



# Major Commercial Fishes of India

## Indian Oil Sardine

Dr. K.K. Prajith and Ramchandra Khileri

### Introduction

Indian Oil sardine, *Sardinella longiceps* is a very important species, contributing to nearly one third of the total marine fish production of India. Besides its usefulness as a highly favoured table fish, it serves as a source of valuable by-products like fish meal, poultry feed etc. Its importance as a highly lucrative fishery is restricted to the southern and central regions of the west coast of India. Unlike

the Mackerel which sports fisheries along both the coast of India and also several parts of the Indo-Pacific region, the Oil sardine fishery, sported by *S. longiceps* does not exist beyond the west coast of India, though stray individuals occur over a wider area in the Indo-Pacific region.

### Scientific classification

The scientific name of Indian Oil sardine is *Sardinella longiceps* (Valenciennes, 1847), which belongs to



*Sardinella longiceps*

the Family Clupeidae under the Class Teleostomi and Order *Clupeiformes*. Local names of Oil sardine are *Mathi*, *Nalla Mathi*, *Nei chala* (Malayalam), *Bhutai* (Kannada), *Tarali* (Marathi and Hindi), *Nonalai*, *Peichalai* (Tamil), *Noona-Kovalu* (Telugu), *Pesalai* (Sinhalese), *Noona Kavala*, *Disco kabala* (Oriya) and *Aade*, *Tarali* (Gujarati).

#### Distribution

*Sardinella longiceps* is distributed from the Gulf of Aden to southeast India, and possibly in the Andaman Islands also. It is not found in the Red Sea or the Persian Gulf. In India, juveniles and adults are reported from Saurashtra to the Coromandal coasts. Enormous shoals supporting the fisheries strike the Kerala and Karnataka coasts whereas they are poor in Maharashtra. Stray incidents occur along the east coast.

#### Distinguishing characters

Body elongated even to the point of being sub-cylindrical. They have a slightly rounded belly and have eight rays on their pelvic fin. They have a very large number of gill rakers and a faint golden spot behind the gill opening. They also have a faint golden bilateral line as well as a black spot on the hind border of the gill cover.

#### Fishery

FAO statistics show no apparent decline in the annual landings of this species. Oil sardine dominated the landings with 6.0 lakh t (15.7%) though compared to the record landings in 2012 there is a reduction of about 1.2 lakh t.

In Maharashtra, *S. longiceps* contributed 17,013 t (4.7%) to the total fish landings in 2013, but showed 49% decline compared to previous year. The Oil sardine continued to dominate the catch this year also with a total landing of 98,453 t contributing 22.5% of the total catch in Karnataka and 40,633 t comprising 39% of the total catch in Goa. Oil sardine contributed 2.47 lakh t to the marine fish landings of Kerala in 2013, registering a decline of 38% against 2012. In Tamil Nadu and Puducherry among the pelagics, Oil sardine formed 47.9% followed by other sardines (17.4%).

#### Food and feeding

The Oil sardines mainly feeds on phytoplankton. A plankton species *Fragillaria oceanic* is considered as the most favourite food of Oil sardine. Beside this, other planktonic groups such as diatoms, dinoflagellates, copepods, crustaceans larvae, fish eggs, algae, organic debris etc. are considered as the other food ingredients of sardine. Juveniles of sardine are considered as omnivores. But the adults mainly feed on phytoplankton.

#### Reproduction

Early in the spawning season many of the oldest, most mature adults between 17-19 cm arrive while the juvenile sardine arrive to breed later in the season. Ovary development is classified in Stages I to VI. Stages IV, V and VI are able to spawn. These fish only spawn once in a spawning season and seasonal fecundity is 75,000 eggs. The eggs are spherical and range from 1-4 mm in diameter.



### Shoaling behaviour

A shoal has been defined as an assemblage of a large number of fish of the same species, or similar size and age, and moving almost in the same speed. The shoals range from 2-25 m in length and 1-20 m in breadth. Though the shape of the shoals are variable, they are roughly pointed in front and blunt behind. The characteristic features of different kinds of shoals encountered are described below:



### Surface shoals

- **Flipping shoals:** The characteristic feature of the flipping shoals is the occurrence of frequent splashing noises accompanied by jerking movement of the fish in the surface waters; more frequently seen during morning hours and nights.
- **Pattering shoals:** Pattering is characterized by frequent small noises, either simultaneous or in quick succession, which resemble the sound of big rain drops falling in the sea.
- **Rippling shoals:** Rippling is noticed even when the wind is heavy. Some individual fish from such shoals are at times clearly discernible from a distance.

- **Leaping shoals:** Some individuals from the shoal sometimes resort to leaping above the water, covering short distance (a few feet). These types of shoals are observed practically in the case of many shoal when attacked by predators and disturbed by fishing operations.

In addition to the above characteristics of different shoals some shoals were also distinguishable by certain colour-effects associated with them. They are described below:

- **Bluish colouration:** During the peak of the fishery, such type of slow-moving shoals are invariably encountered in appreciable numbers. Such a colouration is characteristic of compact shoals observed during daytime; and the individual fish are not visible.
- **Pinkish colouration:** It is observed during daytime. Like the bluish shoals, the individual fish are not visible and the shoal is slow-moving in this case also.
- **Luminescent shoals:** A shoal, when luminescent, appears as a patch of light (delimited by the size of the shoal) moving in the surface seas.

### Bottom shoals

- **Bubbling shoals:** Their presence can often be judged by the emergence of chains of tiny bubbles from the sea bottom and these bubbles break up at the water-surface.



- **Fish odour:** Sometimes, a strong fish odour in an area indicates the occurrence of sardine concentrations in the bottom, while the fish are not at all visible.

### Exploitation (Craft and Gear)

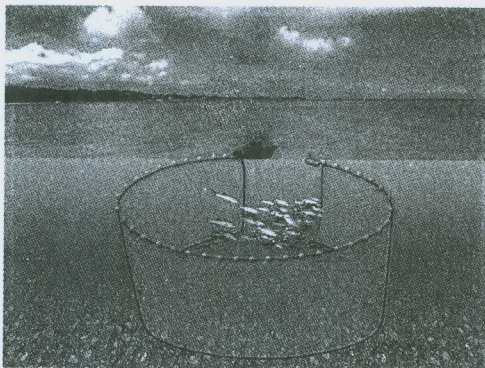
**Dug-out canoes:** A simple type of fishing craft for fishing within short distances from the coast is a small sized canoe made by scooping logs of wood in the form of boat. The “Dams”, “Thonies”, “Vanchies” etc. of the southeast and southwest coasts of India come under this category. In calm weather, oars may be enough for propulsion. But if winds and currents prevail, sails may be used.

**Outrigger canoes:** Sometimes plank-built canoes may be provided with a single outrigger as in the “Rampani” boats used for capturing Mackerel in Karnataka.

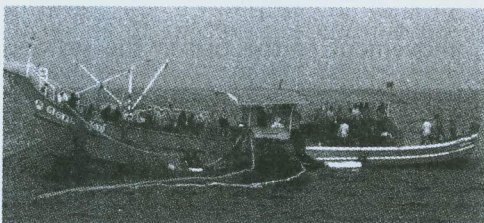
**Gill netter:** Vessels of almost any size can undertake gill netting. The number of nets used for fishing is adjusted to suit the size of the operating vessel. The vessels vary in length between 25 to 55 feet. The deck must be so laid out that the gear can be conveniently stowed, with a clear passage from bow to stern so that the gear can be passed after hauling. An arrangement with wheelhouse and engine room forward or behind may be used depending on the operating method adopted. In a typical arrangement with the engine and wheelhouse in the backward configuration, sufficient deck space must be available behind the house for storing and handling the net. A forward arrangement can also be used for side hauling, in which case the wheelhouse is

sometimes so located to provide a clear working passage.

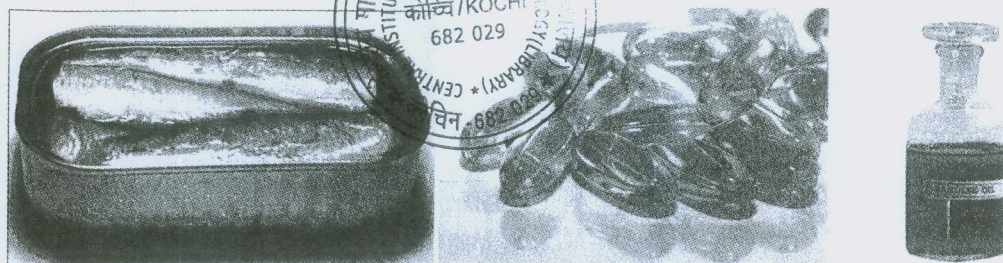
**Stern trawlers:** Fishing over the stern can be a very efficient way of trawling. Stern trawling is the most wide-spread method of fishing in India. The vessels range in size from 32 to 55 feet in length and may be fitted with 60 to



Diagrammatic representation of purse seine net  
(Source: www.xinhaicorp.com)



Operation of ring seines for Oil sardine - off Kochi



Canned Oil sardine

Variety of products from Oil sardine

120 horsepower and above engine. Vessels above 45' in length may also be constructed in steel.

The important gears used for capturing Oil sardines are seines including ring seine and purse-seine (*Mathikolivala*, *Pattenkolivala*, *Odam Vala*, *Paithuvala*), Shore seines (*Rampani*), Gillnets, both drift and set gillnets (*Mathichalavala*). Among them *Mathikolivala*, *Pattenkolivala*, *Rampani* and *Mathichalavala* are important. The shore seine, *Rampani* is possibly the most efficient, whenever it is utilized.

#### Utilization

The Sardine being nutritionally rich, affordable and favoured table fish occurring abundantly almost throughout the year, is serving as a source for valuable by-products. Sardine lipids with their high polyunsaturated fatty acid (PUFA) content are nutritionally important. Omega-3 (n-3) PUFA from sardines, especially eicosa pentaenoic acid (EPA, C-20:5) and docosa hexaenoic acid (DHA, C-22:6), are of particular interest because of their role in improving health and reducing the risk of chronic afflictions like

cardiac diseases, auto-immune disorders, diabetes and even cancer.

A major bulk of the catch is disposed off in fresh condition at a price of ₹ 73/- to ₹ 250/- per kg. In recent years a few companies in Kerala started canning of Oil sardines; but they could not compete the international market and as also the internal consumption was also very little. Some of the catch is cured by sun drying and are exported to countries Sri Lanka. But with the increasing demand in fresh conditions locally, curing has been stopped. Extracted from the body muscle, the oil is utilized in painting boats, patching of jute, dressing of leather and tamping of metals. In 1968-69, 670 t of oil was produced. The press cake or guano is also used as fish meal for live stock since it contains calcium and phosphate.

**Dr. K.K. Prajith and  
Ramchandra Khileri**

ICAR-Central Institute of Fisheries Technology  
Veraval Research Centre  
Matsya Bhavan, Bhidia Plot  
Veraval, Gujarat - 362 269  
E Mail: prajithkk@gmail.com