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ON THE CEPHALOPODS COLLECTED DURING THE EXPLORATORY SURVEY BY FORV SAGAR SAMPADA IN THE ANDAMAN-NICOBAR SEAS

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ABSTRACT

The cephalopods collected by FORV *Sagar Sampada* from the Andaman-Nicobar seas (5° - 15°N; 90° - 95°E) are reported. Altogether twenty six species belonging to 22 genera were recorded. Of the 41 Isaacs- Kidd Midwater Trawl stations, 16 recorded cephalopods. Eggs and developing embryos were also present at these stations, while juveniles of *Abralia andamanica*, *Abralia* sp., *Abraliopsis gilchristii*, *Octopoteuthis* sp., *Cranchia* sp. and *Licocranchia* sp., were recorded in some of the stations.

In the pelagic trawl, cephalopods were recorded from 26 of the 30 stations covered. Sixteen species belonging to 15 genera were recorded in the catches, the most dominant species being *Symplectoteuthis oualaniensis* followed by *Abralia* sp., *Abralia andamanica*, and *Onycoteuthis banksi*. A large specimen of *Thysanoteuthis rhombus* measuring 585 mm DML (weighing 5.3 kg) was also caught at station 495.

The bottom trawl catches were composed of the neritic water species *Sepia pharoanis*, *S. aculeata*, *S. prashadi*, *S. trigonina*, *Euprymna stenodactyla*, *Loligo duvaucelii* and *Octopus* sp.

The present observations indicate a wide distribution of the cephalopods both in the coastal and oceanic waters of the Andaman-Nicobar Archipelago. It is suggested that steps may be taken to exploit the resources by adopting suitable techniques such as light fishing with lift net.

INTRODUCTION

Cephalopods constitute one of the important exploited marine fishery resources of our country at present. The annual cephalopod landings were less than 1,400 t until 1972 but gradually increased from 1973 onwards with the commencement of export of frozen cephalopod products to several countries. At present the exploitation from Indian waters stands at 35,000 t.

Regarding the potential cephalopod resources of the Indian Ocean, our information is limited. Gulland (1970) estimated it to be over several hundreds of thousand tonnes. Voss (1973) estimated the potential at 5,00,000 t and Tussing (1974) also put it at the same figure. Yet another estimate is 2,00,000t (Anonymous, 1977). George *et al.* (1977) have estimated that the cephalopod resource potential of the Indian economic zone would be of the order of 1,80,000 t, of which 55% would be contributed from the upper east coast, 11% from the lower east coast, 20% from the southwest coast, 11% from the northwest coast and the remaining 3% from the Lashadweep Sea.

So far, no estimate has been made of the cephalopod resources of the Andaman-Nicobar seas. There

is no organized fishery in this region and little attention has been paid to the existing incidental catches, and the different species which contribute them. The present account is only an initial attempt to attract the attention of the various fishing agencies towards this potential resource which is yet to be recognised and exploited.

MATERIAL AND METHODS

The data presented in this account were from the cruise of FORV *Sagar Sampada* conducted in March-April, 1986. The cruise covered the Andaman-Nicobar Archipelago between Lat. 5° and 15° N and Long. 90° and 95° E, with a track distance of 5,049 n. miles and an area of 1,70,526 sq. n. miles. Totally 41 stations were sampled along the cruises track at an interval of 1°. The area surveyed and the locations of the different sampling stations are given in Fig. 1.

In the present work, collections obtained from IKMT, pelagic trawl and bottom trawl only are considered. While IKMT was operated in all the 41 stations, pelagic trawl was operated in 30 stations and the bottom trawl in 3 stations (where the depth was less).

Eggs, developing embryos and juveniles were collected in the IKMT. Cephalopods obtained in pe-

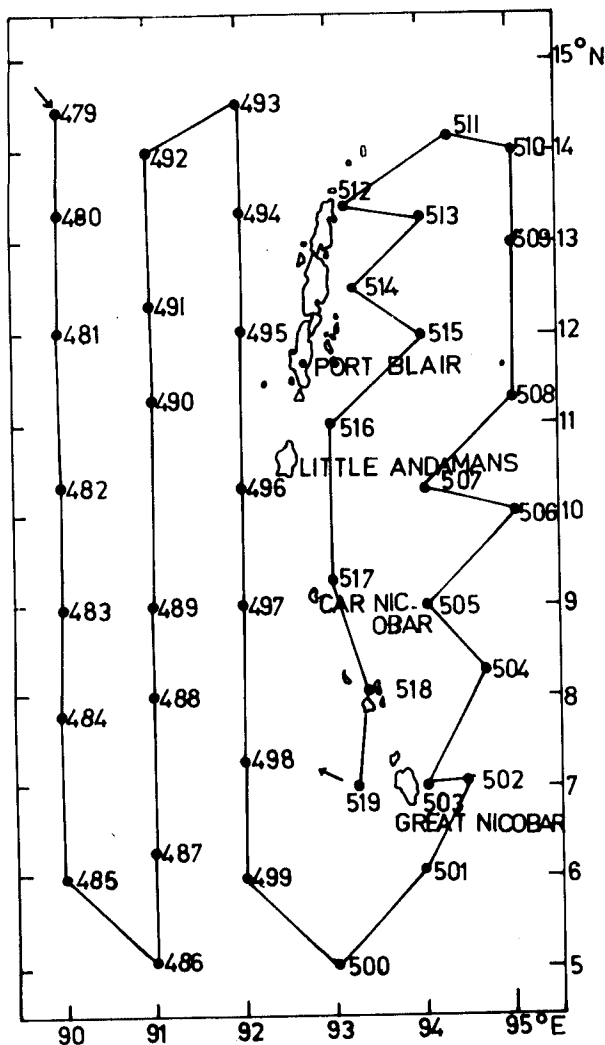


Fig. 1. Locations of sampling stations and the track of the Cruise No. 14 of FORV Sagar Sampada in Andaman-Nicobar Archipelago.

logic and bottom trawls were sorted out and weighed to find out their percentage contributions in the total quantity of the collections and to estimate the species composition. Mantle lengths of the specimens of different species were taken to find out the size composition.

OBSERVATIONS

Distribution of cephalopods

The details of occurrence of cephalopods in the study area are presented in Table 1. Of the 41 stations where IKMT was operated, cephalopods were recorded at 16 stations. The stations were 483-487, 492-495, 499, 502, 503, 507, 508, 516 and 518. Cephalopod eggs and developing embryos were

present at all the stations, while juveniles were recorded at seven of the above stations.

In the pelagic trawl, which was operated at 30 stations, cephalopods were caught from 26 stations (90%). Cephalopods contributed to the entire catch at station 490 and substantially to the total catch at stations 480, 491, 492, 495 and 517.

Cephalopods were caught in all the three operations of the bottom trawl at stations 511, 512 and 518. They contributed to 12.1% at the first station while in the latter two stations their contribution was about 3%.

Species composition

Totally 26 species belonging to 22 genera were recorded. It was observed that the species belonging to the genera *Sepia*, *Loligo*, *Doryteuthis*, *Euprymna* and *Octopus* were found exclusively in the coastal waters, while the squids of the genera *Ancistrocheirus*, *Enoploteuthis*, *Abralia*, *Abraliopsis*, *Cranchia*, *Licocranchia*, *Helicocranchia*, *Onycoteuthis*, *Gonotopsis*, *Histioteuthis*, *Ctenopteryx*, *Chiroteuthis*, *Octopoteuthis*, *Corynomma*, *Japetella*, *Symplectoteuthis* and *Thysanoteuthis* were recorded in the oceanic waters. Occurrence of eggs, early stages of life history and also adults suggests that their entire life cycle is completed in the pelagic zone.

Among the cephalopods collected, species like *Sepia pharoonis*, *S. prashadi*, *S. aculeata*, *Loligo duvacelii* and *Doryteuthis sibogae* are being exploited along the Indian coasts and elsewhere. Species like *Symplectoteuthis oualaniensis* and *Thysanoteuthis rhombus* are potential oceanic squid resources.

Sepia pharoonis

This cuttlefish was caught in the bottom trawl from three stations viz., 511, 512 and 518 (Fig. 2). It formed 10.0, 63.0 and 53.0% of the cephalopods caught respectively. The mantle length ranged from 133 mm to 251 mm.

Doryteuthis sibogae

This squid was also caught in the bottom trawl along with the above species. The size ranged from 60 to 146 mm. Percentage contributions of this species was 89.0, 3.0 and 11 of the total cephalopods respectively at stations 511, 512 and 518 (Fig. 2).

Symplectoteuthis oualaniensis

This oceanic squid was obtained frequently during the cruises over an extensive area (Fig. 2). It

TABLE 1. Catch of cephalopods (kg) and their percentage contribution at different stations

Stn.	Pelagic trawl		Bottom trawl	
	Quantity	%	Quantity	%
479	-	-	-	-
480	0.210	65.6	-	-
481	0.110	3.1	-	-
482	1.300	11.8	-	-
483	0.120	16.1	-	-
484	0.445	20.9	-	-
485	0.056	0.1	-	-
486	0.070	9.8	-	-
487	-	-	-	-
488	-	-	-	-
489	0.080	12.1	-	-
490	0.250	100	-	-
491	1.375	57.4	-	-
492	0.740	75.5	-	-
493	0.091	8.0	-	-
494	X	-	-	-
495	6.720	62.0	-	-
496	0.060	6.9	-	-
497	0.280	0.6	-	-
498	0.005	0.9	-	-
499	2.790	43.1	-	-
500	0.300	43.5	-	-
501	0.005	2.5	-	-
502	0.160	13.6	-	-
503	-	-	-	-
504	1.010	2.5	-	-
505	0.890	10.0	-	-
506	-	-	-	-
507	9.561	13.6	-	-
508	-	-	-	-
509	X	-	-	-
510	X	-	-	-
511	-	-	7.510	12.1
512	-	-	5.785	3.2
513	-	-	-	-
514	-	-	-	-
515	1.065	8.1	-	-
516	0.040	0.2	-	-
517	3.183	60.3	-	-
518	-	-	2.500	3.1
519	-	-	-	-

X = Absent, - = No fishing

occurred at 23 stations (70% of the stations sampled). It was caught in the pelagic trawl only and formed the entire or substantial part of the catch at most of the above stations. The mantle length ranged from 13 to 125 mm. It is of interest to record a catch of 3,537 juveniles at station 517 (DML 13 to 26 mm), which suggests that this may be a nursery ground for this species.

Thysanoteuthis rhombus

This oceanic squid was caught from two stations 495 and 516 (Fig. 2). At the former station a single large female was caught and because of its large size, the morphometric measurements (in mm) are given below:

- Total weight of the specimen (kg) : 5.3
- Total length : 912
- Mantle length : 585
- Head length : 350
- Eye diameter : 40
- Width across the fins : 490
- Length of gladius : 573
- Width of the gladius : 43
- Length of nidamental gland : 221
- Diameter of the intra-ovarian egg : 4

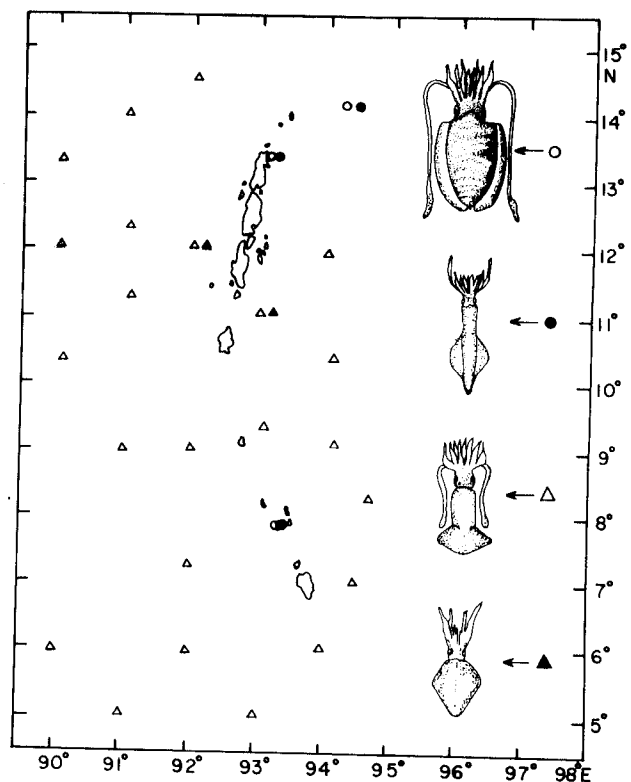


Fig. 2. Occurrence of four species of cephalopods in the seas around Andaman-Nicobar Archipelago.

At station 516, a juvenile specimen of this species measuring 50 mm in length and weighing 10 g was caught.

Details regarding the occurrence of the other 22 species are given in Table 2. *Abralia andamanica*, *Abralia* sp., *Abraliopsis* sp., *Onychoteuthis* sp. and *Gonotopsis* sp. were found to occur frequently in the catches.

GENERAL REMARKS

From the foregoing account, it is evident that the distribution of cephalopods in the seas around the Andaman-Nicobar Archipelago is wide and appears to be substantial. Cephalopods are distributed both in the oceanic and neritic waters. Faunal composition indicates the richness of the distribution which needs further study in this area.

Cephalopods are considered to be potentially important marine living resource and further exploitation to a high magnitude is possible. The present

world production is estimated to be 1.5 million tonnes which can be increased substantially. Nearly 70% of the presently exploited resource of cephalopods come from the neritic waters, but directed fishing for this resource is limited. While cephalopods are considered a non-conventional resource in many areas, their high protein and low fat content can make it an important item of human diet. In fact there has been a leap in the cuttlefish and squid catches in the world during 1970-'80 and it is projected that the contribution of cephalopods to the world fisheries will be about 2 million tonnes by 1990 (Silas, 1985). It is also opined that India can play an important role in exploiting this projected potential, by expanding the present fishing operations from the neritic waters to the oceanic. The Andaman-Nicobar waters offer a virgin area for cephalopod fishing.

Since there is no directed fishing at present for cephalopods in the continental shelf waters, there is

TABLE 2. Occurrence of different species of cephalopods in the Andaman - Nicobar area

Species	IKMT	Pelagic trawl	Bottom trawl
<i>Sepia aculeata</i>	—	—	518
<i>S. prashadi</i>	—	—	511
<i>S. trigonina</i>	—	—	518
<i>Euprymna stenodactyla</i>	—	—	518
<i>Loligo duvaucelii</i>	—	—	511, 512, 518
<i>Ancistrocheirus lusueuri</i>	—	499	—
<i>Enoploteuthis</i> sp.	—	484	—
<i>Abralia andamanica</i>	493	482, 490, 493, 495, 499, 501, 505, 517	—
<i>Abralia</i> sp.	483, 493, 499, 518	480, 482, 484, 490, 493, 496, 499, 500, 501, 505, 507, 517	—
<i>Abraliopsis gilchristii</i>	507	486, 493, 499, 501, 517	—
<i>Onychoteuthis banksi</i>	—	482, 484, 489, 499, 504, 505, 507, 515, 518	—
<i>Gonotopsis</i> sp.	—	483, 505, 515	—
<i>Histioteuthis</i> sp.	—	515	—
<i>Ctenopteryx</i> sp.	—	483	—
<i>Chroteuthis</i> sp.	—	493	—
<i>Octopoteuthis</i> sp.	499, 503	515	—
<i>Cranchia</i> sp.	487, 499, 502, 508, 518	499, 502	—
<i>Licocranchia</i> sp.	493	515	—
<i>Helicocranchia</i> sp.	—	502, 516	—
<i>Corynomma</i> sp.	—	502	—
<i>Japatella</i> sp.	—	481, 515	—
<i>Octopus</i> sp.	—	—	515

Numbers indicate the stations.

an urgent need for developing the same. Steps should also be taken to use some of the mechanised boats for light-fishing with lift nets for exploiting oceanic squids. There is also need for improving the traditional gears for specific capture of squids and cuttlefishes, besides making attempts to catch the octopus by using traps, pots etc., in the coastal waters. There is also scope for improving the utilization of the presently exploited resources from the continental shelf by creating an awareness among the people of its utility and by developing varied products from the squids and cuttlefishes.

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