



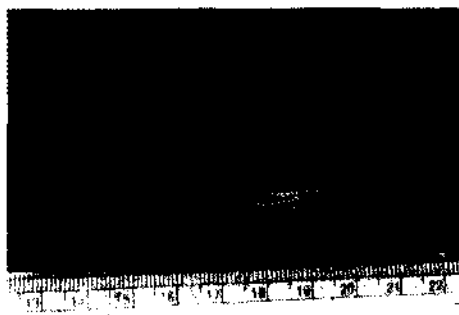
## MIDWATER FISHES NEW CHALLENGES AND PROMISES

Since time immemorial, people world over have been depending on the resources from the coastal waters. Now it is time to venture into the least exploited oceanic zones. Mesopelagic, the vast and stable habitat of the midwater oceanic realm (200-1000m), harbours large quantities of exploitable but unutilized/underutilized resources like pelagic shrimps, cephalopods, myctophids etc. that form dominant components of the widely occurring association of diverse organisms—the Deep Scattering Layers (DSL), detectable acoustically.

Earlier surveys by U.S. GLOBEC/FAO revealed the presence of vast quantities of mesopelagic resources, to the tune of an estimated 100 million tonnes of myctophids worth exploiting, in the Arabian Sea. Only minimal efforts are directed even at experimental level towards exploring/capturing/rightly exploiting these rich and valuable biota.

CMFRI was infact one among the first Institutes which

initiated preliminary surveys in the Indian EEZ using Fishery Oceanographic Research Vessel (FORV) *Sagar Sampada* during 1985 - 1986. By virtue of the



*Diaphus fragilis* (Myctophidae)

importance and priorities, the DSL investigation was further taken up as one of the key areas of national priority research under the MLR Programme of Department of Ocean Development (CMFRI as the nodal agency) by FORV-*Sagar Sampada* during 1998 - 2002, with the specific objective to explore their potential and to identify the target groups / areas for future survey. This multi-institutional investigation has revealed that the resources, especially pelagic shrimps (*Sergestes* sp. and

*Oplophorus* sp.) comes even up to 23,500 tonnes in 1° square, some of which can be used for direct human consumption and myctophids (*Benthosema* sp. and *Diaphus* sp.; comes even up to 24,000 tonnes in 1° square) are widely distributed in the Indian EEZ particularly in the West Coast and the bulk of the production is found to be from the North. These resources are found to aggregate and are abundant near shelf break areas and beyond slope waters. They are found to be more prevalent during pre-monsoon and monsoon seasons. These organisms appear to perform diurnal vertical migrations and occur at depths between 300 and 500m during daytime and come to surface down to about 100m at night. Though these organisms form broad / diffuse layers during daytime which ranges from 150-250m thickness, they are found to be more compactly packed/dense at night and are seen to occur in large numbers in night catches. Their daily excursions to the surface enable us to

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capture them with minimum effort during night hours by developing appropriate harvest technology. They are found to be more aggressive and possess better net avoidance capabilities, especially during day-time. Estimations using a non-quantitative gear like Isaacs-Kidd Midwater Trawl have indicated the presence of few thousands of tonnes of potential resources, which is infact promising and can assume that the presence of resources to the tune of millions of tonnes is a possibility. Whether these untapped protein rich food resource can be utilized directly or indirectly through value addition for human use, is a different question altogether, which needs lot of research inputs.

The DSL also consists of young/adults of economically important forms like decapod crustaceans, cephalopods, epipelagic fishes and mesopelagic fishes. They form a real trophic network that carries numerous food chains and play an important role in transporting energy from upper waters into mid waters. These dense aggregations of prey/predator items attract many commercially important carnivorous fin fishes/shell fishes and act as indicator organisms. There may perhaps be quite a few potential forms/avenues still resting in the darkness of the deep and let us strive for more researches and major surveys in these areas to unfold several such hidden living wealth.