Squids and Cuttlefishes - A Promising Resource from the Seas Around India

Sqiuds, cuttlefishes and octopuses are collectively known as Cephalopods, a group of invertebrates under phylum Mollusca. Realising the food value of sqiuds and cuttlefishes there has been some kind of sustenance fishery for this group since early times in our country. When the trawling for shrimps got its momentum since the early sixties, squids and cuttlefishes used to occur as by-catches in considerable quantities. But these were used to be discarded into the sea as they had no commercial importance then. However, in recent years a good export market has come into being for this group and hence increasing quantities of squids and cuttlefishes are now landed from the trawl catches. Still there is no organised or directed fishery for this group.

The average production of squids and cuttlefishes at present is estimated around 40,000 tonnes contributing to about 2% of the all India marine fish production. Seventyfive - 90% of the catch comes from the west coast as trawl fishing is heavily concentrated in the region. The rest of the catch is landed at centres along the east coast.

The average annual production 1985-87 in the different maritime States of India is given in the following Table :

State	Average annual catch (t)	% in all India cephalopod catch
Gujarat	6,056	16.7
Maharashtra	12,360	34.1
Karnataka	1,710	4.7
Goa	734	2.0
Kerala	10,287	28.3
Tamilnadu	4,281	11.8
Pondicherry	51	0.1
Andhra Pradesh	682	1.9
Orissa	108	0.3
West Bengal	14	—
Lakshadweep	10	—

In recent years, CMFRI has strengthened its research investigations on cephalopod resources and observations are made from the research centres of this Institute at Veraval, Bombay, Mangalore, Cochin, Mandapam, Madras and Visakhapatnam. Besides studying the catch, effort and species composition, stock assessment of this group is also being made for the inshore and off shore regions. The dominant species composition at different centres is given below :

Species	Centres
SQUIDS	
Loligo duvauceli	all centres
Loligo uyii	Madras
Doryteuthis singhalensis	Vizhinjam and Cochin
Doryteuthis sibogae	Vizhinjam and Madras
Sepioteuthis lessoniana	Mandapam
CUTTLEFISHES	
Sepia pharaonis	all centres
Sepia aculeata	all centres
Sepia elliptica	Cochin and Veraval
Sepia brevimana	Madras
Sepia prashadi	Madras
Sepiella inermis	all centres
OCTOPUSES	
Octopus vulgaris, *Octopus cyaneus*, *Octopus membranaceus*	Lakshadweep

The data on catch per unit effort observed over a period of years indicated that CPUE was of higher magnitude in the observation centres like Bombay, Veraval, Sakthikulangara, Madras and Visakhapatnam. These are thus the leading centres for cephalopod production in the country.

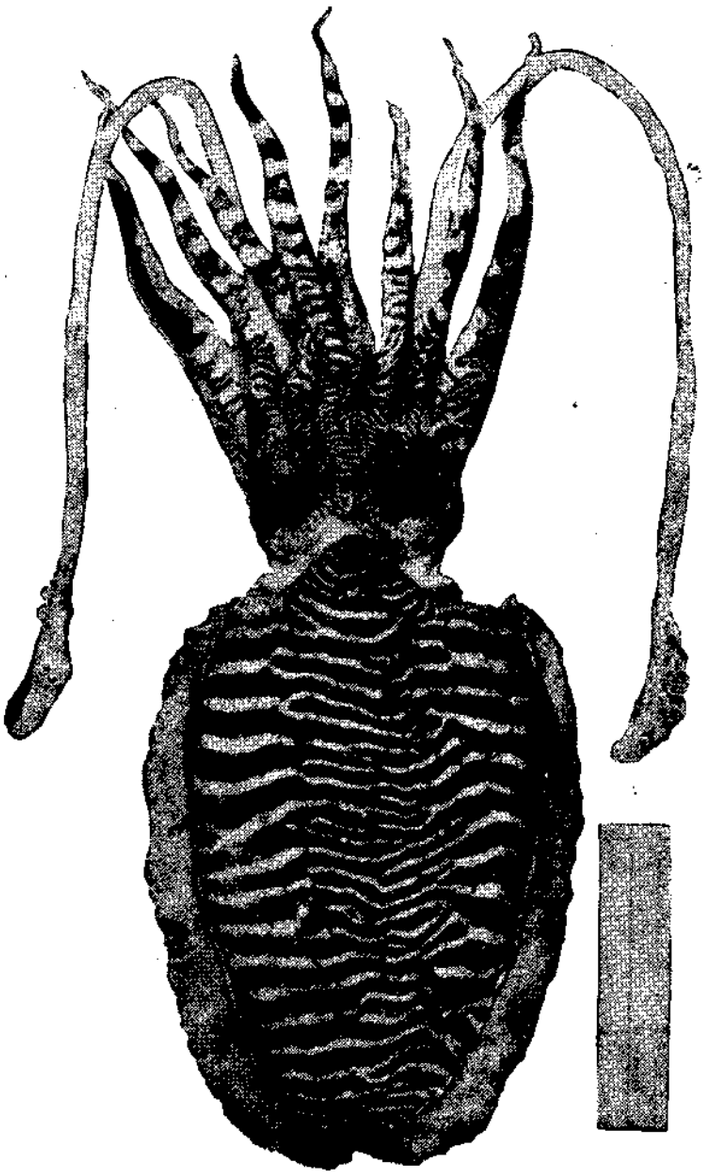
Export of cephalopods :

The range of cephalopod products exported include frozen cuttlefish, frozen cuttlefish fillets, frozen squids, dried squids & cuttlefishes, and cuttlebones. The cuttlebone was the first item to be exported from 1966 onwards and others followed from 1973. An average quantity of 9,500 tonnes of cephalopod products valued at Rs 198 million was exported from India during 1985-87.

Potential resources of squids and cuttlefishes :

In view of the importance of economy of the fisheries sector. the cephalopod resuorces in the exploratory surveys have been undertaken by different government agencies to locate potential grounds for the group.

The erstwhile Pelagic Fishery Project in its survey beyond the traditional fishing grounds has indicated good concentrations of squids and cuttlefishes off the south west coast and in the Gulf Mannar. The exploratory surveys by the vessels of Fishery Survey of India off the Kerala coast and Wadge Bank have indicated good cephalopod catch rates. Survey by *M. T. Muraena* has also given similar indications for the north west coast. The foreign vessels operating under charter in Indian EEZ had a catch rate of 106 kg/hr in the depth range of 60-80 m. Trawl surveys by ***FORV Sagar Sampada*** have indicated good concentrations of cuttlefishes and squids along the west coast in the 50-200 m depth zone.

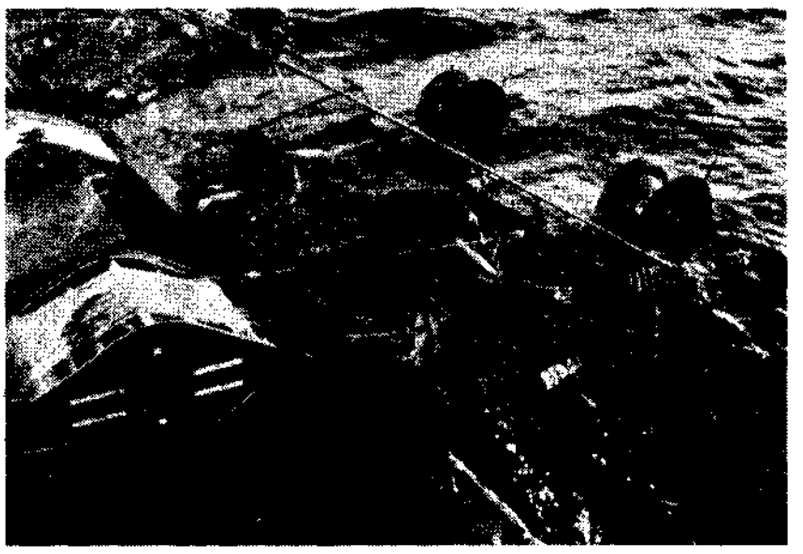


Sepia pharaonis, a commercially important cuttlefish

During the surveys by *R. V. Varuna* in the Arabian Sea, *R.V. Shoyo Maru* in the north Arabian Sea and ***F O R V Sagar Sampada*** off north west coast and north east coasts, the high potential for the exploitation of oceanic squids was recognized.

The cephalopod potential for the Indian EEZ is estimated at 180,000 tonnes. The estimates for Eastern Arabian Sea are 50,000 and Bay of Bengal are — 100,000 tonnes and 100,000 — 150,000 tonnes respectively. A harvest potential of 50,000 tonnes from the neretic sector and at 25,000 — 50,000 tonnes

Oceanic squid
Symplectoteuthis oualaniensis

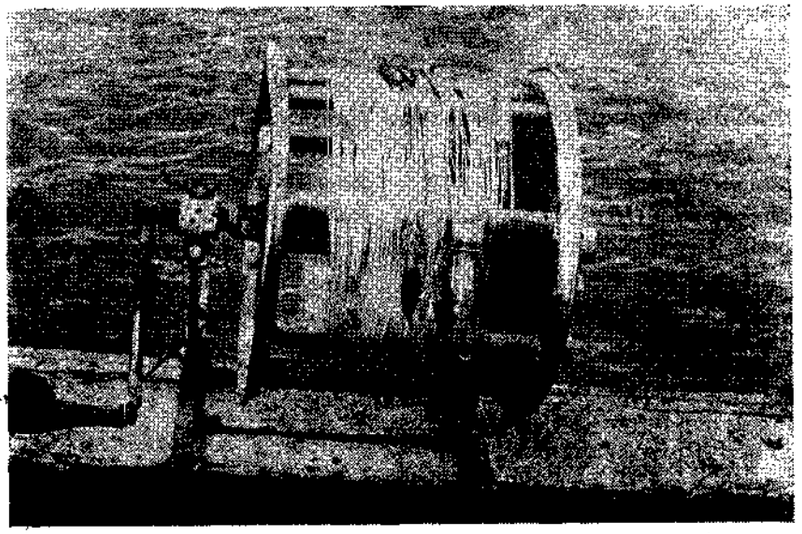


Automatic Squid jigging machine in operation

from oceanic sector are also estimated.

The need for aimed fishery for cephalopods :

Though the cephalopod production in the country has increased since 1973, much greater harvest could be made through aimed fishery for squids and cuttlefishes. There is considerable gap between the potential estimates and actual production. Experimental fishing with high opening bottom trawls have indicated that this gear could be successfully employed for increasing cephalopod production. Squid jigging and fishing with stick-held dip nets are two highly successful methods employed in Japan. Experimental fishing with these gears was first attempted by Marine Products Export Development Authority in 1985 which showed that these methods were technically feasible.



Hand Squid jigging unit

Recently a squid jigging programme aiming at training Indian personnel in the operation of the gear and testing the technical feasibility has been undertaken with a Japanese consultant under the auspices of Central Institute of Fisheries, Nautical & Engineering Training and Fishery Survey of India with the scientific involvement of CMFRI. Two vessels, *M. V. Matsya sugandhi* of FSI and *MFV Bluefin* of CIFNET rigged for automatic jigging are operating along south west coast. Encouraging results have been obtained off Quilon and off Vizhinjam coasts. This programme is expected to provide information on the commercial viability of this modern method in our waters.

Squid jigging involves simple gear and operation techniques with moderate capital investment. Two thirds of Japan's production is contributed by this gear. Squid jigging is a fishing method developed basically taking into consideration the behaviour of squids in response to certain physical factors like light etc. Squids are fast growing which naturally makes them voracious in their feeding habits. They prey upon anything coming in their way, be it crustaceans, finfishes or their own kind. They congregate in schools and are generally found in the deep scattering layers which are rich in forage organisms. They are attracted by artificial lights. All these behavioural aspects have been fruitfully utilised in catching them with jigs.

Technique of squid jigging

Squid jigging is either done with manually operated hand line units or with automatic mechanised units. But in either case, the principle involved is the same. A jig is nothing but an artificial bait. It has spindle shaped body made of coloured hard or soft synthetic material with two sets of sharply pointed hooks arranged in crown like clusters. Jigs are attached to monofilament lines at one metre interval. The line is wound round on to a drum which is cylindrical in hand line units or elliptical in mechanised units. The line is released into the water through out board rollers. A sinker is attached to the line. The automatic unit has two such drums and the line is released automatically to required depths and on reaching the set depth it is hauled back. The operation is repeated automatically. The jigs and the units are designed in such a way that the hooked squids drop on board automatically when hauled up.

Incandescent or halogen lamps of 1 to 4 KW power are used for attracting squids. It has been observed in Japanese waters that the squids concentrate in the boundary between light and shade. Stability of the craft increases the operational efficiency and for this purpose special type of anchors known as parachute anchors are used.