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FLUCTUATIONS IN THE MACKEREL CATCHES AT COCHIN*

On 21st and 28th September 1982, heavy catches of mackerel were landed by purse seiners at the Fisheries Harbour, Cochin, the estimated landings being 293.529 and 108.999 tonnes respectively. Since such heavy landings are quite unprecedented in the recent past, observations made on the biology of the fish and its fishery are presented.

The particulars of number of units, catch and catch per unit at Cochin during September 1982 are presented in Table 1. On 21st September, 56 purse seiners and 110 carrier boats landed 293.529 tonnes of mackerel at 5241.589 kg per unit. In the morning of the day when the purse seiners and carrier boats started arriving with catches, the auction price ranged from Rs.4550/- to Rs.4900/- per tonne of mackerel (Figs. 1 & 2). As the boats continued to bring in heavy catches, the price declined to Rs.1500/- per tonne of fish later in the day. On the following day, the mackerel catch came down to 16.059 tonnes at a catch rate of 297.389 kg per unit. On 28th instant, mackerel landings were good aggregating 108.999 tonnes at 2018.500 kg per unit. But, the fish merchants were not prepared to buy the catches as there was poor demand for fish in the market (being Bakrid). The catches of 28th continued to come till the early hours of 29th instant. On 29th morning, the catches were found strewn all over the Fisheries Harbour. The price came down to Rs.700/- per carrier boat of 1.8 to 2.0 tonnes of mackerel. Most of the mackerel landed was spoiled and some of the lots were transported as manure. This glut of mackerel in the harbour affected the auction sale of drift net catches. The price of cat fishes, pomfrets, horse mackerel, seer fishes, etc., declined drastically resulting in a fall in the average income per drift net boat from Rs.500/- to 525/- in the previous week to about Rs.240/- in the week under reference. The total estimated landings of mackerel in September 1982 aggregated 1026.222 tonnes which, incidentally, is the highest monthly catch recorded at Cochin since March 1981 (catch: 1055.407 tonnes).

The size-ranges and dominant modal sizes of mackerel in the purse seine catches at Cochin in September 1982 (observation day-wise) are given in Table 2. The overall size-range of the fish during the month was 153-276 mm and the modal sizes varied between 180 and 250 mm suggesting that the fishery was supported mainly by 1-year and 2-years-old individuals. A majority of fish (58%) were in spent condition followed by immature, spent-recovering and developing

individuals. The bulk (92%) of the bumper catch of 21st September comprised spent fish followed by spent-recovering individuals. These were 2-years-old.

The mackerel catches in Kerala State, constituting on an average about 30% of the landings in India, have been showing a declining trend from 1978 through 1982, the catches in the concerned years being 25917, 18585, 18474, 16200 and 10717** tonnes respectively. At Manassery,, Cochin, the mackerel fishery by indigenous boats operating Thangu vala (boat seine) and Ayila vala (gill net) has been sporadic and poor in 1978 and 1979, the landings being 521.449 and 387.325 tonnes respectively. With the introduction of purse seining on a commercial scale in 1979, the fishery improved considerably. The month-wise mackerel landings and catch per unit effort by purse seiners at Cochin during August 1979 - December 1982 are delineated in Table 3. The total landings of mackerel by purse seines, drift nets and trawl nets at the Fisheries Harbour, Cochin during 1979, 1980, 1981 and 1982 aggregated 248.989, 4359.363, 3948.141 and 2158.698 tonnes respectively of which purse seines contributed 19.32%, 96.83%, 98.78% and 97.20% in the concerned years. In 1980, the purse seine fishery was better during post-monsoon months with high yields and yield rates particularly in October (1495.203 tonnes and 662.180 kg per unit) and December (1127.243 tonnes and 679.881 kg per unit). This trend of high yields and yield rates continued through the pre-monsoon season of 1981 when the returns registered high values (e.g., 1335.692 tonnes and 1649.002 kg per unit in February and 1055.407 tonnes and 1552.069 kg per unit in March). The fishery was moderately good through the 1981 post-monsoon and 1982 pre-monsoon seasons. But for the high yield recorded in September, during October through December 1982 the fishery exhibited almost the same trend as in the post-monsoon season of 1981. As compared to the landings during 1980 and 1981, those in 1982 were considerably less. The fall in the effort expended during these years was rather marginal (9580, 8870 and 8779 purse seine units in the respective years).

The month-wise delineation of the catch data, however, does not give a true picture of the sporadic nature and magnitude of fluctuations in the mackerel fishery at Cochin. On an average, the number of days expended for fishing by purse seiners is 25 or 26 in a

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Table 1. Particulars of the purse seine mackerel fishery at the fisheries Harbour, Cochin in September 1982.

Date of observation	Number of units operated		Mackerel	
	Purse seiners	Carriers	Catch (kg)	Catch per purse seiner (kg)
4.9.1982	33	28	71409	2163.909
17—	52	35	63499	1221.135
21—	56	110	293529	5241.589
22—	54	46	16059	297.389
24—	54	40	47932	887.630
28—	54	52	108999	2018.500

Table 2. Size ranges and dominant modal sizes of mackerel in the purse seine catches at the Fisheries Harbour, Cochin in September 1982.

Date of observation	Size-range (mm)	Dominant modal size + (mm)
4-9-82	170—240	190, 200
17—	225—272	240
21—	228—275	230, 245
22—	215—276	235, 250
24—	153—222	180, 190
28—	220—270	235

+ Mid-points of size-groups.

month. An examination of the catch statistics of the Fishery Resources Assessment Division of the CMFRI suggests that on a majority of fishing days in a month the mackerel catch of purse seiners is highly negligible or even nil, the total landings of the month being made up of the good catches of certain days only. It is possible that mackerel shoals do not occur in sufficient concentration in the present fishing belt, even after extension of the fishing area by purse seiners. In Table 4 are presented the maximum mackerel catches and catch per unit effort recorded on certain days by purse seiners at Cochin during August 1979–December 1982. If Tables 3 and 4 are read in conjunction



Fig.1. A purse seine carrier boat with mackerel at the Fisheries Harbour, Cochin.

with each other, the reasoning that the total landings of a month are constituted by the good catches of certain days only becomes obvious.

When Thangu vala was the principal gear employed in the mackerel fishery in the inshore belt of 4–10 km from Cochin, the fishery which was of small magnitude exhibited two phases, one of occurrence of juveniles during May–August and another of commercial sizes during October–April, with negligible or nil catches in September. With the extension of the area of fishing by purse seiners in 1979, the fishery exhibited a different picture since then—of large catches and very good catch rates of mainly adults in the pre-monsoon months of certain years and of predominantly juveniles in the post-monsoon period of certain other years (vide Table 3). It is interesting to note that on

Table 3. Mackerel landings (kg) and catch per unit effort (kg) (in parenthesis) by purse seiners at the Fisheries Harbour, Cochin during August 1979–December 1982.

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1979	—	—	—	—	—	—	—	++	++	17565 (87.388)	28545 (102.312)	2000 (7.143)	48110 (58.386)
1980	15985 (53.822)	40247 (105.359)	116767 (197.242)	112289 (111.287)	287150 (354.506)	No operation			329183 (322.728)	1495203 (662.180)	696961 (448.495)	1127243 (679.881)	4221028 (440.608)
1981	59195 (65.699)	1335692 (1649.002)	1055407 (1552.069)	476030 (587.691)	239073 (283.262)	"	"	"	319951 (325.484)	392323 (313.107)	15507 (12.998)	6688 (4.791)	3999866 (439.669)
1982	11110 (8.341)	314094 (283.478)	68631 (109.810)	154243 (119.476)	151366 (132.197)	"	"	"	1026222 (846.718)	355158 (309.102)	5047 (12.875)	12352 (23.528)	2098223 (239.005)

++No mackerel in the purse seine catches.

Table 4. Maximum mackerel catches (kg) and catch per unit effort (kg) (in parenthesis) on certain days by purse seiners at the Fisheries Harbour, Cochin during August 1979–December 1982.

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1979	—	—	—	—	—	—	—	—	—	18th 7660 (957.500)	15th 7500 (277.778)	27th 1000 (62.500)
1980	18th 3250 (406.250)	26th 8238 (374.455)	10th 30546 (872.743)	26th 33274 (627.811)	2nd 39092 (1699.652)	No operation			26th 127987 (1777.597)	13th 262471 (2322.752)	13th 66933 (1365.980)	24th 226420 (2902.821)
1981	3rd 12500 (367.647)	20th 186575 (4664.375)	2nd 92380 (3849.167)	18th 89320 (1488.667)	28th 103390 (2067.800)	"	"	"	5th 66120 (1889.143)	6th 122090 (2219.818)	23rd 3033 (58.327)	8th 2040 (53.684)
1982	30th 1942 (37.346)	11th 62980 (1049.667)	18th 20825 (833.000)	12th 35453 (644.600)	17th 13707 (274.140)	"	"	"	21st 293529 (5241.589)	5th 55500 (1067.308)	19th 1350 (54.000)	17th 3720 (97.895)



Fig.2. Bumper catch being packed for the market.

some days in September (vide Table 1) high catches and catch rates were obtained which indicates that the mackerel shoals available in the inshore waters were not adequately exploited before the introduction of purse seiners in the area (vide Table 3). Several hypotheses have been put forward for the shore-ward coastal migration of mackerel and the resultant wide fluctuation in the fishery. The significance of temperature and salinity in the availability of mackerel has been established by comparing the monthly mackerel landings and values of temperature and salinity at different centres by various authors. Certain optimal levels of temperature and salinity have been found to be good for the mackerel fishery.

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