

# **KADALEKUM KANIVUKAL**

**(Bounties of the Sea)**

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# **THE ORGANIC WEALTH AND FISH PRODUCTION IN THE SEA - Zooplankton Production**

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Food is one of the important requirements for the existence of any living organism. In the oceans the food production takes place at two levels - primary level and secondary level. Among these, the food is synthesised only at the primary level in the form of carbohydrates. The micro and macrophytes in the seas are responsible for primary production. The zooplankters carry out the important function of converting plant matter into animal substances which forms the food for fish and other higher animals.

The zooplankters may range in size from a fraction of a millimetre to a few centimetres. Since they have no powerful locomotor organs they depend on current and wind for moving from place to place. However, comparatively larger zooplankters can propel themselves at some speed.

The zooplankters can be divided into two categories. One group of holoplanktons lead a floating life throughout their life whereas the second one called mesoplankton lead a floating life only during the early part of their life. Later they lead sessile or burrowing life.

The major zooplankters are the single-celled foraminifera, sponge larvae, coelenterates namely siphonophora, medusa, pleurobrachia, annelid worms such as polychetes, arrow worms or chaetognaths, copepods, krill of Antarctic ocean, euphausiids, ostracods, amphipods, lucifer, mysids, cladocerans, larvae of prawns, crabs and lobsters, larvae of bivalve molluscs and gastropods, pteropods and heteropods, larvae of echinoderms, prochordates such as salps, doliolids and appendicularians and fish eggs and larvae.

Even though zooplankters are widely distributed in all the oceans and the seas, their variety and density are not uniform

everywhere and in all seasons. The occurrence and abundance depend on the factors such as temperature, salinity and availability of food organisms. Therefore, there could be difference in the composition and quantity of zooplanktons produced during different seasons of the year. Another reason for the geographical variation in the density of zooplankton is the variations in the abundance of the phytoplankton which is their chief food. Similarly the quantity of fishes in a particular sea area depends on the quantity of zooplankton in that area forming a link in the food chain.

All living organisms in the sea die at different stages of their lives and settle at the bottom. A portion of such matter forms the food for benthic organisms including the demersal fish. The microorganisms or bacteria act upon these dead materials and convert them into inorganic materials which are essential for production at the primary level. Plant life is not possible in greater depth due to lack of sunlight as the inorganic nutrients such as nitrites, nitrates and phosphates cannot be made use of for photosynthesis. However, in certain sea areas, especially in the inshore region, the nutrient rich water is brought to the upper euphotic zone by a physical process known as upwelling which supplies these nutrients to the phytoplankton in this zone where they are utilised to produce carbohydrates through photosynthesis. The phytoplankton helps the rapid growth and multiplication of zooplankton and forms food for planktivorous fishes. The larger fishes and higher animals including reptiles and mammals prey on such planktivores. Productivity is comparatively more at all levels in the areas of upwelling.

Upwelling is more pronounced along the south west coast. Therefore, the production at all levels is also more in this sea area and the pelagic fishes namely sardines, mackerels and white bait occur more here.

A general assessment of the seas around India would reveal that the west coast is two times more productive than the east coast. The fish production also follows the same ratio. This shows that the fishery resources of any particular sea area is directly related to the production at the primary and secondary levels. In other words it may be possible to predict the fishery resources of any area if one knows the quantum of production at the primary and the secondary levels. It has

been estimated that the fish production is usually 1% of the total phytoplankton production or 10% of total zooplankton production.

The total fish production and the exploitable part of it in the Exclusive Economic Zone of India has been estimated based on the secondary production of the area. Thus the west coast and east coast of India and the Andaman & Nicobar seas have a fish stock of 4.78, 13.2 and 13.7 million tonnes respectively with a total of 7.47 million tonnes. From this stock 50% of the fish resources which amounts to 3.73 million tonnes can be sustainably exploited from our EEZ.