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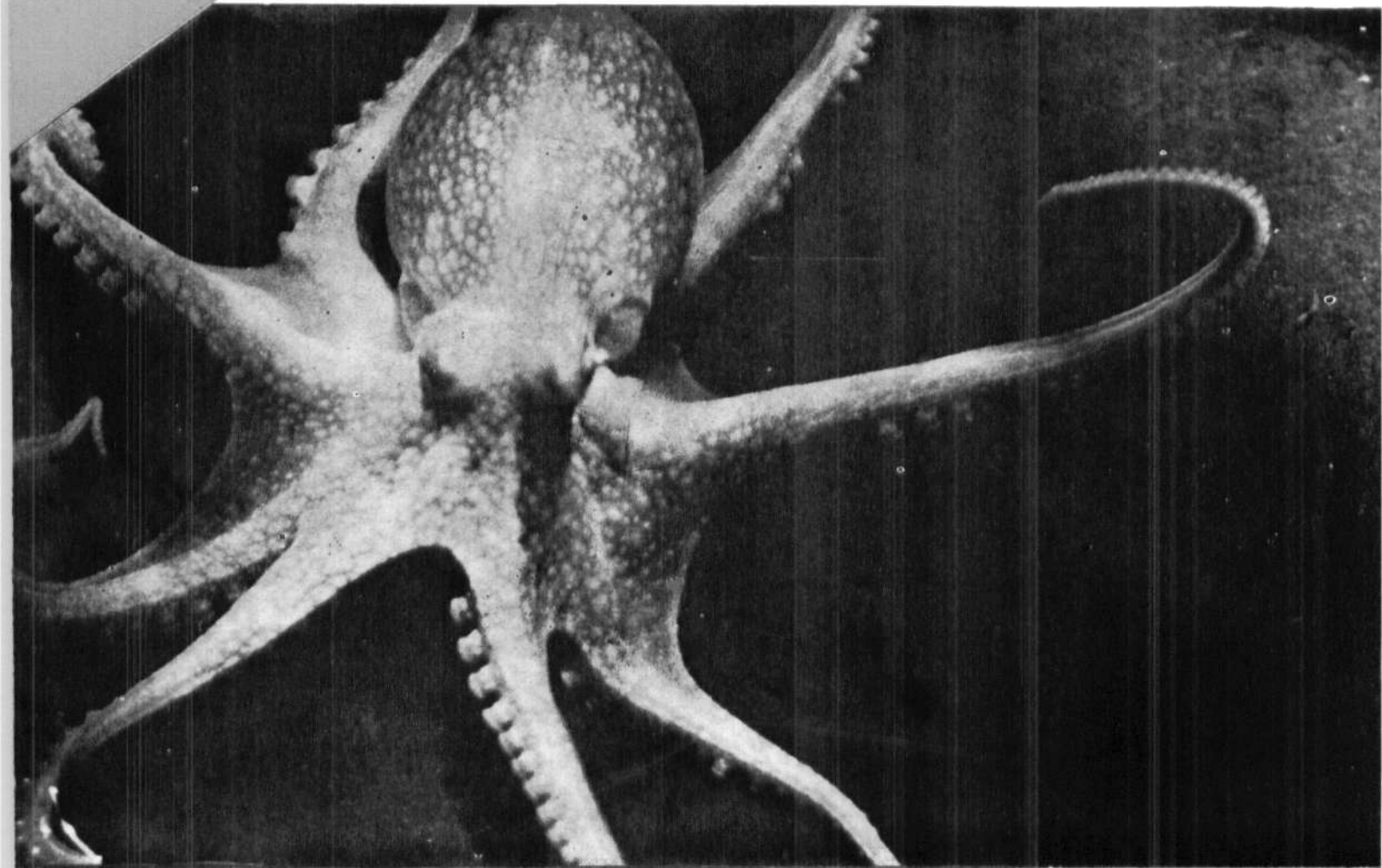
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CEPHALOPOD BIONOMICS, FISHERIES AND RESOURCES OF THE EXCLUSIVE ECONOMIC ZONE OF INDIA

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OCTOPOD RESOURCES

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ABSTRACT

The Octopod resources of the Indian seas are dealt with and the possibilities for organising a fishery by adopting modern methods of fishing are discussed.

INTRODUCTION

Among cephalopod resources, octopods are the least exploited in India. It is known that octopods occur in fair quantities in different parts of the Indian coasts (Hornell, 1917). In earlier years there has been fishing of octopods in some areas along the mainland coast. However, at the present time, the exploitation of octopods is chiefly in the Nicobar Island and in the Lakshadweep where it supports subsistence fishery.

As many as 200 species of Octopodidae are known to occur in the World Oceans (Worms, 1983). Of these about 60 species are known from the Indian Ocean (Hoyle, 1886; Goodrich, 1896; Massy, 1916; Robson, 1929; Adam, 1938, 1939b; Oommen, 1966, 1967, 1971, 1976, 1977a; Silas, 1968; Pickford, 1974; Roper *et al.*, 1984). Thirty eight species of octopods belonging to the family Octopodidae, Tremoctopodidae, and Argonautidae abound the Indian Seas including Andaman and Lakshadweep Seas (Table 1). Of these,

TABLE 1. Distribution of species of octopods in the Seas around India

Seas around Mainland	Andaman Sea	Lakshadweep Islands*
<i>Octopus aegina</i> Gray	<i>Octopus arborescens</i> (Hoyle)	<i>Octopus gardiner</i> (Hoyle)
<i>Octopus areolatus</i> Orbigny	<i>Octopus elegans</i> Brook	
<i>Octopus cyaneus</i> Gray	<i>Octopus cyaneus</i> Gray	
<i>Octopus de filippi</i> Verany	<i>Octopus globosus</i> Appellof	
<i>Octopus dollfus</i> Robson	<i>Octopus hongkongensis</i> Hoyle	

<i>Octopus fusiformis</i> Brook	<i>Octopus harridus</i> Orbigny
<i>Octopus globosus</i> Appellof	<i>Octopus michalumpshrot</i> Goodrich
<i>Octopus herdmani</i> Hoyle	<i>Octopus nierstrazi</i> Adam
<i>Octopus hongkongensis</i> Hoyle	<i>Octopus prashadi</i> Adam
<i>Octopus macropus</i> Risso	<i>Octopus rugosus</i> (Bosc)
<i>Octopus membranaceus</i> Quoy & Gaimard	<i>Octopus taprobanensis</i> Robson
<i>Octopus pallida</i> Hoyle	<i>Octopus vulgaris</i> Cuvier
<i>Octopus rugosus</i> Bosc	<i>Teretioctopus alcocki</i> Robson
<i>Octopus varunae</i> Oommen	<i>Berrya keralensis</i> Oommen
<i>Octopus winckworthi</i> (Robson)	<i>Benthooctopus profundorum</i> Robson
<i>Cistopus indicus</i> (Orbigny)	<i>Tremoctopus violaceus</i> Della Chiaje
<i>Scaergus unicolor</i> Orbigny	<i>Argonauta bottgeri</i> Maltzan
<i>Hapalochlaena maculosa</i> (Hoyle)	
<i>Berrya annae</i> Oommen	
<i>Berrya hoylei</i> (Berry)	
<i>Berrya keralensis</i> Oommen	
<i>Teretioctopus alcocki</i> Robson	
<i>Teretioctopus indicus</i> Robson	
<i>Tremoctopus violaceus</i> Della Chiaje	
<i>Argonauta argo</i> Linnaeus	
<i>Argonauta hians</i> Solander	

* the resource information is incomplete.

the common species are *Octopus dollfusi*, *Octopus globosus* and *Cistopus indicus*.

Many octopods such as *Octopus dollfusi*, *O. cyaneus*, *O. aegina* and *Cistopus indicus* occur in shallow coastal waters in the intertidal and subtidal areas among rocks, stones or corals hiding themselves among crevices. Unlike squids and cuttlefishes octopods lead a solitary life and do not form schools. Some species such as *Berrya* spp. occur in deep waters along the continental shelf edge and upper continental slope. A few others such as *Ocythoe* and *Tremoctopus* are pelagic (Voss, 1973).

Some octopods are known to make seasonal migrations which are influenced by breeding activity. Octopods are exclusively carnivores and they feed on crustaceans, fishes and molluscs. There is very little information on the biological aspects of octopods of Indian Seas. Sarvesan (1974) studied the brooding habits of *Octopus dollfusi*.

At present there is no demand for octopods within the country except in the bait fishery and where they are caught as subsistence fishery. There appears to be scope for developing an octopus fishery, particularly in the Andaman, Nicobar Islands, the Lakshadweep, the Gulf of Mannar and Palk Bay and the Gulf of Kutch.

SUBSISTENCE FISHING

Shell traps consisting of lines of shells such as *Lambis*, *Tonna dolium*, *Rapana bulbosa*, *Murex virgineus* and *Hemifusus* were commonly used for fishing octopus at Tondi, Devipatnam and Mandapam on the south-east coast of India (Hornell, 1917; Sarvesan, 1974).

As early as in 1902, Boden Kloss in his travels through the Andaman and Nicobar Islands wrote about the torch light fishing in Car Nicobar. One of us (E.G.S.) had occasion to witness this in January, 1960 at Car Nicobar. During low tide extensive areas of this reef are exposed and when this happens at night hundreds of villagers congregate along the shoreline with 2 metre or longer torches made of dried coconut palm leaves which would keep burning for a couple of hours. Different types of spears are used for spearing fish and octopods from the coral rock pools and from between submerged boulders. This is almost a ritual fishing and may last for about two to three hours at night.

During daytime, at Malacca Bay, Car Nicobar (Pls I and II) when the tide is receding, women and children can be seen harpooning in or poisoning coral rock pools for fish and octopods. The poison used

is the seed of *Barringtonia* which tree is abundant along the water front. The spiny rachi of a palm is used as the base for grating the seed and the mash is mixed in the water in tide pools or in receding rivulets which are at one end funnelled to a trap using coconut palm leaves on dead coral boulders (Pl. I D). The different types of spears and harpoons used in fishing from the reef area (photographs by E.G.S.) are shown in Pl. III.

At Agati one of us (E.G.S.) has seen octopods being caught from the lagoon and reef by using a long, straight iron rod barbed at the tip. The octopods (species not confirmed) caught weigh about 700 gm to 1 kg or so and are used for local consumption and as bait.

OCTOPUS FISHING IN OTHER COUNTRIES

The octopod fisheries and fishing methods adopted in the major octopod producing countries are relevant and hence are briefly dealt with below. Major exploitation of octopods is concentrated in the Pacific and Atlantic Oceans and the Mediterranean Sea by various countries of which Spain, Japan, Republic of Korea, Italy, Morocco, Thailand, Mexico, Portugal, U.S.S.R. and Tunisia are leading in production. The world octopod production was of the magnitude of 190,129 t in 1981 accounting for 14.6% of world total cephalopod production (F.A.O., 1983). The octopods contribute slightly more than the cuttlefishes to the world cephalopod production as the latter accounted for 13.7% in the world production. Spain is the foremost country in octopod production with an annual production of 61,589 t in 1981. Japan has been the leading country until recently but her production has declined and was 56,749 t in 1981. The average annual octopod production of the ten major countries during 1977-'81 are given in Table 2. It may be

TABLE 2. Average annual octopod production in ten leading countries during 1977-'81.

Country	Production (tonnes)
Spain	.. 57,885
Japan	.. 56,749
Republic of Korea	.. 18,333
Italy	.. 11,535
Morocco	.. 9,482
Thailand	.. 6,460
Mexico	.. 5,791
Portugal	.. 5,065
U.S.S.R.	.. 4,137
Tunisia	.. 3,416

Source: F.A.O. (1983)

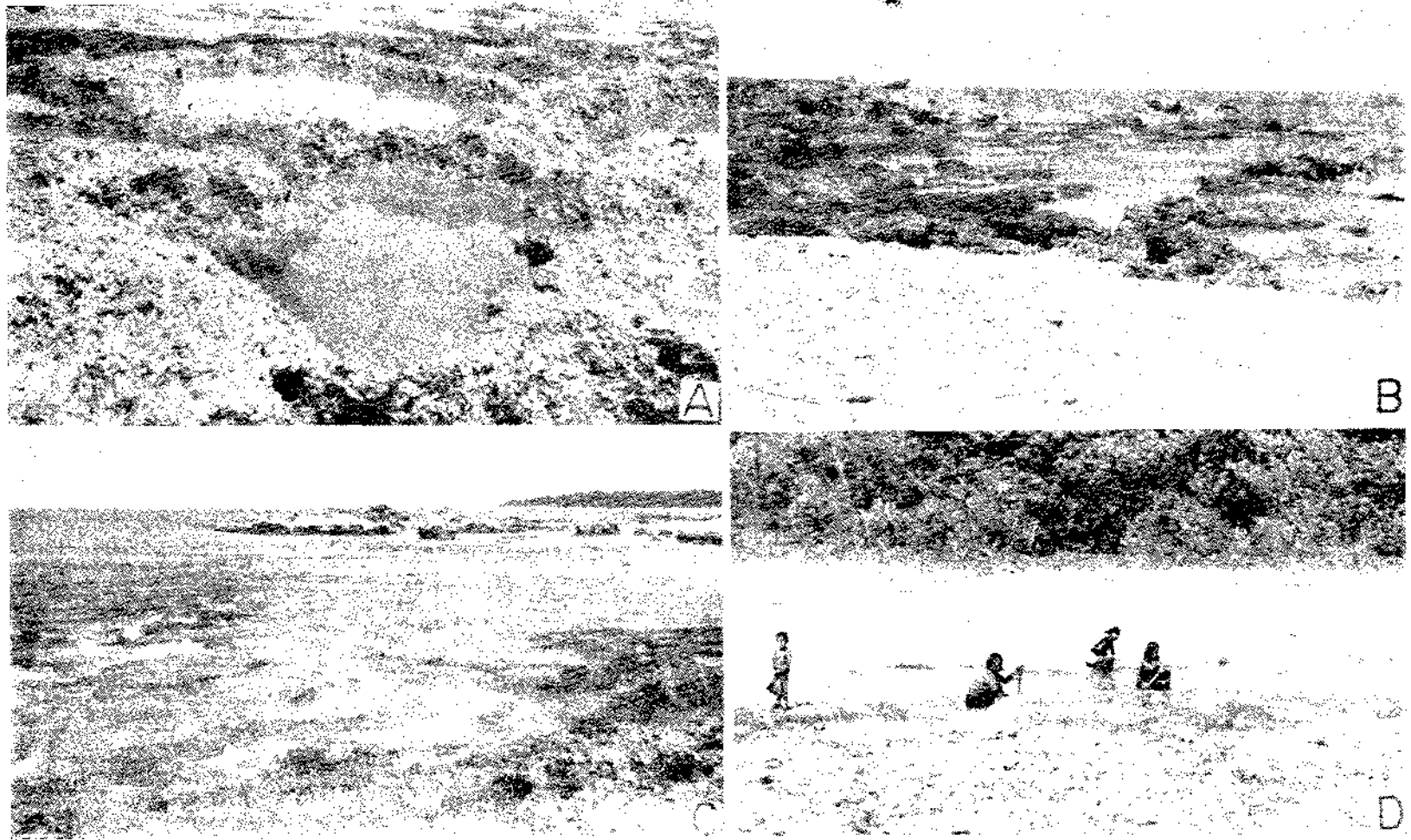


PLATE I. A-C. Exposed reef at low tide, Malacca Bay, Car Nicobar. D. Women grating and mixing *Barringtonia* seed with the water to poison reef animals for capture. (Photos : E. G. S.)

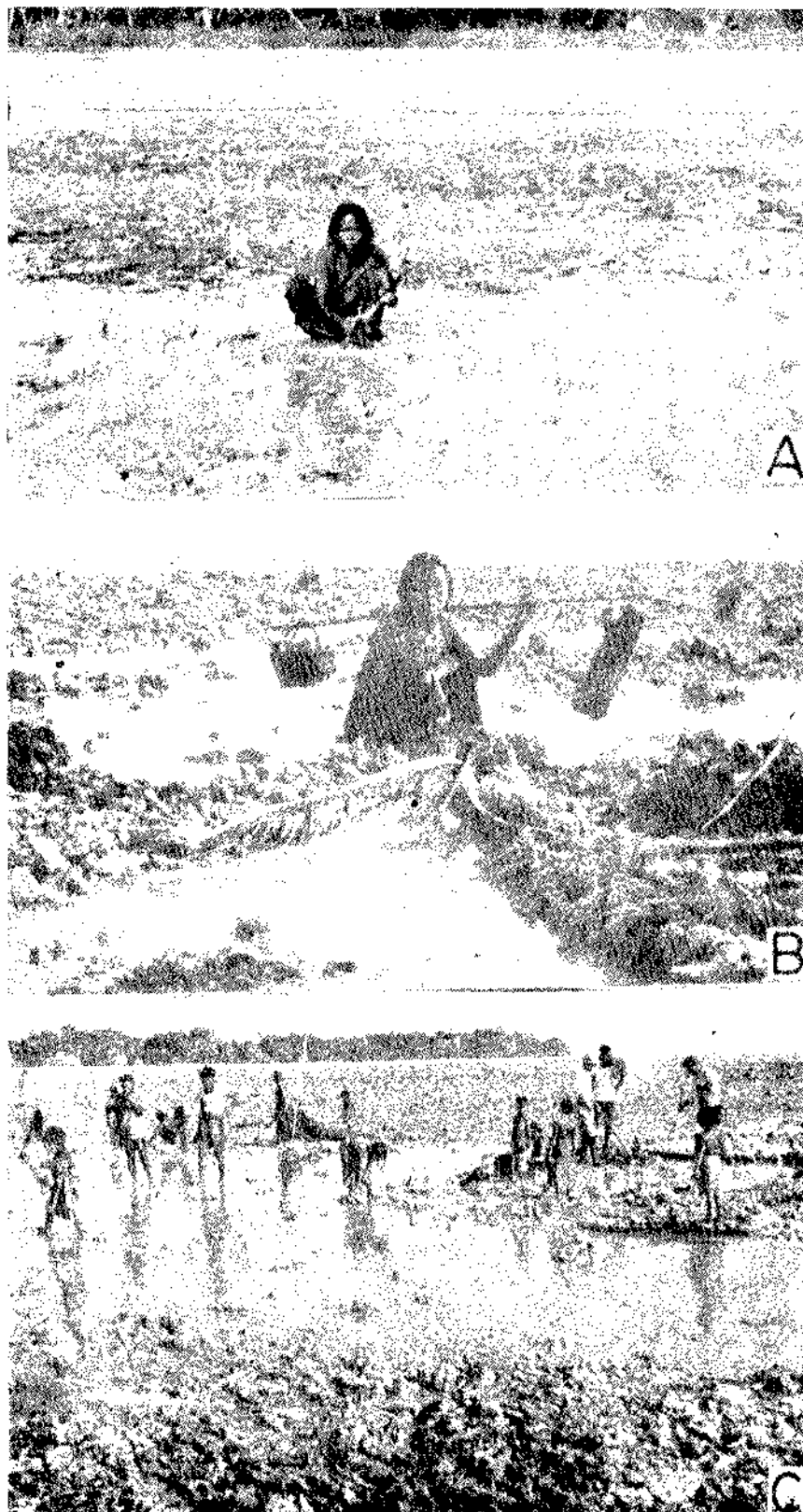


PLATE II. A-C. Malacca Bay, Car Nicobar at low tide when women and children fish for fin fishes and octopods after poisoning the rock pools and receding rivulets and also use traps (B). (Photos : E. G. S.)



PLATE III A. Spearing fish and octopods in Aberdeen Bay, Port Blair, Andamans. B and C. Returning after a morning's catch at Malacca Bay, Car Nicobar. D. Types of spears used for fishing on the reefs in Car Nicobar. (Photos : E. G. S.)

seen that fairly good quantities of octopods are also harvested by the Republic of Korea and Italy. Most of the species of octopods exploited in commercial fisheries in various parts of the world belong to the genera *Octopus*, *Cistopus* and *Eledone*.

Spain's octopod production in the Eastern Central Atlantic is obtained from bottom trawling by medium and large stern trawlers (Anon, 1977). The catches comprise of three species of octopods viz., *Octopus vulgaris*, *Eledone cirrhosa* and *Eledone moschata*. Japan exploits octopus resources present in her coastal waters, the oceanic areas around Hokkaido in the Pacific Ocean and distant waters in the Eastern Central Atlantic Ocean off Sahara and Mauritania.

In Japanese waters there are two distinct octopod fisheries, fishery in the Inland Sea and that in oceanic waters. In the octopod fishery in the coastal waters of the Inland Sea of Japan which is mainly for *Octopus vulgaris* from Hokkaido to Okinawa and the northern oceanic fishery around Hokkaido for larger-sized species such as *Paroctopus dofleini*, the bottom trawl is the main gear employed. Octopus fishing in the coastal waters of Japan is carried out almost throughout the year and accounts for 30 per cent of Japan's octopod production. Fishing is generally restricted to 20-30 m depth and has been recently extended to 80 m zone. Fishing operations are conducted when tidal current is strong. The stocks in the inshore waters consisted of *Octopus vulgaris* and *Octopus ocellatus* and are fished by trawling and gears such as octopus pots, trailing hooks, long lines, hand lines and spears. The fishing methods and gears employed depend on the behaviour of the octopods and nature of the environment.

Fishing with octopus pots takes advantage of the hiding habit of octopus in crevices and hollows in the reefs or rocky areas. Ceramic pots of different sizes and shapes or wooden boxes are tied in series to a main line and laid on the sea bottom with or without bait. Each unit or 'basket' consists of 600 to 800 metre mainline with 50-100 pots or boxes. The pots are lifted after 1-3 days. In recent years ceramic pots and wooden boxes are being replaced by boxes of vinyl chloride (Yamashita, 1976).

Trailing hooks operated in waters of 10-50 m depth from a small boat are hooks with fish or entrails of octopus as bait and provided with a line and they are dragged over gravel or rocky bottom. The trailing hooks are also operated by allowing them to drift

with the current or the wind, attached to buoys (Yamashita, 1976; Anon, 1981). One fisherman can operate 15-20 such hooks from a small boat of less than 3 t. The length of the lines from buoy to the hook is carefully adjusted according to the nature of bottom and water depth and is approximately 1.3 times the depth. When an octopus is entangled, the buoy stops drifting and the line is hauled up.

Long-lines employed in octopus fishing in Japan consists of a mainline 450-2,000 m in length with about 2,000 hooks. The long-lines are of two types, those with baited hooks and those without bait. In the latter type of hooks the reverse movement of octopus is made use of for hooking. The long-lines can be used by a fisherman with a small boat of 5 t capacity and a set of 10-20 long-lines are laid at depths ranging from 70-150 m. The fishery is conducted during the spawning season of octopods when they migrate from deeper to shallow waters.

Handlines with various types of barbless hooks arranged around a stem like a jig are also employed in octopus fishing. The handline hooks are usually baited and operated from a small boat in shallow to moderately deep waters.

Apart from the above methods of fishing, spears, harpoons or rakes are also used in Japan for catching octopus found in shallow waters in the subtidal zone. In this method the fisherman make use of a glass bottomed bucket to locate octopus crawling at the bottom.

Three species of octopods *Octopus aegina*, *O. dofleini* and *Cistopus indicus* are obtained in bottom trawl nets from the continental shelf of Hong Kong. *O. aegina* occurs at depths of 30-120 m in Hong Kong waters and the annual production of this species is about 100 t (Voss and Williamson, 1971). *Octopus dofleini* and *Cistopus indicus* are distributed from shallow depths upto to 50 m. *Cistopus indicus* is a common octopod captured in kelongs of Singapore and consumed (Pickford, 1974).

A keen demand exists for octopod products in some countries especially Japan (Anon, 1977; Santhakrishnan, 1984). There are good possibilities for organizing a fishery in the country for this non-conventional resource by adopting suitable methods for their sustained exploitation.

REFERENCES

- ABDULLA, I. M. AND A. Z. IDRUS 1978. The fish processing industry in peninsular Malaysia. *Proc. Symp. Fish Utilization Technology and Marketing in the IPFC Region, 18th Session, Manila, Philippines* : 45-60.
- ADAM, W 1934. Cephalopoda. *Result Sci. Voy. Ind. Orient. Meerl. Mem. Mus. r. Hist. Nat. Belgique*, 2 (16) : 1-28.
- ADAM, W 1937. Notes sur les cephalopodes : VII—sur un cas de regeneration chez *Sepioteuthis lessoniana* Lesson, 1830. *Bull. Mus. r. Hist. nat. Belg.* 13 (45) : 1-4.
- ADAM, W. 1938. Sur quelques cephalopodes octopodes des iles Andamans. *Bull. Mus. r. Hist. nat. Belgique*, 14 (7) : 1-25.
- ADAM, W. 1939a. Notes sur les cephalopodes. 13. Sur une nouvelle espece de *Sepia*, *Sepia winckworthi* sp. nov. *Bull. Mus. r. Hist. nat. Belgique*, 15 (32) : 1-11.
- ADAM, W. 1939b. The Cephalopoda in the Indian Museum, Calcutta. *Rec. Indian Mus.*, 41 : 61-110.
- ADAM, W. 1939c. Cephalopoda. Pt. I. Le genre *Seploteuthis* Blainville, 1824. *Siboga Exped. Monographie*, 55a : 1-33.
- ADAM, W. 1939d. Les cephalopodes de l'expedition du Siboga Pt. II. Revision des especes Indo-Malaises du genre *Sepia* Liane, 1758. Pt. III. Revision du genre *Septiella* (Gray) Steenstrup, 1880. *Siboga Exped. Monographie*, 55b : 35-122.
- ADAM, W. 1954. Cephalopoda. Pt. III & IV. Cephalopodes a l'exclusion des genres *Sepia*, *Septiella* et *Seploteuthis*. *Siboga Exped. Monographie*, 55c : 123-193.
- ADAM, W. 1959. Les Cephalopodes de la mer Rouge. Mission Robert Ph. DOLLFUS en Egypte (1927-1929), *Res. Sci.* 3 partie, 28 : 125-193.
- ADAM, W. 1960. Cephalopoda from the Gulf of Aquaba. *Contr. Knowl. Red Sea*. 16. *Bull. Sea-Fish. Res. Stn. Israel*, 26 : 3-26.
- ADAM, W. 1965. Redescription de Deux Especes de *Sepia* Insuffisamment Decrites par J. Steenstrup, 1875. *Vidensk. Medd. fra Dansk naturh. Foren.*, 128 : 169-176.
- ADAM, W. 1973. Contributions to the knowledge of the Red Sea. No. 47. Cephalopoda from the Red Sea. *Bull. Sea-Fish. Res. Stn. Haifa*, : 9-47.
- ADAM, W. 1975. Notes sur les cephalopodes. 26. Une nouvelle espece de *Todarodes todarodes filippensis* sp. nov. de l'Ocean Indian. *Biologie, Bull. Inst. r. Sci. nat. Belg.*, 50 (9) : 1-10.
- ADAM, W. 1979. The Sepiidae (Cephalopoda, Decapoda) in the collection of the Western Australian Museum. *Rec. W. Aust Mus.*, 7 (2) : 109-212.
- ADAM, W., AND W. J. REES. 1966. A review of the cephalopod family Sepiidae. *John Murray Exped. Sci. Rept.*, 11 (1) : 1-165.
- ALAGARAJA, K. 1984. Simple methods for estimation of parameters for assessing exploited fish stocks. *Indian J. Fish.*, 31 : 177-208.
- ALAGARSWAMI, K. 1966. On the embryonic development of the squid (? *Seploteuthis arctipinnis* Gould) from the Gulf of Mannar. *J. Mar. Biol. Ass. India*. 8 (2) : 278-284.
- ALDRICH, F. A., AND M. M. ALDRICH 1968. On the regeneration of the tentacular arm on the giant squid *Architeuthis dux* Steenstrup (Decapoda, Architeuthidae). *Can. J. Zool.*, 46 (3) : 845-847.
- ALLAN, J. K., 1945. Planktonic cephalopod larvae from the Eastern Australian coast. *Rec. Aust. Mus.*, 21 (6) : 317-350.
- ANON 1977. Development potential of selected fishery products in the regional member countries of the Asian Development Bank. 7 : *The international market for cephalopods*. SCS/DEV/76/16 : 95 p.
- ANON 1981. Three questions on octopus. *Fishery Jour.* 13 (Yamaha Motor Co., Japan) : 1-8.
- ANON, 1982. Review of Methods used for studying and Assessing squid resources. *IPFC : RRD/82/5 Date March 1982, Sydney, Australia*, 7 p.
- ANON, 1983. South China Sea Fisheries Development and Coordinating Programme. Joint ADB/FAO (SCSP-INFOFISH Market Studies. Vol. V. The International Market for Cephalopoda. SCS/DEV/83/24, 53 p.
- ARAVINDAKSHAN, P. N., AND M. SAKTYVEL 1973. The location of cephalopod nurseries in the Indian Ocean. *Handbook to the International Zooplankton Collections*, 5 : 70-75.
- ASEMOLE, N. P., AND M. J. ASEMOLE 1977. Comparative feeding ecology of sea birds of a tropical oceanic island. *Yale Univ. Peabody Mus. Nat. Hist., Bull.*, 24 : 1-131.
- BAL, D. V., AND K. VIRABHADRA RAO 1984. *Marine Fisheries* Tata McGraw Hill Publishing Company Ltd., New Delhi, 470 p.
- BALINSKY, B. I. 1981. *Introduction to Embryology*. Philadelphia, Pa. : Saunders College, 688 p.
- BAPAT, S. V., N. RADHAKRISHNAN AND K. N. RABACHANDRA KARTHA. 1972. A survey of the trawl fish resources off Karwar, India. Symposium on Demersal Fisheries, *Proc. Indo-Pacific Fish. Coun.*, 13 (3) : 354-383.
- BAPAT, S. V. *et al.* 1982. Fishery resources of the Exclusive Economic Zone of the northwest coast of India. *Bull. Cent. Mar. Fish. Res. Inst.*, 33 : 86 p.
- BARNARD, K. H. 1947. Rare squid at the cape (*Thysanoteuthis rhombus* Trochal). *J. Conch. Lond.*, 22 : 286.

- BELYAEV, G. M. 1962. Beaks of cephalopod molluscs in oceanic bottom deposits. *Okeanologiya*, 2 (2) : 311-326.
- BELYAEVA, G. F. 1979. Squids of the Indian Ocean as intermediate hosts of helminths. In: Bauer, O. N. (Ed.), Abstracts of proceedings: 7th All-Union Conference on Fish-parasites and Diseases. Nauka, Moscow, 1979 : 1-131.
- BEN-YAMI, M. 1976. *Fishing with light*. FAO Fishing Manual Fishing News Books Ltd., England, 121 p.
- BERRY, S. S. 1912. The Cephalopoda of the Hawaiian Islands. *Bull. U. S. Bur. Fish.*, 32 : 257-362.
- BERTALANFFY, L. VON. 1938. A quantitative theory of organic growth. *Hum. Biol.*, 10 (2) : 181-213.
- BIDDER, A. M. 1950. The digestive mechanism of the European squids, *Loligo vulgaris*, *L. forbesii*, *Alloteuthis media* and *A. subulata*. *Quart. Jour. Micr. Sci.*, 91 (1) : 1-32.
- BOLZKY, S. V. 1977. Post-hatching behaviour and mode of life in cephalopods. *Symp. Zool. Soc. London*, 381, 557-567.
- BOYCOTT, B. B. 1957. The cuttlefish *Sepia*. *New Biol.*, (25) : 98-118.
- BRAZIER, J. 1892. *List of the Cephalopoda in the collection of the Australian Museum*. Sydney, 3 p.
- BROCK, J. 1886. Indische Cephalopoden. *Zool. Jb.*, 2 : 591-624.
- BRUGGEN, A. C. VAN. 1962. *Thysanoteuthis rhombus* in Algoa Bay. *Ann. of the Natal Museum*, 15 : 267-272.
- BURGESS, L. A. 1967. *Lollotus rhomboidalis*, a new species of loliginid squid from the Indian Ocean. *Bull. Mar. Sci.*, 17 (2) : 319-329.
- CADDY, J. F. (ed.). 1983a. Advances in assessment of world cephalopod resources. *FAO Fish. Tech. Pap.*, (231) : 452 p.
- CADDY, J. F. 1983b. The Cephalopods: Factors relevant to their population dynamics and to the assessment and management of stocks. In: Caddy, J. F. (ed.), Advances in assessment of world cephalopod resources. *FAO Fish. Tech. Pap.*, (231) : 416-452.
- CAILLIET, G. M. AND D. L. VAUGHAN, 1983. A review of the methods and problems for quantitative assessment of *Loligo opalescens*. *Biol. Oceanogr.*, 2 : 379-400.
- CALLAN, H. G. 1940. The absence of a sex hormone controlling regeneration of the hectocotylus in *Octopus vulgaris* L. *Pubbl. Staz. Zool. Napoli*, 18 : 15-19.
- CHANDRA MOHAN, P. AND D. RATNA RAO. 1978. On the occurrence of *Sepietta oweniana* (Cephalopoda) from Visakhapatnam. *Current Sci.*, 47 (22) : 879-880.
- CHELLAPPA, D. E. 1959. A note on the night fishing observation from a *kelong*. *J. Mar. Biol. Ass. India*, 1 (1) : 93-94.
- CHIKUNI, S. 1983. Cephalopod resources in the Indo-Pacific Region. In: Caddy, J. F. (ed.), Advances in assessment of world cephalopod resources. *FAO Fish. Tech. Pap.*, (231) : 264-305.
- CHUN, C. 1910. Die Cephalopoden. I. Teil: Deposida. *Wissenschaftliche Ergebnisse deutschen Tiefsee-Expedition 'Valdivia' 1898-1899*, 18 : 1-402.
- CHUN, C. 1915. Cephalopoda. II. Teil: Myopsida, Octopoda. *Wissenschaftliche Ergebnisse deutschen Tiefsee-Expedition 'Valdivia' 1898-1899*, 18 : 405-552.
- CLARKE, M. R. 1962 a. The identification of cephalopod 'Beak' and the relationship between beak size and total body weight. *Bull. Brit. Mus., (N.H.) Zoology* 8(10) : pl. 13-22, 421-480.
- CLARKE, M. R. 1962 b. Significance of cephalopod beaks. *Nature*, 193 (4815) : 560-64.
- CLARKE, M. R. 1966. A review of the systematics and ecology of oceanic squids. *Adv. Mar. Biol.*, 4 : 91-300.
- CLARKE, M. R. 1980. Cephalopoda in the diet of sperm whales of the southern hemisphere and their bearing on sperm whale biology. *Discovery Rept.* 37 : 1-324.
- CLARKE, M. R. AND C. C. LU. 1974. Vertical Distribution of Cephalopods at 30°N 23°W in the North Atlantic. *J. Mar. Biol. Ass. U.K.* (1974) 54 : 969-984.
- CLARKE, M. R. AND C. C. LU. 1975. Vertical Distribution of Cephalopods at 18° N and 25°W in the North Atlantic, *Ibid.*, (1975) 55 : 165-182.
- CLARKE, M. R. AND N. MAC LEOD. 1974. Cephalopod remains from a sperm whale caught off Vigo Spain. *J. Mar. Biol. Assoc. U.K.*, 54 : 959-968.
- CLARKE, M. R. AND N. MAC LEOD. 1976. Cephalopod remains of whales caught off Iceland. *J. Mar. Biol. Assoc. U.K.*, 56 : 733-749.
- CLARKE, M. R. 1977. Beaks, nets and numbers. *Symp. Zool. Soc. Lond.*, 38 : 89-126.
- CMFRI, 1957. Annual Report of the Chief Research Officer for the year ending 31st March 1956. *Indian J. Fish.*, 4 (2) : 387-418.
- CMFRI, 1980. Industrial fisheries off Visakhapatnam coast based on exploratory surveys during 1972-1978. *Mar. Fish. Infor. Serv. T & E Ser.*, No. 15 : 1-15.
- CMFRI, 1981. By-catch of the shrimp fishing in India. *Mar. Fish. Infor. Serv. T & E. Ser. No. 28* : 1-13.
- CMFRI, 1982. Trends in marine fish production in India—1981. *Mar. Fish. Infor. Serv. T & E. Ser. No. 41* : 1-32.
- COLLINS, S. AND M. DUNNING. 1981. Tasman squid studies demonstrate gill netting effective. *Aust. Fish.*, 40 (8) : 4-6.
- COTTON, B. C., AND F. K. GODFREY. 1940. The Mollusca of south Australia. Pt. 2. Scaphopoda, Cephalopoda, Aplousophora and Crepidopoda. Adelaide, 317-600.
- COURT, W. G. 1980. Japan's squid fishing industry. *Mar. Fish. Rev.*, 42 (7-8) : 1-9.
- COUSTEAU, J. Y., AND P. DIOLÉ. 1973. *Octopus and Squid—The Soft Intelligence*. A & W Visual Library, New York, 304 p.
- CSIR. 1962. *The Wealth of India. Raw Materials Vol. 4 Supplement. Fish and Fisheries. Com. Sci. Ind. Res.*, New Delhi, 132 p.
- DAYARATNE, N. M. P. J. 1978. A preliminary study on the cuttle fish catches from the Wadda Bank trawler fishery. *Bull. Fish. Res. Sri Lanka*, 28 : 21-55.

- DEES, LOLA T. 1961. Cephalopods: cuttlefish, octopus, squids
Fish. Leaf. (524): 1-10.
- DEFRETIN, R. AND A. RICHARD. 1967. Ultrastructure de la glande optique de *Sepia officinalis* L. (Mollusque, Cephalopode) Mise en évidence de la sécrétion et de son contrôle photopériodique. *C. R. Hebd. Seances Acad. Sci., Ser. D* 265: 1416-1418.
- DELL, R. K. 1952. The recent Cephalopoda of New Zealand. *Bull. Dom. Mus. Wellington*, (16): 1-157.
- DESHMUKH, V. M. 1973. Fishery and biology of *Pomadasys hasta* (Bloch). *Indian J. Fish.*, 20 (2): 497-522.
- DEVADOSS, P. AND P. K. MAHADEVAN PILLAI. 1973. Observations on the food of juveniles of *Psettodes erumei* (Bloch). *Indian J. Fish.*, 20 (2): 664-667.
- DEVADOSS, P. AND P. K. MAHADEVAN PILLAI. 1979. Observations on the food and feeding habits of the eel *Muraenesox cinereus* (Forsk.) from Porto Novo. *Indian J. Fish.*, 26 (1 & 2): 244-247.
- DONG, Z. 1981. The Present status of the prospects of cephalopod resources in the West Pacific. *J. Fish. China*, 5 (3): 263-70 (Not consulted in original)
- DRACOVICH, A. AND J. A. KELLY JR. 1963. A biological study and some economic aspects of squid in Tampa Bay, Florida. *Proc. Gulf and Carib. Fish. Inst.*, 15th Annual Session (1962) 87-102.
- DRAGOVICH, A. AND T. POTTHOFF. 1972. Comparative study of food of skipjack and yellowfin tunas off the coast of West Africa. *Fish. Bull. U.S.*, 70: 1087-1110.
- DRUZHININ, A. D. 1972. Observations on the trawl fishery of Southern Burma. Symposium on Demersal Resources, *Proc. Indo-Pacific Fish. Coun.*, 13 (3): 151-209.
- DRUZHININ, A. D. 1973. On the fishery resources of the Gulf of Aden and some adjacent areas. FAO, Rome, DP 9/12 PDY 64/501/7.
- DULHUNTY, A. F., AND GAGE, P. W. 1971. Selective effect of an Octopus Toxin on action potentials. *J. Physiol. (London)*, 218: 433-445.
- DURCHON, M. AND A. RICHARD. 1967. Etude, en culture organotypique, du rôle endocriné de la glande optique dans la maturation ovarienne chez *Sepia officinalis* L. (Mollusque, Cephalopode). *C. R. Hebd. Seances Acad. Sci., Ser. D* 264: 1497-1500.
- EFP. 1979a. Fishing news and notes. Survey of EEZ. *Explo. Fish. Project Newsletter*. 2 (2): 21-23.
- EFP. 1979b. Results of operation of M. V. *Matsyantreeksanti* along northwestern part of Indian EEZ during May to October, 1979. Survey of EEZ Series. No. 2. *Exp. Fish. Project*, Bombay: 1-15.
- EFP. 1979c. Results of the exploratory fishing conducted during 1978-79. *Bull. Explo. Fish. Project*. 9: 66 pp.
- EFP. 1982. Results of exploratory survey of fishery resources of Wadge Bank. *Progress Report 1. Explo. Fish. Project*, Bombay: 26 p.
- FAO. 1983. Year book of Fishery Statistics 1981: Catches and Landings. *FAO Yearb. Fish. Stat.* (52).
- FAO/UN. 1961. Report to the Government of India on a survey of the Fishery Resources of the Bay of Bengal. Project FAO/EJPA 158-53, based on the work of V. M. Naumov, FAO/TA Marine Fisheries Biologist.
- FERAL, JEAN-PIERRE. 1978. La régénération des de la seiche *Sepia officinalis* (Cephalopoda, Sepioidea) (1). I-Etude Morphologique. *Cahiers de Biologie Marine*, XIX: 355-361.
- FIELDS, W. G. 1965. The structure, development, food relations, reproduction and life history of the squid, *Loligo opalescens* Berry. *Calif. Dept. Fish and Game, Fish Bull.* (131): 1-108.
- FILIPPOVA, J. A. 1968. New data on the Cephalopoda of the Indian Ocean. *Proc. Symp. Mollusca*, Mar. Biol. Ass. India, Pt. 1: 257-264.
- FISCUS, C. H. 1982. Predation of marine mammals on squids on the eastern North Pacific Ocean and the Bering Sea. *Mar. Fish. Rev.*, 44(2): 1-10.
- FISHERY AGENCY OF JAPAN. 1976. Report on cruise of the R. V. SHOYO MARU in the North Arabian Sea Survey, in cooperation with the IOP, FAO, to assess the pelagic fish stocks, 2 October 1975—14 January 1976. *Res. Dev. Div., Fish. Agen. Japan*, 110 pp.
- FISHERY AGENCY OF JAPAN. 1977. Report on cruise of the R. V. SHOYO MARU in the North Arabian Sea, in cooperation with IOP, FAO, to assess the pelagic fish stocks, 2 October 1976—13 January 1977. *Res. Dev. Div., Fish. Agen. Japan*. 165 p.
- FLECKER, H. AND COTTON, B. G. 1955. Fatal bites from Octopus. *Med. J. Aust.*, 2: 329-331.
- FREEMAN, S. E. AND TURNER, R. J. 1970. Muculotoxin, a potent toxin secreted by *Octopus maculosus* Hoyle. *Toxicol. Appl. Pharmacol.*, 16: 681-690.
- GAGE, P. W. AND A. F. DULHUNTY. 1979. Effects of toxin from the Blue-ringed Octopus *Haplochlæna maculosa*. In: Marine Toxins and other bioactive marine Metabolites Ed. Y. Hashimoto, *Jap. Sci. Soc. Press*. Ch. 3: 85-106.
- GEORGE, A. I., M. S. NAZIR AHMED AND T. N. SIVADASAN ASARI. 1976. Observations on the carangid fishery of Vizhinjam coast, Trivandrum, with special reference to *Decapterus dayi*. (Wakiya). *Bull. Dept. Fish. Kerala*, 1 (1): 9-15.
- GEORGE, P. C., B. T. ANTONY RAJA AND K. C. GEORGE. 1977. Fishery Resources of Indian Economic Zone. *Silver Jubilee Souvenir*, Integ. Fish. Proj., October, 1977: 79-116.
- GHIRETTI, F. 1960. Toxicity of octopus saliva against Crustaceans. *Ann. N. Y. Acad. Sci.* 90, 726-741.
- GOODRICH, E. S. 1896. Report on a collection of Cephalopoda from the Calcutta Museum. *Trans. Linn. Soc. London*, 7: 1-24.
- GOPALAKRISHNAN, P. 1970. Some observations on the shore ecology of the Okha coast. *J. Mar. Biol. Ass. India*, 12 (1 & 2): 15-34.
- GOULD, A. A. 1852. 12. Mollusca and shells United States Exploring Expedition 1838-1842 under the command of C. Wilkes, 510 p.

- GRAVELY, F. H. 1941. Shells and other animal remains found on the Madras beach. I. Groups other than snails etc. (Mollusca : Gastropoda). *Bull. Madras Govt. Mus. (New Ser.). Nat Hist.*, 5 (1) : 112 p.
- GRIEB, T. M., AND R. D. BEEMAN. 1978. A study of spermatogenesis in the spawning population of the squid, *Loligo opalescens* In: Recksiek, C. W. and H. W. Frey (eds.) Biological, oceanographic, and acoustic aspects of the market squid, *Loligo opalescens* Berry. *Calif. Dept. Fish. and Game, Fish Bull.*, 169 : 11-21.
- GRIFFIN, L. E. 1900. The anatomy of *Nautilus pompilius*. *Mem. Nat. Acad. Sci.*, 8 (5) : 1-197.
- GRIMPE, G. 1926. Biologische Beobachtungen an *Sepia officianales*. *Verhandl. D. Zool. Gen. Suppl. Zool. Anz.* 31 : 148-153.
- GULLAND, J. A. (Ed.). 1970. The fish resources of the ocean. FAO/Fishing News (Books) Ltd., Surry, England, 255 p.
- HAMABE, M., C. HAMURO AND M. OGURA. 1982. *Squid jigging from small boats*. FAO Fishing Manuals, Fishing News Books Ltd., Farnham, England, 74 p.
- HAMABE, M., T. KAWAKAMI, Y. WATABE AND T. OKUTANI. 1976a. Perspectives for Japanese Overseas squid fisheries. *FAO Fish. Rep.* 170 (Suppl. 1) : 47-52.
- HAMABE M. T. KAWAKAMI, Y. WATABE T. OKUTANI AND K. IKEDA. 1976b. Review of cephalopod resources and their exploitation by Japan. *FAO Fish. Rep.* 170 (Suppl. 1) : 1-3.
- HAMURO, C. AND S. MIZUSHIMA. 1976. Concept and design of the 99 GT Squid jigging vessel. *FAO Fish. Rep.* 170 (Suppl. 1) : 103-106.
- HANKO B. 1913. Über einen gespaltenen arm von *Octopus vulgaris*. *Wilhelm Roux Arch. Entw. Mech. Org.* 37 : 217-222.
- HERDMAN W. A. 1903-1906. *Report to the Government of Ceylon on the Pearl Oyster Fisheries of the Gulf of Mannar (with Supplementary Reports upon the Marine Biology of Ceylon Naturalists)*. *Roy. Soc. London* 1 : 1-307 : 2 : 1-300 : 3 : 1-384 : 4 : 1-326 : 5 : 1-452.
- HERNANDO A. M. (JR) AND E. C. FLORES. 1981. The Philippines squid fishery : A review. *Mar. Fish. Rev.* 43 (1) : 13-20.
- HIDA, T. S. AND W. T. PEREYRA. 1966. Results of bottom trawling in Indian Seas by R/V ANTON BRUNN in 1963. *Proc. Indo-Pacific Fish. Coun.* 11 (2) : 156-171.
- HIXON, R. F. 1983. *Loligo opalescens*. In Ed. P. R. Boyll Cephalopod Life-Cycles. Vol. I. Species accounts. Academic Press. pp. 95-114.
- HODGKIN, A. L. 1964. The conduction of the nervous impulse. Liverpool Univ. Press, Liverpool, England, pp. 20-29.
- HORNELL, J. 1917. The edible molluscs of Madras Presidency. *Madras Fish. Bull.*, 11 : 1-51.
- HORNELL, J. 1922. The common molluscs of South India. *Madras Fish. Bull.*, 14 : 97-215.
- HORNELL, J. 1950. Fishing in many waters. Chapter XV. Fishing for Octopus, Cuttlefish and Squid. *Cambridge Univ. Press. Cambridge*, 130-135.
- HORNELL, J. 1951. *Indian Molluscs. Bombay Nat. Hist. Society, Bombay*, 96 p.
- HOWARD, F. G. 1981. Cephalopods : An under utilized resource. *Scottish Fisheries Bulletin*, 46 : 26-29.
- HOYLE, W. E. 1885a. Brief notice of the 'Challenger' Cephalopoda (p. 472). *Rep. Scient. Resul. Voy. 'Challenger' (1873-76)*, Narrative I, 657 p.
- HOYLE, W. E. 1885b. Diagnoses of new species of Cephalopoda collected during the cruise of H.M.S. 'Challenger'. Part I. The Octopoda. *Ann. Mag. nat. Hist. Ser. 5*, 15 : 222-236.
- HOYLE, W. E. 1885c. Diagnoses of new species of Cephalopoda collected during the cruise of H.M.S. 'Challenger' Part II. The Decapoda. *Ann. Mag. nat. Hist. Ser. 5*, 16 : 181-203.
- HOYLE, W. E. 1885d. Preliminary report on the Cephalopoda collected by H.M.S. 'Challenger'. Part I. The Octopoda *Proc. Roy. Soc. Edinburgh*, 13 : 94-114.
- HOYLE, W. E. 1885e. Preliminary report on the Cephalopoda collected by H.M.S. 'Challenger'. Part II. The Decapoda *Proc. Roy. Soc. Edinburgh*, 13 : 281-310.
- HOYLE, W. E. 1886. Report on the Cephalopoda collected by H.M.S. 'Challenger' during the years 1873-1876. *Rep. Scien Resul. Voy. 'Challenger' (Zoology)*, 16 (44) : 1-245.
- HOYLE, W. E. 1904a. *Sepia burnupi* n. sp. from Natal. *J. Conch. London*, 11 : 27-28.
- HOYLE, W. E. 1904b. Report on Cephalopoda collected by Prof. Herdman at Ceylon, 1902. *Rep. Ceylon Pearl Oyster Fish.* 2, Suppl. 14 : 185-200.
- HOYLE, W. E. 1905. The Cephalopoda. In: S. Gardiner. *The Fauna and Geography of the Maldive and Laccadive Archipelagoes*, 2, Suppl. 1 : 575-988.
- HOYLE, W. E. 1907a. The Cephalopoda. The marine fauna of Zanzibar and East Africa from collections made by Cyril Crossland in 1901-1902. *Proc. Zool. Soc. London*, 450-461.
- HOYLE, W. E. 1907b. Reports on the marine biology of the Sudanese Red Sea. 6. On the Cephalopoda. *J. Linn. Soc (Zool.)*, 31 : 35-43.
- HURLEY, A. C. 1977. Mating behaviour of the squid *Loligo opalescens*. *Mar. Behav. Physiol.*, 4 : 195-203.
- HURLEY, G. V. 1980. Recent development in the squid, *Illex illecebrosus* fishery of Newfoundland, Canada. *Mar. Fish Rev.*, 42 (7-8) : 15-22.
- IMBER, M. J. 1975. Lycoteuthid squids as prey of petrels in New Zealand Seas. *N. Z. J. Mar. Freshw. Res.*, 9 : 483-492.
- IMBER, M. J. 1978. The squid families Cranchiidae and Gonatidae. (Cephalopoda : Teuthoidea) in the New Zealand region. *New Zealand J. Zool.* 5 (3) : 445-484.
- INSTITUTE OF MARINE RESEARCH. 1975. Report on Cruise Nos. 1 and 2 of R/V DR. FRIDTJOF NANSEN, Indian Ocean Fishery and Development Programme. Pelagic Fish Assessment Survey of North Arabian Sea. Bergen, Institute of Marine research, 15 p.

- ISHI, M. 1977. Studies on the growth and age of the squid, *Ommastrephos bartrami* (Le Sueur) in the Pacific off Japan. *Bull. Hokkaido Reg. Fish. Res. Lab.*, (42) : 25-36.
- IVERSEN, I. L. K. AND L. PINKAS. 1971. A pictorial guide to beaks of certain eastern Pacific Cephalopods. In: Food habits of Albacore, bluefin tuna and Bonito in Californian Waters. *Fish. Bull.*, 152 : 83-105.
- JAMES, P. S. B. R. 1967. The ribbon fishes of the family Trichiuridae of India. Memoir 1, *Mar. Biol. Ass. India*, 228 p
- JAUNICO, M. 1980. Development in South American squid fisheries. *Mar. Fish. Rev.*, 42 (7-8) : 10-14.
- JAYABALAN, N. AND K. RAMAMURTHI. 1977. Cephalopods of Porto Novo. *J. Annamalai Univ. (Sci.)*, 31 : 29-34.
- JAYAPRAKASH, A. A. 1974. Food and feeding habits of juveniles of 'Koth' *Orotioides brunneus* (Day) in Bombay waters. *Indian J. Fish.*, 21 (1) : 127-140.
- JMFRCC. 1980. Report of feasibility study 1978 on squid jigging fisheries in the southwestern Pacific Ocean, 178 p.
- JONES, R. 1981. The use of length composition data in fish stock assessments (with notes on VPA and COHORT analysis). *FAO Fish. Circ.*, (734) : 55 p.
- JONES, S. 1968. The molluscan fishery resources of India. *Proc. Symp. Mollusca*, Mar. Biol. Ass. India, Pt. 111 : 906-918.
- JOTHINAYAGAM, J. T. 1981. Studies on *Sepiella inermis* (Ferrussac and d'Orbigny) population occurring along the Madras coast. *Proc. Symp. Ecol. Anim. Popul.*, Zool. Surv. India, Pt. 1 : 83-89.
- JUANICO MARCELO, 1983. Squid Maturity Scales for population analysis. In: Caddy J.F. (ed). Advances in Assessment of Cephalopod Resources. *FAO Fish. Tech. Pap.* (231) : 341-378.
- KAGWADE, P. V. 1969. Food and feeding habits of *Polynemus heptadactylus* Cuv. and Val. *Indian J. Fish.*, 16 (1 & 2), 188-197.
- KALAVATI, C. AND C. C. NARASIMHAMURTI. 1977. *Steinhausia spraguei* n.s.p. a microsporidian parasite of the excretory cells found in the renal appendages of *Sepia elliptica*. *Rivista Parassit.* 38(2-3) : 271-275.
- KALAVATI, C. AND C. C. NARASIMHAMURTI 1980. A new dicyemid mesozoan *Dodecadicyema loligoi* n. gen., n. sp. from the renal appendages of *Loligo* sp. *Proc. Indian Acad. Sci (Anim. Sci.)*, 89 (3) : 287-292.
- KALAVATI, C., C. C. NARASIMHAMURTI AND T. SUSEELA 1978. A new species of *Dicyemmennea*, *D. coromandelensis* n. sp. from *Sepia elliptica* Hoyle. *Proc. Indian Acad. Sci.*, 87 B (6) : 161-167.
- KAREKAR, P. S. AND D. V. BAL. 1958. The food and feeding habits of *Polynemus indicus* (Shaw). *Indian J. Fish.*, 5 (1) : 77-94.
- KARNEKAMP, C. 1979. An aberrantly shaped shield of *Sepia* sp. and a response to this. *Kreukel. Amst.*, 15 (7-8) : 60.
- KARPOV, KONSTANTIN, A. AND G. M. CAILLIET 1978. Prey composition of the Market Squid, *Loligo opalascens* Berry in relation to depth and location of capture, size of squid and sex of spawning squid. *Calif. Coop. Ocean Fish. Invest. Repts.* 20 : 51-57.
- KSAHARA, S. AND T. NASUMI. 1976. Present status and future aspects of the fishery for the common squid *Todarodes pacificus* (Steenstrup) in the sea of Japan. *FAO Fish. Rep.*, 170(Suppl. 1) : 30-46.
- KAWAKAMI, T. 1980. A review of sperm whale food. *Sci. Rep. Whales Res. Inst.*, (32) : 199-218.
- KAWATA, H., K. KATAYA, U. AND T. TAKAHASHI 1955. Studies on the complete utilization of whole fish IV. The chemical composition of some fish viscera and the soluble feed made from cuttlefish liver. *Bull. Japan. Soc. Sci. Fish.*, 21 (7) : 503-508.
- KLOSS, C. B. 1902. *Andaman and Nicobars*, Reprint 1971, Vivek Publishing House, Delhi, 373 p.
- KORE, B. A. AND M. C. JOSHI 1975. Food of the squid *Loligo duvaucelli* d'Orbigny. *Proc. Indian Acad. Sci.*, 81 B (1) : 20-28.
- KRISHNAMURTHI, B 1957. Fishery resources of the Rameswaram Island. *Indian J. Fish.*, 4 (2) : 229-253.
- KRUMHOLZ, L. A. AND D. P. DE SYLVA. 1958. Some foods of marlins near Bimini, Bahamas. *Fla. Ocar. Res. Publ.*, 28 : 1-31
- KUMARAN, M 1964. Studies on the food of *Euthynnus affinis affinis* (CANTOR), *Auxis thazard* (Lacepede), *Auxis thynnoides* Bleeker and *Sarda orientalis* (Temminck and Schlegel) *Proc. Symp. Scombroid Fishes*, Mar. Biol. Ass. India, Pt. 11 : 599-606.
- KUTHALINGAN, M. D. K., G. LUTHER, S. LAZARUS AND K. PRABHAKARAN NAIR 1982. Experimental trawling off Vizhinjam. *Mar. Fish. Infor. Serv. T & E Ser.*, No. 40 : 5-7.
- LANE, F. W. 1962. *Kingdom of the octopus. The life history of the Cephalopoda.* The worlds of science (Zoology) Pyramid Publications, New York. 287 p.
- LANGE, A. M. AND M. PSISENWINNE, 1980. Biological considerations relevant to the management of squid (*Loligo pealei* and *Illex illecebrosus*) of the northwest Atlantic. *Mar. Fish. Rev.*, 42 (7-8) : 23-38.
- LANGE, A. M. T., AND M. P. SISENWINNE 1983. Squid resources of the northwest Atlantic. In: Caddy, J. F. (ed.), Advance in assessment of world cephalopod resources. *FAO Fish. Tech. Pap.* (231) : 21-54.
- LANGE, M. M. 1920. On the regeneration and finer structure of the arms of the cephalopods. *J. exp. Ecol.* 31 (1) : 1-57.
- LONG, D. AND W. F. RATHJEN 1980. Experimental jigging for squid off the Northeast United States. *Mar. Fish. Rev.*, 42 (7-8) : 60-66.
- LU, C. C. AND M. R. CLARKE. 1975. Vertical distribution of cephalopods at 40°N, 53°N and 60°N at 20°W in the North Atlantic. *J. Mar. Biol. Ass. U.K.* (1975) 55 : 153-163.
- LU, C. C. AND M. R. CLARKE. 1975. Vertical distribution of cephalopods at 11°N, 20°W in the North Atlantic. *Ibid.* (1975) 55 : 369-389.
- LUTHER, G., P. N. RADHAKRISHNAN NAIR, G. GOPAKUMAR AND K. PRABHAKARAN NAIR 1982. Present status of small-scale traditional fishery at Vizhinjam. *Mar. Fish. Infor. Serv. TN & E Ser.*, o. 38 : 1-16.

- MAES, V. O. 1967. The littoral marine molluscs of Cocos—Keeling Islands (Indian Ocean). *Proc. Acad. Nat. Sci. Phila.*, 119 (4): 93-217.
- MAHADEVAN, S. AND K. NAGAPPAN NAYAR 1967. Underwater ecological observations in the Gulf of Mannar off Tuticorin. *J. Mar. Biol. Ass. India*, 9 (1): 147-163.
- MAHADEVAN S. AND K. NAGAPPAN NAYAR 1974. Ecology of pearl oysters and chank beds. The commercial molluscs of India. *Bull. Centr. Mar. Fish. Res. Inst.*, 25: 106-121.
- MAKSIMOV, V. P. 1969. Pitanie bol'shegla zogo tuntsa (*Thunnus obesus* Lowe) i mechry by (*Xiphias gladius* L.). Vostochnoi chasti tropichesko i Atlantiki, Atl. Nauchno-Issled. Int. Rybn. Khoz. Okenogr. (Atl. NIRO), 25: 87-99 (Engl. transl. Fish. Res. Bd. Can. Transl. Ser. 2248).
- MASSEY, A. L. 1916. The Cephalopoda of the Indian Museum. *Rec. Indian Mus.*, 12: 185-247.
- MASSEY, A. L. 1927. The Cephalopoda of the South African Museum. *Ann. S. African Mus.*, 25: 151-167.
- MATSUMOTO, G. 1976. Transportation and maintenance of adult squid (*Doryteuthis bleekeri*) for physiological studies. *Biol. Bull.*, 150: 279-285.
- MAY R. M. 1933. La formation des terminaisons nerveuses dans les ventouses du bras regeneré du cephalopode *Octopus vulgaris* Lam. *Ann. St. Oceanogr. Salammbô* 7: 1-15.
- MEENON, K. K. P. 1978. Fish processing industry in India. *Proc. Symp. Fish Utilization Technology and Marketing in the IPFC Region*, 18th Session, Manila, Philippines, 73-84.
- MERCER, M. C. 1974. Modified Leslie - Delany assessments of the northern pilot whale (*Gobicephalus melaena*) and annual production of the short-finned squid (*Illex illecebrosus*) based upon their interaction at Newfoundland. *ICNAF Res. Doc.*, 74/49: 14p.
- MERCER, M. C., R. K. MISRA, G. V. HURLEY. 1980. Sex determination of the omastrephid squid *Illex illecebrosus* using Beak morphometrics. *Can. J. Fish. Aquat. Sci.*, 37: 283-286.
- MIENIS, H. K. 1977. Squid from the stomach of a deep water shark. *Correspondentblad ned. Malac. Veren.*, 178: 707.
- MIENIS, H. K. 1978. Who found *Spirula* or *Argonauta* on the Mediterranean coast of Israel or in the Red Sea *Levanina*, 15: 170-172.
- MIMURA, K. AND STAFF OF NFRFL 1963. Synopsis of biological data on yellowfin tuna, *Neothunnus macropterus* Temminck and Schlegel, 1842. *FAO Fish. Rep.* 6 (2): 319-349.
- MISAKI, H. AND T. OKUTANI 1976. Studies on early life history of Decapodan Mollusca—VI. An evidence of spawning of an oceanic squid, *Thysanoteuthis rhombus* Trochel, in the Japanese waters. 'Venus', *Jap. Jour. Malacology*, 35 (4): 211-213.
- MOJUMDER, P. 1969. Food of the catfish *Tachysurus thalassurus* (Ruppell). *Indian J. Fish.*, 16 (1 & 2): 161-169.
- MOJUMDER, P. AND S. S. DAN 1979. Studies on food and feeding habits of catfish *Tachysurus tenuispinis* (Day). *Indian J. Fish.*, 26 (1 & 2): 115-124.
- MOSES, S. T. 1948. A preliminary report on the Cephalopoda of Baroda. *Bull. Dept. Fish. Baroda State*, 13: 1-3.
- MOSES, S. T. 1949. A preliminary report on the cephalopods of Baroda. *Proc. 35th Indian Sci. Congr.*, 198.
- MOYNIHAN, M. 1975. Conservation of displays and comparable stereotyped patterns among cephalopods. In: Eds. Bascends, Beer and Manning: *Function and Evolution in Behaviour*, Chapter 13: 276-291.
- MOYNIHAN, M. 1983. Notes on the behaviour of *Idiosepius pygmaeus* (Cephalopoda: Idiosepiidae). *Behaviour*, 85: (1-2): 42-57.
- MOYNIHAN, M. AND A. RODANICHE, 1977. Communications, Crypsis and mimicry among Cephalopods. In: *How animals communicate* (Seb-cock, T.A. Ed). Indiana Univ. Press, Bloomington.
- MOYNIHAN, M. AND A. F. RODANICHE. 1982. Behaviour and Natural History of the Caribbean reef squid *Sepioteuthis sepioides* with a consideration of social, signal and defensive pattern. for difficult and dangerous environments. pp. 1-151. Verlag Paul Parey. Berlin and Hamburg.
- MPEDA 1976. Processing of cuttlefish and squid for export. *Indian Sea Foods*, XII (2 & 3): 21-29.
- MPEDA 1985. *Statistics of marine products exports 1983*. The Marine Products Export Development Authority, Cochin 264 p.
- MUKUNDAN, C. 1968. Molluscs in Indian tradition and economy *Souvenir, Symp. Mollusca*, Mar. Biol. Ass. India, Cochin, January 12-16, 1968: 45-52.
- MURATA, M. AND M. IANÉ, 1977. Some information on the ecology of the oceanic squid, *Onmastrephes bartrami* (Lesueur) and *Onychoteuthis borealis japonicus* Okada in the Pacific Ocean of Northeastern Japan. *Bull. Hokkaido Reg. Fish. Res. Labs*, (42): 1-23.
- MURATA, M., M. ISEI, AND M. OSAKI 1981. On the regeneration of tentacle of the oceanic squid *Onmastrephes bartrami* (Lesueur). *Bull. Hokkaido Reg. Fish. Res. Lab.*, 46: 1-14.
- MUTHU, M. S., K. A. NARASIMHAM, G. SUDHAKARA RAO, Y-APPANNA SASTRY AND P. RAMALINGAM 1975. On the commercial trawl fisheries off Kakinada during 1967-70. *Indian J. Fish.*, 22 (1 & 2): 171-186.
- NAGABHUSHANAM, R. 1968a. Physiology of chromatophores in Cephalopoda. *Proc. Symp. Mollusca*, Mar. Biol. Ass. India, Pt. II: 568-571.
- NAGABHUSHANAM, R. 1968b. Studies on neurosecretion in Mollusca. *Proc. Symp. Mollusca*, Mar. Biol. Ass. India, Pt. II: 572-579.
- NAIR, R. V. AND K. K. APPUKUTTAN. 1973. Observations on the food of deep sea sharks *Halasturus halsidus* (Alcock), *Eridacnis radcliffei* Smith and *Isago omarensis* Compagno and Springs *Indian J. Fish.*, 20 (2): 575-583.
- NAIR, S. GOPALAN 1958. A preliminary account of the fisheries of Vizhinjam. *Indian J. Fish.*, 5 (1): 32-55.

- NARASIMHAM, K. A., G. SUDHAKARA RAO, Y. APPANNA SASTRY AND W. VENUGOPALAN 1979. Demersal fishery resources off Kakinada with a note on economics of commercial trawling. *Indian J. Fish.*, 26 (1 & 2) : 90-100.
- NARASIMHAMURTI, C. C. 1979. The emeriid, *Aggregata kudoi* n. sp. from *Sepia elliptica*. *Angewandte parasit*, 20 (3) : 154-158.
- NATARAJAN, N. AND R. NATARAJAN 1980. Food and feeding habits of *Psettoodes erumei* (Bloch and Schn.) and *Pseudorhombus arsius* (Ham. Buch.). *Matsya*, 6 : 30-42.
- NATSUKARI, Y. 1983. Taxonomical and morphological studies on the Loliginid squids—III. *Nipponololigo*, a new subgenus of the Genus *Loligo*. *Venus, The Jap. Jour. Malacol.*, 42 (4) : 313-318.
- NAZUMI, T. 1975. Notes on the species of squids collected in the Tajima region of the Japanese Sea, 1974. *Bull. Hyogo Pref Fish Stn.*, 15 : 9-13 (in Japanese)
- NELSON, M. *et al.*, 1983. On the fishery and biology of the giant squid *Dosidicus gigas* in the Gulf of California, Mexico. In: Caddy, J. F. (ed), *Advances in assessment of world cephalopod resources*. *FAO Fish Tech. Pap.*, 231 : 306-340
- NIHIMURA S. 1966. Notes on the occurrence and biology of the oceanic squid, *Thysanoteuthis rhombus* Troscchel in Japan. *Publ. Seto. Mar. Biol. Lab.*, 14 (4) : 327-349.
- NIXON, N. AND J. B. MESSENGER 1977. The biology of the cephalopods. Proceedings of a Symposium held at the Zoological Society of London on 10 and 11 April 1975. *Symp. Zool. Soc. London*, 38 : 615 p.
- OGURA, M. 1976. Fishing tackle and fishing efficiency in squid jigging. *FAO Fish. Rep.*, 170 (Suppl. 1) : 99-102.
- OGURA, M. AND T. NASUMI 1976. Fishing lamps and light attraction for squid jigging. *FAO Fish. Rep.*, 170 (Suppl. 1) : 93-98.
- OKADA, Y. 1933. Animal of *Spirula*. *Venus*, 3 (1) : 144-145.
- OKUTANI, T. 1970. A small collection of gastropod and decapod molluscs from the Seychelles Bank, Indian Ocean, by the trawling vessel KOYO-MARU, 1968. *Venus, The Jap. Jour. of Malacology*, 29 (4) : 123-130.
- OKUTANI, T. 1973a. Preliminary note on planktonic Oegopsid cephalopod larvae obtained by the International Indian Ocean Expedition. *J. mar. biol. Ass. India*, 15 (1) : 213-217.
- OKUTANI, T. 1973b. Guide and keys to squid in Japan. *Bull. Tokai. Reg. Fish. Res. Lab.*, (74) : 83-111.
- OKUTANI, T. 1977. Stock assessment of cephalopod resources fished by Japan. *FAO Fish. Tech. Pap.*, (173) : 62 p.
- OKUTANI, T. 1980. Useful and latent cuttlefish and squids of the world. Published from National Coop. Ass. of Squid Processors for the 15th Anniv. of its foundation : 66 p.
- OKUTANI, T. AND SUZUKI, K. 1975. Concurrence of bathypelagic *Spirula spirula* and epipelagic *Argonauta boettgeri* in stomach contents of a yellowfin tuna from the Indian Ocean. *Venus, The Jap. Jour. of Malacology*, 34 (1 & 2) : 49-51.
- OKUTANI, T. AND TUNG, I. H. 1978. Review of biology of commercially important squids in Japanese and adjacent waters. 1. *Symplectoteuthis oualaniensis* (Lesson). *Veliger*, 21 (1) : 87-94.
- OOMMEN, V. P. 1966. The Octopoda of the Kerala coast. I. A new species of the genus *Berrya*, Adam 1943. *Bull. Dept. Mar. Biol. Oceanogr. Univ. Kerala*, 2 : 51.
- OOMMEN, V. P. 1967. New records of octopoda from the Arabian Sea. *Bull. Dept. Mar. Biol. Oceanogr., Univ. Kerala*, 3 : 29.
- OOMMEN, V. P. 1971. *Octopus varunae*, a new species from the west coast of India. *Bull. Dept. Mar. Biol. Oceanogr., Univ. Cochin*, 5 : 69.
- OOMMEN, V. P. 1975. New records of decapod cephalopods from the Arabian Sea. *J. mar. biol. Ass. India*, 17 (2) : 186-190.
- OOMMEN, V. P. 1976. A new species of the genus *Optathoteuthis* Verrill, 1883 (Cephalopoda : Mollusca) from the southwest coast of India. *J. mar. Biol. Ass. India*, 18 (2) : 368-374.
- OOMMEN, V. P. 1977a. Two octopods new to Arabian Sea. *Indian J. Fish.*, 24 (1 & 2) : 25-32.
- OOMMEN, V. P. 1977b. Studies on the food, feeding and fishery of certain cephalopods from the west coast of India. *Bull. Dept. Mar. Sci. Univ. Cochin*, 8 : 73-152.
- ORTMANN, A. S. 1891. Cephalopoden von Ceylon. *Zool. Jb. Syst.*, 5 : 669-678.
- OSAKO, M. AND M. MURATA 1983. Stock assessment of cephalopod resources in the Northwestern Pacific. In: Caddy, J. F. (ed.), *Advances in assessment of world cephalopod resources*. *FAO Fish. Tech. Pap.*, (231) : 55-144.
- OWEN, R. 1832. Memoir on the Pearly Nautilus *Nautilus pompilius* Linnaeus, London, 68 p.
- PADMANABHAN, V. 1970. On new fish products—Cuttlefish and squids. *Quart. Newsletter, Govt. of India, Indo-Norwegian Project*, 2 (2 & 3) : 4-6.
- PANDIT, A. R. AND N. G. MAGAR 1972. Chemical composition of *Sepia orientalis* and *Loligo vulgaris*. *Fish Technol.*, 9 (2) : 122-125.
- PARIN, N. V. 1967. The materials on the distribution and biology of the snake mackerel—*Gempylus serpens* Cuv. (Pisces) Gempylidae in the Pacific and Indian Ocean : *Vopr. Ichthyology*, 7 (6) : (in Russian), 990-999.
- PARONA, C. 1900. Sulla dicotomia della braccia nei cefalopodi. *Boll. Musel Lab. Zool. Anat. Comp. r. Univ. Genova*, 96 : 1-7.
- PAULY, D. AND N. DAVID 1981. ELEFANI, a BASIC program for the objective extraction of growth parameters from length frequency data. *Meeresforsch.*, 28 (4) : 205-211.
- PAYNE, R. L. 1978. Note on possible priorities for future commercial fisheries of demersal and small pelagic species. *Report of the FAO/Norway Workshop on the Fishery Resources of the North Arabian Sea*, 2 : 194-201.
- PFEFFER, G. 1912. Die Cephalopoden der Plankton—Expedition. Zugleich eine monographische Übersicht der Oegopsiden Cephalopoden. *Ergebnisse der Plankton—Expedition der Humboldt—Stiftung*, 2 : 1-815.
- PERRIN, W. F., R. R. WARNER, C. H. FISCUS AND D. B. HOLTS 1973. Stomach contents of porpoise *Stenella* spp. and Yellowfin tuna, *Thunnus albacares*, in mixed-species aggregations. *Fish. Bull. U.S.*, 71 : 1077-1092.

- PICKFORD, G. E. 1946. *Vampyroteuthis infernalis* Chun. An archaic disbranchiate cephalopod. I. Natural history and distribution. *Dana Rept.*, 29 : 1-40.
- PICKFORD, G. E. 1949a. Distribution of the eggs of *Vampyroteuthis infernalis* Chun. *J. mar. Res.*, 8 (1) : 73-83.
- PICKFORD, G. E. 1949b. *Vampyroteuthis infernalis* Chun. An archaic dibranchiate cephalopod. II. External anatomy. *Dana Rept.*, 32 : 1-132.
- PICKFORD, G. E. 1952. The Vampyromorpha of the Discovery Expedition. *Discovery Repts.*, 26 : 197-210.
- PICKFORD, G. E. 1959. Vampyromorpha. *Galathea Rept.*, 1 : 243-253.
- PICKFORD, G. E. 1974. *Cistopus indicus* (Orbigny) : A common Indo-Malayan species of Octopus. *J. mar. biol. Ass. India*, 16 (1) : 43-48.
- PORTMANN, A. 1952. Les luas dorsaux de *Tremoctopus violaceus* delle chiaje. *Revue Suisse Zool.*, 59 (13) : 288-293.
- PRASAD, R. R. AND P. V. RAMACHANDRAN NAIR 1973. India and the Indian Ocean fisheries. *J. Mar. Biol. Ass. India*, 15 (1) : 1-19.
- RABINDRANATH, P. 1966. Biology and seasonal distribution of the pelagic food fishes of Travancore coast. *Kerala Univ. Publ.*, 1-140.
- RADHAKRISHNAN, N. 1973. Pelagic fisheries of Vizhinjam. *Indian J. Fish.*, 20 (2) : 584-598.
- RAHAMAN, A. A. 1967. Gonad and hepatic indexes of the Indian cephalopods *Sepioteuthis arctipinnis* Gould and *Sepia aculeata* Ferrussae and d'Orbigny. *Proc. Indian Acad. Sci.* 67 B (3) : 104-113.
- RAHAMAN, A. A. 1980. Ecological observations on spawning of a few invertebrates of the Madras coast. *J. Madurai Kamaraj Univ. (Sci.)*, 9 (1) : 71-77.
- RAJAGOPAL, K. V., S. RAVICHANDRA REDDY AND K. SAKUNTALA 1977. Fish baits : Need for collection, care, preparation and propagation in India. *Seafood Export Jour.*, 9 (5) : 9-13.
- RAJU, G. 1964. Observations on the food and feeding habits of the oceanic skipjack *Katsuwonus pelamis* (Linnaeus) of the Laccadive Sea during the years 1958-59. *Proc. Symp. Scombroid Fishes*, Mar. Biol. Ass. India, Pt. II : 607-625.
- RANCUREL, P. 1971. Les contenus stomacaux de *Alepisaurus ferox* dans le Sud-ouest Pacifique (Cephalopods). *Cah. O.R.S.T. O.M. Ser. Oceanogr.* 8 (4) 3-87.
- RANCUREL, P. 1976. Note sur les Cephalopodes des contenus stomacaux de *Thunnus albacares* (Bonnaterre) dans le Sud-ouest Pacifique. *Ibid.*, 14(1) : 71-80.
- RAO, K. SRINIVASA 1964. Observations on the food and feeding habits of *Scomberomorus guttatus* (Bloch and Schneider) and the juveniles of *S. lineolatus* (Cuvier and Valenciennes) *S. commerson* (Lacepede) from the Waltair coast. *Proc. Symp. Scombroid Fishes*, Mar. Biol. Ass. India Pt. II : 591-598.
- RAO, SUBBA M. V. 1977. Molluscs of Digha coast, West Bengal. 2. Bivalvia, Scaphopoda and Cephalopoda. *Newsl. Zool. Surv. India*, 3 (5) : 298-302.
- RAO, K. VENKATASUBBA 1968. Some aspects of the biology of 'ghol' *Pseudosquilla diacanthus* (Lacepede). *Indian J. Fish.*, 10 (2) : 413-459.
- RAO, K. VIRABHADRA 1954. Biology and fishery of the Palk-Bay squid *Sepioteuthis arctipinnis* Gould. *Indian J. Fish.*, 1 : 37-66.
- RAO, K. VIRABHADRA 1958. Molluscan Fisheries. *Fisheries of the West Coast of India. Cent. Mar. Fish. Res. Inst.*, : 55-59.
- RAO, K. VIRABHADRA 1969a. Molluscs have many uses. *Indian Frmg.*, 29 (9) : 41-45.
- RAO, K. VIRABHADRA 1969b. Distribution pattern of the major exploited marine fishery resources of India. *Bull. Cent. Mar. Fish. Res. Inst.*, 6 : 1-69.
- RAO, K. VIRABHADRA 1973. Distribution pattern of the major exploited marine fishery resources of India. *Proc. Symp. Living Resources of the Seas around India*, CMFRI Special Publication : 18-101.
- RAO, K. VIRABHADRA AND K. DORAIRAJ 1968. Exploratory trawling off Goa by the Government of India fishing vessels. *Indian J. Fish.*, 15 (1 & 2) : 1-14.
- RAO, S. R., S. M. SHAH AND R. VISVANATHAN 1968. Calcium, Strontium and Radium content of molluscan shells. *J. Mar. Biol. Ass. India*, 10 (1) : 159-165.
- RAY, H. C. 1937. Contribution to the knowledge of the molluscan fauna of Maungmagan, Lower Burma (with descriptions of one new genus and species of the Family Turridae (Gastropoda)). *Indian Mus., Calcutta*, 8 : 1-150.
- RAYUDU, G. V. AND P. CHANDRA MOHAN 1982. A note on the fishery of squids and cuttlefish of Visakhapatnam. *Seafood Exp. Jour.*, 14 (4) : 23-27.
- REES, W. J. 1949. Note on the hooked squid, *Onychoteuthis banksi*. *Proc. malac. Soc. Lond.*, 28 : 43-45.
- RIGGENBACH, E. 1901. Beobachtung uber selbstverstummung. *Zool. Anz.*, 24 : 587-593.
- ROBSON, G. C. 1921. On the Cephalopoda obtained by the Percy Sladen Trust Expedition to the Indian Ocean in 1905. *Trans. Linn. Soc. London*, 17 (2) : 429-442.
- ROBSON, G. C. 1924a. Preliminary report on the Cephalopoda (Decapoda) procured by the S. S. 'Pickle'. *Rep. Fish. mar. biol. Surv. Union S. Africa*, 3, *Spec. Rept.*, 9 : 1-14.
- ROBSON, G. C. 1924b. On the Cephalopoda obtained in South African waters by Dr. J. D. F. Gilchrist in 1920-1921. *Proc. Zool. Soc. London* : 589-686.
- ROBSON, G. C. 1926a. Notes on the cephalopoda. No. 1. Descriptions of two new species of *Octopus* from southern India and Ceylon. *Ann. Mag. nat. Hist.*, Ser. 9, 17 : 159-167.
- ROBSON, G. C. 1926b. The Cephalopoda obtained by the S. S. 'Pickle' (Supplementary Report). *Fisheries and Marine Biological Survey Report*, No. 4, for the year 1925, 1-6.
- ROBSON, G. C. 1929. *A Monograph of the Recent Cephalopoda. Part I. Octopodinae*. British Museum (Nat. Hist.) London, 236 p.

- ROBSON, G. C. 1932. A monograph of the recent cephalopoda. Part II. The Octopoda (excluding the Octopodinae), London. British Museum (Natural History), 359 p.
- ROPER, C. F. E. 1966. A study of the genus *Enepterothis* (Cephalopoda : Oegopsida) in the Atlantic ocean, with a redescription of the type species, *E. leptura* (Leach, 1817). *Dana Rept.*, 66 : 1-46.
- ROPER, C. F. E., M. J. SWEENEY AND C. E. NAUEN 1984. Cephalopods of the world. An annotated and illustrated catalogue of species of interest to fisheries. *FAO Fish. Synop.*, (125) 3 : 277 p.
- ROPER, C. F. E. AND R. E. YOUNG. 1975. Vertical distribution of pelagic cephalopods. *Smithsonian Contr. Zool.*, No. 209 : 1-51.
- ROPER, C. F. E., R. E. YOUNG AND G. L. VOSS 1969. An illustrated key to the families of the order Teuthoidea (Cephalopoda). *Smithson. Contrib. Zool.*, 13 : 32 p.
- ROSENBERG, P. 1973. The Giant Axon of the squid : A useful preparation for neurophysiological and pharmacological studies. F. Reiner Ed. *Methods of neurochemistry*, Vol. IV, Marcel Dekker, New York, 327 pp.
- SAITO, R. 1976. The Japanese fishery (jigging) for *Nototodarus sloani sloani* in New Zealand waters. *FAO Fish. Rep.*, 170 (Suppl. 1) : 53-60.
- SANDERS, M. J. 1979. Development of fisheries in areas of the Red Sea and Gulf of Aden. Preliminary stock assessment for the cuttlefish *Sepia pharaonis* taken off the coast of the People's Democratic Republic of Yemen. *FAO Field Document*, FAO-FI-RAB-77/008, 58 p.
- SANDERS, M. J. 1981. Revised stock assessment for the cuttlefish *Sepia pharaonis* taken off the coast of the Peoples' Democratic Republic of Yemen. *RAB/77/008/13*. 44p. *FAO*, Project for the development of fisheries in areas of the Red Sea and Gulf of Aden, Cairo, Egypt.
- SANDERS, M. J. AND M. BOUHLEL 1981. Interim report of a mesh selection study conducted in the People's Democratic Republic of Yemen on the cuttlefish *Sepia pharaonis*. *FAO/UNDP Project on Development of Fisheries in areas of the Red Sea and Gulf of Aden* : 35 p.
- SANDERS, M. J. AND M. BOUHLEL 1983. Mesh selection study conducted in the People's Democratic Republic of Yemen on the cuttlefish *Sepia pharaonis*. In : Caddy, J. F. (ed.), *Advances in assessment of World Cephalopod Resources*, *FAO Fish. Tech. Pap.*, 231 : 181-203.
- SANJEVA RAJ, P. J. AND M. KALYANI 1971. *Euprymna morsei* (Verrill, 1881) (Sepiolidae : Cephalopoda) from the Indian Coast. *J. mar. biol. Ass. India*, 13 (1) : 135-137.
- SANTHANAKRISHNAN, G. 1982a. Diversified markets for Indian marine products. *Seafood Export Jour.*, 14 (4) : 9-12.
- SANTHANAKRISHNAN, G. 1982b. Dried squid. Part I. A value-added diversified product and its potential export markets. *Seafood Export Jour.*, 14 (6) : 9-11.
- SANTHANAKRISHNAN, G. 1982c. Dried squid. Part 2. A note on processing, packing and storing. *Seafood Export Jour.*, 14 (7) : 1-13.
- SANTHANAKRISHNAN, G. 1984. Diversification of products and markets. Octopus and un-exploited marine resources for diversification. *Seafood Export Jour.*, 15 (9) : 11-16.
- SARVESAN, R. 1969a. Catalogue of molluscs. 2. Cephalopoda. *Bull. Cent. Mar. Fish. Res. Inst.*, 9 : 23-25.
- SARVESAN, R. 1969b. Some observations on parental care in *Octopus dollfusii* Robson (Cephalopoda : Octopodidae). *J. Mar. Biol. Ass. India*, 11 (1 & 2) : 203-205.
- SARVESAN, R. 1974. V. Cephalopods. In : *The Commercial Molluscs of India*. *Bull. Centr. Mar. Fish. Res. Inst.*, 25 : 63-83.
- SARVESAN, R. 1976. On the occurrence of *Sepia trygonia* (Rochebrune) (Cephalopoda : Sepiidae) in Gulf of Mannar. *Indian J. Fish.*, 23 (1 & 2) : 256-260.
- SABAKI, M. 1929. A monograph of the dibranchiate cephalopods, of the Japanese and adjacent waters. *Fac. Agric. Hokkaido Univ.*, Suppl., 20 : 1-357.
- SASTRY, H. M. C. AND L. M. SRIKAR 1982. Protein and related changes in cuttlefish *Sepia aculeata* in iced storage. *Symposium on Harvest and Post-harvest Technology of Fish*, 24-27 November 1982, Cochin, *Soc. Fish. Technologists*. Abstract.
- SATO, T. 1976. Results of exploratory fishing for *Doridicus gigas* (d'Orbigny) off California and Mexico. *FAO Fish. Rep.*, 170 (Suppl. 1) : 61-67.
- SATO, T. AND H. HATANAKA 1983. A review of assessment of Japanese distant-water fisheries for cephalopods. In : Caddy, J. F. (ed.), *Advances in assessment of world cephalopod resources*. *FAO Fish. Tech. Pap.*, (231) : 145-180.
- SATYAMURTHI, S. T. 1956. The mollusca of Krusadai Island (In Gulf of Mannar). II. Scaphopoda, Pelecypoda and Cephalopoda. *Bull. Madras Govt. Mus. (New Ser.) Nat. Hist. Sect.*, 1 (2) Pt. 7 : 202 p.
- SAUNDERS, W. B. 1981. The species of living *Nautilus* and their distribution. *Vellger*, 24 (1) : 8-17.
- SEKHARAN, K. V., M. S. MUTHU, K. VENKATA SUBBA RAO, V. RAMAMOZHANA RAO, P. MOJUMDER AND S. REUBEN 1973. Exploratory trawling on the continental shelf along the north-western part of the Bay of Bengal. *Proc. Symp. Living Resources of the Seas around India*, CMFRI Spl. Publication : 280-337.
- SHREEHY, D. J. AND S. F. VIE, 1980. 'Sake-ika' : Dried squid processing equipment and markets. *Marine Fisheries Review*, 42 (7-8) : 92 p.
- SHRNOY, A. S. 1985. Squids from India to Japan. *Infofish marketing Digest*, (FAO), No. 2 : 43-44.
- SHIN, P. K. S. 1982. The Hong Kong Squid Fishery. In *Review of National Squid Fisheries*, IPFC/RRD/82/Inf. 8 (a), March 1982, Sydney, Australia, 10 p.
- SILAS, E. G. 1963. Synopsis of biological data on dogtooth tuna *Gymnosarda unicolor* (Ruppel) 1838 (Indo-Pacific). *FAO Fish. Rep.*, 6 (2) : 877-899.

- SILAS, E. G. 1968. Cephalopoda of the west coast of India collected during the cruises of the research vessel 'VARJUNA', with catalogue of the species known from the Indian Ocean. *Proc. Symp. Mollusca. Mar. Biol. Ass. India, Pt. I*: 277-359.
- SILAS, E. G. 1969a. Exploratory fishing by R. V. VARUNA. *Bull. Cent. Mar. Fish. Res. Inst.*, 12: 86 pp.
- SILAS, E. G. 1969b. Pelagic fisheries of the Indian Ocean. *Indian Frmg.*, 19 (9): 63-66.
- SILAS, E. G., S. K. DHARMARAJA AND K. RENGARAJAN 1976. Exploited marine fishery resources of India—a synoptic survey with comments on potential resources. *Bull. Cent. Mar. Fish. Res. Inst.*, 27: 25 p.
- SILAS, E. G., K. S. RAO, R. SARVESAN, K. P. NAIR AND M. M. MEYAPPAN 1982. The exploited squid and cuttlefish resources of India: A review. *Mar. Fish. Infor. Serv. T & E Ser.*, No. 34: 1-16.
- SILAS, E. G. AND P. P. PILLAI 1982. Resources of tunas and related species and their fisheries in the Indian Ocean. *Bull. Cent. Mar. Fish. Res. Inst.*, 32: 174 p.
- SIVALINGAM, D. AND S. KRISHNA PILLAI 1983. Preliminary experiments on breeding of cephalopods. *Proc. Symp. Coastal Aquaculture.*, Part 2, Mar. Biol. Assn. India, 633-635.
- SIVAPRAKASAM, T. E. 1967. Observations on the food and feeding habits of *Papastromateus niger* (Bloch) of the Saurashtra coast. *Indian J. Fish.*, 10 (1): 140-147.
- SREENIVASAN, A. 1962. Two cases of bacterial discolouration of squids. *Curr. Sci.*, 31 (9): 381-382.
- SREENIVASAN, P. V. 1974. Observations on the food and feeding habits of the 'Torpedo Travally' *Megalaspis cordyla* (Linnaeus) from Vizhinjam Bay. *Indian J. Fish.*, 21 (1): 76-84.
- STENSTRUP, J. J. 1856. Hectocotyldannelsen hos octopods-lægsterne *Argonauta* og *Tremactopus*, oplyst ved Iagttagelse at lignende Dannelsen hos Blacksprunt-terne i Almindelighed. *K. danske Vidensk. Selsk. Skr.*, 5 R., 4: 186-215, 2 pl.
- SULLIVAN, D., AND J. M. CULLEN. 1983. Food of the squid *Notodarus gouldi* in Bass Strait. *Aust. J. Mar. Freshw. Res.*, 34: 261-85.
- SULOCHANAN, P. AND M. E. JOHN 1982. Cephalopod resources in southwest coast of India. *Symposium on Harvest and Post-harvest Technology of Fish*, 24-27 November, 1982, Cochin Soc. Fish. Technologists, Abstract.
- SUMMERS, W. C. 1969. Winter population of *Loligo pealei* in the Mid-Atlantic bight. *Boll. Bull.*, 137 (1): 202-216.
- SUMMERS, W. C. 1983. *Loligo pealei*. In Ed. P. R. Boyle *Cephalopod Life Cycles*, Vol. 1: Species accounts. Academic Press. pp. 115-142.
- SURAYANARAYANAN, A. AND K. K. ALEXANDER 1980. Biochemical studies on the molluscan muscle. 2. Studies on the muscles of some bivalves and cephalopods. *J. Anim. Morph. Physiol.* 27 (1-2): 180-189.
- SURESHAN, C. AND K. V. SOMASHEKHARAN NAIR 1969. Food and feeding habits of the demersal fishes off Bombay. *Indian J. Fish.*, 16 (1 & 2): 56-74.
- TAKAHASHI, T. 1965. Squid meat and its processing. In: *Fish as Food*. G. Borgstrom (ed.), Academic Press, New York: 339-354.
- TAKI, I. 1981. A catalogue of the Cephalopoda of Wakayama Prefecture. In: *A catalogue of molluscs of Wakayama Prefecture, The Province of Kii*. 1. Bivalvia, Scaphopoda and Cephalopoda. Sato mar. biol. Lab. Japan, 301 p.
- TALBOT, F. H. AND M. J. PENNETH 1963. Synopsis of biological data on species of the genus *Thunnus* (*Sensu lato*) (South Africa). *AFO Fish. Rep.*, 6 (2): 608-646.
- TAMPI, P. R. S. 1959. The ecological and fisheries characteristics of a salt water lagoon near Mandapam. *J. Mar. Biol. Ass. India*, 1 (2): 113-130.
- TANIKAWA, E. AND M. SENO 1952. Studies on the complete utilization of the squid (*Ommastrephes sloanii pacificus*) 5. Nutritive value and digestibility of squid meat. *Bull. Fac. Fish. Hokkaido Univ.*, 3 (1): 73-94.
- TASAKI, I. 1968. *Nerve Excitation*. Charles C. Thomas Springfield Illinois, pp. 200-26.
- THEILE, J. 1915. In: Chun, C. *Wiss. Ergebn. Deutsche Tiefsee Exped.*, Bd. 18 Pt. 2.
- THEILASILINGAM, T., G. VENKATARAMAN, K. N. KRISHNA KARTHA AND P. KARUNAKARAN NAIR 1968. Results of the exploratory trawl fishing on the continental slope of the southwest coast of India by M. F. V. 'Kalava'. *Indian J. Fish.* 11 (2): 547-558.
- THORE, S. 1945. On the Cephalopoda of Professor O. Carlgren's Expedition to South Africa in 1935. *K. fysiogr. Sällsk. Lund Forh.*, 15: 49-57.
- TOLL, R. B. AND S. C. HERR. 1981. Cephalopods in the diet of the sword fish, *Xiphias gladius* from the Florida Strait. *Fish. Bull. U.S.* 79(4): 765-774.
- TRETHEWIE, E. R. 1965. Pharmacological effects of the venom of the common octopus, *Hapalochlaena maculosa*. *Toxicol.* 3: 55-59.
- TUNG, IH-HSU 1976. On the reproduction of common squid, *Symplectoteuthis orientalis* (Lesson). *Rep. Inst. Fish. Biol. Taipei*, 3 (2): 26-48 (in Chinese with English summary).
- TUNG, IH-HSU, CHIH-CHENG LAN AND CHEN-CHIN-HU 1973. The preliminary investigation for exploitation of common squid resources. *Rep. Inst. Fish. Biol., Taipei*, 3 (1): 211-247 (in Chinese with English summary).
- TRUONG, A. R. 1974. Fishery management issues in the Indian Ocean. Indian Ocean Programme, FAO, Rome, IOF/CEV/74/35: 39 p.
- UNDP/FAO 1974a. Survey Results 1972/73. *Progress Report No. 6*: 141 p.
- UNDP/FAO 1974b. Plankton—Fish eggs and larvae studies. *Progress Report No. 7*: 21 p.
- UNDP/FAO 1976a. Survey Results 1973/74. *Progress Report No. 12*: 32 p.

- UNDP/FAO 1976b. Survey Results 1974/75. *Progress Report No. 13* : 21 p.
- UNDP/FAO 1976c. Pelagic fishery Investigation on the southwest coast. *Final Report of the Norwegian Agency for International Development (NORAD) and the Institute of Marine Research Bergen* : 55 p.
- UNDP/FAO 1976d. A synopsis of the information on pelagic resources off the southwest coast of India. *Progress Report No. 18* : 31 p.
- UNDP/FAO 1977. Report of acoustic survey along the southwest coast of India, November 1976. *Progress Report, 1*. FAO, Rome FIRS-IND/75/0348 : 28 p.
- UNNITHAN, K. A. 1982. Observations on the biology of cuttlefish *Sepiella inermis* at Mandapam. *Indian J. Fish.*, 29 (1 & 2) : 101-111.
- VERGHESE, G. 1981. Present status of small scale fisheries in Lakshadweep. *Bull. Cent. Mar. Fish. Res. Inst.*, 30 B : 60-64.
- VELAIN, C. 1877. Remarques generales au sujet de la faune des iles St. Paul et Amsterdam, Suivies d'une description de la faune malacologique des deux iles. *Archs. Zool. exp. gen.*, 6 : 1-144.
- VENKATARAMAN, R. AND K. DEVADASAN 1978. Marine products processing industry in India : Its growth and future prospects. *Proc. Symp. Fish Utilization Technology and marketing in the IPFC Region, 18th Sesson, Manila, Philippines* : 38-44.
- VERRILL, A. E. 1881a. Report on the cephalopods and on some additional species dredged by the U. S. Fish Commission Steamer 'Fish-hawk', during the season of 1880. *Bull. Mus. Comp. Zool.*, 8 : 99-116.
- VERRILL, A. E. 1881b. Regeneration of lost parts in the squid *Loligo pealei*. *Amer. J. Sc.*, (3rd ser.), 21 : 333-334.
- VERRILL, A. E. 1882. Report on the cephalopods of the north-eastern coast of America. *Rep. U. S. Comm. Fish and Fisheries*, 1879, 7 : 211-455.
- Voss, G. L. 1956. A review of the cephalopods of the Gulf of Mexico. *Bull. mar. Sci. Gulf. Carib.*, 6 (2) : 85-178.
- Voss, G. L. 1962. South African cephalopods. *Trans. R. Soc. S. Africa*, 36 (4) : 245-272.
- Voss, G. L. 1963. Cephalopods of the Philippine Islands. *Bull. U. S. nat. Mus.*, 234 : 1-180.
- Voss, G. L. 1967. Some bathypelagic cephalopods from South African waters. *Ann. S. African Mus.*, 50 (5) : 61-88.
- Voss, G. L. 1973. Cephalopod resources of the world. *FAO Fish. Circ.* (149) : 75 p.
- Voss, G. L. 1977. Present status and new trends in cephalopod systematics. *Symp. Zool. Soc. London*, 38 : 49-60.
- Voss, G. L. AND D. S. HERDMAN 1959. *Thysanoteuthis rhombus*, a large cephalopod new to Western Atlantic. *Mar. Lab. Univ. Miami, Nautilus*, 73 (1) : 23-25.
- Voss, G. L. AND G. R. WILLIAMSON 1971. *Cephalopods of Hong-kong*. Government Press, Hongkong : 138 p.
- VOVK, A. N. 1972. Method of determining maturing stages in gonads of the squid *Loligo pealei*. *Zoologicheskii Zhurnal (USSR)*, 51 (1) : 127-132. (Translation Ser. No. 2337, 1973, Fish Res. Bd. Can.)
- WELLS, M. J. 1962. Brain and Behaviour of Cephalopods. Heines mann, London.
- WELLS, M. J. 1966. Cephalopod Sense organs. In [physiology of Mollusca, Edited by K. M. Wilbur and C. M. Younge, New York, Academic Press. Vol. 2 : 523-45.
- WELLS, M. J. 1978. Octopus : Physiology and behaviour of an advanced invertebrate. Chapman and Hall London and John Wiley and Sons, New York, 417 p.
- WELLS, M. J. AND J. WELLS. 1972. Sexual display and mating of *Octopus vulgaris* Cuvier and *O. cyanea* gray and attempts to alter performance by manipulating the glandular condition of animals. *Animal Behav.* 20 : 293-308.
- WILLIAMS, F. 1964. The Scombroid fishes of East Africa. *Proc. Symp. Scombroid Fishes*, Mar. Biol. Ass. India, Pt. I : 107-164.
- WILLIAMS, 1967. Longline fishing for tuna off the coast of East Africa, 1958-1960. *Indian J. Fish.*, 10 (1) : 233-290.
- WILLY, A. 1902. Contribution to the natural history of the pearly nautilus Part 6. of *Zoological Results based on material from New Britain, New Guinea, Loyalty Islands*. (34) Cambridge.
- WINCKWORTH, R. 1926. A list of Cephalopoda in the Colombo Museum. *Spolia Zeylan.*, 13 : 323-331.
- WINCKWORTH, R. 1936. Marine Mollusca from South India and Ceylon. 4. A new Indian *Sepia*. *Proc. Malac. Soc. London* 22 : 16-23.
- WOLFF, G. A. 1984. Identification and estimation of size from the beaks of 18 species of Cephalopods from the Pacific Ocean. *NOAA Tech. Rept. NMFS* 17 : 1-50.
- WOLFF, G. A. AND J. H. WORMUTH. 1979. Biometric Separation of the beaks of two morphologically similar species of the squid family Ommastrephidae. *Bull. Mar. Sci.* 29(4) : 587-592.
- WORMS, J. 1983. World fisheries for cephalopods : A synoptic overview. In : Caddy J. E. (ed.), *Advances in Assessment of world cephalopod Resources*, *FAO Fish. Tech. Pap.*, (231) : 1-20.
- WORMUTH, J. H. 1976. The biogeography and numerical taxonomy of the Oegopsid squid family Ommastrephidae in Pacific Ocean. *Bull. Scripps. Inst. Oceanogr.*, 23 : 90 p.
- WULKER, G. 1920. Ueber Cephalopoden des Roten Meeres. *Sneckenbergiana*, 2 : 48-58.
- YAJIMA, S. AND S. MITSUGI 1976. Japanese squid jigging gear. *FAO Fish. Rep.*, 170 (Suppl. 1) 85-88.
- YAMANAKA, H. 1976. Summery Report on cruise of R. V. *SOHYO MARU* in the Northern Arabian Sea, Oct. 1975-Feb. 1976. Far Seas Fisheries Research Laboratory, Japan Fisheries Agency pp. 1-9 with 30 figs, 7 tables, 6 plates and 2 appendices.
- YAMANAKA, H., Y. NISHIGAWA AND J. MORITA 1976. Summary Report on cruise of the R. V. *SHOYO MARU* in the North Arabian Sea. *FAO/UNDP Indian Ocean Programme Technica Report No. 11*, 47 p.

- YAMAZAKI, T. AND M. CHUENCHITPONG. 1981. Survey Report on squid stick-held dip net at Ban PHE District. *SEAFDEC Training Dept.* MP/No. 10 : 1-14.
- YAMAZAKI, T. P., MASTHAWBE AND S. SAKARANG. 1983. Survey Report on a new type of squid lift net. *SEAFDEC Training Dept.* TD/MP/15 : 1-16. June 1983.
- YAMASHITA, Y. 1976. The octopus Fishery of Hokkaido. Suppl. to the Report of the Expert Consultation on Fishing for Squid and other cephalopods. *FAO Fish. Rep.* (170) Suppl. 1, 142-143.
- YBOH, Q. L. AND Z. MERICAN 1978. Processing of non-commercial and low-cost fish in Malaysia. *Proc. Symp. Fish Utilization Technology and Marketing in the IPFC Region, 18th Session, Manila, Philippines* : 572-580
- YOUNG, R. E. 1975. A brief review of the biology of the oceanic squid, *Symplectoteuthis oualaniensis* (Lesson). *Comp. Biochem. Physiol.* 52 B : 141-143.
- YOUNG, J. Z. 1962. Courtship and mating by the coral reef octopus (*O. horridus*). *Proc. Zool. Soc. London*, 138 : 157-62.
- YOUNG, J. Z. 1965. The Central Nervous System of *Nautilus*. *Philos. Trans. R. Soc. Biol. Sci.*, 249 : 1-25.
- YOUNG, J. Z. 1971. Anatomy and Nervous system of *Octopus vulgaris*. Clarendon Press, Oxford.
- YOUNG, J. Z. 1977. Brain, behaviour and Evolution. *Symp. Zool. Soc. London*, 38 : 377-434.
- YOSHIKAWA, N. 1978. Fisheries in Japan. Squid and cuttlefish, Publ. by Japan Marine Products Photo Materials Association. Tokyo, 162 p.
- ZUEV, G. V. 1971. *Cephalopods from the northwestern part of the Indian Ocean, Moscow*, 223 pp.
- ZUEV, G. V. AND K. N. NESS 1971. *Squid (Biology and Fishery)*, *Pishchevaya Promyshlennost Press, Moscow*.
- ZUPANOVIC, S. AND S. Q. MOHIUDDIN 1973. A survey of the fishery resources in the northeastern part of the Arabian Sea. *J. mar. Biol. Ass. India*, 15 (2) : 496-537.