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The "Choodai"

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The sardines, other than the oil sardine, though not so important as the latter nor as abundant, are of considerable local importance in that they are popular food fishes contributing to a seasonal fishery at some places along the east coast, especially the south eastern region. Due to their thin bodies and non-oily nature, they are conveniently and rapidly beach dried in large quantities and exported to interior places, in excess of local consumption in the fresh and cured states. *Sardinella albella* and *S. jussieu* are the two important species forming the fishery, others contributing only in a small measure to the fishery being *S. sirm* and *S. clupeioides*. In recent years (1960-1965) on an all India basis, these sardines which are together called "Choodai" in Tamil along the coast of Madras State, have contributed from 1.89 to 5.23 per cent of the total marine fish catch.

The "Choodai" fishery of the Mandapam area is the most important fishery in the region between Danushkodi and Panaikulam, an eight kilometre stretch of the Palk Bay coast. The fishery commences in late March or early April and extends upto October or November, by which time the Palk Bay becomes too rough for the fishing operations of non-powered craft.

However, what distinguishes the "Choodai" fishery from other fisheries is the very small size of the fishes caught which is only about $\frac{3}{4}$ " to 4" (20-100 mm). That itself is apt to make any one wonder whether such a fishery can last long, a fear, however, not well founded.

Only a small portion of the catch is consumed in the fresh condition. Well over 95% is dried on the beach and exported to the interior places in the Madras State where there is good demand for the same. Some 3000 fishermen are engaged in the fishery. The magnitude of the catches within this limited area is about 1000 to 2000 tonnes on the average.

Production in a lean year may drop to as low as a third of that in a good year. Superimposed on these annual changes are changes within seasons - periods of high yield alternating with periods of low yield. Both these features are common to other fisheries also. However, both these types of fluctuations in the "Choodai" fishery have been investigated.

The fishery of Mandapam area is composed of two species of sardines, *Sardinella albella* and *Sardinella jussieu*, the former being more important of the two. These sardines appear to have a sort of mutually repellent relationship. When one is abundant in the

catches the other is scarce. There is also a pronounced lunar influence on the catches, the fishery being highly productive during the periods of the dark phases of the moon, a fact explained by an interesting behaviour of the sardines. From April to June or July, the young sardines of the year are mostly under 60 mm in size and can be seen near the sea surface only at night in large shoals. They create brilliant flashes of luminous patches on the surface, very conspicuous on dark nights which the fishermen take advantage of for locating them. If a torch is lighted the sardines gather near the light, when they can easily be transferred to the boat with dip nets. This habit is exploited by the fishermen who use torches made of palmyrah leaves. But the most important method of catching the sardines is to surround the shoals with a shore-seine and simply drag them to the shore. With increase in size and age, that is, after June or July, they come up to the surface during day time also and are caught in gill nets. Even after July, the bulk of the catches is landed at night. The weight and number of fishes in a shoal can be truly amazing. A single 3-hour haul by a shore-seine may land as much as 12 tons containing 60,00,000 sardines each weighing from 1 to 6 grammes.

The breeding season of these sardines is February-June. They breed when about a year old, but the catches are composed mainly of fishes between 2 and 8 months old. There is reason to believe that the major cause of annual catch variations is the change in the number of fishes born and surviving to the catchable stage each year. In sardines and in fact in all fishes, the number of individuals in successive generations or year-classes may vary within wide limits. If the relative abundance of a year-class can be estimated sometime before it actually enters the fishery, it would go a long way towards removing the uncertainties about the prospects of fishing seasons. But most often we come to know of these variations in year-class strength rather late, the aim of the fishery biologist is to reduce this time-gap. What is required for this purpose is a thorough knowledge of the conditions in the sea at the time when the fishes are born. However, the situation in the "Choodai" fishery is a little more hopeful than in many other fisheries. As was stated earlier, the landings of a year are composed mainly of fishes born in that year itself. The production during the first 1 or 2 months of the season gives an indication of the relative strength of the concerned year-class, and this in turn helps in assessing the prospects in the remaining months of the season.

Greater success has attended the work on the variations in catches within a season. In the sea sometimes, blooms of *Noctiluca*, a minute planktonic organism numbering to millions under one square metre appear suddenly. When these organisms are abundant, there could be scarcity of sardines.

The sardines feed on both phytoplankton and zooplankton. When suitable plankton is abundant, an increase in the availability of sardines can be expected. The tendency therefore will be to gather in greater numbers in places where there is abundance of food than elsewhere. But with regard to the food of the sardines, viz., plankton, there can be wide changes in quality and quantity within short periods of time in the same area. A number of oceanographic and meteorological conditions contribute to these variations in

plankton. In the Mandapam area, it has been found that when there is a steady wind from land to the sea for a few days, the sea is agitated and there is an increase in plankton production. This is followed by an increase in the availability of sardine shoals. A study of the fishery has also shown that there could be a peak in the availability of fish shoals in October–November, depending on certain oceanographic and meteorological conditions.

The prospects of increasing the catches are good by bringing more area under fishing. The shore-seines which at present bring in the bulk of the catches fish only up to about a mile from the shore; whereas gill nets can operate much farther. Therefore the increase in the number of gill nets taking part in the fishery is a welcome development in the direction of increased production. However, this has given rise to a controversy similar to the one that other nations like Japan and the United Kingdom had to face under similar circumstances. The shore-seine men complain that the gill net operators are catching fish, which otherwise should naturally come into their traditional fishing grounds. Investigations have shown that this fear is mostly groundless, because generally shore-seines and gill nets catch fishes of widely different sizes. If however, the gill net is operated inside or just outside the shore-seine grounds, it might conceivably break up or divert the shoals.

It has been stated that the sardines are caught between the ages of two and eight months. Why not then wait for them to grow older? There are a number of difficulties in the way. First, the fishermen stop fishing after October or November not because of the dearth of fishes but because of rough weather. Therefore a pause in fishing would only swell the number of fishes surviving into the off season. Moreover, the investigations have shown that as the sardines grow older and larger and especially after the first year of life, they tend to move away from the nearshore waters, where shore-seines which now account for over 90% of the production would not be able to catch them. There can therefore be no gain in increasing the number of uncatchable fish. If man does not catch them nature will work towards the attrition of the shoals. Predators like sea birds, sharks, and other big fishes feed on them extensively. They are also attacked by parasites, both internal and external, as different types of worms and copepods. Scientifically speaking, it is necessary to know the probability of survival of the young fishes saved from capture. However there is hope that gradual redeployment of part of the man-power engaged in inshore fishing to offshore fishing on sardines and other fishes could lead to desirable results.
