

CURRENT KNOWLEDGE ON THE OFFSHORE FISHERY RESOURCES OF
INDIA AND POSSIBILITIES OF THEIR EXPLOITATION

By

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The exploited marine fish resources of India come almost exclusively from within the 50 m depth contour of the continental shelf and the rather small contribution from the offshore waters is made by the Government vessels engaged in exploratory fishing surveys.

The Fishery Survey of India (FSI), the Indo-Norwegian Project, renamed as Integrated Fishery Project (IFP) and the Central Marine Fisheries Research Institute (CMFRI) played significant roles during the past four decades in gathering and disseminating a lot of information on qualitative and quantitative aspects of the offshore fishery resources of the country.

It is fairly clear by now that much of the trawlable offshore ground fish resources are restricted to the outer shelf and slopes as well as to certain restricted areas such as the Quilon Bank and Wadge Bank along the south-west coast. The species caught are mainly percoid fishes, several meso- and bathy-pelagic fishes as well as deep sea prawns and lobsters. Beyond the continental slope there is virtually no evidence of commercially available ground fish. However, this is compensated by the oceanic crabs etc. The successful pole and line fishing for the skipjack in the Lakshadweep and the possibilities of tuna fishing off the coast of Karnataka, Goa and in the Andaman waters are now common knowledge.

Recent surveys of the UNDP/FAO Pelagic Fisheries Project (PPF) off the south-west coast (Anon, 1974, 1976 a, 1976 b) and the industrial bottom fish survey along the north-west coast by the Indo-polish survey vessel **M. T. Murena** (Bapat et al. 1982) threw much light on the offshore distribution of some of the underexploited fish resources like the whitebaits (*Stolephorus spp.*), horse mackerels, scads (*Decapterus spp.*) cat fish and ribbon fish.

Long-line explorations of the FSI (Joseph, and John 1986) and the Central Institute of Fisheries Nautical and Engineering Training (CIFNET)

vessels (Swaminath et al, 1986) for tunas give much hope on the commercial possibilities of tuna longlining off Karnataka coast.

Looking more closely at certain underexploited ground fish resources, it is seen that perches, mainly serranids, lutjanids and lethrinids form a significant component among these. Joseph and John (1986) cite good catch rates of this category within 50 — 200 m on the Wadge Bank and Gulf of Mannar and within 50 — 150 m off the north-west coast. The 'Kalava' (*Epinephelus* spp.) ground of the rocky outcrops of the south-west coast are well known for line and trap fishing for these large perches.

Nemipterus japonicus is a dominant species in the 100 — 200 m depth zone along the west coast and the Wadge Bank — Gulf of Mannar area.

Among the carangids, horse mackerel and scads have been found in large concentrations between 50 — 100 m depth along the west coast and lower east coast during the surveys of the Pelagic Fisheries Project, the M. T. Murena surveys and the FSI surveys.

The seasonal availability during July — September period of cat fish in significant quantities on the mid shelf along south-west coast of India has been reported by the PFP. Like-wise very good catches of cat fish were recorded from the 50 — 100 m depths along the upper east coast by the FSI vessels (Joseph and John 1986.)

Among the virtually unexploited significant deep sea demersal resources may be mentioned a variety of species such as the 'Black ruff' *Centrolophus niger*, the 'Bull's eye' *Priacanthus* spp., the 'Green eye' *Chlorophthalmus* spp., *Cubiceps* sp. and the Indian 'Drift fish' *Psenes indicus*. While many others like *Parascoplopsis* spp., the boar fishes (*Antigonia* spp.,) snake mackerels (*Epinnula* sp.) and *Emmelichthys* sp. and different deep sea 'rat tail' together contribute to the fish biomass in no small measure (Silas, 1969). Rich grounds for 'Bull's eye' and 'drift fish' are reported from the south west coast and lower east coast within the 50 — 100 m depth (Joseph and John 1986).

The component of shell fishes like the deep sea lobster *Puerulus sewelli* and a few species of penaeid and non-penaeid deep sea prawns from the shelf slopes of the west coast are significant resources amenable to commercial exploitation. Important species of deep sea prawns available from the 150 — 400 m depths are *Heterocarpus* spp., *Aristeus semidentatus*, *Parapandalus spinipes*, *Plesionica martia*, *Penaeopsis* spp., and *Solenocera* spp., These prawns are however medium or small sized compared to the inshore commercial species.

The deep sea lobster standing stock has been estimated by Oommen (1985) to be of the order of 12940 tonnes from the South-west coast and 1860 tonnes from the Gulf of Mannar. While Oommen (1985) indicated the most productive season as February-June, the surveys by FSI revealed a more protracted season of availability for the species. The oceanic crab (*Charybdis edwardsi*) is yet another crustacean located often in huge swarms (Silas, 1969).

Of the oceanic pelagic fishes, the larger tunas, bill fishes and sharks are the main components to reckon with. Potential yield estimates of tunas and allied species from the Indian Ocean are between 0.51 to 0.79 million tonnes (Joseph and John 1986). However, the average catch has been around 0.2 million tonnes. The main oceanic species concerned here are the yellow fin (*Thunnus albacares*), big eye (*T. obesus*) and albacore (*T. alalunga*). India has virtually no share of the commercial catches of these species from the Indian ocean except perhaps the marginal exploitation of the young yellow fin stock touching Lakshadweep archipelago, where the skipjack is the main resource which sustains the traditional pole and line fishery of the region.

However, recent exploratory long lining explorations by the FSI and CIFNET vessels have indicated high hooking rates of the larger oceanic tunas and pelagic sharks from the Exclusive Economic Zone of the country. It is seen that the yellow fin tuna is the dominant species in these catches in the Indian waters, whereas, big eye tuna was more abundant in the equatorial waters and the albacore confined to Andaman-Nicobar Seas (Joseph and John 1986).

It is significant to note that skipjack tuna was more frequently hooked from the east coast in these surveys. The very high hooking rate of yellow fin tuna (24-33%) off Karnataka within 150 miles from the coast by FSI and CIFNET vessels is the highlight of the surveys.

Another major commercial resources of high value from the offshore waters is that of cephalopods — the oceanic squids and cuttlefishes. Recent surveys indicate this group as forming about 4% of demersal catch from the west coast and 0.6% from east coast, with good concentration in the 50-100m depths off the north west coast and the Wadge Bank and Gulf of Mannar areas. Over the Wadge Bank the large cuttle fish *Sepia pharaonis* is found to be a dominant component. A potential yield estimate of 1.8 lakh tonnes is indicated for cephalopod resource from the Indian waters of which about 0.15 lakh tonnes only are currently caught.

While looking at the problems of exploitation of the offshore resources outside the traditional grounds, it will be seen that qualitatively these can be broadly divided into three types.

The first type is the underexploited resources like those of horse mackerels, whitebaits, the offshore stocks of cat fish, ribbon fish, the threadfin breams and other larger percoids. These are conventional types of food fishes which are easy to be marketed internally.

The second type of resource including the deep sea lobsters and some of the larger deep sea prawns, the squids and cuttlefish and the oceanic tunas have an export potential and could be exploited advantageously for this purpose.

The third category includes those ground fishes of an unconventional nature, some of which such as *Psenes indicus* and *Priacanthus* spp. are by now familiar as food fishes. There are others which are available in large quantities from the deeper grounds like *Chlorophthalmus* spp., *Centrolophus niger*, *Emmelichthys* sp., *Antigonia* sp., *Parasclopsis* sp. etc. which require to be processed and popularised to attract either internal or export market.

The basic problem with regard to exploitation of the offshore resources are related to their capture from the distant grounds, safe transport and storage as well as those connected with processing of the several unconventional resources for making them suitable for marketing.

On the capture side, for bottom trawling for ground fish, midwater trawling for columnar resources, purse-seining or long lining for oceanic tunas, larger vessels of around 23 m length or above are required so as to satisfy power requirements, endurance, storage space and crew accommodation.

The capital outlay for each such unit with the complement of suitable gears will be high and consequently the returns will have to match the investment to make the operations economically viable.

The establishment of shore infrastructure by way of provision of deeper fishing harbours, on-shore storage and processing facilities which have to be provided at all major zones will also absorb a high capital.

The special types of diversified processing techniques for unconventional species will have to be developed.

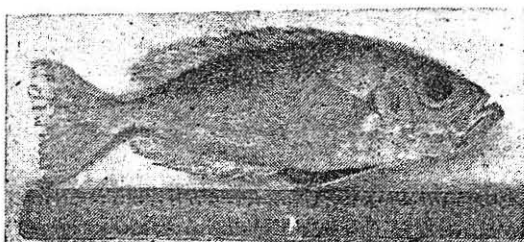
Promotional efforts to market all the products will also have to be taken up by the existing organisations supporting marine products exports.

Lastly, even if all the above problems are taken care of, the private industry appears to be diffident of investing huge capital on deep sea fishing

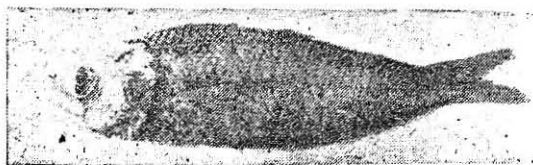
ventures as they do not feel assured of good profit margins due to the very nature of the problems mentioned earlier. However, it is in the fitness of things that all encouragement is given to those agencies who show willingness to exploit the known offshore resources of our Exclusive Economic Zone. If certain foreign countries could make profitable fishing ventures out of very distant waters from their shores, it will not be over optimistic to hope that Indian entrepreneurs would also be able to do the same successfully from the not so distant bases on our coasts. With the knowledge accumulated so far on the resources of our offshore waters, it is time that practical steps are taken for their commercial exploitation.

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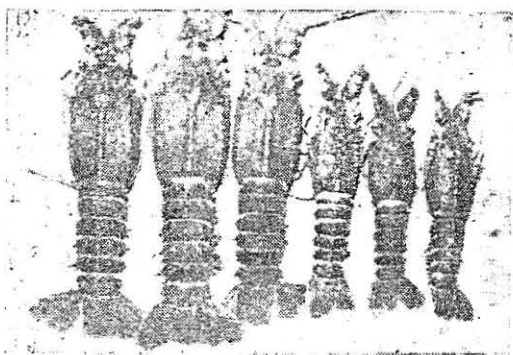
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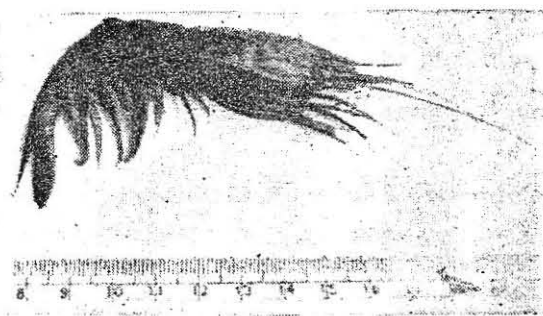
Priacanthus hamrur



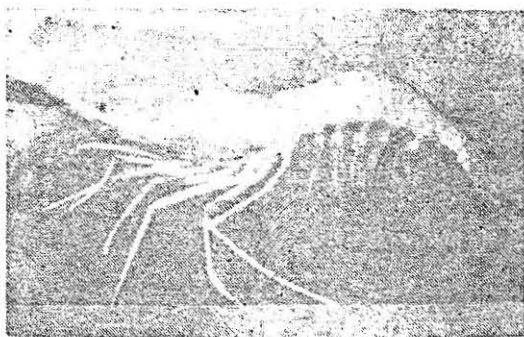
Cubiceps sp.



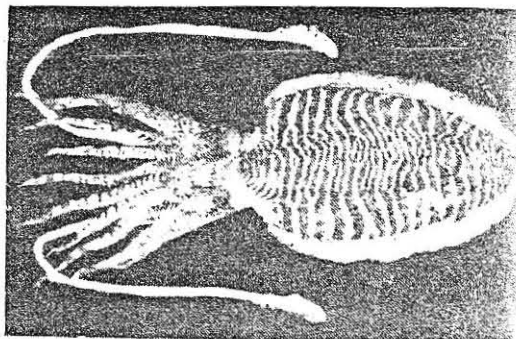
Puerulus sewelli



Heterocarpus woodmasoni



Solenocera hextii



Sepia pharaonis