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INDIAN COUNCIL OF AGRICULTURAL RESEARCH

समुद्री मात्स्यिकी सूचना सेवा: समुद्री मात्स्यिकी पर आधारित अनुसंधान परिणामों को आयोजकों, मत्स्य उद्योगों और मत्स्य पालकों के बीच प्रसार करना और तकनीकी का प्रयोगशाला से श्रमशाला तक हस्तांतरित करना इस तकनीकी और विस्तार अंकवली का लक्ष्य है।

The Marine Fisheries Information Service : Technical and Extension Series envisages dissemination of information on marine fishery resources based on research results to the planners, industry and fish farmers, and transfer of technology from laboratory to field.

Abbreviation - Mar. Fish. Infor. Serv., T & E Ser., No. 167 : January, February, March 2001

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Front cover photo : The Indian oil sardine, *Sardinella longiceps* a potential pelagic resource in the east coast of India

मुख आवरण चित्र : भारतीय तारली, *सारडिनेला लॉंगिसेप्स*- भारत के पूर्व तट की एक शक्य वेलापवर्ती संपदा

Erratum : The front cover of MFIS No.166 may be read as *Penaeus canaliculatus*, a highly sought after marine prawn— — — — — Kerala.

951 RECENT EXPLOITATION TREND OF OIL SARDINE ALONG TAMIL NADU - PONDICHERRY COAST

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The Indian oil sardine *Sardinella longiceps*, though a non-conventional resource of the east coast, supports now a regular fishery of high magnitude especially along Andhra Pradesh and Tamil Nadu - Pondicherry coasts. The estimated annual average landing from east coast during the period 1993-97 was 60,638 tonnes against 46,000 t obtained along west coast thereby showing the potential of this new resource, especially along the southern maritime states of the east coast. It has been observed that the oil sardine catch during 1993-97 increased to more than three fold in Andhra Pradesh from that of the previous five year period 1988-92 while along Tamil Nadu - Pondicherry coast the catch almost doubled and recorded 80% of the total oil sardine production of east coast.

Some informations are available on the fishery trend of oil sardine during 1981-86 and 1985-90 (Mar. Fish. Infor. Serv., T & E Ser., 88, 1988 and 119, 1992). The present study complements the information on the recent trend of exploitation along Tamil Nadu - Pondicherry coast.

Trend of fishery

The period 1991-97 recorded 45% of total all India production of oil sardine from east coast of which the annual average of nearly 43,200 t (80%) was obtained along Tamil Nadu - Pondicherry coast constituting 10% of the total marine fish production. Catch trend along the coast showed an all time recorded high yield of nearly 80,000 t in 1977 (Fig. 1). Progressive increase of the annual average yield during each 5 year period 1973 - '77 to 1993 - '97 indicated visible increase in the magnitude of the fishery especially since 1990 (Table 1).

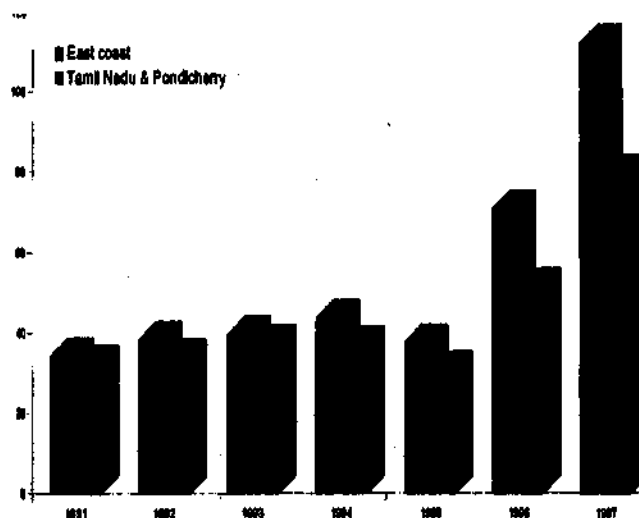


Fig. 1: Oil sardine landings of Tamil Nadu - Pondicherry coast during 1991-97 in relation to total production along the east coast

TABLE 1. Average oil sardine landings during 1973-77 to 1993-97 (in tonnes) and its percentage to total average fish production of Tamil Nadu - Pondicherry coast.

Period	Average oil sardine landings	% to total average fish production
1973 - '77	152	0.07
1978 - '82	530	0.22
1983 - '87	3,476	1.28
1988 - '92	24,346	7.27
1993 - '97	47,195	11

Gearwise catch trend

The trend of landings by different tackles from various coastal districts of Tamil Nadu including Pondicherry (Table 2) revealed that

47% was exploited by bagnet *eda valai*, the operation of which is restricted at present to the coastal waters from Chengalpet to Quaide-Milleth districts (prior to recent change in nomenclature of coastal districts) and Pondicherry. Annual average catch per unit effort of oil sardine during 1991-97 by *eda valai* units indicated maximum of 1386 kg and 1187 kg from Quaide-Milleth and South Arcot district respectively (Table 3). The sardine gillnets known locally by different names such as *kavala valai*, *thatta valai*, *mathi valai* and *chala valai* operated almost throughout the coastal waters realised 25% of the total oil sardine catch during the period.

It was remarkable to observe that 23% the total exploited oil sardine resources was caught by trawlers. By virtue of unprecedented heavy landings in pair trawlers at Pamban, Rameswaram and Mandapam, recorded highest annual average of about 6500 t constituting 64.6% of the total oil sardine recorded in trawlers. Unprecedented heavy landing of oil sardine predominantly by pair trawlers operated 15-20 km off the shore at depth of 12-16 m during January - February period have been recorded at Rameswaram-Pamban area (*Mar. Fish. Infor. Serv., T & E Ser., 117, 1992*).

Other nets including shore seines and boat seines operated to a limited extent caught 5% of the landings. Unusually large oil sardine landings by shore seines around Mandapam area has been reported while at Tuticorin, oil sardine formed 2% of the shore seine catches (*Mar. Fish. Infor. Serv., T & E Ser., 104 & 123, 1992*).

Exploitation trend of the resource along Tamil Nadu - Pondicherry coast during the period under study suggested that the annual average of nearly 44,000 t constituting 40% of the total oil sardine production is reported along Quaide-Milleth district. South Arcot district ranked next (19.8%) followed by Ramanathapuram (16%), Pondicherry (9.2%),

Chengalpet (6.2%), Madras (4.7%) and Pudukottai (2.2%).

Seasonal trend

Analysis of the seasonal oil sardine fishery during 1991 - '97 indicated a productive second quarter (April - June) and third quarter (July - September) accounting for 33% and 30% of the total catch respectively. Earlier studies also have reported heavy landings during May and June along Madras coast (*Mar. Fish. Infor. Serv., T & E Ser., 96, 1989*). Fishery season for oil sardine in Visakhapatnam coast is reported to be June - December (*Mar. Fish. Infor. Serv., T & E Ser., 133, 1994*) and a similar trend during 1985-90 has been reported along Tamil Nadu coast (*Mar. Fish. Infor. Serv., T & E Ser., 115., 1990*). The present study indicating a productive April - September period probably suggests the characteristic seasonally fluctuating oil sardine fishery.

Gearwise seasonal landings indicated that the fishery exploited by major nets like bagnet and gillnet operated during the productive seasons recorded a major share of 72% (Fig.2). The abundance of oil sardine in trawlers was observed to be highest in the first quarter (January - March) as a consequence of intensive

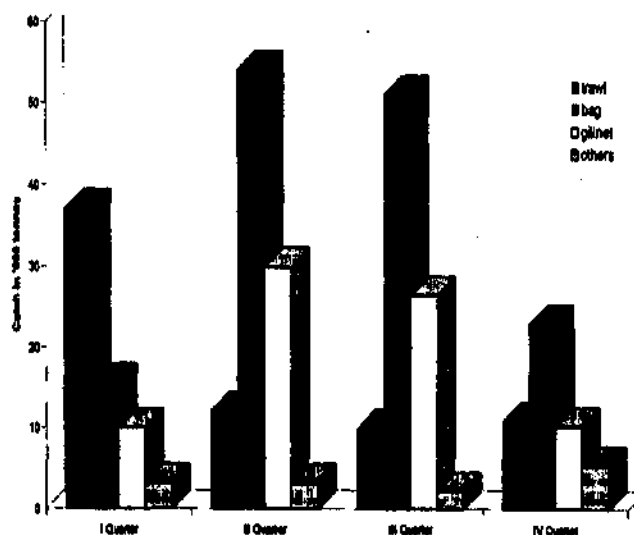


Fig. 2 : Seasonal abundance of oil sardine obtained in different gears during 1991-97 from Tamil Nadu - Pondicherry coast.

TABLE 2. Average oil sardine catch (in tonnes) during 1991-97 by different gears along the coastal districts of Tamil Nadu and Pondicherry

Districts	Gear				Total
	Trawl net	Bagnet	Gill net	Others	
Chengalpet	0	1458(7.1)	1023(9.4)	230(11.6)	2711(6.9)
Madras	0	1553(7.6)	303(2.8)	177(8.9)	2033(4.7)
South Arcot	5.(01)	6315(31.9)	1731(15.8)	340(17.2)	8591(19.8)
Quaide-Milleth	2410(4.1)	8312(40.6)	6000(55.0)	498(25.3)	17220(39.9)
Tanjavoor	139(1.4)	0	34(0.3)	0	173(0.4)
Pudukottai	952(9.5)	0	0	0	952(2.2)
Ramanathapuram	6455(64.6)	0	243(2.2)	251(12.7)	6949(16.0)
Nellai	0	0	0	0	0
Katabomman					
Chidambarnar	11(90.1)	0	423(3.9)	57(2.9)	491(1.1)
Kanyakumari	0	0	187(1.7)	76(3.8)	263(0.6)
Pondicherry (U.T)	17(0.2)	2628(12.8)	969(8.9)	349(17.6)	3943(9.1)
Total	9989	20446	10992	1978	43335
Precentage	23	47	25	5	

Table 3. The catch per unit effort (in kg) of *eda valai* in various coastal districts of Tamil Nadu and Pondicherry during 1991-97

District/year	1991	1992	1993	1994	1995	1996	1997	Average
Chengalpet	1,006	1,008	266	416	344	1,115	694	693
Madras	128	427	391	469	153	167	879	374
S.Arcot	481	606	603	620	3,427	1,463	1,106	1187
Pondicherry	106	705	580	504	68	243	1,546	536
Quaide-Milleth	960	1,150	1,305	979	2,821	1,203	978	1316

operations of pair trawlers. Though the presence of oil sardine in shrimp trawlers was almost a regular feature, among the trawlers, pair trawlers accounted for 65% of the landings of oil sardine. Abundant quantity of oil sardine in shrimp trawlers off Visakhapatnam was reported in the month of January forming 54% of annual trawl catch followed by February (16%) and indicated movement of oil sardine and other

sardines to deeper waters during January - February and February - March respectively as has been revealed by the diminishing catch rates of these groups in gear operated in nearshore waters during that period (*Mar. Fish. Infor. Serv., T & E Ser., 133, 1994*). The landings of oil sardine by shore seines and boat seines were high during the fourth quarter (October - December).

Biological characteristics

Detailed biological studies on oil sardine along the east coast are limited to a few references on the length ranges of the species in the fishery, availability of mature specimen at a few centres and on the reported occurrences of eggs and larvae. Information available so far indicated that oil sardine caught along the east coast ranged in size between 20 and 207 mm total length. The size ranges of fishes obtained in earlier observations in various gears at few centres are given in Table 4. As gillnet was the major gear at most of the centres, large sized fish around 125 mm and onwards formed major catch whereas fishes caught by bagnets, shore seines and trawl nets were small.

The presence of eggs and larvae of *Sardinella longiceps* along the Madras coast has been established (Treubia 25(2) : 202 - 213, 1960). Based on the frequent occurrence of mature oil sardine along the coast, it has been suggested that oil sardine has prolonged spawning season during May - June to September - October (Indian J. Fish. 31 (3)). Ripe fishes were encountered during May - August along Madras coast and young fishes (60-64mm) observed in boat seine catches during November (Mar. Fish. Infor. Serv., T & E Ser., 96 1989). Further observations have revealed fishes of advanced maturity condition at Tuticorin in September 1982, May 1983 and March 1984 and at Parangipettai during July - September 1989 (Mar. Fish. Infor. Serv., T & E Ser., 88, 1988). Fishes caught at Pondicherry during November - December 1993 had gonad in first and second stage of maturity (Mar. Fish. Infor. Serv., T & E Ser., 16, 1985). The spawning period of oil sardine at Tuticorin was observed to be October - November (Mar. Fish. Infor. Serv., T & E Ser., 120, 1993). As seen from the fecundity studies, the species along Visakhapatnam coast appears to have a prolonged spawning period with intense spawning activity during December -

February, April - June, and August - October. It was also premised that the species attain maturity at 137 mm and at the completion of 3, 6, 9, 12, 15 months of life it attains average length of 99.0, 139.5, 183.8 and 195.4 mm respectively (Mar. Fish. Infor. Serv., T & E Ser., 120, 1993).

As the oil sardine provides a regular fishery of considerable magnitude especially along Andhra Pradesh and Tamil Nadu - Pondicherry coasts, detailed investigations on length frequency and spawning characteristics of the species at selected centres deserve special attention to study the dynamics and predict the resources availability in the years to come.

Remarks

The oil sardine fishery, once considered as a non-conventional resource of the east coast, now appears to be an important fishery of high magnitude particularly along Andhra Pradesh and Tamil Nadu - Pondicherry coasts showing progressive increase in catches. Based on the present study, it appears that by extending the operations of bagnet *eda valvai*, which registered 47% of the total oil sardine production to those maritime districts of Tamil Nadu where it has not yet been introduced may bring high returns.

Reports suggest that the oil sardine fishery obtained along the coast has benefited the fishers only to a limited extent. Owing to lack of demand for local consumption, large portion of oil sardine was marketed outside the state. During the period of unprecedented heavy landings considerable quantities were sun-dried and supplied to manufacturers of poultry feed.

Oil sardine catches are reported to have been obtained along the east coast of India in areas close to harbours, back waters and river mouths indicating its affinity particularly during

Table 4. Size range of oil sardine (in mm) recorded in different gear at few centres along Andhra Pradesh, Tamil Nadu and Pondicherry

Centres	Gear				
	Trawl net	Bagnet	Gill net	Shore seine	Boat seine
Gopalpur	N.L.	0	120-175	50-100	50-100
Kakinada	160-195	0	170-195	125-198	0
Visakhapatnam	72-175	0	100-175	92-187	40-205
	70-165	0	102-187	0	57-147
Pondicherry	0	0	140-202	0	0
Madras	0	0	126-195	0	60-64
Parangipettai	0	0	102-193	0	0
Cuddalore	0	140-169	0	0	0
Pazhayar	0	110-114	0	0	0
Kaveripattinam	0	95-170	0	0	0
Tuticorin	0	0	120-185	0	0
Rameswaram	165-176	0	0	0	0
Pamban	165-176	0	0	0	0
Mandapam	165-176	0	0	0	0

N.L.: No landings reported.

juvenile phase to areas where there is admixture of fresh and brackish water (*Mar. Fish. Infor. Serv. T & E Ser.*, **88**, 1988). Based on the circulation patterns in Arabian Sea and the possibility of oil sardine entering the Bay of Bengal from the south-west coast of India along with the surface currents driven by the south-west monsoon during May - August appears to be a reasonable explanation for their fishery in the region. The fish seems to maintain this coastal habitat till

December but come early under the influence of the clockwise circulation that sets in towards the latter part of November - January period and get carried off the coasts in the subsequent period (*Mar. Fish. Serv. T & E Ser.*, **133**, 1994).

Acknowledgement

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952 OCCURRENCE OF DEEP SEA SQUIDS IN COMMERCIAL TRAWL CATCHES FROM COCHIN

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Cephalopods form a significant percentage (approximately 20%) of the trawl landings in Kerala, the catch mainly comprising of the neretic loliginid squids and the sepioid

cuttlefishes. Since cephalopods have a good export demand, it is the second most sought after commodity after prawns by the trawl operators. Due to the ever increasing pressure to maximize

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Kakinada	160-195	0	170-195	125-198	0
Visakhapatnam	72-175	0	100-175	92-187	40-205
	70-165	0	102-187	0	57-147
Pondicherry	0	0	140-202	0	0
Madras	0	0	126-195	0	60-64
Parangipettai	0	0	102-193	0	0
Cuddalore	0	140-169	0	0	0
Pazhayar	0	110-114	0	0	0
Kaveripattinam	0	95-170	0	0	0
Tuticorin	0	0	120-185	0	0
Rameswaram	165-176	0	0	0	0
Pamban	165-176	0	0	0	0
Mandapam	165-176	0	0	0	0

N.L : No landings reported.

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cuttlefishes. Since cephalopods have a good export demand, it is the second most sought after commodity after prawns by the trawl operators. Due to the ever increasing pressure to maximize

their returns, trawl operators have recently expanded the trawling grounds to deeper areas by equipping their vessels with electronic fishing aids like fish finders and GPS (global positioning system). The year 1999-2000 witnessed unprecedented expansion of trawl grounds up to the 500 m depth zones by trawl boats operating from Cochin and nearby fishing ports. This has resulted in the landing of hitherto little known and unexploited marine resources although the main target of these boats were the deep sea prawns, occasionally a few species of cephalopods were also caught along with the prawn.

During second week of February 2000, several trawl boats operating from Munambam Fishing Harbour reported the occurrence of very large unusually shaped squids (reported in local newspapers) in their catches. One of these specimens was preserved in ice by an enterprising fisheries NGO (Green Seas, Munambam) for scientific examination. This specimen was later brought to the laboratory for detailed study and preservation. The following are the details recorded.

The specimen was caught (on 17-2-2000) in a haul made by a 55 feet OAL trawl boat operating at 9°26'N;75°31'E (48 nm west of Alleppey) at a depth of 465 m. The boat, engaged in multi-day fishing, was powered by a 130 HP Leyland turbo charger engine with 1200 m wire rope and 70 kg steel otter boards. The squid specimen (Fig.1) which weighed 7.5 kg had the following dimensions (Table 1).

TABLE 1. Morphometric characters of the deep sea squid caught off Alleppey.

Characteristics	Measurement (mm)
Dorsal Mantle Length (DML)	620
Total Length	1060
Mantle Width	515

Fin Length	580
Head Length	145
Right Arm I	350
Right Arm II	335 (damaged)
Right Arm III	395
Right Arm IV	365
Left Arm I	292
Left Arm II	270
Left Arm III	320
Left Arm IV	335 (damaged)
Head Width	95.7
Mouth diameter	48.3
Mantle thickness	53.6
Sex	Male, mature



Fig. 1 : Dorsal view of *Thysanoteuthis rhombus* caught by a 55 feet OAL trawler from 9° 26, 75° 31, E (off Alleppey) at a depth of 465 m.

Both the tentacles of the specimen were missing, besides the eyes were also damaged. The identification protocol given by the FAO was followed to identify the specimen. Based on the mantle shape (rhombic), fin length (extending to nearly full length of the mantle) and shape of the funnel-locking apparatus (short, broad with transverse groove) the specimen was identified as the diamond back squid *Thysanoteuthis rhombus* (Order: Teuthoidea; Suborder: Oegopsida; Family: Thysanoteuthidae).

This large monotypic squid (attains at least 100 cm DML and 20 kg weight, common to 60 cm DML) is reported to occur worldwide in tropical and warm subtropical oceanic waters but nowhere abundant. An epipelagic, oceanic species, often occurring in pairs or small schools, it forms a small fishery in the Japan Sea. In India, its occurrence has been reported off the coast of Gujarat during the winter months, in Andaman and Nicobar Islands and off Vizhinjam. Off Andaman and Nicobar Island a single large female measured 585 mm DML and weighed 5.3 kg was reported. During 1996, 3 specimens of *T. rhombus* of 300-340 mm were caught in hook and lines at 75-100 m depth. The present record therefore, is the largest reported from Indian waters.

Besides, *T. rhombus*, another strange squid species was also reported in catches by the deep sea trawlers operating from Munambam Fisheries Harbour. This specimen was not physically examined, only a photograph (Fig.2) was made available by the NGO. From the photograph, the squid was tentatively identified as *Chroteuthis* sp. Although continental, considered predominantly oceanic, this genus also occurs in demersal trawls in the



Fig. 2: Ventral view of the *Chroteuthis* sp. squid caught by Munambam based deep sea trawlers during February 2000.

continental slope waters at depths of 300-600 m especially off northern Australia. *Chroteuthis* have no commercial fisheries potential, due to their soft gelatinous body. In India, they have been caught in pelagic trawls in the Andaman and Nicobar Islands.

The extension of trawling grounds by the trawl fleets in Kerala has resulted in the capture of new cephalopod resources, the abundance and commercial value of which remains to be explored. Presently, the cephalopods caught by these trawlers are few.

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953 EXPLOITATION OF THE BROWN MUSSEL *PERNA INDICA* (KURIAKOSE AND NAIR) FROM SELECTED CENTRES ALONG THE WEST COAST OF TAMIL NADU

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The brown mussel, *Perna indica*, is found abundantly on intertidal and subtidal rocks along

the southwest coast of India. The species is edible and has been under exploitation for a long time.

Both the tentacles of the specimen were missing, besides the eyes were also damaged. The identification protocol given by the FAO was followed to identify the specimen. Based on the mantle shape (rhombic), fin length (extending to nearly full length of the mantle) and shape of the funnel-locking apparatus (short, broad with transverse groove) the specimen was identified as the diamond back squid *Thysanoteuthis rhombus* (Order: Teuthoidea; Suborder: Oegopsida; Family: Thysanoteuthidae).

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953 EXPLOITATION OF THE BROWN MUSSEL *PERNA INDICA* (KURIAKOSE AND NAIR) FROM SELECTED CENTRES ALONG THE WEST COAST OF TAMIL NADU

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The brown mussel, *Perna indica*, is found abundantly on intertidal and subtidal rocks along

the southwest coast of India. The species is edible and has been under exploitation for a long time.

This study was undertaken to determine the current level of exploitation from selected centres along the west coast of Tamil Nadu, since estimates of catch and effort form part of the basic information required for fishery management.

Based on a preliminary survey of the coastal mussel fishing areas, three major centres, namely Enayam, Colachel and Kadiapatanam were selected for collection of data. Description of these areas and the details of the method of mussel fishing are given in Appukuttan *et al* (CMFRI Bull.42(2): 257-263, 1988) and Joel and Ebenezer (Mar. Fish. Infor. Serv., T & E Ser., 100: 9-13, 1989). Data on catch (in weight) and fishing effort were collected from the year 1994-'95 to 1998-'99 and estimates were made according to the method described by Prabhu and Dhulkhed (*Indian J. Fish.* 17: 57-75, 1970), except that the fishing effort was recorded in mandays.

The mussel fishing season extended from October - November to March - April (Table 1). The fishery was in its peak during November - January and started to decline from February (Fig.1). In an earlier study conducted by Appukuttan *et al* (*op.cit.*) for the period 1982 - '84, maximum catch was recorded during November - December and the pattern of mussel landings continued to remain more or less the same.

The estimated annual catch (C), fishing effort (E) and catch per effort (D/E) at the three

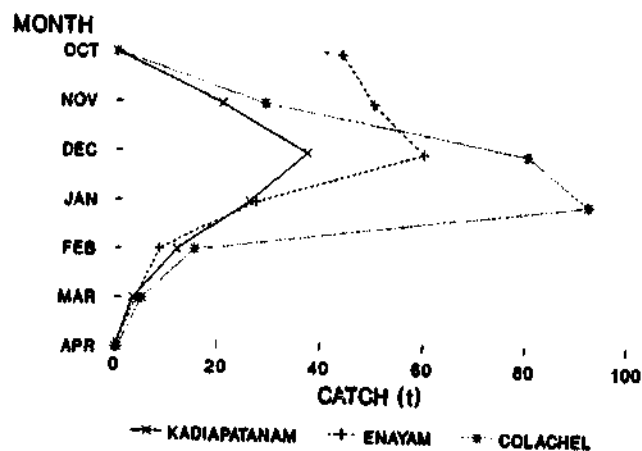


Fig. 1: Monthly (average) variations in the catch of *Perna indica* at the three centres

centres are presented in Table 2. The catch, effort and catch per effort decreased gradually after the considerable increase noticed in 1996 - '97. The catch showed wide annual fluctuations (Fig.2) and such variations were reported by earlier workers too. Similarly, average monthly variations were also quite prominent.

The catch per unit effort, which is generally considered proportional to index of abundance, has decreased slightly at Enayam in 1998 - '99 when compared to 1994 - '95, the beginning year of the present study. At Colachel, the C/E remained almost the same in 1994 - '99. At Kadiapatanam, the lowest value was in 1997 - '98 and was increasing subsequently although it had not reached the level of 1994 - '95 (Fig.3).

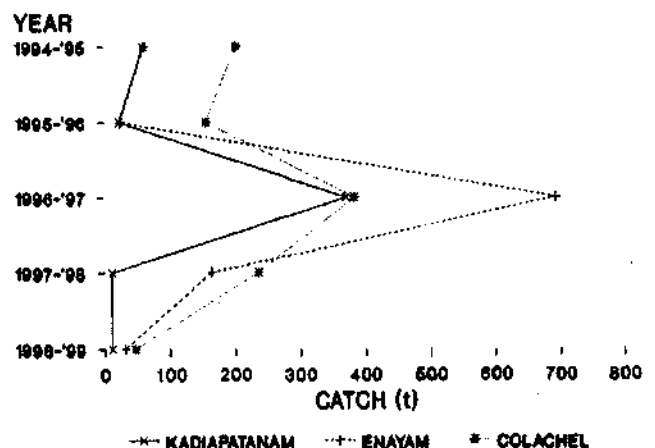


Fig. 2: Annual variations in the catch of *Perna indica* at the three centres

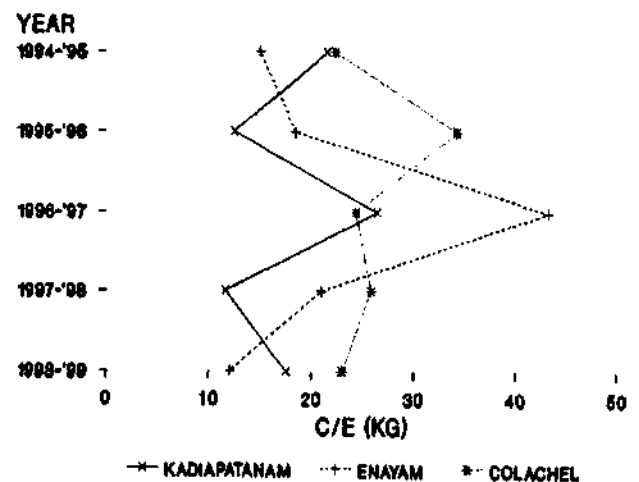


Fig. 3: Annual variations in the catch per effort of *Perna indica* at the three centres

TABLE 1. Details of monthly (average of five years) catch, effort and C/E at Enayam, Colachel and Kadiapatnam

Month	Enayam			Colachel			Kadipatanam		
	Catch(C) (kg)	Effort(E) (mandays)	C/E (kg)	Catch(C) (kg)	Effort(E) (mandays)	C/E (kg)	Catch(C) (kg)	Effort(E) (mandays)	C/E (kg)
October	43728	1028	42.54	0	0	0	0	0	0
November	50110	1330	37.68	29142	1311	22.23	20754	631	32.89
December	59958	1800	33.31	80243	3012	26.64	37323	1496	24.95
January	27559	1165	23.66	92228	2595	35.54	26174	1187	22.05
February	8647	638	13.55	15584	1120	13.91	12148	613	19.82
March	4173	370	11.28	5257	496	10.60	3555	320	11.11
April	0	0	0	528	66	8.00	0	0	0

TABLE 2. Details of annual variations of catch, effort and C/E at Enayam, Colachel and Kadiapatnam

Month	Enayam			Colachel			Kadipatanam		
	Catch(C) (kg)	Effort(E) (mandays)	C/E (kg)	Catch(C) (kg)	Effort(E) (mandays)	C/E (kg)	Catch(C) (kg)	Effort(E) (mandays)	C/E (kg)
1994-95	60778	4036	15.06	201542	9000	22.39	59058	2740	21.55
1995-96	23-62	1248	18.48	154902	4514	34.32	21580	1716	12.58
1996-97	692317	15990	43.30	383188	15716	24.38	370789	14014	26.46
1997-98	163775	7812	20.96	236088	9136	25.84	10943	938	11.67
1998-99	30946	2568	12.05	46958	2044	22.97	11220	640	17.53
Average	194176	6331	30.67	204536	8082	25.31	94718	4010	23.62

Since exploitation takes place only during a part of the year (October - April), avoiding the peak period of spawning and settlement of mussels along the southwest coast of India, the population gets time and opportunity to re-establish on coastal rocks in these areas.

Acknowledgements

The authors are grateful to the Director, Central Marine Fisheries Research Institute, Cochin, the Head, Molluscan Fisheries Division of the Institute, and the Officer in - charge, VRC of CMFRI, Vizhinjam for their encouragement as well as for providing facilities for this study.

954 LIVE STRANDING OF DOLPHINS AT TUTICORIN - RESCUE AND RELEASE OPERATIONS

T.S. Balasubramanian

Tuticorin Research Centre of Central Marine Fisheries Research Institute, Tuticorin.

On 23.04.2000 two dolphins were found swimming in the shallow waters of Karapad (Tuticorin) bay situated near CMFRI fish culture pond and parallel to the harbour link road by few fishermen during the early hours of the day. The water in this shallow area is clear, unlike the

open bay which is ash ridden. They passed on the information to the CMFRI employees who were on watch duty. Later few nature lovers tried to help the dolphins by scaring them away into open bay. But dolphins returned to the shallow water and reluctant to move further into the

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open bay which is ash ridden. They passed on the information to the CMFRI employees who were on watch duty. Later few nature lovers tried to help the dolphins by scaring them away into open bay. But dolphins returned to the shallow water and reluctant to move further into the

deeper turbid water. This behaviour was similar to our earlier encounter during the second week of August 1999 near Tuticorin Thermal Power Station.

In the course of time few people gathered at the sight, caught hold of the dolphins and started torturing them. However, the timely interventions of some public, staff of CMFRI and members of Press rescued them and helped them to reach safely the deeper area of the bay. The successful attempt of public was well appreciated and flashed in the local press and TV net work.

On 24.04.2000 once again one dolphins was found swimming in the shallow waters of the above said area. Once again the life saving mission was initiated by staff of CMFRI along with Officials of Forest (Marine) to pursue the animal to reach the deeper clear water. As the animal was quite healthy and swims fast with periodic diving, the rescue team could not easily reach and direct the dolphin to deepwaters and hence the rescue operations were suspended.

The dolphin was found swimming on the following day in the same area at little lesser speed, incessant swimming and the partial starvation had rendered the animal tired which made easy to rescue the animal after an hours hard struggling (Fig. 1).



Fig. 1: Rescue operation

The animal was tamed by gentle holding and patting followed by rolling of smooth cloth around its body for holding without creating any disturbance to breathing and injury to its external organs. Utmost care was taken not to exert any pressure so as to cause internal injury in handling. Even while holding no pressure was exerted in the ventral side and while manually carrying the animal was kept wet by keeping in sea surface; dorsal down and blow hole above water. This way the marine mammal was prevented from suffocating and with no hinderence to its normal breathing. Under the tender care, the animal became quite like a pet and did not show any aggressiveness.

The dolphin was identified from external morphology as *Tursiops truncatus aduncus*, a male measuring 2.62m and weighing approximately 175kg. (Table 1). Few mild bruises were seen on the body. Hundreds of people gathered to see the live dolphin. Then the dolphin was slowly and gently returned to the deeper clear water of open sea by swimming along the dolphin. The sea and coastal area was monnitord for the next two days for any stranding of dolphins. There were no reports of stranding in the following days which confirms the success of rescue operation, first of its kind from India.

TABLE 1. Morphometric measurements in cm of *Tursiops truncatus aduncus* stranded live at Tuticorin on 24.04.2000.

Total length	:	262
Beak length	:	11
Jaw length	:	33
Snout to blowhole	:	38
Snout to eye	:	41
Dorsal base	:	39
Dorsal height	:	46
Inner curvature	:	31
Flipper base	:	23
Flipper length	:	41
Inner curvature	:	25
Grith at dorsal	:	150
Weight (Approx)	:	175kg.
Sex	:	Male

955 **Whelk processing industry at Thirespuram — Tuticorin**

Tuticorin located on the southeast coast of India with its rocky and reely grounds in the Gulf of Mannar affords vast opportunities for the exploitation of a variety of finfishes, shellfishes, molluscan resources.

Most of the molluscan shells especially gastropod shells have been known from time immemorial for their ornamentation, meat, lime shell and other purposes. Many commercially important gastropods are landed as by-catch from shrimp trawlers at Tuticorin fishing harbour area along with fishes, crustaceans and cephalapods.

In recent years, there has been an upsurge of interest in the use of processed gastropod shells for various type of applications. They assume much importance in export as well as ornamentation trade. This note enlightes the processing stages of whelks in a small industry at Thirespuram, Tuticorin.

Whelks are recently being exploited from east and west coast of India on commercial basis for extraction of meat and operculum for export trade and for shells, shell based handi-craft industry. Whelks assumed importance in early 1990's since the meat of the shells are exported in good quantities from India to Japan since July 1993. In 1994, India exported good quantity of meat to Japan and Singapore.

In Tuticorin, whelks inhabit depth of 100-150 m at 50-60 km away from the shore. Also whelks prefer to live in sandy bottom,. Two species of edible whelks, *Babylonia spirata* (Linne) and *B. zeylanica* are landed along with other gastropods and bivalves as by-catch from shrimp trawlers.

During January & February (180-210 basket/month/trawler) and June & July (210-250 basket/month/trawler) whelk landings were heavy when compared to other months.

The average by catch ranges from 5-7 basket/day/trawler. A basket contains approximately 7-8 kgs. (wet weight). Fresh whelks cost about Rs. 2/Kg.

The following steps are observed at the processing, exporting industry.

Cooking

Big size aluminum drum/vessel (50-100 litre capacity) is used to boil the raw shells. Before boiling, sufficient quantity of baking soda is added. Boiling with baking soda for a few minutes softens the molluscs muscle which facilitates to remove the soft parts manually at quicker speed.

Cleaning with bleaching powder

After removing the flesh, the whelks are transferred to another vessel containing solution of chlorine bleach (50 gm bleaching powder in one litre water) so as to dissolve the remaining flesh / soft parts and outer shell organic growth found in the shells.

Cleaning with acid

Now the contents are passed on to the other vessel containing hot water with hydrochloric acid (HCl)/sulphuric acid (H_2SO_4) in the ratio of 30:0.5 (for 10 Kg Shells). As a result the shells are well polished.

Cleaning with water

In order to free these shells from acid effects, once again water is used to clean the shells and rubbed with clean cloth. Now all the shells become brighter and glittering.

Sun drying

Finally all the shells are spread on a palm mat/thick polythene sheet for a couple of days (Fig.1) Entire processing stages would be completed within five days.



Fig. 1: Sun drying of whelk.

All the polished shells are packed in a plastic container/ trough (10-20 Kg) and transported to the shell based handicraft industry situated in and around Tuticorin and other areas of Tamil Nadu. The processed shells are sold at the rate of Rs 8-10/Kg (Fig.2).

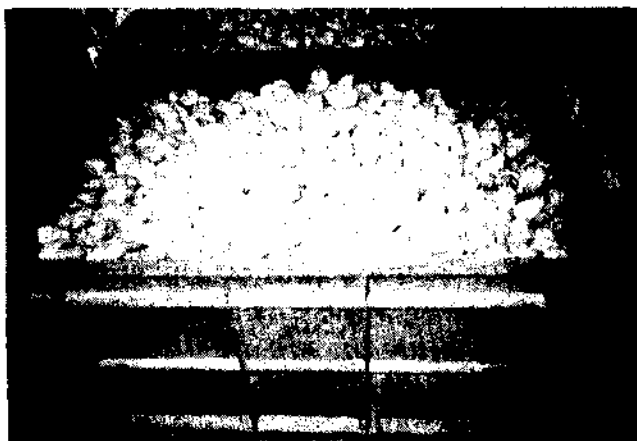


Fig. 2: Whelk ready for transportation

Conclusion

Prior to 1993, these shells were used only for lime industry and fetched very low price. With the progress of local processing technology in the recent years and with the emergence of specialised use, each and every member of molluscan species came to receive special attention and therefore found newer markets.

This has resulted in the generation of better income to the fishermen.

Prepared by Jesi Selvarani, Senior Research Fellow, TRC of CMFRI, Tuticorin.

956 The early development of the star fish *Pentaceraster regulus* (Muller and Troschel) from Tuticorin

Although more than 20 species of star fishes are known from the Gulf of Mannar, except for the observations on the development of the star fish *Asterina burtoni* Gray, no development of any star-fish has been studied from the region. The star fish *Pentaceraster regulus* (Muller and Troschel) is a widely distributed and common species in the Gulf of Mannar and Palk Bay in shallow waters. Though this species was maintained for a number of years in an aquarium at Mandapam (Gulf of Mannar), no spawning could be observed as they were reared in running sea water. This species was first noticed to spawn in November '97 and again in November '98 in FRP tanks in the hatchery of TRC of CMFRI, Tuticorin. Rao (J. Mar. Biol. Ass. India. 8(2) : 254-272, 1968) studied the reproductive and nutritional cycles of the same species from Mandapam came to the conclusion that this species spawns in November.

The males and females were found to spawn simultaneously in the tanks. The sperms and eggs were released from five gonopores situated in the interbranchial areas on the dorsal side. The sperms were released in thin streams whereas the eggs were released in thick streams at an interval of two to three minutes. The star fish bent the arms ventrally to exert pressure to release the sperms and eggs. The eggs were spherical, bluish green in colour and measured 120 μ m in diameter on an average (Fig.A). Due to the difficulty in maintaining all the eggs, only three lakhs eggs were reared in one tonne tank. Cleavage was total and indeterminate. After 24 hours, blastula was formed. This was oval and ciliated all over the body with a single blastopore.



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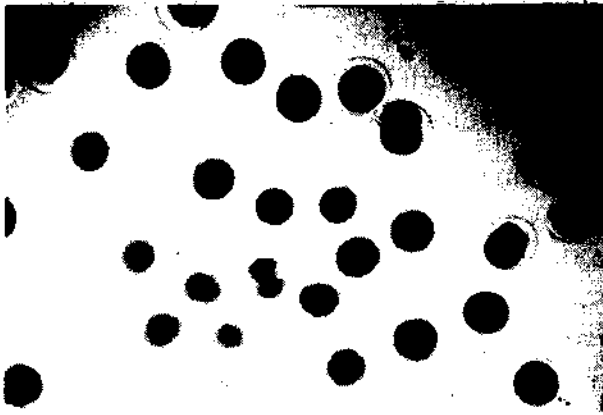


Fig. A : A group of eggs (some of them are fertilized and some in two celled stage)

Dipleurula stage with a single ciliated band measuring $270\ \mu\text{m}$ in length and $115\ \mu\text{m}$ in breadth were noticed after 48 hours. Early bipinnaria (Fig. B) was observed on the third day in which the single ciliated band was divided into a small pre-oral band and a large post-oral band. At this stage, the larva measured $390\ \mu\text{m}$ in length and $214\ \mu\text{m}$ in breadth. It had a distinct mouth and a digestive tract. The late bipinnaria larva (Fig. C) resembled an auricularia of the holothurians. The stomach was sacciform with a coelomic sac on either side of the digestive tract. After 15 days, the bipinnaria transformed into brachiolaria (Fig. D). The anterior end was

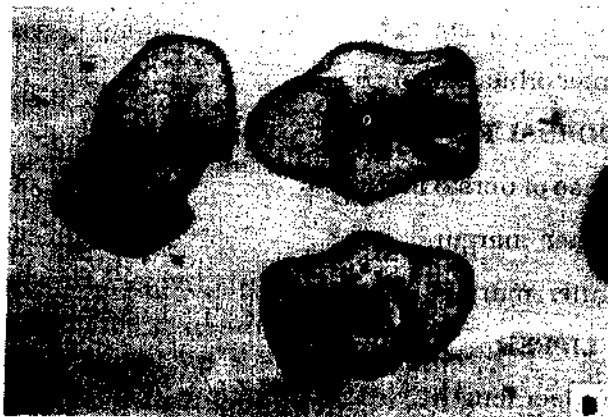


Fig. B: Early bipinnaria

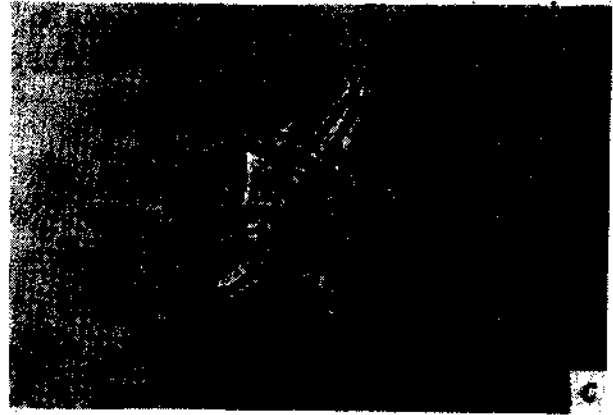


Fig. C. Late bipinnaria

somewhat elongated with three pairs of long projections on either side. At this state the length was $625\ \mu\text{m}$ and the breadth was $426\ \mu\text{m}$.

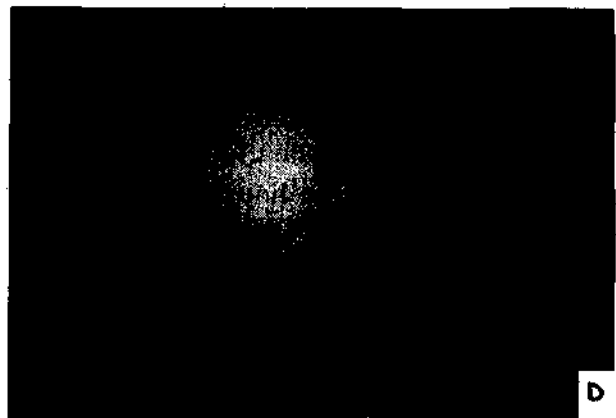


Fig. D: Brachiolaria

The larvae were fed with the micro algae *Isochrysis galbana* (1 million cells / ml) daily. The water in the rearing tank was exchanged completely on alternate days. After 15 days, the culture medium was infested with copepods and ciliates rendering further development impossible and therefore the experiment was terminated.

* Prepared by D.B. James, A. Chellam and P.S. Asha, TRC of CMFRI, Tuticorin.

957 **Live stranding of sei whale *Balaenoptera borealis* Lesson at Tuticorin**

On receipt of a message about the stranding of a whale in live condition, on 1-6-2000 a team from CMFRI visited the place to collect information on the stranding of whale.

On enquiry it is understood that the said whale was noticed by the fishermen around 9.00 P.M. near the Hare island where it was struggling for existence. On noticing this few fishermen hauled up the huge structure by using strong nylon ropes and pulled to the shore near Thirespuram with the help of 3 Tuticorin type of mechanized vallams after having failed in their attempt to save the animal from the stranded shallow water around 1.00 P.M. After the animal was brought to the shore it was impounded in the tidal zone. As it was suffering from strain and starvation coupled with the human torture, the poor animal died around 5.00 P.M.

The whale was pulled to the shore by the fishermen during night hours. Arrangements were made by few unscrupulous elements without obtaining prior permissions from the concerned authorities to display the animal for the public view by charging Rs.5/- per head. But by the timely intervention of forest official the above act was stopped and the public were allowed to view the animal free of cost.

The whale was identified as a female *Balaenoptera borealis* (Sei whale) measuring 9.5 m. Necessary morphometric measurements were taken and presented in Table 1. On close examination, the whale had only 4 very minor bruises on the head region. Neither deep cuts nor wounds were seen on the entire body. Arrangements were made by the forest department to bury the animal at the beach itself and decided to recover the entire skeleton after 6 to 8 months period as the decaying would be

completed by that time. Before conducting burial of whale, portions of the kidney, stomach and intestine were collected and preserved for further studies.

Some fishermen revealed that one more whale was sighted along with the stranded whale on the previous day in the fishing ground. Perhaps it may be its male partner and might have chased for breeding which ultimately resulted stranding in shallow water. After entering into the shallow water its direction finding (echo location mechanism) system might have been confused and got stranded.

TABLE 1. Morphometric measurements (in cm) of *Balaenoptera borealis* stranded Live at Tuticorin on 1.6.2000.

Tip of upper jaw to deepest part of fluke notch..	950
Tip of upper jaw to centre of anus.....	712
Tip of upper jaw to end of genital slit.....	680
Tip of upper jaw to origin of dorsal fin.....	672
Tip of upper jaw to anterior insertion of flipper	300
Tip of upper jaw to centre of blow hole.....	150
Tip of upper jaw to centre of eye.....	201
Projection of lower jaw beyond upper jaw.....	64
Length of upper jaw.....	198
Number of blowhole.....	2
Inter orbital distance.....	143
DORSAL FIN	
Base of dorsal fin	46
Outer margin	44
Inner margin	30
FLIPPER	
Flipper length	120
Base of flipper	37
Inner margin	87

Breadth of flipper in the middle27

CAUDAL FIN

Fluke Span234

Mammary slits15+15

Inter space of slits12

Notch of fluke to anus340

Notch of fluke to Dorsal fin282

Baleen counts more than298

Baleen plate length184

Baleen plate breadth311

Throat grooves42

Largest groove length515

Length of rostrum144

Sex Female

Weight8 ton

Reported by T.S. Balasubramanian, TRC of CMFRI, Tuticorin.

958 Stranding of spinner dolphins and a whale along Tuticorin coast

On 21.9.99 one spinner dolphin *Stenella longirostris* Gray was accidentally caught at Tharuvaikulam by 'Mural Valai' (a small drift gill net) operated off Vaipar at a depth of 10-12m. The specimen was a male measuring 1.1m and weighing approximately 20kg (Fig.1)

Again on 30.9.99 one more dolphin of the same kind measuring 1.38m weighing roughly 30kg was also accidentally caught by podivalai operated off Tuticorin at a depth of 12-15m. Morphometric measurements of both the specimens are presented in Table-1.

On 5.2.2000, a photograph of stranded whale



Fig. 1: *Stenella longirostris* (Spinner dolphin) accidentally caught at Tharuvaikulam on 21.9.1999.

has appeared in a local Tamil daily 'Dinamalar' informing about a whale washed ashore near Kayalpatnam coast. The specimen was totally putrified and part of its skeleton was partially exposed especially neural arches, thoracic ribs which were intact partially. Few of the skeletal parts were found missing. Part of cranium and maxillar bones were fallen and lying 30m away from the specimen. Hardly 20% flesh was seen on the entire body, remaining were decayed naturally and removed off either by incessant wave action or eaten by animals.

As such from the putrified condition of the specimen it was inferred that the marine mammal might have died over a month ago, off Kayalpatnam. Subsequently, drifted towards Kayalpatnam coast in advanced decomposed state and washed ashore during second week of February, 2000. The specimen was roughly measuring about 13.5m in length, the jaw bones were measuring 1.9m and part of cranium has 4.5m depth in size. The exact identification could not be established due to lack of striking external morphological characters.

Breadth of flipper in the middle27

CAUDAL FIN

Fluke Span234

Mammary slits15+15

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Again on 30.9.99 one more dolphin of the same kind measuring 1.38m weighing roughly 30kg was also accidentally caught by podivalai operated off Tuticorin at a depth of 12-15m. Morphometric measurements of both the specimens are presented in Table-1.

On 5.2.2000, a photograph of stranded whale



Fig. 1: *Stenella longirostris* (Spinner dolphin) accidentally caught at Tharuvaikulam on 21.9.1999.

has appeared in a local Tamil daily 'Dinamalar' informing about a whale washed ashore near Kayalpatnam coast. The specimen was totally putrified and part of its skeleton was partially exposed especially neural arches, thoracic ribs which were intact partially. Few of the skeletal parts were found missing. Part of cranium and maxillar bones were fallen and lying 30m away from the specimen. Hardly 20% flesh was seen on the entire body, remaining were decayed naturally and removed off either by incessant wave action or eaten by animals.

As such from the putrified condition of the specimen it was inferred that the marine mammal might have died over a month ago, off Kayalpatnam. Subsequently, drifted towards Kayalpatnam coast in advanced decomposed state and washed ashore during second week of February, 2000. The specimen was roughly measuring about 13.5m in length, the jaw bones were measuring 1.9m and part of cranium has 4.5m depth in size. The exact identification could not be established due to lack of striking external morphological characters.

TABLE 1 Morphometric measurements (cm) of *Stenella longirostris* stranded at Tharuvaikulam and Tuticorin

	1	2
Total length	110	138
Snout to origin of dorsal	43	67.5
Snout to eye	17	29
Snout to blow hole	24	30
Snout to origin of flipper	35	40
Length of upper jaw	16	19
Length of lower jaw	16	18.5
Eye diameter	1.5	2.5
Inter Orbital distance	24	25
Snout to genital opening	71	93
Snout to anal opening	81	101
Girth at dorsal	55	64
Girth at caudal	22	30
Girth at flipper	43	56
Number of teeth on upper jaw	51+50	49+49
Number of teeth on lower jaw	50+51	50+49
Dorsal base, height, and inner curvature	15,19,9	17,21,11
Flipper base, height and inner curvature	7,18,13	13,23,15
Length of caudal fluke (end to end)	24	30
Sex	Male	Male
Approximate weight	20kg	30kg

Reported by T.S. Balasubramanian and B. Jesi Selvarani, SRF DOD project, TRC of CMFRI, Tuticorin.

951 तमिलनाडु - पोण्डिचेरी तट की तारली मात्स्यिकी - हाल की विदोहन प्रवणता और कुछ जैविक सूचनाएं

पी.के. महादेवन पिल्लै, के.रमणी और वी. राधाकृष्णन नायर
केंद्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान, कोचीन

भारत के पूर्वी तट पर भारतीय तारली *सारडिनेल्ला लॉंगिसेप्स* की उपस्थिति नियमित नहीं थी। पर आज यह जाति इस क्षेत्र के, विशेषतः आन्ध्राप्रदेश और तमिलनाडु - पोण्डिचेरी तट की मात्स्यिकी को बनाये रखने वाली नियमित एवं प्रमुख मात्स्यिकी बन गयी है। 1993-97 के दौरान पूर्वी तट से इस जाति का अवतरण पश्चिम तट के 46,000 टन के आगे 60,638 टन था जो पूर्वी तट के समुद्रवर्ती राज्यों में इस नयी संपदा की शक्यता व्यक्त करती है। आन्ध्राप्रदेश में भी इस अवधि में 1988-92 के पिछले पंच वर्षीय अवधि की तुलना में तीन गुनी वृद्धि देखी गयी और तमिलनाडु में पकड़ दुगुनी होकर पूर्वी तट की कुल तारली पकड़ के 80% रिकार्ड की।

वर्तमान अध्ययन तमिलनाडु -पोण्डिचेरी तट पर इस मात्स्यिकी की आज की विदोहन प्रवणता पर सूचना देती है।

मात्स्यिकी प्रवणता

1991-97 की अवधि में पूर्वी तट से तारली उत्पादन कुल अखिल भारतीय उत्पादन के 45% था जिसमें लगभग 43,200 टन (80%) का वार्षिक औसत तमिलनाडु - पोण्डिचेरी तट से प्राप्त हुआ था जो कुल समुद्री मछली उत्पादन के 10% था। 1977 में पकड़ उच्च थी। 1973-77 से 1993-97 की अवधि की प्रत्येक पंच वर्षीय अवधि मात्स्यिकी की वृद्धि रिकार्ड करती है।

संभारवार पकड़

तमिलनाडु और पोण्डिचेरी में उपयोग किये विभिन्न मत्स्यन जालों में 47% का सबसे अधिक योगदान बैग जाल

इडावलै से प्राप्त हुआ। अब इसका प्रचालन चेंगलपेट से क्वेयद - मिल्लत जिलाओं और पोण्डिचेरी में सीमित है। इसके अलावा कावला वलै, तड्डा वलै (मत्ति वलै और चाला) वलै जैसे तारली गिल जालों का प्रयोग किया जिससे उत्पादन कुल तारली पकड़ का 25% था।

यह विचारणीय बात है कि कुल तारली उत्पादन का 23% आनायों से पकड़ा गया था। पाम्बान, रामेश्वरम और मंडपम में अनाय जोड़ियों के प्रचालन से लगभग 6500 टन का उच्चतम वार्षिक औसत पकड़ प्राप्त हुआ जो अनायों द्वारा प्राप्त कुल तारली पकड़ का 64.6% था।

तट संपाश और पोत संपाशों के सीमित प्रचालन से 5% अवतरण प्राप्त हुआ। मंडपम में प्रचालित तट संपाशों से तारली का असाधारण अवतरण हुआ तो टूटिकोरिन में तटसंपाशों से अवतरण केवल 2% था।

वर्तमान अध्ययन के अनुसार तमिलनाडु-पोण्डिचेरी तट में इस संपदा की विदोहन प्रवणता इस प्रकार रही: वार्षिक औसत 44,000 टन (40%) के साथ तारली उत्पादन में क्वेयद-मिल्लत आगे था। दूसरा स्थान साउथ आरकोट (19.8%) ने पाया और इसके बाद रामनाथपुरम (16%) पोण्डिचेरी (9.2%), चेंगलपेट (6.2%), मन्नारस (4.7%) और पुतुकोटाई (2.2%) आते हैं। गिलजालों के ज़रिए प्राप्त कुछ सीमित पकड़ को छोड़कर बाकी तटीय जिलाओं में पकड़ नगण्य थी।

मौसमी प्रवणता

1991-97 की अवधि के मौसमी मात्स्यिकी के विश्लेषण के अनुसार द्वितीय तिमाही (अप्रैल-जून) और तीसरी तिमाही (जुलाई-सितंबर) कुल पकड़ के क्रमशः 33% और 30% के साथ उत्पादकीय देखा गया। इसके पूर्व के अध्ययन भी मई

और जून के दौरान मन्नास तट से उच्च अवतरण रिपोर्ट की है । विशाखपट्टणम तट पर तारलियों का मौसम जून-दिसंबर देखा जाता है और तमिलनाडु तट से भी 1985-90 के दौरान इसी प्रवणता रिपोर्ट की गयी है । वर्तमान अध्ययन का अप्रैल-सितंबर अवधि के उत्पादकीय मौसम तारली मात्स्यिकी का अनियमित मौसमिक उतार-चढ़ाव का स्वभाव वैशिष्ट्य व्यक्त करता है ।

उत्पादकीय मौसमों के दौरान प्रचालित बैग जाल और गिलजालों जैसे बड़े जालों के ज़रिए 72% अवतरण रिकार्ड किया । आनाय जोड़ों के तीव्र प्रचालनों के फलस्वरूप आनायों में तारलियों की प्रचुरता जनवरी-मार्च की पहली तिमाही में देखी गयी । चिंगट आनायों में तारलियों की उपस्थिति असाधारण बात नहीं है, फिर भी आनाय जोड़े ने 65% तारली अवतरण रिकार्ड किया । विशाखपट्टणम से प्रचालित चिंगट आनायों में जनवरी में वार्षिक आनाय पकड़ के 54% तक होकर तारलियों की उच्च पकड़ रिपोर्ट की और फरवरी में 16% यह व्यक्त करता है कि जनवरी-फरवरी और फरवरी-मार्च के दौरान तारलियाँ और अन्य तारलियाँ गहरे जलक्षेत्र की ओर जाते हैं । इस अवधि के दौरान तटवर्ती क्षेत्रों में प्रचालित संभारों में तारली पकड़ नगण्य थी ।

तट संपाशों और पोत संपाशों के ज़रिए चौथी तिमाही (अक्टूबर-दिसंबर) में तारलियों का उच्च अवतरण देखा गया ।

जैविक विशिष्टताएं

अभी तक प्राप्त सूचनाओं के अनुसार पूर्वी तट से पकड़े गये तारलियों की कुल लंबाई 20 और 207 मि मी के रेंच में थी । अधिकांश केन्द्रों के मुख्य संभार आनाय होने के कारण 125 मि मी और ज्यादा लंबाई के तारलियाँ आनायों की मुख्य पकड़ थे । बैग जाल, तट संपाश आदि के ज़रिए प्राप्त मछलियाँ कम लंबाई की थी ।

निरीक्षण से व्यक्त हुआ कि तारलियों का अंडजनन काल मई-जून से सितंबर-अक्टूबर तक की लंबी अवधि

होता है । मन्नास तट में मई-अगस्त के दौरान प्रौढ मछलियाँ देखी गयी और नवंबर के पोत संपाश पकड़ में 60-64 मि मी की छोटी मछलियाँ प्राप्त हुई थी । इस पर आगे किये गये निरीक्षण ट्रुटिकोरिन में सितंबर, 1982, मई, 1983 और मार्च, 1984 में और परंगिपेट्टाई में जुलाई-सितंबर, 1986 के दौरान प्रौढ मछलियों की उपस्थिति रिकार्ड की । पोंडिचेरी में 1993 नवंबर-दिसंबर के दौरान पकड़ी गयी मछलियों में प्रथम और द्वितीय प्रैढावस्था प्राप्त जननग्रंथी थी । ट्रुटिकोरिन में तारलियों का अंडजनन काल अक्टूबर-नवंबर देखा गया । विशाखपट्टणम तट की जाति का अंडजनन काल बहुत लंबा देखा गया और दिसंबर-फरवरी, अप्रैल-जून और अगस्त-अक्टूबर के दौरान तीव्र अंडजनन होते हुए देखा । यह देखा गया कि यह जाति 137 मि मी तक बढ़ने पर प्रौढ बन जाती है और 3,6,9,12,15 महीने पूरे करने पर क्रमशः 99.0, 139.5, 183.8 और 195.4 मि मी की लंबाई प्राप्त करती है ।

आन्ध्रप्रदेश और तमिलनाडु-पोंडिचेरी तट की एक नियमित एवं प्रमुख मात्स्यिकी होने के कारण चुने गये केंद्रों पर इसके लंबाई वितरण और अंडजनन विशिष्टताओं पर एक विशेष अध्ययन अनिवार्य है कि इसकी गतिकी और आनेवाले सालों में इसकी उपलब्धि समझ सकें ।

अभ्युक्तियाँ

तारली मात्स्यिकी जो पूर्वी तट की एक विरल संपदा मानी जाती थी, आज आन्ध्रप्रदेश और तमिलनाडु-पोंडिचेरी तट की प्रमुख मात्स्यिकी के रूप में उभर कर आयी है । वर्तमान अध्ययन के आधार पर यह महसूस होता है कि बैग जाल इडा बले जिसने कुल तारली पकड़ के 47 % रजिस्टर किया है, के प्रचालन तमिलनाडु के उन समुद्रवर्ती राज्यों में, जहाँ अभी तक इसका प्रचालन नहीं किया गया है, विस्तृत करने से उच्च पकड़ पाने की संभावना है ।

रिपोर्ट के अनुसार स्थानीय माँग की कमी के कारण अधिकांश तारली पकड़ को बाहर बेच दिया । भारी अवतरण की अवधि में इसे सूर्यताप में सुखाकर कुकुट खाद्य निर्माण के लिए उपयोग किया ।

तारली पकड़ भारत के पूर्वी तट में पत्तनों के निकट पश्च जल क्षेत्रों और नदी मुँह क्षेत्रों से प्राप्त होती है जो अलवणजल और नुनखरा जल के संयुक्त क्षेत्र है । अरब

समुद्र के परिचालन के आधार पर और दक्षिण-पश्चिम मानसून के समय मई-अगस्त के दौरान ऊपरीतल प्रवाह के साथ दक्षिण- पश्चिमी तट से तारलियाँ बंगाल की खाड़ी में प्रवेश करने के कारण ये हमेशा ज्वारनदमुखों और पश्च जल क्षेत्रों में पाये जाते हैं । दिसंबर तक ये यहाँ रहते हैं और नवंबर-जनवरी में होनेवाले दक्षिणावर्त परिचालन में पड़कर तट से अप्रत्यक्ष हो जाते हैं ।

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952 कोचीन की वाणिज्यिक आनाय पकड़ों में गभीर सागरी स्क्विडों की उपस्थिति

के.सुनिलकुमार मोहम्मद, वी.कृपा, मात्यू जोसेफ और पी.एस. अलोषियस

केंद्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान, कोचीन

नेरिटिक लॉलिगिड स्क्विडों और सीपियोइड सुफेनकों (कटलफिश) के साथ केरल के आनाय अवतरणों में शीर्षपादों की प्रतिशतता (20%) महत्वपूर्ण होता है । उच्च निर्यात माँग के कारण आनाय प्रचालकों ने झींगे के बाद दूसरा स्थान शीर्षपादों को दिया है । आज इसकी अधिकतम पकड़ केलिए हो जानेवाली व्यस्तता के कारण आनाय प्रचालकों ने अपने पोतों को इलेक्ट्रॉनिक मत्स्यन उपकरणों के साथ आनायन क्षेत्र गभीर क्षेत्रों में विस्तृत किया है । वर्ष 1999-2000 में कोचीन और निकटस्थ मत्स्यन पत्तनों से प्रचालित आनायों ने 500 मी की गहराई तक मत्स्यन विस्तृत किया । इसका परिणाम यह हुआ कि अभी तक अविदोहित कई समुद्री संपदाएं पकड़ में प्राप्त होने लगी । इन पोतों का मुख्य लक्ष्य गभीर सागर झींगे थे, लेकिन इसके साथ अभी तक अविदोहित कुछ शीर्षपाद जातियों को भी पकड़ सका ।

फरवरी, 2000 के दूसरे हफ्ते में मुनम्बम मत्स्यन पोताश्रय से प्रचालित आनाय पोत दलों ने बहुत बड़े असाधारण आकारवाले स्क्विडों की पकड़ के बारे में रिपोर्ट की जो स्थानीय समाचार पत्रों में भी स्थान पाया था । इनमें से एक नमूने को वैज्ञानिक परीक्षण के लिए एक मात्स्यिकी एन जी

ओ (ग्रीन सीमा मुनम्बम) में बर्फ में सुरक्षित रखा जिसको बाद में विस्तृत अध्ययन और परिरक्षण केलिए प्रयोगशाला में ले आया । अध्ययन का ब्योरा नीचे दिया जाता है ।

इस नमूने को आलपुष्पा से 48 एन एम पश्चिम में 465 मी गहराई में प्रचालित एक 55 फीट कुल लंबाई के आनाय पोत के एक खींच में प्राप्त (17-2-2000) हुआ था । इस नमूने का भार 7.5 कि ग्रा था । इसका शारीरिक मापन मि मी में नीचे दिया जाता है ।

पृष्ठीय प्रावार मेटल लंबाई	-	620 मि मी
कुल लंबाई	-	1060
प्रावार की चौड़ाई	-	515
पख की लंबाई	-	580
सिर की लंबाई	-	145
दाहिने भुज I	-	350
दाहिने भुज II	-	335 (टूटा हुआ था)
दाहिने भुज III	-	395
दाहिने भुज IV	-	365
बायाँ भुज I	-	292

बायाँ भुज II	-	270
बायाँ भुज III	-	320
बायाँ भुज IV	-	335 (टूटा हुआ था)
सिर की चौड़ाई	-	95.7
मुँह का व्यास	-	48.3
प्रावार की मोटाई	-	53.6
लिंग	-	नर, परिपक्व

इसके दोनों स्पर्शक (टेन्टेकल) गायब हुए थे और आँखों का भी नाश हुआ था। इस नमूने को पहचानने के लिए एफ ए ओ (रोपेर आदि 1984) द्वारा दिया हुआ पूर्वलेखा की सहायता ली। इसके प्रावार आकार, पख की लंबाई और फनेल लॉकिंग एम्पारटस के आधार पर इसे हीरपृष्ठ स्किवड *थैसानोट्यूथिस रोम्बस* पहचान लिया।

यह बड़े एकलप्रसूपी स्किवड (जो कम से कम 100 से मी की पृष्ठीय प्रावार लंबाई और 20 कि ग्रा भार प्राप्त करता है और 60 से मी पृष्ठीय प्रावार लंबाई सर्वसाधारण) उष्णकटिबंधीय और गरम उष्णकटिबंधीय सागरी जलक्षेत्रों में उपस्थित है। हमेशा जोड़ियों या झुण्डों में दिखायी पड़नेवाली यह अधिवेलापवर्ती सागरी जाति जापान समुद्र की एक छोटी मात्स्यिकी है। भारत में गुजरात तटों में (शीतकाल के महीनों में), आन्डमान, और निकोबार द्वीपसमूहों में और विषिंजम में इसकी उपस्थिति रिपोर्ट की गयी है। आन्डमान और

निकोबार द्वीप समूहों से 535 मि मी पृष्ठीय प्रावार लंबाई और 5.3 कि ग्रा भार की एक मादा नमूना प्राप्त हुई थी। 1996 के दौरान 300-340 मि मी के तीन टी. *रोम्बस* नमूनों को 75-100 मी की गहराई से पकड़ी थी। अतः वर्तमान रिकार्ड, भारतीय जलक्षेत्रों से अभी तक प्राप्त नमूनों में सब से बड़ा है।

टी. *रोम्बस* के अलावा अन्य अपरिचित स्किवड जाति की उपस्थिति भी मुनम्बम मात्स्यिकी पोताश्रय से प्रचालित गभीर समुद्र आनायों की पकड़ ने रिकार्ड की थी। इसका शारीरिक परीक्षण नहीं किया गया कि एन जी ओ से केवल इसका चित्र ही प्राप्त हुआ था। चित्र से इसे *काइरोट्यूथिस* पहचान लिया। यह सागरी होने पर भी इसका वंश महाद्वीपीय ढाल में 300-600 मी गहराई में प्रचालन करने वाले तलमज्जी आनायों में विशेषतः उत्तर आस्ट्रेलिया से पाये जाते हैं। *काइरोट्यूथिस* इसके मुद्दु जिलेटिनी शरीर के कारण वाणिज्यिक मात्स्यिकी में संभाव्यता नहीं रखती है।

केरल के आनाय प्रचालकों द्वारा आनाय तलों का विस्तार नई शीर्षपाद संपदाओं की पकड़ में परिणत हुआ। इसकी प्रचुरता और वाणिज्यिक मूल्य के बारे में और भी अन्वेषण करना अनिवार्य है। आजकल इन आनायों द्वारा पकड़े जाने वाले शीर्षपादों की संख्या बहुत कम है।

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953 तमिलनाडु के चुने गये केंद्रों से भूरा शंबु *पेरना इन्डिका* का विदोहन

एन. रामचन्द्रन और के. रामकृष्णन नायर

सी एम एफ आर आइ का विषिंजम अनुसंधान केंद्र, विषिंजम - केरल, भारत

भूरा शंबु *पेरना इन्डिका* भारत के दक्षिण पश्चिम तटों के अंतराज्वारीय और उपज्वारीय चट्टानों में प्रचुर मात्रा में पाया जाता है। इस खाद्य जाति का विदोहन बहुत कम हुआ है। इस अध्ययन का लक्ष्य तमिलनाडु के पश्चिम तटों के चुने गये केंद्रों से इसका वर्तमान विदोहन निर्धारित करना है जो मात्स्यिकी प्रबन्धन के लिए अनिवार्य है।

तटीय शंबु मत्स्यन पर चलाये गये प्राथमिक सर्वेक्षण के आधार पर इनायम, कोलच्चल और काडियपट्टनम को डाटा संग्रहण के लिए चुन लिया। 1994-95 से 1998-99 के तक के पकड़ और प्रयास की डाटा एकत्रित किया। यह प्रभु और दुलकद (इन्डियन जर्नल ऑफ फिशरीज़ 17:57-75, 1970 में) द्वारा दिये गये तरीका से एकत्रित किया गया और

मत्स्यन प्रयास मत्स्यन में लगे मानवदिवस के अनुसार आकलित किया ।

शंबु मत्स्यन काल अक्तूबर-नवंबर से मार्च - अप्रैल तक लंबित होता है । इसकी मात्स्यकी नवंबर - जनवरी में उच्च थी और फरवरी से कम होने लगी । अप्पुकुट्टन आवि द्वारा 1982-84 की अवधि में चलाये गये अध्ययन के अनुसार अधिकतम पकड नवंबर-दिसंबर में रिकार्ड की थी और शंबु अवतरण पैटर्न लगभग वैसा ही था ।

पकड, प्रयास और प्रति प्रयास पकड 1996-97 में हुई बढ़ती के बाद क्रमशः घट गयी । पकड में व्यापक वार्षिक उतार - चढ़ाव देखा गया । पहले के कार्यकर्ताओं ने भी इस प्रकार की विविधता पर रिपोर्ट की गयी थी । इस प्रकार

औसत माहिक विविधता भी सुस्पष्ट थी ।

वर्तमान अध्ययन में इनायम की प्रति एकक प्रयास पकड जो साधारणतया प्रचुरता सूचक के समानुपाती मानी जाती है, 1994-95 की तुलना में 1998-99 में घटती दिखायी । कोलच्चल में 1994-95 और 1998-99 में पकड लगभग समान थी । काडियपट्टनम में न्यूनतम पकड 1997-98 में देखी गयी । बाद में क्रमिक बढ़ती होने पर भी 1994-95 का स्तर तक नहीं आया । भारत के दक्षिण - पश्चिम तटों में शंबुओं का विदोहन अंडजनन और बस्ति की अवधि को छोड़कर केवल एक छोटी अवधि में, यानी अक्तूबर-अप्रैल में ही होता है । अतः शंबुओं की जनसंख्या इस क्षेत्र में और भी बढ़ने के लिए समय और मौका मिलता है ।

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954 टूटिकोरिन में जीवित डॉल्फिनों का धंसन और इन्हें समुद्र में वापस छोड़ने के लिए लिये गये सुरक्षा उपायों की रिपोर्ट

टी.एस. बालसुब्रमण्यन

सी एम एफ आर आइ का टूटिकोरिन अनुसंधान केन्द्र, टूटिकोरिन

टूटिकोरिन के कुछ मछुआरों ने कारापाड खाड़ी के उथले जलक्षेत्र में 23-4-2000 को प्रातः दो डॉल्फिनों को तैरते देखा । उन्होंने टूटिकोरिन अनुसंधान केन्द्र को यह खबर दी । कुछ लोगों ने इन्हें वापस समुद्र भेजने के लिए कोशिश की, लेकिन इनको गहरे और पंकिल जल में जाने की इच्छा नहीं थी । कुछ दयालु व्यक्तियों, सी एम एफ आर आइ के कर्मचारियों और प्रेस के लोगों ने इनकी सुरक्षा के लिए आगे आये और इनको खाड़ी के गहरे क्षेत्र में जाने के लिए सहायता दी । माध्यमों ने इस प्रवृत्ति को खूब सराहना की ।

अगले दिन 24-4-2000 को भी उसी क्षेत्र में एक डॉल्फिन को उसी अवस्था में पाया गया । सी एम एफ आर आइ और वन विभाग के पदधारियों ने इसकी रक्षा करने

के लिए फिर आगे आये । यह डॉल्फिन बहुत स्वस्थ और शक्ति था कि सुरक्षा उपाय उसके पास पहुँचाना संभव नहीं था । इसलिए सुरक्षा उपाय अगले दिन (25-4-2000) के लिए स्थगित किया ।

अगले दिन इसी क्षेत्र में इस डॉल्फिन को तैरते हुए देखा । उस समय वह कुछ थक्का हुआ नज़र आया, तैरने की गति धीमी थी और खाद्य की कमी भी व्यक्त थी । ऐसी स्थिति में उसे पकड़ना आसान था । उसे धीरे से पकड़ कर पीट पर स्नेह से हाथ फेरकर वश में लाया और खींचने की सुविधा के लिए एक नरम कपड़े से शरीर को घेर लिया और बहुत सतर्कता से पकड़ लिया । पकड़ते समय आब्रता बनाये रखने के लिए समुद्रोपरितल में स्पर्श कराके रखा और श्वसन में

रुकावट नहीं होने के लिए पृष्ठ भाग और वातन छिद्र जल के ऊपर कराके पकड़ा। इस प्रकार के नरम बर्ताव के कारण यह एक पालतू जानवर जैसे शान्त बन गया।

बाहरी शारीरिक अभिलक्षणों से इसे *ट्रेसियोप्स ट्रंकाटस अडंगस* पहचान लिया। इसकी लंबाई 2.62 मी और भार 1.75 किग्रा था। शरीर पर कुछ छोटी छोटी चोट दिखायी पड़ी थी। सुरक्षा टीम ने इसे धीरे से गहरे जलक्षेत्र में जाने के लिए सहायता दी। अगले दो दिनों के लिए भी मोनिटरिंग किया गया और खुले समुद्र या निकटवर्ती तट पर कोई धंसन नहीं हुआ था।

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955 टूटिकोरिन में स्थित तिरेशपुरम का विल्क संसाधन उद्योग

भारत के दक्षिण पूर्वी तट के टूटिकोरिन पखमछलियों, कवचप्राणियों, मलस्क संपदाओं आदि से संपुष्ट है। मात्मार की खाड़ी के अपतटीय तल की चट्टानी प्रकृति इन संपदाओं को भरपूर करती है।

मलस्क कवच विशेषतः रंध्रपाद कवच अनादि काल से अलंकरण, चूना निर्माण आदि के लिए मशहूर है। इन मलस्कों का मांस स्वादिष्ट और पौष्टिक भी है। टूटिकोरिन मत्स्यन पोताश्रय में चिंगट आनायों से उप पकड़ के रूप में रंध्रपादों का अवतरण होता है।

हाल के सालों में विभिन्न प्रयोगों के लिए संसाधित रंध्रपाद कवचों का अत्यधिक उपयोग हो रहा है। निर्यात एवं अलंकार विपणन में संसाधित रंध्रपाद कवचों ने अद्वितीय स्थान पाया है। आज कवच संसाधन उद्योगों की प्रगति उच्च ध्यानाकर्षण केंद्र बन गया है। यह लेख टूटिकोरिन में स्थित तिरेशपुरम के विल्क नामक रंध्रपाद के विभिन्न संसाधन अवस्थाओं संबंधी जानकारी देती है।

आज निर्यात और कवच हस्तशिल्प उद्योगों के लिए मांस और प्रच्छद लेने के लिए भारत के पूर्वी और पश्चिम तटों से विल्कों का वाणिज्यिक विदोहन हो रहा है। 1990 के वर्षों में

ही विल्क का महत्वपूर्ण स्थान था। जुलाई 1993 से जापान को कवच मांस का निर्यात प्रारंभ किया था और 1994 में भारत से जापान और सिंगपूर को अच्छी मात्रा में मांस निर्यात किया था।

टूटिकोरिन में तट से लगभग 50-60 कि मी दूर 100-150 मी की गहराई में विल्क संपदा देखी गयी है। ये रेतीली तल भी पसन्द करते हैं। यहाँ से चिंगट आनायों में प्राप्त अन्य रंध्रपाद और द्विकपाटियों के साथ उप-पकड़ के रूप में दो खाद्य विल्क जातियाँ *बाबिलॉणिया स्पिराटा* और *बी.जेयलानिका* का अवतरण हुआ।

जनवरी एवं फरवरी और जून एवं जुलाई में विल्क का अवतरण अन्य महीनों की तुलना में ज्यादा होता है। प्रति दिन के आनायन में 5-7 विल्क उपपकड़ के रूप में प्राप्त होते हैं। प्रति बाल्टी की उपपकड़ निकटतम 7-8 कि ग्रा होती है। प्रति कि ग्रा ताज़ा विल्क लगभग 2/- रु मूल्य पाता है। जनवरी-फरवरी की अपेक्षा जून-जुलाई में अधिक अवतरण होता है। पोत मालिक से प्रति कि ग्रा 2/- रु पर दलाल विल्क खरीदकर संसाधन उद्योगों को प्रति कि ग्रा 3-5/- रु की दर में बेचते हैं।

उद्योगों का संसाधन: निर्यात उद्योगों में निम्नलिखित कार्रवाईयाँ होती हैं।

1. पाक विधि

50-100 ली क्षमता के ऐलुमिनियम पात्र में बेकिंग सोडा जोड़कर कवचों को उबालते हैं। इस प्रकार उबालने के कारण मलस्कों की पेशी मृदु बन जाती है और कवचों से शीघ्र निकाल सकते हैं।

2. विरंचक चूर्ण (ब्लीचिंग पाउडर) से सफाई

मांस निकालने के बाद विल्कों को क्लोरिन ब्लीच (50 ग्रा विरंचक चूर्ण एक लीटर जल के साथ) लायनी युक्त पात्र में डालते हैं जिससे बाकी रह गये मांस/मृदु भाग और कवचों पर होनेवाली जैव बढ़ती विलीन हो जाते हैं।

3. अम्ल(एसिड) से सफाई

अब इन चीज़ों को हाइड्रोक्लोरिक एसिड/ सल्फूरिक एसिड 30:0.5 की दर पर जोड़ गये गरम पानी युक्त (10 कि ग्रा कवच के लिए) पात्र में डालते हैं। इस प्रकार की सफाई कवचों को चमकीला बनाता है।

4. जल से सफाई

कवच फिर जल से धोकर एसिडों के प्रभाव से मुक्त करते हैं और सुधरे कपड़े से पोंछते हैं। अब कवच और भी चमकीला बन जाते हैं।

5. धूप में सुखाना

अंत में इन कवचों को चटाई या घने पॉलिथीन शीट पर डालकर दो दिनों तक धूप में सुखाते हैं। पूरा संसाधन कार्य 5 दिनों के अंदर हो जाता है।

संसाधन के बाद कवचों को प्लास्टिक पात्र/द्रोणों में (10-20 कि ग्रा) पैक करके टूटिकोरिन एवं तमिलनाडु में स्थित हस्तशिल्प उद्योगों को प्रति कि ग्रा 8-10/- रु पर बेच देते हैं।

समापन

वर्ष 1993 तक कवचों का उपयोग केवल घुना उद्योग में सीमित था और इससे प्राप्त मूल्य भी नगण्य था। संसाधन तकनीक की प्रगति और कवचों के विशिष्ट उपयोग की जानकारी मलस्क वर्ग के हर एक सदस्य को विशेष ध्यान का केंद्र बना दिया और विपणन साध्यताएं भी बढ़ने लगी जिसके फलस्वरूप मछुआरों और उद्यमकर्ताओं के जीवन-शैली भी सुधरी गयी।

टूटिकोरिन अनुसंधान केंद्र, टूटिकोरिन के जेसी सेल्वरानी की रिपोर्ट

956 टूटिकोरिन से नक्षत्र मछली पेन्टासेरास्टर रेगुलस का विकास

मान्नार की खाड़ी में नक्षत्र मछलियों की 20 जातियों की उपस्थिति पर जानकारी उपलब्ध है। फिर भी ऑस्टेरिना बरटोनी ग्रे के विकास पर जेम्स 1973 के निरीक्षण के अतिरिक्त और किसी भी नक्षत्र मछली के विकास पर अध्ययन इस क्षेत्र से नहीं किया गया है। नक्षत्र मछली पेन्टासेरास्टर रेगुलस बहुत व्यापक और मान्नार और पाक खाड़ी के उथले जलक्षेत्र में सर्वसामान्य भी है। इस जाति को मण्डपम (मान्नार की खाड़ी) के जलजीवशाला में सालों तक संरक्षण करने पर भी प्रवाही

समुद्र जल उपयोग करने के कारण अंडजनन नहीं देखा गया। इस जाति का पहला अंडजनन नवंबर 97 में देखा और दुबारा नवंबर 98 में सी एम एफ आर आइ के टूटिकोरिन अनुसंधान केंद्र के स्फुटशाला में एफ आर पी टैंकों में हुआ था।

नर और मादाएं टैंकों में एक ही समय अंडजनन करत थे। शुक्राणु और अंडे पृष्ठ भाग के इन्टरब्राकियल क्षेत्र में स्थित गोनोपेरस से निकलते थे। शुक्राणु पतले धारे के रूप में और अंडे घने धारे के रूप में दो या तीन मिनटों के अंतराल में प्रवहित होते थे। नक्षत्र मछली के अंडे गोलाकार के और नील हरे रंग के थे और लगभग $120\mu\text{m}$ व्यास के थे। सभी अंडों का संरक्षण मुश्किल होने के कारण एक टैंक में केवल तीन लाख अंडों का पालन किया था। पूरे अंडों का विदलन हुआ और यह अनियमित था। 24 घंटों के बाद कोरक (ब्लैस्टूला) रूपायित हुआ। यह अण्डाकृति का था। 48 घंटों बाद $270\mu\text{m}$ की लंबाई और $115\mu\text{m}$ की चौड़ाई के एक पक्षमाभी पट्ट के साथ द्विपार्श्वक (डाइप्लूरुला) अवस्था देखी गयी। तीसरे दिन एक मात्र पक्षमाभी पट्टी का विघटन हुआ और एक छोटी मुखपूर्वी पट्टी और एक बड़े मुखपश्चीय पट्टी में विभजित होकर द्विपच्छक बन गया। इस अवस्था में डिम्बक $390\mu\text{m}$ लंबाई और 214 चौड़ाई का था। इसके मुँह और पाचन क्षेत्र रूपायित हुए थे। यह द्विपच्छक डिम्बक (बाइपिनेरिया लार्वा) होलोथूरियनों के कर्णकाभ डिम्बक जैसे था। इसका उदर पाचन क्षेत्र के दोनों भागों में एक प्रगुही कोश के साथ कोषरूप का था। 15 दिनों बाद द्विपच्छक लघुबाहु डिम्बक के रूप में रूपान्तरित हो गया। इस अवस्था में इसकी लंबाई $625\mu\text{m}$ और चौड़ाई $426\mu\text{m}$ था।

डिम्बकों को रेज़ मैक्रो एल्गे आइसोक्राइसिस गाल्थोना से खिलाया। एकान्तर दिनों में पालन टैंक के जल बदलते थे। 15 दिनों बाद संवर्धन माध्यम अरित्रपावों और पक्षमाभी प्राणियों से ग्रस्त देखा गया जिसके कारण आगे का कार्य असाध्य बन गया और इसलिए यह परीक्षण समाप्त किया गया।

टूटिकोरिन अनुसंधान केंद्र के डी.बी.जेम्स, ए.वेल्लम व पी.एस.आशा की रिपोर्ट.

957 टूटिकोरिन में सी तिमि बालिनोप्टीरा बोरियालिस लैसन का धंसन

1-6-2000 को अपराह्न लगभग 3.00 बजे टूटिकोरिन नोर्थ पुलिस थाने से एक जीवित तिमि के धंसन के बारे में सन्देश मिली । तुरन्त ही मैं कुछ अधिकारियों के साथ इसके बारे में सूचना इकट्ठ करने के लिए वहाँ गया

पूछताछ से मालूम पडा कि हेयर ड्रीप के निकट लगभग 9 बजे को कुछ मछुए इसे तट पर तडपते देखा । उसे वापस समुद्र भेजने का प्रयास सफल नही होने पर टूटिकोरिन में प्रचालित 3 यंत्रीकृत वल्लम के सहारे से मध्याह्न 1.00 बजे तक इसे तिरेशपुरम के निकट के तट पर लाया और ज्वारीय क्षेत्र में डाला । लेकिन थकावट, भूख और मनुष्य द्वारा सताने के कारण साँच के 5.00 बजे तक यह मर गया ।

मछुआरों ने मरे तिमि को रात के समय तट पर खींच लाया । कुछ अनैतिक लोगों ने संबंधित अधिकारियों की अनुमति के बगैर प्रति व्यक्ति 5/- रु की दर पर इसे प्रदर्शन के लिए रखा । मगर वन अधिकारियों ने समय पर इस कारवाइ रोक ली और लोगों को निशुल्क इसे देखने का अवसर दिया ।

2-6-2000 को फिर से उस जगह का सन्दर्शन करके इस तिमि पर कुछ और सूचना और धंसन का कारण संग्रहित करने का प्रयास किया । यह 9.5 मी लंबाई की मादा जाति के सी तिमि बालिनोप्टीरा बोरियालिस थी। इसके शरीरिक मापन ले लिया । वन विभाग ने पुलिन में ही इसके दफन के लिए आवश्यक प्रबन्धन किया और 6-8 महीने बाद कंकाल पुनःप्राप्त करने का निर्णय लिया । दफन करने के पहले इसके वृक्क, जठर और आंत्र संग्रहित करके आगे के अध्ययन के लिए परिरक्षित किया ।

इसके शरीर के निरीक्षण करने पर सिर पर चार छोटी घाव दीख पडी । कुछ मछुआरों ने बताया कि इसके साथ और तिमि भी था । शायद यह इसके नर संगी होगा जो प्रजनन के लिए धंसे तिमि को भगाते हुए उथले जलक्षेत्र पर आया होगा । उथले जल क्षेत्र में आने के बाद ध्वनि नियंत्रक तंत्र खराब होकर धंसा हुआ होगा ।

टूटिकोरिन अनुसंधान केन्द्र, टूटिकोरिन के टी.एम.बालमुब्रमण्यन की रिपोर्ट

958 टूटिकोरिन तट पर स्पिन्नर डॉल्फिनों और तिमि का धंसन

वायुपार से 10-12 मी गहराई में प्रचालित एक मुरल वलै (एक छोटा ड्रिफ्ट जाल) के जरिए तरुवायकुलम पर 21-9-99 को एक स्पिन्नर डॉल्फिन स्टेनेल्ला लॉंगिरोस्ट्रिस पकडा गया । यह 1.1 मी लंबाई और 20 कि ग्रा भार के एक नर नमूना था ।

दुबारा 30-9-99 को 1.38 मी लंबाई और लगभग 30 कि ग्रा भार के इसी प्रकार के और एक डॉल्फिन टूटिकोरिन से 12-15 मी की गहराई में प्रचालित पोडिवलै में पकडा गया ।

15-2-2000 को तमिलनाडु के समाचार पत्र "दिनमणी" में कायलपट्टनम तट के निकट तिमि के धंसन के बारे में रिपोर्ट और फोटोग्राफ आया । यह नमूना पूरी तरह सड गया था । इसके कुछ कंकाल भागों का भी नाश हुआ था । खोपडी और हनुओं की हडडी 30 मी दूरी पर पडे थे । शरीर पर मांस 20% से भी कम था । बाकी प्राकृतिक तौर पर सड गया था या तरंगों के आघात या अन्य जीवों द्वारा खाने के कारण नष्ट हुआ था ।

टूटिकोरिन अनुसंधान केन्द्र के टी.एस.बालमुब्रमण्यन और बी.जेसी सेलवरानी की रिपोर्ट

Announcement

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

has released a book in connection with its Golden Jubilee (1947 - 1997) entitled

Marine Fisheries Research and Management

Edited by V.N. Pillai and N.G. Menon

The book contains 61 articles under 6 sections; Marine biology, Marine fisheries, Pelagic resources, Demersal resources, Mariculture and Socio-economics & Extension. The voluminous data generated by the Institute in space and time over the last 5 decades on finfish/shellfish biology, resource status, marine environment, fishing impacts, mariculture technologies and socio-economics of culture and capture fisheries have been analysed and synthesised in the articles to enable to evolve suitable management policies relevant to each resource and each situation.

The subject matters broadly focus on the various aspects of marine biology, sensitive ecosystems, status of marine fish production, pelagic, demersal finfish/shell fish resources, role of remote sensing in fishery forecast, deep sea potentials, mariculture of finfishes, crustaceans, molluscs, sea weeds and other ancillary marine organisms along with the social and economic implications of fishery activities.

- ☛ The review articles are written by 118 experienced scientist/technicians of the Institute.
- ☛ This compendium has 914 pages with several figures and illustrations in Black and White.
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