrow coastal belt within the 25 fathom line. Generally, the gears employed in this fishery are boat-seines called *Mothikolli vala*, *Pattenkolli vala*, *Thattum vala*, *Paithu vala* and *Nona vala* in the Kerala region, beach-seines known as *Rampani*, *Kairampani* and *Yendi* along the Mysore Coast, cast-nets and gill-nets. Certain types of specialised small-meshed cast-nets called *Koori bale* are operated in the Mangalore zone from July to September when small-sized oil sardine abound in the coastal waters. Similarly, another specialised type of net employed in the above region is *Ida bale* which is actually a big-meshed gill-net operated for large-sized oil sardine. During July to September, a type of small-meshed boat-seine called *Nethel-vala*, mainly used for catching white baits, is operated for small-sized oil sardine in the Calicut zone. Comparing the catching efficiency of all these gears, the boat-seines of Kerala and *Rampanis* of Mysore with their catch-per-unit exceeding one and ten tonnes respectively, seem to account for the major part of the oil sardine catch in these regions.

In addition to the importance of oil sardine as food both in the fresh and cured conditions, its oil has several uses as in the jute, leather and soap industries, and guano as fertiliser in the coconut, coffee, tea and other plantations. With the growing demand for fresh fish in the interior places and also because of the availability of ice from a chain of ice factories set up at some of the important fish landing centres, good quantities of oil sardine are now transported to the interior places and marketed in fresh condition. In addition to this, carrier launches also transport oil sardine to Bombay from the *Rampani* operating centres along the Mysore Coast. Judged from the magnitude of the catches made during the peak season particularly in the *Rampani* operating centres along Kanara Coast where glut conditions seem to prevail at times following extraordinarily heavy landings of oil sardine, it appears that there is further scope for extending more cold storage and transport facilities so that more fresh fish, now converted into manure, could be made available to the needy consumers in the remote areas. Because of the extreme fluctuations in the oil sardine fishery, the establishment of dependent industries, particularly canning, has not progressed at the expected pace although a very limited number of them has come up along the Mysore and Kerala coasts.

The oil sardine fishery generally commences on the west coast soon after the outbreak of the South West Monsoon. The beginning of the fishery is marked by the entry of big-sized fish in advanced stages of maturity. In certain years small-sized oil sardine belonging to the 0-year class, i. e., not yet one year old, and measuring 4 to 5 cm in length also occur in large numbers during August-October. Such an occurrence of small-sized fish over several months is suggestive of the protracted nature of spawning in the oil sardine. With



PLATE I. Fig. 1. Oil sardine (17.8 cm) with opercular tag.

Fig. 2. Oil sardine belonging to different size groups supporting the fishery. Length of fish (top to bottom) 17.8, 15.4, 11.8, 8.6 and 4.2 cm.

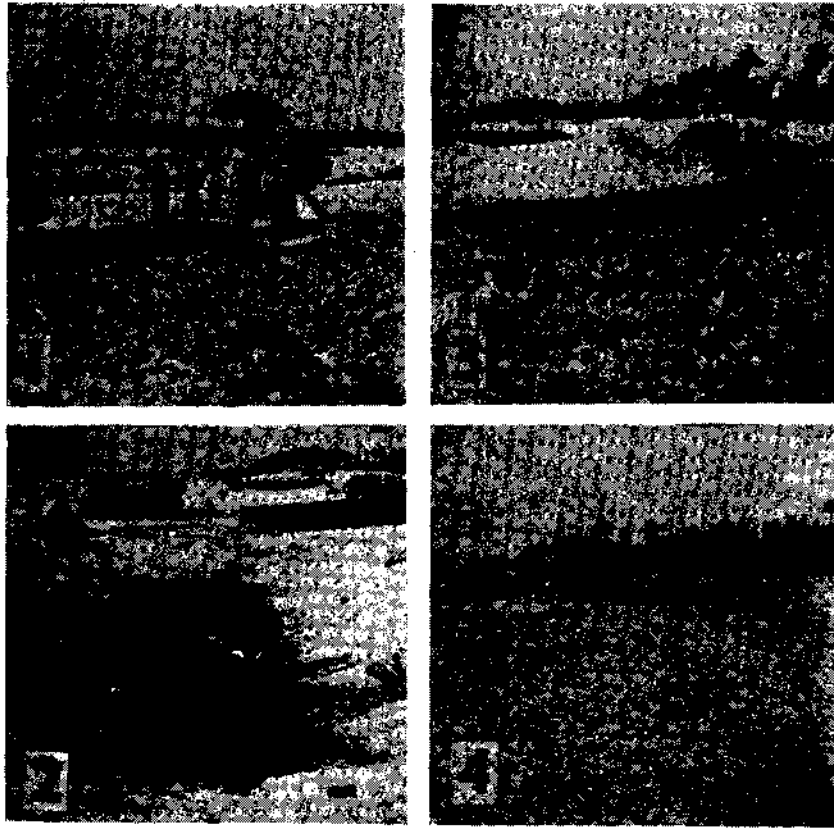


PLATE II. Fig. 1. Oil sardine from *Rampani* being dumped into the pit for preparing manure.
Fig. 2. Crude oil emanating from the pit.
Fig. 3. Manure from the pit spread out for drying.
Fig. 4. Fresh oil sardine spread out for sun drying.

—Photos by courtesy of Mr. M. H. Dhulkhed.

the disappearance of these size groups, the medium sized fish ranging in size from 12 to 15 cm dominate the catches and support the fishery during the peak period which generally extends from September to January after which the fishery dwindles and comes to a close by about April-May coinciding with the summer months. During the period of peak abundance of oil sardine, temperature has been observed to vary from 27° to 29°C and salinity from 33 to 35‰. Divergent views have been expressed on the age and life span of the oil sardine. Some are of the view that the oil sardine attains 15, 17 and 19 cm at the end of 1st, 2nd and 3rd year of its life respectively, while others are of the opinion that it attains 10, 15 and 19 cm respectively at the successive years of its life. Thus, considering the composition of the oil sardine catches during the peak periods in different years, it can be stated that the fishery is dependent to a great extent on the availability of 0-and 1-year old fish in the inshore waters. The present belief that the sardines spawn only once in their lifetime may have to be revised in view of the occurrence of big-sized fish above 17-18 cm with re-maturing gonads in November and December. Regarding the spawning behaviour in oil sardine, indications are that it may be protracted over a period extending from July to October or even November. Since individuals in advanced stages of maturity frequent the inshore waters during the commencement of the fishery in July, followed by the entry of juveniles of 4-5 cm in size, the possibility of the spawning grounds being not far away from the coastal region is not ruled out. However, the exact spawning grounds of oil sardine are yet to be located for which a more concerted vigil may have to be kept along the entire coast of Kerala and Mysore and the search for eggs and larvae intensified particularly during the South West Monsoon months.

For the first time in India, an attempt to release oil sardine tagged with opercular plastic tags (see Plate I, Fig. 1) is being made for studying the growth and migration among this species. As pointed out earlier the oil sardine fishery is supported by different size groups (see plate I, Fig. 2) but where from they come and where they go, the route of their migration—whether it is from the offshore to inshore waters or whether they move along the coastal waters from south to north or *vice versa* are certain vital aspects which still remain to be investigated in detail. It is with a view to elucidating information on such important aspects concerning the Indian oil sardine that a programme for tagging this species has been initiated along the west coast of India at four important centres, namely, Karwar, Mangalore, Calicut and Cochin. It is proposed to tag on a large scale oil sardine in different size groups depending upon their availability at the above centres and a beginning has already been made off Narakkal near Cochin. It may be mentioned here that oil sardine tagged on an experimental basis at Mangalore in 1964 and 1965 and released in cages anchored in the open sea had survived for over 8 days without any ill effects whatsoever on them, thus showing that the opercular tags are quite suitable for this species. In order to make this venture a success, wide publicity is being given through hand bills and posters in different languages and also through press soliciting the co-operation of the public who are also paid for the fish with or tag alone recovered and returned to any of the establishments of the Central Marine Fisheries Research Institute or its survey staff. A good beginning has already been made and the results are being watched with great interest by all concerned in this pioneer attempt in tagging one of the important marine migratory shoaling species in India.