



समुद्री मात्स्यकी सूचना सेवा MARINE FISHERIES INFORMATION SERVICE

No. 122

AUGUST, SEPTEMBER 1993



तकनीकी एवं TECHNICAL AND
विस्तार अंकावली EXTENSION SERIES

केन्द्रीय समुद्री मात्स्यकी CENTRAL MARINE FISHERIES
अनुसंधान संस्थान RESEARCH INSTITUTE
कोचिन, भारत COCHIN, INDIA

भारतीय कृषि अनुसंधान परिषद
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

OCCURRENCE OF SPAWNERS, JUVENILES AND YOUNG FISH IN RELATION TO THE FISHERY SEASONS OF SOME MAJOR FISHERY RESOURCES OF INDIA — A PRELIMINARY STUDY

G. Luther and Y. Appanna Sastry

Visakhapatnam Research Centre of CMFRI, Visakhapatnam - 530 003

According to the All India Census of Marine Fishermen, Craft and Gear conducted by the CMFRI (*Mar. Fish. Infor. Serv., T & E Ser.*, No. 30, 1980) 10 major gears are employed along the Indian coasts. They are drift/set/gill nets, hooks & line, fixed bag nets, boat seines, shore-seines, *rampanis*, trawlnets and purse seines besides traps, scoop nets and others. Trawlnet, drift/set/gillnet, and hooks & line are the major gears operated only in Gujarat and Maharashtra; purse seines in Karnataka and Kerala, and *rampani* in Karnataka. However, boat seines are operated mostly in Karnataka, Kerala and Andhra Pradesh and shore seines in the above three states as well as in Tamilnadu.

The major species of fish catches of many of these gears landed at the different landing centres near the various research centres of CMFRI have been investigated by the scientific and technical staff of the Institute over the past 45 years for their fishery and population characteristics, and the results have been documented in several publications which include *Indian J. Fish.*, Vols. 1-4, 9-11, 13-16, 18-30, 32 & 34; *Mar. Fish. Infor. Serv., T & E Ser.*, Nos. 8,14, 30, 70-90, 96; *Annual Reports of CMFRI*; *Indian J. Mar. Sci.*, Vol. 4; *J. mar. biol. Ass. India*, Vol.33; *Proc. Symp. Living Res. seas around India*, 1973 (CMFRI): 234-240; and *Recent Advances in Marine Biology*, P.S.B.R. James (Ed.), To-day and Tomorrow's Printers and publishers, 1986: 29-101.

It is now common knowledge that the average life span of the majority of the species comprising the tropical marine fisheries resources is short being around 2-3 years. The fisheries for most of our resources are supported to a large extent by juvenile fish whose average life span is about one year. This means that majority of individuals born at a time do not have the chance to spawn at least once in their life time. If this

situation is allowed to go beyond a limit, the stock position is bound to go down leading to diminishing returns. This decreasing trend in the state of the stock may be viciated further if the spawners too are exposed to higher fishing pressure.

Keeping these various factors in view, an attempt has been made to evaluate the state of exploitation of our coastal fishery resources for which we have the needed primary data. The aspects investigated fall under 2 major heads with reference to the gears, namely, main fishery season coinciding with (i) the main spawning season and (ii) the main juvenile/young fish fishery season (Table 1). The aim of this account is to point out the period or periods when caution is to be exercised so as to conserve spawners, juveniles and young fishes from over-exploitation.

The primary data collected for this study comprised regionwise, gear-wise, species-wise particulars relating to the monthly landings of different species and the percentage occurrence of their mature, juvenile and young fish in the landings. Fish below-half the size at first maturity was considered to represent young fish. Where only the polygons were available for the monthly length frequency distribution, the percentage of the area the of the polygon below the size at first maturity of that species was estimated. This area was measured by using a transparent graph sheet. The main fishery season was considered to be the period when the monthly catch exceeded the average monthly catch. The months when the occurrence of mature fish exceeded 55% of its catch was considered to constitute the main spawning season. Similar orientation was applied for determining the juvenile fish fishery season also. For the young fish fishery season, however, the months in which their occurrence exceeded 27% was considered.

The important results obtained from the analysis of the data collected in accordance with the aim of the present study are furnished in Table 1. The table gives the major species that have been studied from each gear at each observation centre, their main fishery season and the periods when the juvenile and young fish season of the indicated species coincided with the fishery season for the species. Thus it may be noted that 9 species from Gujarat, 17 from Maharashtra, 32 from Karnataka, 50 from Kerala, 23 from Tamilnadu and 48 from Andhra Pradesh have come under this study.

Fishery season in the different regions

The present study shows that fishing activity takes place throughout the year along the major part of the Indian coasts, except in Karnataka where fishing is either suspended or poor during June-July period. In the Madras area the fishing activity is very low during June. The main fishery season irrespective of the gears employed vary in the different maritime states. It is during June and October-December in Gujarat; August and October-February in Maharashtra; September-March in Karnataka; May-June and August-November in Kerala; April-November in Tamilnadu and October-April in Andhra Pradesh. The main fishery season observed for the different observation centres are furnished in the table. Whether the same season prevails throughout the coasts of Gujarat and Maharashtra is not known as the present observations were stated to have been based on investigations carried out at Veraval and Bombay only. Along the Karnataka coast, however, the fishery season extends for a longer period, from August to May at Karwar, while it is from September to March at Manglore. Similarly, the main fishery season at Calicut extends from September to January, while it is from May to November at Cochin and from May to October at Vizhinjam. Along the Tamilnadu coast also the main fishery season varied at the three observation centres namely, Tuticorin, Mandapam and Madras; they being April-September and November, March-November and January-February respectively. In Andhra Pradesh, December-April forms the main season at Kakinada while it is from August to March at Visakhapatnam.

It is further noticed that while the fishery season along the north as well as middle of the west coast from Veraval to Calicut is during

September-March, it is during April-November along the southern belt of the peninsula extending from Cochin to Mandapam, and for the rest of the east coast upto Visakhapatnam it is during October-April. The foregoing seasonal trends indicate shifting of the fishery seasons from south to north and north to south with the passage of time. It may further be noted that although the foregoing fishery seasons of the different regions of the Indian coasts that have emerged are based on the seasons of some of the major fishery resources, they do reflect the seasonal trends of the total fishery resources of each region (see *CMFRI Bull. No. 27, 1976*).

Mature fish in the fishery

A study of the seasons of occurrence of fish in advanced stages of maturity in relation to the main fishery season (see Table) indicates that fish in advanced stages of maturity occur only during some part or parts of the main fishery season. Scarcity of mature fish or their occurrence only for a shorter period during the main fishery season is more evident at Calicut, Mandapam, Madras and Visakhapatnam observation centres. The reasons for such a situation remain to be investigated. It would appear that in these areas fish on attaining maturity may move away from the inshore fishing grounds.

Juvenile and young fish in the fishery

A review of the size composition of the different fishery resources in the various localities examined indicates that the major bulk of their landings comprise juveniles. Column 5 of the table gives the periods over which juveniles of fish indicated against them in column 2 form dominant catches in the different gears at the different observation centres. The available information shows that juveniles form dominant catches during September-January and May off Veraval; November-December off Bombay; September-December and April off Karwar; in January and October off Mangalore; during September-November off Calicut; June-September off Cochin; July-November off Vizhinjam; April-September off Tuticorin; May-June and October Mandapam; during July-October off Kakinada and in February and September off Visakhapatnam.

The present study has indicated that fisheries for some of the major fishery resources at some centres are largely supported by juvenile

TABLE 1. The main fishery season and their coincidence with spawning, juvenile fishery and young fish fishery seasons at various centres

Sl. No.	State/Research Centre/Gear	Species studied/reported	Main fishery season	Spawning season coinciding with fishery season	Main fishery season coinciding with juvenile fishery season	Main fishery season coinciding with young fish season
1	2	3	4	5	6	7
I. GUJARAT						
VERAVAL Centre						
1.	Trawl net	<i>Tachysurus tenuispinis</i> , <i>Nemipterus japonicus</i> , <i>N. mesoprion</i> , <i>Johneops vogleri</i> , <i>Otolithus cuvieri</i>	Mar.-Apr. & Oct.-Jan.	Mar.-Apr. & Oct.-Jan.	... ..	... ..
2.	Dol net	<i>Harpodon nehereus</i> , <i>Tachysurus thalassinus</i> , <i>Coilia dussumieri</i> , <i>Pampus argenteus</i>	May-Dec. & Jan.	Oct.-Jan.	Sep.-Jan. (1) & May	Sep.-Jan. (1)
3.	Drift/gill net	<i>Otolithus cuvieri</i>	Mar.-Jun. & Oct.-Jan.	Mar.-Apr. & Nov.-Jan.	... ..	... ..
II. MAHARASHTRA						
BOMBAY Centre						
4.	Trawl net & dol net	<i>Coilia dussumieri</i> , <i>Chirocentrus dorab</i> , <i>Trichiurus lepturus</i>	Aug. & Oct.-Mar.	Aug. & Oct.-Feb.	... ..	... ..
5.	Dol net	<i>Harpodon nehereus</i> , <i>Hippolysmata</i> (1) <i>curvirostris</i> , <i>Muraenosox talabonoids</i>	Aug.-Feb.	Aug.-Dec.	Nov.-Dec. (1)	Jan.-Feb. (1) Aug.-Sep. & Dec.
6.	Trawl net, dol net & gill net	<i>Protonebea diacanthus</i> , <i>Pampus argenteus</i>	Aug.-Mar.	Aug.-Feb.	... ..	... ..
7.	Trawl net	<i>Johneops vogleri</i> (1), <i>Otolithus cuvieri</i> , <i>O. ruber</i> , <i>Euplerogrammus muticus</i> , <i>Psettodes erumei</i> , <i>Opisthopterus tardoore</i> (2)	Oct. Mar.	Oct.	Jan. (1) Mar. & Nov.	Oct.-Nov. (1)
8.	Gill net	<i>Megalaspis cordyla</i> , <i>Euthynnus affinis</i> , <i>Scomberomorus guttatus</i>	Aug. Dec.	Aug.-Sep.	... ..	... ..
9.	Hooks & line	<i>Muraenosox talabonoides</i> (1)	Jul.-Dec.	Aug.-Sep.	Oct.-Dec.	Dec. (1)
III. KARNATAKA						
KARWAR Centre						
10.	Drift/gill net	<i>Sardinella longiceps</i> , <i>Rastrelliger kanagurta</i> , <i>S. fimbriata</i>	Aug.-May	Aug.-Dec.	Aug.-May	... ..
11.	Boat-seine	— Do —	— Do —	Aug.-Dec.	Sep.-Oct. & Dec.	
12.	Drift/gill net, boat-seine, purse-seine & shore-seine	<i>Sardinella longiceps</i> (1), <i>Rastrelliger kanagurta</i> (3), <i>Sardinella fimbriata</i> (2)	Aug.-May	Aug.-Apr.	Jan.-May (1), (2), (3) & Aug.-Dec.	
13.	Shore-seine	— Do —	Aug.-May	Aug.-Dec.	Aug.-Sep. & Dec.	... ..
14.	Purse-seine	— Do —	Aug.-May	Aug.-Dec.	Apr. & Sep.-Dec.	

1	2	3	4	5	6	7
MANGALORE Centre						
15.	Trawl net	<i>Anadontostoma chacunda</i> , <i>Nematolossus nasus</i> , <i>Saurida tumbil</i> , <i>S. undosquamis</i> , <i>Lactarius lactarius</i> , <i>Nemipterus mesoprion</i> , <i>Johneops osseous</i> , <i>Otolithus ruber</i> , <i>Psenes indicus</i> , <i>Oratosquilla nepa</i> (1)	Oct.-Apr.	Oct.-Jan. & Mar.	... ...	... ...
16.	Trawl net & drift/gill net	<i>Scoliodon laticaudus</i> , <i>Trichiurus lepturus</i> , <i>Scomberomorus commerson</i>	Oct.-Apr.	Mar. & Oct.-Jan.	... ...	... ...
17.	Trawl & drift/gill net/purse-seine	<i>Tachysurus tenuispinis</i> , <i>Caranx kalla</i> , <i>Parastromateus niger</i> , <i>Rastrelliger kanagurta</i>	Sep.-Apr.	Mar. & Sep.-Jan.	... ...	... ...
18.	Purse seine & trawl net	<i>Sardinella longiceps</i> (1), <i>Stolephorus bataviensis</i> , <i>S. devisi</i> , <i>Thryssa mystax</i> , <i>Cynoglossus macrostomatus</i>	Sep.-Apr.	Mar. & Oct.-Jan.	Jan. (1)	... ...
19.	Purse-seine	<i>Sardinella gibbosa</i> , <i>Leiognathus bindus</i> , <i>Secutor insidiator</i> , <i>Rastrelliger kanagurta</i> , <i>Decapterus dayi</i>	Sep.-Mar.	Mar. & Oct.-Jan.	Jan.	Sep.
20.	Drift net & purse-seine	<i>Tachysurus dussumieri</i> , <i>Auxis thazard</i>	Sep.-Mar.	Mar. & Sep.-Jan.	... ...	... ...
21.	Drift net & gill net	<i>Scomberomorus guttatus</i> , <i>Pampus argenteus</i>	Sep.-Mar.	Mar. & Sep.-Oct.	... ...	... ...
22.	Rampani net	<i>Rastrelliger kanagurta</i> (1)	Oct.-Mar.	Oct.-Mar.	Oct.	
23.	Boat-seine	<i>Parapenaeopsis styliifera</i> (1)	Apr.-May & Nov.-Dec.	Nov.-Dec. & Apr.-May	Not coinciding	Nov.
IV. KERALA						
CALICUT Centre						
24.	Gill/drift net	<i>Euthynnus affinis</i> (1), <i>Scomberomorus commerson</i> , <i>S. guttatus</i> , <i>Caranx kalla</i>	Sep.-Jan.	Sep.	Sep.-Nov.	
25.	Shore-seine	<i>Megalaspis cordyla</i>	Jan.-Apr. & Sep.-Nov.	Not coinciding	Jan.-Apr. & Sep.-Nov.	Not coinciding
26.	Boat-seine & gill net	<i>Sardinella longiceps</i> (1), <i>Parastromateus niger</i> , <i>Rastrelliger kanagurta</i> (3), <i>Thryssa mystax</i> (2)	Sep.-Feb.	Sep.	Sep.-Dec.	Not coinciding
27.	Drift net & hooks & line	<i>Tachysurus thalassinus</i> , <i>T. serratus</i>	Mar. & Sep.-Jan.	Sep.	... ...	... ...
28.	Hooks & line, drift & trawl net	<i>Tachysurus tenuispinis</i> , <i>Megalaspis cordyla</i> (1)	Mar. & Sep.-Jan.	Sep.	Jan. (1), Mar. & Sep.-Dec.	(1) Not coinciding
29.	Trawl net	<i>Cynoglossus macrostomus</i> , Anchovy, Seer fish, Pomfrets, <i>P. argenteus</i>	Nov.-Feb.	Not coinciding	......	......
30.	Boat-seine	<i>Caranx kalla</i> (2), <i>Leiognathus bindus</i> (3) <i>Sardinella longiceps</i> (1)	Sep.-Feb.	Sep.	Nov.-Feb.	Not coinciding

1	2	3	4	5	6	7
COCHIN Centre						
31.	Trawl net	<i>Saurida tumbil</i> , <i>S. undosquamis</i> , (1) <i>Nemipterus japonicus</i> , <i>N. mesoprion</i> , <i>Johneops sine</i> , <i>J. dussumieri</i> , <i>Kathala</i> , <i>axillaris</i> , <i>Otolithus cuvieri</i> , <i>O. ruber</i> , <i>Rastrelliger kanagurta</i> , <i>Caranx djeddaba</i> , <i>C. kalla</i> , <i>Pampus argenteus</i> , <i>Lactarius</i> <i>lactarius</i> , <i>C. kurra</i> , <i>Thryssa mystax</i> , <i>P. stylifera</i>	Jun.-Nov.	Jun.-Oct.	(1) Oct.- Nov.	Jun.- Jul.
32.	Purse-seine, trawl net & boat-seine	<i>Sardinella longiceps</i> (1), <i>Metapenaeus affinis</i> (2)	Jan.& May- Nov.	Jan., Jun.-Jul. Sep.& Oct.	Not coinciding	... ..
33.	Trawl net & purse-seine	<i>Stolephorus bataviensis</i> , <i>Scomberomorus commerson</i> , <i>S. devisi</i> <i>S. buccanneri</i> , <i>S. macrops</i> , <i>Decapterus</i> <i>russelli</i> , <i>Megalaspis cordyla</i>	May-Jun. & Nov.	Jun.	... ..	... ..
34.	Purse-seine, trawl & drift net	<i>Tychysurus dussumieri</i> , <i>T. serratus</i> , <i>T. thalassinus</i> , <i>T. tenuispinis</i> , <i>Rastrelliger kanagurta</i> (1)	May- Nov.	Jun.-Oct.	Jun.- Sep.	... ..
35.	Boat-seine	<i>R. kanagurta</i> , <i>S. longiceps</i>	Jan.-Aug.	Jan.-Mar.	Mar.-Jul.	May & Jun.
36.	Purse-seine	— Do —	May-Nov. & Sep.-Oct.	Jun.-Jul.	Jun.-Sep.	... ..
37.	Drift net	<i>Thynnus albacares</i> , <i>Scomberomorus commerson</i>	May- Nov.	Jun.-Sep.	... ..	... ..
38.	Drift net & purse-seine	<i>Auxis thazard</i> , <i>A. rochii</i> , <i>Euthynnus</i> <i>affinis</i> , <i>Rastrelliger kanagurta</i>	May-Nov.	Jun.-Oct.	... ..	... ..
VIZHINJAM Centre						
40.	Drift/gill net	— Do —	May-Nov.	May & Sep.- Oct.	May	Not coinciding
41.	Boat-seine	<i>Trichiurus lepturus</i> , <i>Rastrelliger kanagurta</i>	May-Nov.	May & Oct.-Nov.	Jun.- Nov.	Jul.-Aug. & Oct.
42.	Boat-seine & hooks & line	<i>Rastrelliger kanagurta</i> (1) <i>Trichiurus lepturus</i>	May-Nov.	May & Aug.- Nov.	(1) Jun.- Nov.	... ..
43.	Shore-seine & gill net	<i>Decapterus dayi</i> , <i>Megalaspis cordyla</i> <i>Sardinella longiceps</i> , <i>Sardinella</i> sp., <i>Rastrelliger kanagurta</i> , <i>Stolephorus</i> <i>devisi</i> , <i>S. bataviensis</i> , <i>S. buccanneri</i> , mulletts, <i>Sphyræna</i> spp., <i>Caranx</i> spp., <i>Decapterus russelli</i> , <i>Trichiurus lepturus</i>	Apr.-Oct.	May & Sep.	... ..	... ..
44.	Shore-seine	— Do —	Apr.-Aug. & Oct.	Apr.-May & Oct.	Not coinciding	Apr. & Jul.- Aug. & Oct.
45.	Drift net/ gill net, boat-seine & shore-seine	<i>Atule mate</i> , <i>Sardinella gibbosa</i> , <i>S. sirm</i> (1), <i>Stolephorus indicus</i> , <i>S. bataviensis</i> , <i>S. buccanneri</i> , (2) <i>Thryssa settrostris</i> , <i>S. fimbriata</i>	Apr.-Nov.	Apr.-May & Sep.- Nov.	Apr.- & Jul.-Nov.	Not coinciding

1	2	3	4	5	6	7
V.	TAMILNADU					
	TUTICORIN Centre.					
46.	Gill net	<i>Sardinella gibbosa</i> , <i>S. longiceps</i> , <i>S. dayi</i> , <i>Scomberomorus commerson</i> , <i>E. affinis</i>	Apr.-Nov.	Oct.-Nov.	Apr.-Sep.	Apr.-Sep.
47.	Hooks & line	— Do —	Jan.-Mar. & Jun.-Oct.	Jan.	... ..	... ..
48.	Trawl net, hooks & line & gill net	Carangids, Seerfish, <i>Sardinella gibbosa</i> , <i>S. longiceps</i> , <i>S. dayi</i>	Jan.-Dec.	Nov.-Jan.	... ..	... ..
49.	Trawl net	— Do —	Jan.-Mar, Jun. & Aug.- Dec.	Jan. & Nov.-Dec.	... ..	... ..
50.	Trawl net	<i>Dasyatis uarnak</i> , <i>D. sephen</i> , <i>D. bleekeri</i> , <i>Rhinoptera javanica</i> , <i>Amphotistius imbricatus</i> , <i>A. kulhi</i> , <i>Actobatus narinari</i> , <i>A. flagellum</i> , <i>Gymnura poecilura</i> , <i>Gazza minuta</i> , <i>Leiognathus brevirostris</i> (1), <i>L. dussumieri</i> (3), <i>L. jonesi</i> , <i>L. equulus</i> , <i>Secutor insidiator</i> <i>S. ruconius</i> , (2) <i>Trichiurus lepturus</i> (4)	Apr.-Nov.	Apr. & Oct.-Nov.	Apr.- Aug. & Oct.	Not coinciding
51.	Gill net	<i>Scollodon palasorrah</i> , <i>Leiognathus dussumieri</i> , <i>L. equulus</i> , <i>Secutor insidiator</i>	Sep.-Oct.	Not coinciding	Sep.- Oct.	Not coinciding
52.	Shore-seine	<i>Gazza minuta</i> , <i>L. brevirostris</i> , <i>L. dussumieri</i> , <i>S. ruconius</i> , <i>Rastrelliger kanagurta</i> , <i>Sardinella gibbosa</i> (1), <i>S. albella</i> (2) <i>Sillago sihama</i> , <i>Sepioteuthis orctipinnis</i> (4)	Sep.-Jun.	Feb.-Jun. & Nov.	Mar.-May, Jun. & Nov.	May-Jun.
	MADRAS Centre					
53.	Trawl net	<i>Sardinella gibbosa</i> , <i>Nemipterus japonicus</i> , <i>Leiognathus bindus</i> , <i>Secutor insidiator</i> , <i>Johnius carutta</i>	Jan.-Feb.	Jan.-Feb.	... ..	... ..
VI.	ANDHRA PRADESH					
	KAKINADA Centre					
54.	Trawl net	<i>Decapteus dayi</i> , <i>D. russelli</i> , <i>Nemipterus japonicus</i> , <i>N. mesoprion</i> (1), <i>Leiognathus bindus</i> (2), <i>Secutor insidiator</i> , <i>Atrobucca nibe</i> , <i>Johnieops vogleri</i> , <i>Johnius carutta</i> , <i>J. dussumieri</i> , <i>Pennahia macrophthalmus</i> , <i>Trichiurus lepturus</i> (3), <i>Eupleurogrammus muticus</i> (4), <i>Lepturacanthus gangeticus</i> , <i>Saurida tumbil</i> , <i>Tachysurus thalassinus</i> , <i>T. tenuispinis</i> , <i>Carangoides malabaricus</i> , <i>Polynemus sextarius</i> , <i>Priacanthus macracanthus</i> , <i>Lactarius lactarius</i>	Nov.-May	Dec.-May	May & Nov.	Mar. & Nov.

1	2	3	4	5	6	7
55.	Shore-seine	<i>Metapenaeus brevicornis</i> (1), <i>Portunus pelagicus</i>	May.-Dec.	Sep.-Nov.	May-Nov.	Jul.
56.	Nylon gill net, boat-seine, shore-seine & crab net	<i>Portunus sanguinolentus</i> (2), <i>P. pelagicus</i> (1), <i>Scylla serrata</i> (3), <i>Trichiurus</i> spp.	Jan.-Dec.	Feb.-Mar. & Sep.-Dec.	Sep.-Oct.	... ..
57.	Boat-seine	<i>Euplerogrammus muticus</i>	Jan.-Dec.	Feb.-Apr. & Nov.-Dec.	Jul.-Nov.	... ..
VISAKHAPATNAM Centre						
58.	Gill net & boat-seine	<i>Rastrelliger kanagurta</i> , <i>R. faughni</i> <i>Decapterus dayi</i> , <i>Stolephorus devisi</i> , <i>S. lajang</i> , <i>Trichiurus lepturus</i> , <i>Sardinella fimbriata</i> , <i>S. longiceps</i> , <i>S. bataviensis</i> , (1) <i>Lactarius lactarius</i> , <i>S. gibbosa</i>	Sep.-Mar.	Jan.-Mar.	(1) Jan.- Mar. & Sep.-Dec.	(1) Sep.
59.	Boat-seine	— Do —	Sep.-Mar.	Feb.- Mar.	Feb.-Mar. & Sep.	Feb.-Mar. & Sep.-Dec.
60.	Hooks & line	<i>Tachysurus tenuispinis</i> , <i>T. thalassinus</i> , <i>Decapterus dayi</i> , sharks, skates, sail fish, <i>Istiophorus platypterus</i> seer fishes, <i>Euthynnus affinis</i> , <i>Thunnus albacares</i> , <i>Scomberomorus guttatus</i> , <i>Katsuwonus pelamis</i> , <i>S. commerson</i>	Mar.- May	Mar. & May	... ..	... ..
61.	Trawl net	<i>Trichiurus leprurus</i> , <i>Rastrelliger</i> <i>kanagurta</i> , <i>Stolephorus devisi</i> , <i>S. bataviensis</i> , <i>Sardinella gibbosa</i> , <i>Saurida tumbil</i> , <i>Tachysurus thalassinus</i> , <i>T. tenuispinis</i> , <i>Polynemus sextarius</i> , <i>Priacanthus</i> <i>macracanthus</i> , <i>Lactarius lactarius</i> , <i>Carangoides malabaricus</i> , <i>Decapterus</i> <i>dayi</i> , <i>Nemipterus japonicus</i> (2), <i>N. mesoprion</i> , sciaenids, goat fishes	Sep.-May	Feb.- Mar., & Dec.	Jan.-Feb. May & Dec.	Feb.-Mar.
62.	Shore-seine	<i>Rastrelliger kanagurta</i> , <i>Stolephorus</i> <i>bataviensis</i> , <i>S. heterolobus</i> , <i>S. devisi</i> , <i>fimbriata</i> , <i>S. gibbosa</i> , <i>Megalaspis</i> <i>cordyla</i> , <i>Decapterus dayi</i> , <i>Trichiurus</i> spp., <i>Dussumieria acuta</i> , <i>Caranx malabaricus</i> , <i>Sardinella albella</i> (1)	Jan.-May & Sep.-Dec.	Feb.-Mar. & Dec.	(1) May & Sep.-Nov.	(1) Feb.-Mar. & Oct.-Dec.

fish. They are mentioned in the order of their magnitude as well as the localities where such a situation has existed in the recent past; *Caranx kalla* off Calicut, *Sardinella fimbriata* at Karwar, *Megalaspis cordyla* at Calicut, *Eupleurogrammus muticus* at Kakinada, *Tachysurus thalassinus* at Visakhapatnam, *Harpodon nehereus* at Veraval and Bombay, *S. fimbriata* at Vizhinjam, *Oratosquilla nepa* at Mangalore-Malpe, *Trichiurus lepturus* at Kakinada, *Metapenaeus affinis* at Cochin, *Leiognathus bindus* at Kakinada, *Restrelliger kanagurta* at Cochin, *S. gibbosa* and *S. albella* at Mandapam, *S. longiceps* at Karwar, *R. kanagurta* in Andamans, *Leiognathus jonesi* and *T. lepturus* at Mandapam, *S. longiceps* at Calicut and *Nemipterus japonicus* at Cochin. The fact that the greatest bulk of the landings of *Lactarius lactarius* landed at Visakhapatnam in the past comprised of juveniles and that the fish itself now being rare in the same locality clearly indicates the damage done to the resource of the species in the past. This should sound a note of caution to reduce fishing pressure on the juveniles so as to allow them to grow and reach at least the size at first maturity. In respect of the young fish landing also, *Lactarius lactarius* at Visakhapatnam received the highest rank, followed by *Megalaspis cordyla* at Calicut, *Trichiurus lepturus* at Vizhinjam, *Leiognathus bindus* at Calicut, *R. kanagurta* in Andamans, *Harpodon nehereus* at Varaval, *Oratosquilla nepa* at Mangalore and *Sardinella gibbosa* at Mandapam.

Published records furnish very little information on the seasons of abundance of the juveniles and young fishes. However, the available information shows that the fishery is

dominated by juveniles for the oil sardine during August-September and December in Karwar, in January at Mangalore and during August-February at Calicut; for *S. fimbriata* from August to May at Karwar and from July to May at Vizhinjam; for *S. sirm* during April-May at Vizhinjam; for *S. albella* from May-November at Mandapam; for *R. kanagurta* in April and September-November at Karwar; september-October at Manglore; in April, September-October at Calicut; during January-March and June-September at Cochin; in January, March, May-July and September-October in Andamans; and from June-November at Vizhinjam; for *T. lepturus* from April to July at Mandapam; August-June at Kakinada; for *E. muticus* from July to November at Kakinada; for *N. japonicus* from October to April at Cochin and during January-February at Visakhapatnam; for *N. mesoprion* in May and August at Kakinada; for *L. bindus* in April-May at Calicut and from July-May at Kakinada; for *L. jonesi* during March-April, June-August and October at Rameswaram (Mandapam); and for the Bombay duck from September-May along the Maharashtra-Gujarat coast.

A perusal of the literature on the biology and fishery of Indian major resources shows that the published records do not always furnish the primary data, particularly that of length frequency or monthly percentage occurrence of adults, juveniles and young fish as looked for the preparation of this account. Documentation of such basic information, it is hoped, would facilitate critical examination and evaluation of the status of the Indian fisheries by interested agencies.

Errata

MFIS No. 120, page 13, table 1, item 9, *Metapenaeopsis maxillipedo* may be read as *Metapenaeopsis stridulans*.

Page 16, table 2, item 9, *Metapenaeus stridulans* may be read as *Metapenaeopsis stridulans*.