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# 16. STUDIES ON THE PEARL OYSTER POPULATION IN PEARL OYSTER GROUNDS OFF TUTICORIN IN THE GULF OF MANNAR

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## ABSTRACT

Details of the inspection of pearl oyster grounds and pearl oyster collection (mainly *Pinctada fucata*) for the period from 1977 to 1986 are presented in this paper. The favourable season for diving operations in this area normally sets in from October and ends in May in the subsequent year. During 1977-1986 forty four pearl banks or Paars in the Gulf of Mannar were inspected. A record number of 4,42,321 *P. fucata* were collected during the year 1985-1986, followed by 3,19,718 in 1984-1985 and 2,10,955 in 1981-1982. In 1981-1982 Utti paar supported the collections mainly by contributing 94.28% of the total oysters gathered. During 1984-1985 Devi paar (24.68%), Fernando paar (20.93%), Cruxian paar (24.10%) and Kara! paar (29.39%) together contributed 98.10% of the total collections. In 1985-1986 season from Cruxian paar alone, 94.34% of the *P. fucata* were collected. SCUBA-diving was effectively employed along with skin diving during 1984-1985 and 1985-1986 seasons.

## INTRODUCTION

The natural pearl fishery in the Gulf of Mannar could not be conducted with any predictable regularity and only 38 fisheries were held during the period from 1663 to till date. The last fishery was held in 1961 and thereafter no pearling was done due to paucity of fishable oyster population in the beds. Tamilnadu Government Fisheries Department carries out regular pearl bank inspections to ascertain that any eventual settlement goes unnoticed. From 1974 inspections were conducted with an eye on collection of oysters for farming and cultured pearl production in their research scheme, then for the Pilot Project and finally for Tamilnadu Pearls Limited, which is a commercial culture pearl producing venture.

## TOPOGRAPHY

The rocky bottom of the sea where the pearl oysters occur are 'Pearl Banks' or 'Pearl beds' which are locally called 'Paars'. They are found from Pamban in the North (78° 18' E Long and 9° 15' Lat) and ending with Manapad in the south (78° 15' E Long. 8° 15' N Lat).

Regionwise it is divided into northern, central and southern divisions. In all there are 83 charted pearl banks (Hornell 1922). The pearl oyster beds in the central division have considerable importance, since all the fisheries of the last two centuries have been confined to this division. The depth of the beds ranges from about 12 m to 25 m and the area varies from small beds of size 0.5 sq. km to huge stretches of 23 sq. km. (Rajendran et al 1976). Majority of the pearl banks are marshalled roughly in line parallel with and at a distance of approximately 10 km to 15 km from shore (Hornell 1922).

## MATERIAL AND METHODS

This account is based on the data collected during the pearl oyster collection trips made during the period from 1977 to 1986.

Mechanised boats, boat crew, skin divers and SCUBA divers, a paar mandadi (Rock pilot) and manducks were engaged in the above work. The pearl banks located by transit bearings of land marks and also by sounding the depth and nature of the sea bottom by paar mandadi.

TABLE 1. Pearl bank survey and pearl oyster collection during 1937 -1986.

SI. No.	Year	No. of Paars Covered	Total No. of Trips	No. of oysters Collected		Total oysters Collected	No. of Oysters Collected/ Trip (Average)	Skin-Diving		Average No. of Oysters Collect-ed/diva	SCUBA - diving		
				<i>P. fucata</i>	Flat oysters			No. of Dives	No of Oysters Total		No. of dives	Total No. of Oysters	Oysters per dive
1.	77-78	12	46	8,795 (83.42%)	1,748 (16.58%)	10,543	229.20	1212	6995	6.77	92	3,548	38.57
2.	78-79	9	41	6,813 (87.50%)	973 (12.50%)	7,786	189.90	1088	4985	4.58	101	2,801	27.73
3.	79-80	6	10	400 (89.89%)	45 (10.11%)	445	44.50	295	237	0.80	20	208	10.40
4.	80-81	17	44	1,716 (92.56%)	138 (07.44%)	1,854	42.14	644	349	0.54	39	1,505	38.89
5.	81-82	2	56	2,10,966	—	21,10,965	3,767.23	6900	210695	30.57	—	—	—
6.	82-83	1	34	33,612	—	33,612	988.59	4250	33612	7.91	—	—	—
7.	83-84	19	61	10,962 (76.02%)	3,457 (23.98%)	14,419	238.37	4397	14419	3.28	—	—	—
8.	84-85	16	230	3,19,718 (87.76%)	44,571 (1224%)	3,64,289	1,683.87	20452	239686	11.72	618	1,24,603	201.62
9.	85-86	19	200	4,42,321 (91.16%)	42,810 (8.84%)	4,85,131	2,425.65	4390	73840	16.82	1,606	4.11,291	273.10
				10,35,302 (91.69%)	93,742 (8.31%)	11,29,044	1,563.77	43628	585088	13.41	2,376	5,43,956	228.94

TABLE - 2. Pearl oysters collected with reference to diving effort in the pearl beds surveyed during 1977 - 1986.

Si. No.	Name of pearl bed	No. of trips	Oysters collected		Scuba dives	Skin dives	Depth in Metres.
			<i>p. fucata</i>	flat oysters			
1-	Devi	174	1,00,503	16,355	512	15,712	12-15
2.	Devi Karai	49	1,17,025	16,622	268	2,523	12-14
3.	Fernando	45	66,938	8,712	66	6,306	11—13
4.	Padutliu marikkan	2	Nil	Nil	Nil	64	11—13
5.	Paduthu marikkan						
	"•"undu	1	Nil	Nil	Nil	20	11-13
6.	Vaiparperia	8	1,575	96	6	609	12-14
7.	Vaipar Karai	12	145	110	Nil	619	11—13
8.	CruxianTundu	7	Nil	Nil	Nil	10	11—13
9-	Cruxian	176	6,10,706	51,340	1,374	5,021	12-18
10.	Vanthivu Arupagam	7	Nil	Nil	4	276	10—12
11.	Nagarai	15	58	2	11	547	13—14
12.	Pethai	2	3	Nil	Nil	92	13-15
13.	Utti	102	2,32,629	Nil	4	7,533	14-17
14.	Uduruvi	1	Nil	Nil	Nil	50	14—17
15.	Kilathi	5	Nil	Nil	Nil	119	13—14

1	2	3	4	5	6	7	8
16.	Athuvai Arupagam		Nil	Nil	Nil	50	14
17.	Melasthi		Nil	Nil	Nil	20	7-9
18.	Paasi		Nil	Nil	Nil	17	14--18
19.	Patharai		Nil	Nil	Nil	105	14--18
20.	Athombathu		Nil	Nil	Nil	20	16--18
21.	Karai	3	Nil	Nil	Nil	29	10--11
22.	Tholayiram	37	3,181	383	101	1,250	15--21
23.	Koothadiyar	4	3	Nil	Nil	155	15—16.5
24.	Vada Onbathu	2	Nil	Nil	Nil	50	15-1 6.5
25.	Saithonbathu	9	737	Nil	9	232	15—16.5
26.	Pulipoondu	11	41	Nil	4	483	15—16.5
27.	Nenchurichan	1	Nil	Nil	Nil	10	15--18
28.	Melaonbathu	2	75	Nil	Nil	40	16--17
29.	Rajavukku Chippi						
	Chothicha	2	4	Nil	Nil	36	16--18
30.	Kudamuthu	6	45	Nil	Nil	381	14--16
31.	Saith Kudamuthu	6	6	Nil	3	195	14--16
32.	Pudu	1	Nil	Nil	Nil	16	17--19
33.	Kadayan	1	Nil	Nil	Nil	30	14--16
34.	Kanava	1	5	Nil	Nil	20	14--16
35.	Karai Karuval	3	3	Nil	Nil	101	16--18
36.	Velangu Karuval	6	1,110	110	3	136	16--18
37.	Poonthottam	6	27	Nil	3	163	14--18
38.	Sandamaram Kovil Piditha	1	30	2	Nil	290	13--18
39.	Tundu	4	453				
40.	Narikuzhi	1	Nil	Nil	Nil	40	12
41.	Kanika	1	Nil	Nil	Nil	40	8
42.	Kondal	1	Nil	Nil	Nil	40	12
43.	Naddn	1	Nil	10	Nil	40	10
44.	Kothandaraman Kovil Piditha	1	Nil	Nil	Nil	40	5

After fixing the pair the divers start diving operations at regular interval. A diver can cover approximately 3 sq. yds. only, per dive (Mahadevan and Nagappan Nayar 1973). The collected oysters were cleaned, measured and

kept in troughs containing sea water. From the collected data an assessment of the pearl oyster population, and average collection per dive were estimated. At the end of the days operation, the collected oysters were transported to the pearl oyster farm.

## OBSERVATION

During 1977-1986, 722 trips were made and 44 pearl oyster beds were inspected. Of these only few beds were found to be productive. *Pinctada fucata* and flat oysters were collected from them, though the flat oysters were in small numbers. Fairly good number of *P. fucata* were collected from Devi paar (1,00,503), Karai paar (1,17,025), Fernando paar (66,938), Cruxian paar (5,10,706) and Utti paar (2,32,629). Other *Pinctada* spp (flat oysters) were collected from Devi paar (16,355), karai paar (16,622), Cruxian paar (51,340) and Fernando paar (8,715) as shown in Table 2, while a few other paars were sparsely populated many others were found to be barren (Table 2).

A maximum of 4,42,321 *P. fucata* were collected during 1985-1986 followed by 3,19,718 oysters in 1984-85 and 2,10,965 numbers in 1981-82. 44,571 flat oysters were collected during 1984-85 and 42,810 numbers were collected in 1985-1986. Of the total collection; *P. fucata* constituted 91.69% and the flat oysters constituted 8.31% (Table 1)

An average of 30.57 oysters were collected per skin dive for the period 1931-1982 followed by 16.82 in 1985-1986. The average oyster collection per skin dive for the entire period was 13.41. In SCUBA diving a maximum collection of 273.10 oysters was achieved in 1985-1986. This was followed by 201.62 oysters per dive during 1984-1985. The average collection of oysters per man hour or per cylinder was 228.94 for the period from 1977-1986.

## REMARKS

Going through the history of pearl fishery in Gulf of Mannar, it is interesting to observe that repopulation of the beds takes place after long barren periods. After the 1928 pearling, the next fishery could be declared only in 1955 which extended till 1961. Surveys and collection operations conducted during the past 25 years indicate that the spat fall on

beds was irregular and subject to great fluctuations. In 1970's the settlement of pearl oysters in oyster grounds was not profuse and there had been marked decrease in density of oyster population as reported by Mahadevan and Nayar (1976).

From Table 2 the productive paars during the period 1977-1986 can be identified. At times the paars that have received good spat fall too are rendered unproductive by certain natural calamities that destroy oysters on large scale. Utti paar, Cruxian paar and Fernando paar which harbour good number of pearl oysters (Table 2) belong to the category of pearl beds where spat fall occur frequently but the oysters rarely survive to reach the pearl bearing stage to support fishery. However these pearl oyster beds are traditionally known for supporting commercial pearl fisheries. (Rajendran et. al., 1976)

With the introduction of SCUBA diving for intensive pearl oyster collection programme, from 1984 to 1986 the pearl oyster collection improved much as is evident from Table 1. With this diving apparatus one diver can remain for an hour under water. During the period 201.62 (1984-1985) oysters were collected per man hour and 273.10 oysters were collected in 1985-1986. Earlier SCUBA diving was employed effectively and an improved system of survey and charting of pearl oyster beds was introduced (Baschieri Salvador! 1960, 1961.) The FAO (1962) recommended the continuations of such surveys.

The flora in the paars include *Gracilaria*, *Hypnea* sp, *Polydora* sp, *Caulerpa* sp. *Hallmeda* sp and *Sargassum* sp as observed by Varma (1960).

The nature of the bottom of the pearl banks observed is given in Table 2A some banks are covered with sand, and few others have broken coral bits.

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