

भारत सरकार  
महासागर विकास विभाग  
भारतीय कृषि अनुसंधान परिषद  
नई दिल्ली

LIBRARY OF CENTRAL MARINE FISHERIES  
RESEARCH INSTITUTE  
COCHIN-682 031, INDIA

**GOVERNMENT OF INDIA**  
**DEPARTMENT OF OCEAN DEVELOPMENT**  
**INDIAN COUNCIL OF AGRICULTURAL RESEARCH**  
**NEW DELHI**

एफ. ओ. आर. वी. सागर संपदा  
**F. O. R. V. SAGAR SAMPADA**

**CRUISE REPORTS**  
**CRUISES 51 - 60**  
**August 1988 - July 1989**



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## FOREWORD

The Fishery Oceanographic Research Vessel Sagar Sampada has continued regular fishery oceanographic cruises within the Exclusive Economic zone of India during the period under report (Aug. 1988 to July 1989). The vessel undertook 10 scientific cruises (Cruise Nos. 51 to 60), of which five were off the northeast coast, one off the southeast coast and four in the Andaman Sea. A total number of 186 oceanographic/fishing stations were occupied during this period.

This preliminary report gives the objectives of the cruises, areas, duration of coverage, station list indicating position, date, time and depth of individual stations covered during each cruise together with the preliminary observations on fishing operations, plankton, mesopelagic resources and environmental parameters.

I wish to express my sincere gratitude to the Department of Ocean Development, Government of India and the Indian Council of Agricultural Research for placing the Sagar Sampada at the disposal of CMFRI for conducting the scientific programmes of the vessel. My sincere thanks are due to the Shipping Corporation of India, the Masters, other officers and crew of SCI on board for efficiently running the vessel.

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I wish to place on record my appreciation of the work done by Shri G. Subbaraju, Shri K. Prabhakaran Nair, Dr. K.J. Mathew, Dr. N. Gopinatha Menon, Shri K.R. Manmadhan Nair, scientists and S/Shri N.P. Kunhikrishnan, P.M. Aboobaker, L.R. Khambadkar and M. Ayyappan Pillai technical staff of this Institute in compiling the information of each cruise.

My thanks are also due to all other scientific and technical staff, especially the Scientist-in-charge and members of the Sagar Sampada Technical Programme Committee (SSTPC) and the staff attached to the SSTPC at this Institute, the Officer-in-charge, Madras RC of CMFRI and the concerned staff especially Shri K.G. Girijavallabhan, Scientist (SG), other sister fisheries Institutes, Universities and Government Departments who have contributed in one way or other for the effective conduct of the cruise programmes of this vessel. The credit of typing the entire report goes to Mrs. V. Jayalakshmi.



DR. P.S.B.R. JAMES  
Director  
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FORV SAGAR SAMPADA

CRUISE NO.51

OBJECTIVES

: Survey of the demersal and pelagic resources of the Northeast coast, between 100m and 1000 m depth zones and the study of the seasonal variations on the oceanographic parameters.

AREA OF OPERATION

: 16°00'N to 20°30'N Lat.

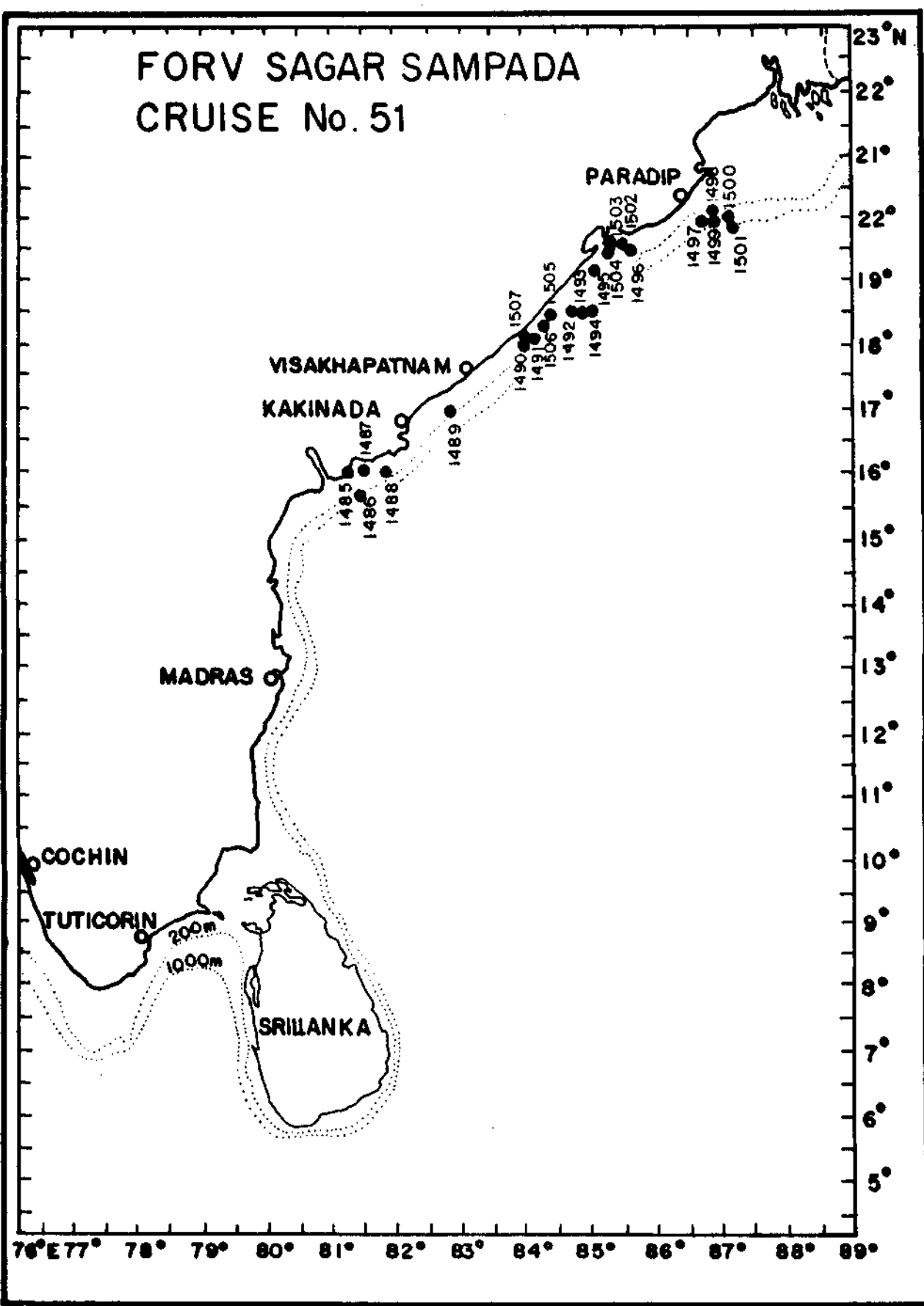
DURATION

: 30.8.1988 - 12.9.1988

COVERAGE:

- Track distance : 1975 Km
- Stations occupied: Nos. 1485 - 1507

# FORV SAGAR SAMPADA CRUISE No. 51



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STATION LIST  
CRUISE NO.51

Stn. No.	Position Lat.°N	Long.°E	Date	Time	Depth to Bottom (m)
1485	16°00'	81°21'	01.09.88	0700	103
1486	16°00'	81°30.3'	01.09.88	0900	200
1487	16°00'	81°31'	01.09.88	1145	500
1488	15°59.5'	81°52.2'	01.09.88	1600	1000
1489	16.58'	82°55'	02.09.88	1330	203
1490	18°02'	84°12.4'	03.09.88	0600	100
1491	18°2.5'	84°11.5'	03.09.88	1100	65
1492	18°29.5'	84°48'	03.09.88	1600	200
1493	18°29.5'	84°11.5'	03.09.88	1720	500
1494	18°31'	84°53'	03.09.88	1930	1000
1495	19°15'	85°12.6'	04.09.88	1000	68
1496	19°32'	85°46'	04.09.88	2030	100
1497	19°59.2'	86°53'	05.09.88	0810	100
1498	20°10'	87°00'	05.09.88	1100	50
1499	10°03'	87°09.5'	05.09.88	1340	200
1500	20°01.8'	87°12'	05.09.88	1500	500
1501	19°58'	87°20'	05.09.88	1720	1000
1502	19°35'	85°45'	06.09.88	0900	37
1503	19°28'	85°30'	06.09.88	1450	58
1504	19°24'	85°27'	06.09.88	1740	58
1505	18°24.5'	84°32'	07.09.88	0750	75
1506	18°16.3'	84°24.6'	07.09.88	1045	78
1507	18°07'	84°13.5'	07.09.88	1645	65

## OBSERVATIONS

### Fishing operations

Pelagic trawling: The mid water pelagic trawl was operated at 6 stations out of which fishes were caught only from <sup>one</sup> station (19°28'N 85°30'E) at 50 m depth; the catch (28 Kg) consisted of a cow-nose ray (20 Kg), besides seer fish, goat fish, lizard fish and Chirocentrus.

Bottom trawling: The bottom trawl was operated at six stations realising a total catch of 880 Kg. The catch rate ranged from 40 Kg. to 500 Kg./hr. The maximum catch rate was recorded at 19°15'N, 85°12'E from 65 m depth. Stationwise catch particulars are given in Table. Catfishes goat fishes and carangids contributed 18.8%, 14.6% and 14% respectively in the total catch; Pomadasys (9.4%), germids (4.7%), mackerel (4.4%), lizard fish (3.7%), Elacate niger (3.6%), silver bellies (3.3%) and sharks (4.6%) were also caught. The less common fishes in the catches were barracuda seer fishes, black pomfrets, and sea breams. Squids and cuttle fishes accounted for 1.6% of the total yield. A good collection of gorgonids and sponges were recorded at (18°07'N 84°13.5'E) at 62 m depth.

Zooplankton studies: Nineteen zooplankton samples were collected using Bongo-60 net within 16°20'10"N and 81°26'-87°27'E from a depth range of 25-100 m



Results of fishing operations  
(Cruise No. 51)

Stn. No.	Total catch (Kg)	Composition in percentage
1491	65	Sea bream (20%); <u>Upeneus</u> spp. (8%); Carangids (8%); gerrids (12%); mackerel (16%); Lizard fish (12%); other fishes (16%); squids (8%)
1495	500	Catfish (28%); <u>Upeneus</u> spp. (21%); Carangids (12.8%); gerrids (7%); <u>Rastrelliger kanagurta</u> (5.6%); <u>Pomadasys</u> sp. (5.6%); Sharks (6%); other fishes (14%)
1496	40	Cat fish (25%); Sharks (25%); Scieanids (10%); <u>Upeneus</u> spp. (7.5%); other fishes (32.5%)
1498	100	Carangids (28.5%); <u>Elacate niger</u> (25%); black pomfret (7%); lizard fish (5%); other fishes (32.5%) and squids (2%)
1502	150	<u>Pomadasys</u> spp. (26.4%); Carangids (15.8%); Cat fish (9.9%) <u>Upeneus</u> spp. (9.9%); silver bellies (9.9%); lizard fishes (5.9%); seer fish (4.6%); other fishes (17.6%)
1507	40	Barracuda (25%); sea bream (25%); carangids (6.2%); other fishes (28.3%); squids (12.5%); cuttlefish (3%)

LIST OF PARTICIPANTS

Dr. S. Lazarus	-Chief Scientist	CMFRI
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Shri S. Govindarajan		"
Shri V.P. Valsaraj		"
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Shri A.C. Kuttappan		CIFT
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Shri G.R. Ghogte		"
Shri P.A. John		"

ACKNOWLEDGEMENT

M.M.L.  
Capt./Dhingra was in command of the vessel.

The help and cooperation of the Master, Officers and crew of the vessel in carrying out the programmes is acknowledged.

FORV SAGAR SAMPADA

CRUISE NO. 52

OBJECTIVES

: To evaluate the fishing resources in the EEZ around the Andaman & Nicobar Islands and to study the seasonal variations in the oceanographic features of the inshore and offshore waters.

AREA OF OPERATION

: 6°45'N to 13°41'N Lat.

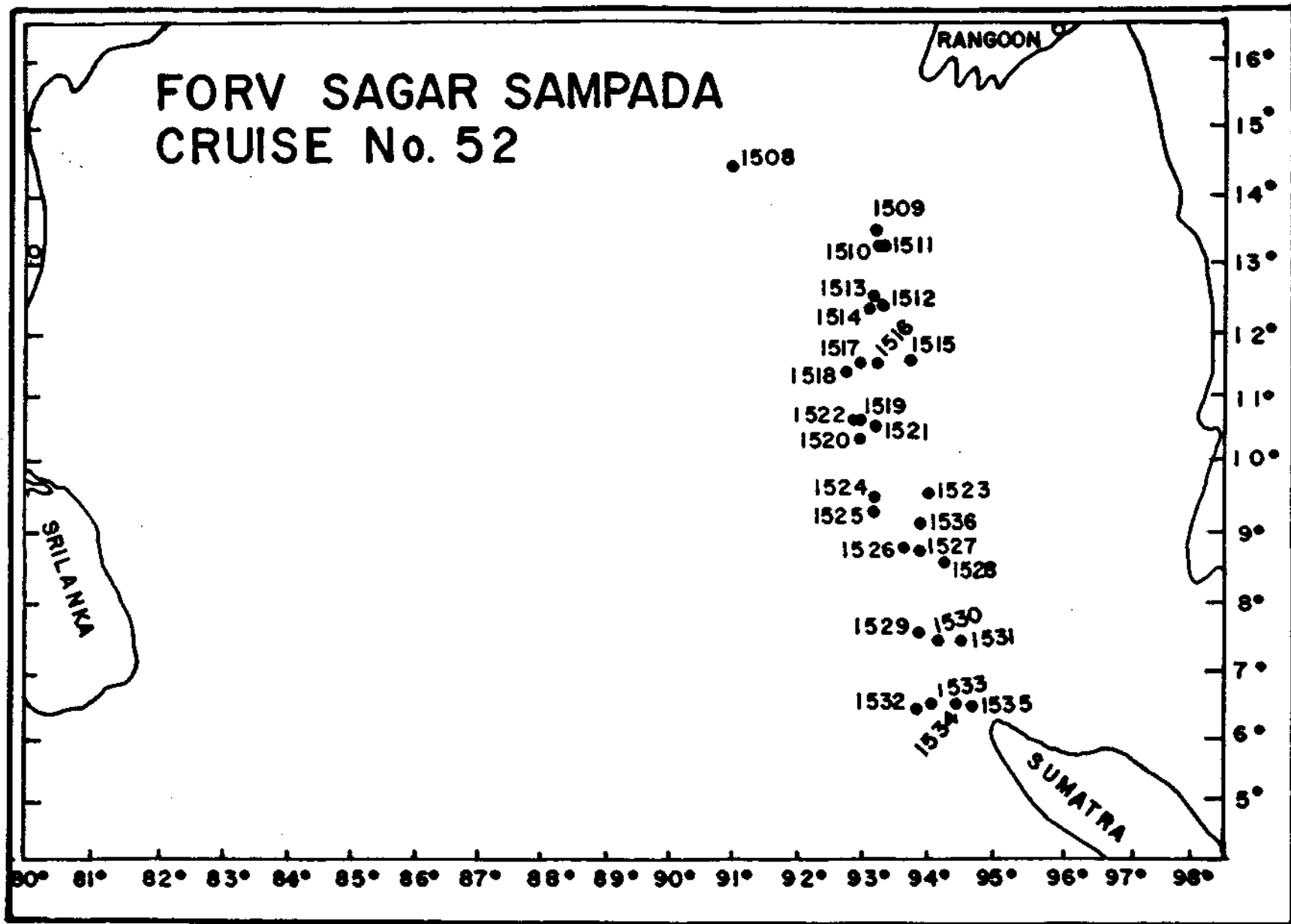
DURATION

: 16.9.1988 to 11.10.1988

COVERAGE:

- Track distance : 5020 Km
- Stations occupied : Nos. 1508 - 1536

# FORV SAGAR SAMPADA CRUISE No. 52



:- 7- :

STATION LIST  
CRUISE NO. 52

Stn. No.	Position		Date	Time		Depth to Bottom
	Lat. °N	Long. °E		From	To	
1508	14°30'	91°00'	20.9.88	0600	0800	2100
1509	13°37'	93°18'	21.9.88	1330	1530	492
1510	13°29'	93°12'	21.9.88	1745	1845	195
1511	13°30'	93°11'	21.9.88	1900	2000	108
1512	12°30'	93°22'	22.9.88	0500	0630	1300
1513	12°30'	93°15'	22.9.88	0800	0900	358
1514	12°30'	93°09'	22.9.88	1430	1530	84
1515	11°32'	93°43'	23.9.88	0500	0600	2000
1516	11°30'	93°05'	23.9.88	1100	1200	1000
1517	11°31'	92°57'	23.9.88	1400	1500	500
1518	11°26'	92°44'	23.9.88	1700	1900	575
1519	10°30'	92°42'	24.9.88	0500	0630	160
1520	10°27'	92°55'	24.9.88	0945	1145	1300
1521	10°30'	93°08'	24.9.88	1430	1715	1200
1522	10°31'	92°41'	24.9.88	2045	2115	100
1523	09°30'	94°00'	1.10.88	1200	1330	3000
1524	09°27'	93°16'	1.10.88	1500	1630	2500
1525	09°19'	93°11'	1.10.88	1900	2030	1600
1526	08°41'	93°37'	2.10.88	0730	0900	150
1527	08°40'	93°56'	2.10.88	1130	1300	1900
1528	08°35'	94°13'	2.10.88	1530	1730	2800
1529	07°29'	93°55'	3.10.88	0630	0830	800
1530	07°28'	94°13'	3.10.88	1100	1300	2000
1531	07°28'	94°30'	3.10.88	1530	1700	2500
1532	06°30'	93°52'	4.10.88	0600	0730	58
1533	06°30'	94°01'	4.10.88	0930	1100	2000
1534	06°33'	92°24'	4.10.88	1400	1530	2000
1535	06°32'	94°33'	4.10.88	1715	1800	2000
1536	09°14'	93°55'	5.10.88	1900	2000	315

OBSERVATIONS

Fishing operations:

Pelagic trawling: Pelagic trawl was operated at day time at 11 stations where the bottom depth range was 160-2000 m. The total yield from all the stations was less than 1Kg. comprised of a few specimens of Decapterus macrosoma, Selar malam and leptocephali of eels.

Zooplankton studies: Twentynine zooplankton samples were collected using Bongo-60 net along the east coast of Andaman and Nicobar Islands within 6°30'N - 14°30'N and 91°00'E - 94°33'E. Copepods, amphipods, chaetognaths, decapods, euphausiids, siphonophores and fish larvae were dominantly represented.

LIST OF PARTICIPANTS

Shri M. Kathirvel	Chief Scientist	CMFRI
Shri P. Livingston	"	"
Shri A. Chellam	"	"
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ACKNOWLEDGEMENT

M.M.L.

Capt./Dhingra was in command of the vessel.

The help and cooperation of the Master, Officers and crew of the vessel in carrying out the programmes is acknowledged.

FORV SAGAR SAMPADA

CRUISE NO. 53

OBJECTIVES

: Survey of demersal and pelagic resources of the North east coast and to study the seasonal variations on the oceanographic parameters.

AREA OF OPERATION

: 16°00'N to 20°30'N Lat.

DURATION

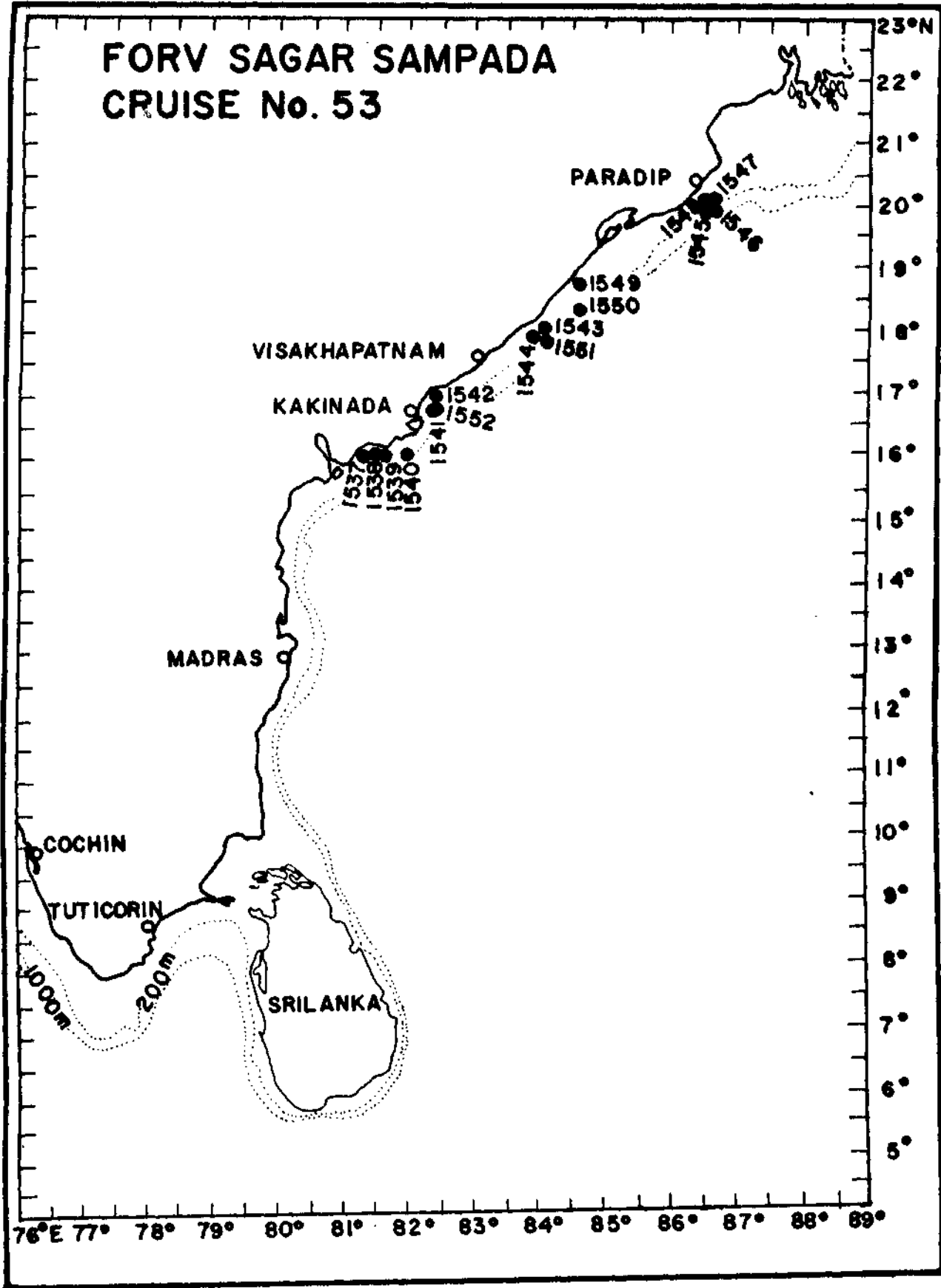
: 14.10.1988 to 27.10.1988

COVERAGE:

- Track distance : 2672 Km
- Stations occupied : Nos. 1537 - 1552



# FORV SAGAR SAMPADA CRUISE No. 53



STATION LIST  
CRUISE NO.53

Station No.	Position		Date	Time		Depth to Bottom
	Lat. °N	Long. °E		From	To	
1537	16°01'	81°27'	19.10.88	0645	0700	100
1538	16°26'	81°29'	19.10.88	0900	0925	200
1539	16°01'	81°37'	19.10.88	1230	1200	500
1540	16°00'	82°03'	19.10.88	1900	1920	1000
1541	16°50'	82°39'	20.10.88	1200	1220	200
1542	16°56'	82°31.5'	20.10.88	1650	1710	65
1543	18°02'	84°17'	21.10.88	1700	1725	100
1544	17°56'	84°10'	21.10.88	1900	1930	500
1545	19°50'	86°46.5'	23.10.88	0715	0745	1000
1546	19°54'	86°45'	23.10.88	0900	0920	500
1547	19°55'	86°44'	23.10.88	1100	1120	200
1548	19°54'	86°46'	23.10.88	1230	1245	100
1549	18°49'	84°47.5'	24.10.88	1100	1115	65
1550	18°26'	84°40'	24.10.88	1845	1900	125
1550 (a)	18°30'	84°43'	24.10.88	1730	1800	120
1551	17°53.5'	83°10'	25.10.88	1145	1200	92
1552	16°47'	82°42'	25.10.88	1800	1830	500

## OBSERVATIONS

### Fishing operations

Bottom trawling: Three types of bottom trawls, such as 32 m CIFT bobbin trawl, chalute model wing trawl and star model plastic bobbin trawl were operated at 6 stations (Table). The total yield was 1,486 Kg with a catch-per-hour of 405 Kg. The catch comprised mainly of Parastromateus niger (32.3%); Lutjanus sp. (28.6%), Pomadasys hasta (6.7%) Priacanthus hamrur (5.5%), seerfishes (4%), Pentaprion longimanus (4%), Epinephelus spp. (2%). Tachysurus thalassinus (1.4%) etc. Catch rates from stations where the depth was less than 100 m varied from 187 Kg to 1299 Kg, with a mean of 496 kg, whereas the catch rate from depth more than 100 m ranged from 56.5 to 166 kg, with an average of 111 kg. One significant result of bottom trawling during this cruise was the location of a rich ground for black pomfret (Parastromateus niger) and perches at 19°53.5'N 86°36.5'E.

Zooplankton studies: Zooplankton samples were collected using Bongo-60 net from 16 stations of the north east coast within 16°00'N-20°30'N and 81°27'E-86°46.5'E at depths ranging between 50 m and 200 m. The total displacement volume ranged from 22 ml to 49.7 ml. Abundance of zooplankton was observed to be more in deeper waters.

Results of fishing operations

Cruise No.53

Stn. No.	Total catch (Kg)	Composition in percentage
1541	32	<u>Priacanthus hamrur</u> (18.8%); <u>Synagrops adeni</u> (75%); Deep sea prawns (5.6%)
1543	50	<u>Pomadasys hasta</u> (20.6%); <u>Argyrops spinifer</u> (6.3%); <u>Gaterin sp.</u> (9.2%); <u>Sphyræna jello</u> (27.2%); <u>Rastrelliger kanagurta</u> (8.2%); <u>Caranx ignobilis</u> (5.1%); <u>Pristipomoides multidenas</u> (4.4%); <u>Upeneus moluccensis</u> (4.0%); <u>Sepia pharaonis</u> (4%)
1543	996	<u>Parastromateus niger</u> (48.2%); <u>Lutjanus johni</u> (35.1%); <u>L. guilcheri</u> (6%); <u>Megalaspis cordyla</u> (2.0%); <u>Scomberomorus commersoni</u> (2.5%); <u>S. guttatus</u> (1.5%)
1549	185	<u>Pomadasys hasta</u> (48.6%); <u>Epinephelus tauvina</u> (11.5%); <u>Argyrops spinifer</u> (8.6%); <u>Lutjanus guilcheri</u> (8.1%); <u>Caranx ignobilis</u> (8.1%); <u>Upeneus moluccensis</u> (5.4%)
1550	140	<u>Pentaprion longimanus</u> (42.8%); <u>Leiognathus bindus</u> (21.4%); <u>Rastrelliger kanagurta</u> (14.3%); <u>Caranx ignobilis</u> (5.7%)
1550 (a)	83	<u>Priacanthus hamrur</u> (90.4%); Deep sea prawn (6%)

LIST OF PARTICIPANTS

Shri G. Gopakumar	- Chief Scientist	CMFRI
Shri A.P. Lipton		"
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Shri R. Ravikumar		Madras Univ
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Shri S.K. Sajeev Kumar		"
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Shri K.K. Pappukutty		"

ACKNOWLEDGEMENT

Capt. M.M.L.Dhingra was in command of the vessel.

The help and cooperation of the Master, Officers and crew of the vessel in carrying out the programmes is acknowledged.

FORV SAGAR SAMPADA

CRUISE NO.54

OBJECTIVES

: To survey the demersal and pelagic resources of the northeast coast, and the study of the seasonal variations on the oceanographic parameters.

AREA OF OPERATION

: 16°00'N to 20°30' N Lat.

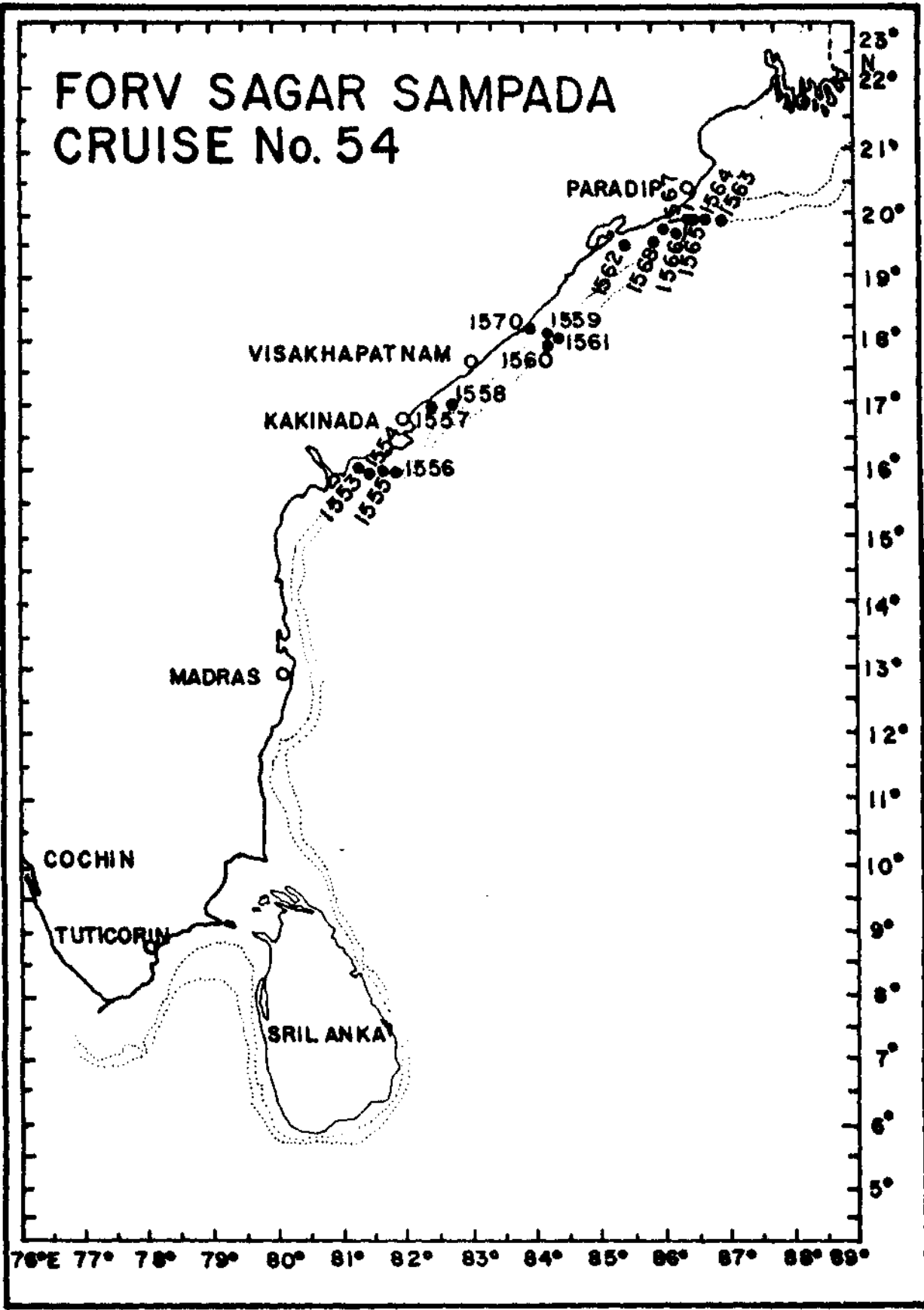
DURATION

: 1.11.1988 to 14.11.1988

COVERAGE:

- Track distance : 3120 Km
- Stations occupied : Nos. 1553 - 1570

# FORV SAGAR SAMPADA CRUISE No. 54



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STATION LIST  
CRUISE NO. 54

Station No.	Position		Date	Time		Depth to Bottom
	Lat. °N	Long. °E		From	To	
1553	16°00'	81°26'	4.11.88	0630	0700	100
1554	15°58'	81°30'	4.11.88	1100	1140	200
1555	15°58'	81°34'	4.11.88	1325	1400	500
1556	15°58'	81°45.5'	4.11.88	1715	1740	1000
1557	17°01.7'	82°33'	5.11.88	1205	1235	52
1558	17°05'	82°49'	5.11.88	1630	1700	86
1559	18°02'	84°14'	6.11.88	1100	1130	100
1560	17°58'	84°14'	6.11.88	1145	1215	500
1561	17°59'	84°20'	6.11.88	1340	1410	1000
1562	19°26'	85°32'	7.11.88	1800	1840	90
1563	19°52'	87°04'	8.11.88	0630	0700	1000
1564	19°53'	86°46'	8.11.88	1005	1040	500
1565	19°53'	86°41'	8.11.88	1115	1145	200
1566	19°53'	86°37'	8.11.88	1210	1240	100
1567	19°43'	86°19.5'	9.11.88	1730	1800	61
1568	19°43'	86°10'	10.11.88	0820	0900	38
1569	19°36'	86°04'	10.11.88	0630	0700	45
1570	18°04.8'	84°17.7'	11.11.88	0920	1000	90



## OBSERVATIONS

### Fishing operations

Bottom trawling: The bottom trawl was operated at 7 stations in the depth range of 36-90 m and obtained 1566 kg. of fishes at a catch rate of 247.4 kg./hour. The catch varied from 65.6 kg. to 682 kg. at different stations (Table). The fish catch comprised mainly of Decapterus russelli (32.6%), Tachysurus thalassinus (10.5%), Stolephorus spp. (96%), Priacanthus hamrur (8.2%), pomfrets (4.5%), Caranx spp. (3.5%) and Megalaspis cordyla (3.2%).

Zooplankton studies: Eighteen zooplankton samples were collected using Dongo-60 net from the east coast within the area 16°00'N-20°30'N and 81°26'E-87°04'E at a depth range of 20-200 m. Copepods, decapod larvae and chaetognaths were dominant plankters.

Results of Fishing operations

(Cruise No.54)

Bottom trawl

Station No.	Total catch (Kg)	Composition in percentage
1553	65	<u>Pampus argenteus</u> (33.8%); Rays (30.8%); <u>Sparus spinifer</u> (8%); <u>Caranx</u> spp. (11.2%); Clupeids (6.7%); Silver bellies (3%); <u>Otolithus cuvieri</u> (3%)
1557	60	<u>Upeneus sulphureus</u> (25%); Ribbon fish (21.7%); <u>Nemipterus japonicus</u> (16.7%); <u>Saurida</u> sp. (14.5%); <u>Dussumieria acuta</u> (5%); Puffer fish (3.3%); silver bellies (3.3%); <u>Priacanthus hamrur</u> (3%); <u>Loligo duvaucelli</u> (2.5%); <u>Caranx</u> spp. (3.3%)
1558	111	<u>Priacanthus hamrur</u> (24.3%); <u>Pomadasys hasta</u> (19.5%); <u>Upeneus sulphureus</u> (18%); <u>Decapterus russelli</u> (9%); <u>Tachysurus thalassinus</u> (8.1%); <u>Psenes indicus</u> (7.7%); <u>Saurida tumbil</u> 7.2%; <u>Lutjanus argentimaculatus</u> (6.8%)
1559	156	<u>Ambassis</u> sp. (51.3%); <u>Tachysurus thalassinus</u> (13.5%); <u>Lutjanus argentimaculatus</u> (6.5%); <u>Epinephelus tauvina</u> (6.5%); <u>Caranx malabaricus</u> (6.4%); <u>Lutjanus rivulatus</u> (4.8%); <u>Sparus spinifer</u> (4.5%) and <u>Sepia</u> (4.5%)
1562	682	<u>Decapterus russelli</u> (73.3%); <u>Priacanthus hamrur</u> (14.7%); Threadfin bream (3.7%); <u>Tachysurus thalassinus</u> (2.2%); Oil sardine (1.5%); <u>Saurida tumbil</u> (1.5%); <u>Upeneus sulphureus</u> (1.5%); <u>Psenes indicus</u> (1.5%)
1567	65.6	<u>Tachysurus thalassinus</u> (28.2%); shark (21.3%); <u>Leiognathus lineolatus</u> (11.3%); <u>L. bindus</u> (9.1%); <u>Pomadasys hasta</u> (6.4%); <u>Upeneus sulphureus</u> (4.5%); <u>Sphyræna obtusata</u> (3.8%); <u>Caranx malabaricus</u> (2.4%); <u>Parastromateus niger</u> (2.2%); electric ray (2.2%); <u>Saurida</u> spp. (3.6%); <u>Loligo duvaucelli</u> (4.5%)
1568	425	<u>Stolephorus betaviensis</u> (35.3%); <u>Tachysurus thalassinus</u> (23.5%); <u>Upeneus sulphureus</u> (11.8%); <u>Megalaspis cordyla</u> (11.8%); <u>Caranx malabaricus</u> (7%); <u>C. kalla</u> (1.2%); <u>Sparus spinifer</u> (3.5%); <u>Lactarius lactarius</u> (2.3%); rays (1.2%)

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ACKNOWLEDGEMENT

Capt. M.M.L.Dhingra was in command of the vessel.

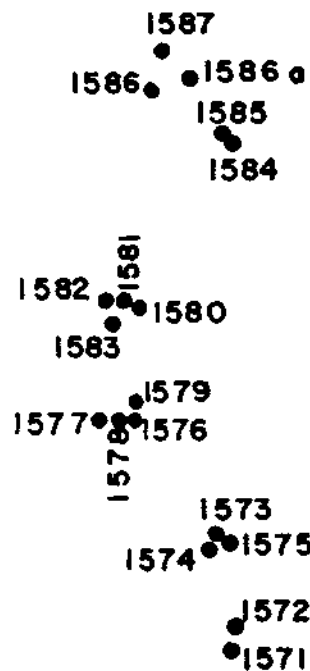
The help and cooperation of the Master, Officers and crew of the vessel in carrying out the programmes is acknowledged.

# FORV SAGAR SAMPADA CRUISE No. 55

MADRAS

SRI LANKA

SUMATRA



80° 81° 82° 83° 84° 85° 86° 87° 88° 89° 90° 91° 92° 93° 94° 95° 96° 97° 98° 99°

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STATION LIST

CRUISE NO.55

Station No.	Position		Date	Time		Depth to Bottom(m)
	Lat. °N	Long. °E		From	To	
1571	06°45'	94°01'	30.11.88	0555	0900	1200
1572	07°01'	94°01'	30.11.88	1335	1555	1000
1573	08°02'	93°40'	01.12.88	0615	0645	50
1574	07°59'	93°43'	01.12.88	0805	1045	1100
1575	07°59'	93°51'	01.12.88	1400	1425	2200
1576	09°18'	92°51'	02.12.88	0630	0655	148
1577	09°18'	92°36'	02.12.88	1015	1205	760
1578	09°18'	92°42'	02.12.88	1400	1630	46
1579	09°21'	92°55'	02.12.88	1655	1715	330
1580	10°30'	92°49'	10.12.88	0800	1005	1250
1581	10°29'	92°40'	10.12.88	1105	1130	108
1582	10°28'	92°36'	10.12.88	1350	1420	74
1583	10°23'	92°29'	10.12.88	1600	1620	259
1584	12°12'	93°51'	11.12.88	1535	1605	700
1585	12°18'	93°46'	11.12.88	1745	1810	1600
1586	12°57'	93°02'	12.12.88	0800	1000	119
1587	13°29'	93°13'	12.12.88	1750	1820	310

OBSERVATIONS

Fishing operations

Bottom trawling: The bottom trawl was operated only at a single station at 119m depth which yielded a total catch of 150 kg of fishes: Protonebes diacanthus and Rhyncobatus ancylostomus formed 33% each in the total catch.

Station No.	Total catch (Kg)	Composition in percentage
1586	150	<u>Protonebes diacanthus</u> (33.3%); <u>Epinephelus tauvina</u> (8.7%); <u>Scoliodon laticaudus</u> (9.3%); <u>Rhyncobatus ancylostomus</u> (33.3%); <u>Caranx spp.</u> (2%); <u>Miscellaneous</u> (13%)

Zooplankton studies: Seventeen zooplankton samples were collected using Bongo-60 net from the Andaman sea within 06°45'N-13°29'N and 92°29'E-94°01'E at a depth range of 40-150 m. The displacement volumes of zooplankton were high, ranging between 90 ml and 300 ml, with the maximum near Barrin Island. The major components of the samples were Sagitta sp., copepods and lucifers. Large number of cephalopod larvae was encountered in station No. 17 and eel larvae in station Nos. 14 and 15.

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Shri K.K. Pappukutty		"
Shri K.B. Thilakan		"

ACKNOWLEDGEMENT

Capt. M.M.L. Dhingra was in command of the vessel.

The help and cooperation of the Master, Officers and crew of the vessel in carrying out the programmes is acknowledged.

FORV SAGAR SAMPADA

CRUISE NO. 56

OBJECTIVES

: To evaluate the fishery resources around Andaman and Nicobar Islands and to study the seasonal variations in the oceanographic features of the inshore and offshore waters.

AREA OF OPERATION

: 06°45'N to 13°41'N Lat.

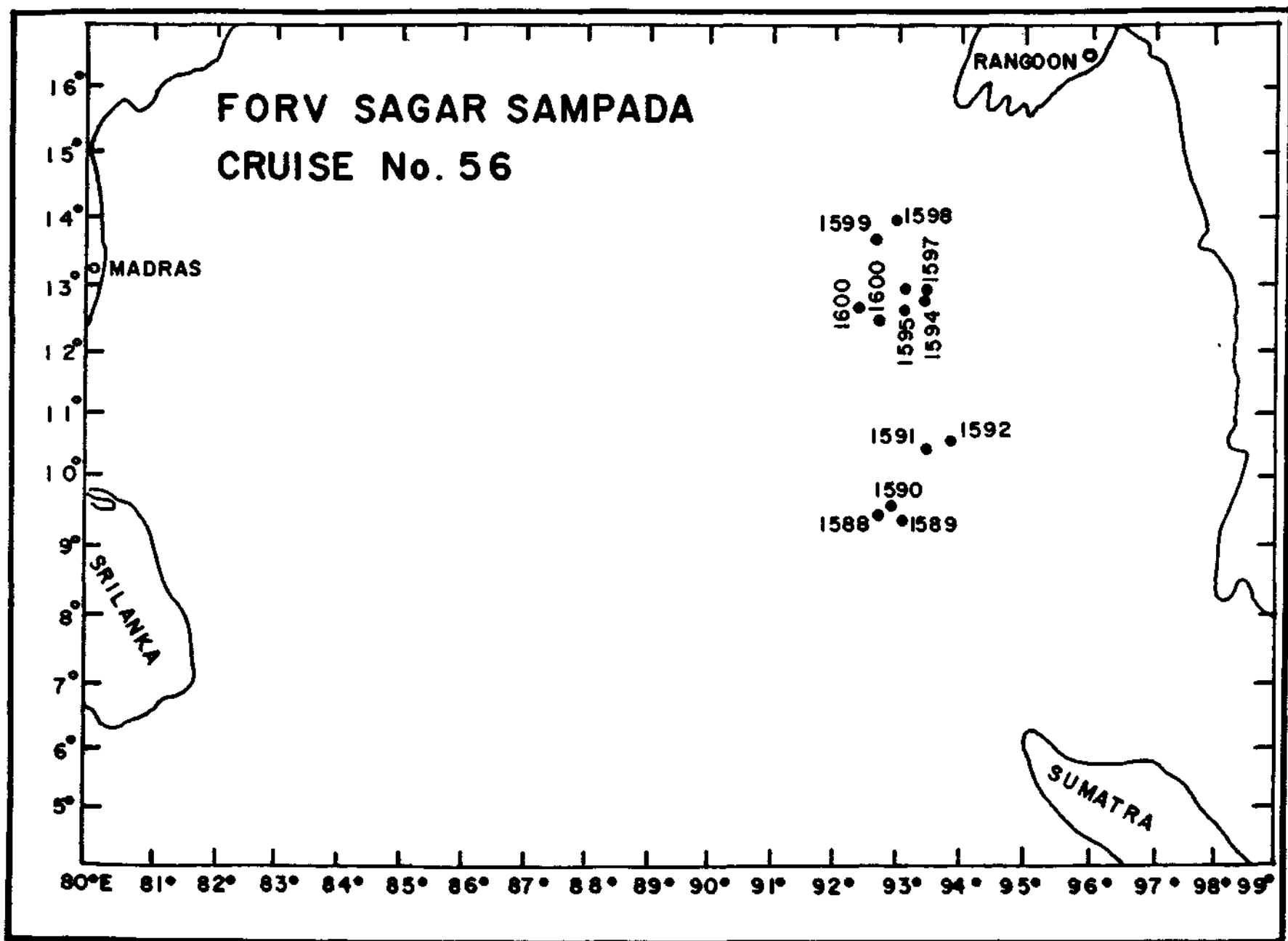
DURATION

: 28.12.1988 to 12.1.1989

COVERAGE:

- Track distance : 4066 Km
- Stations occupied : Nos. 1588 - 1600





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STATION LIST

CRUISE NO.56

Station No.	Position		Date	Time		Depth to Bottom
	Lat. °N	Long. °E		From	To	
1588	09°25'	92°25'	02.01.89	0900	1100	660
1589	09°22'	93°05'	02.01.89	1730	1930	1010
1590	10°28'	92°44'	03.01.89	0500	0700	1010
1591	10°30'	93°24'	03.01.89	1130	1330	2100
1592	10°33'	93°51'	03.01.89	1830	2030	3421
1593	OPERATION SUSPENDED		05.01.89	1900	1910	-
1594	12°49'	93°23'	06.01.89	0500	0700	1760
1595	12°42'	93°05'	06.01.89	1030	1230	107
1596	12°56'	93°03'	06.01.89	1525	1725	131
1597	12°58'	93°17'	06.01.89	1900	2100	751
1598	13°54'	92°53'	07.01.89	1315	1515	741
1599	13°42'	92°34'	07.01.89	1830	2030	817
1600	12°43'	92°17'	08.01.89	0430	0600	609
1600 (a)	12°31.5'	92°33.5'	08.01.89	1100	1300	78

OBSERVATIONS

Fishing operations

Bottom trawling: Bottom trawl was operated at three stations and the total catch was 140 kg. perches like Lethrinus, Lutjanus, Acanthurus and Epinephelus formed the major catch (74%) followed by Decapterus curriodus (7.4%) and other fishes (18.6%).

Zooplankton studies: Eleven zooplankton samples were collected using Bongo-60 net within 9°22'N-13°54'N and 92°17'E-93°51'E at 50-100 m depth range. The displacement value ranged ~~ranged~~ from 11 ml to 240 ml the highest being at station No. 1600 (12°40'N/92°17'E). The zooplankters in the value of abundance, were copepods, amphipods, chaetognaths euphausiids, ostracods, lucifer, ~~etenophores~~, fish eggs and larvae, cephalopod larvae, mysids, alima larvae, Salpa, Porpita, zoea of crab, Doliolum and phyllosoma larvae.

Results of Fishing operations

(Cruise No. 56)

Bottom trawl

Station No.	Total catch (Kg)	Composition in percentage
1595	3	<u>Nemipterus mesoprion</u> (14.8%); <u>Abalistes stellatus</u> (28.4%); <u>Seriolina microfaciata</u> (20.4%); <u>Dactyloptera peterseni</u> (9.1%); <u>Ostracion</u> sp. (3 %); <u>Sepia</u> sp. (19.9%)
1596	11	<u>Decapterus kurroides</u> (96.2%); <u>Nemipterus mesoprion</u> (3.8%)
1600 (a)	126	<u>Lethrinus microdon</u> (34.2%); <u>Lutjanus gilcheri</u> (17.5%); <u>L.bohar</u> (4.3%); <u>Acanthurus bleekeri</u> (10.2%); <u>Pomadasys</u> sp. (4.5%); <u>Pristipomoides filamentus</u> (4%); <u>Naso hexacanthus</u> (3.9%); <u>Alutera monoceros</u> (4%); <u>Epinephelus</u> sp. (3.3%); <u>Upenoids moluccensis</u> (2.5%); <u>Pentaprion longimanus</u> (1.8%); <u>Carangoides</u> (1.2%); Silver bellies (1.5%); <u>Platax</u> sp. (2.1%); <u>Priacanthus</u> sp. (0.3%); Loligo (0.3%)

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LIST OF PARTICIPANTS

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Shri A.K. Sajeev Kumar		"
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Shri P.K. Pushpangathan		"
Shri D.G. Rao		"

ACKNOWLEDGEMENT

The help and cooperation of the Master, Officers and crew of the vessel in carrying out the programme is acknowledged.

FORV SAGAR SAMPADA

CRUISE NO. 57

OBJECTIVES

: Survey of the demersal and pelagic resources of the North east coast upto 1000 m depth in the EEZ and to study the seasonal variations in oceanographic parameters.

AREA OF OPERATION

: 16°00'N to 20°30'N Lat.

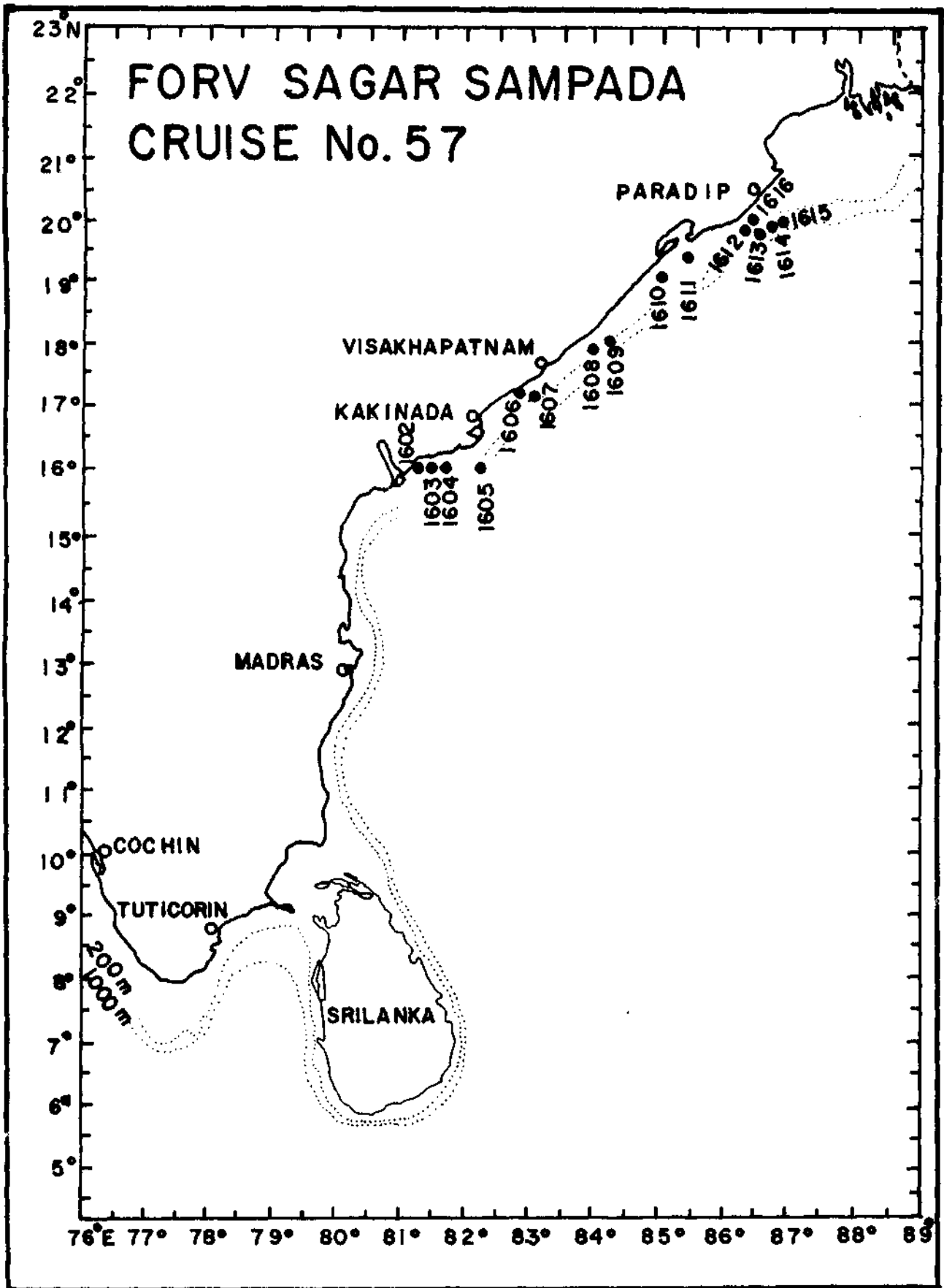
DURATION

: 17.1.1989 to 30.1.1989

COVERAGE:

- Track distance : 2494 Km

- Stations occupied : Nos. 1601 - 161<sup>5</sup>



STATION LISTCRUISE NO.57

Station No.	Position		Date	Time		Depth to Bottom (m)
	Lat. °N	Long. °E		From	To	
1601	16°00'	81°24'	20.01.89	0545	0610	101
1602	16°00'	81°28.3'	20.01.89	0745	0855	200
1603	16°01'	81°36'	20.01.89	0955	1125	530
1604	16°02'	82°14'	20.01.89	1610	1635	1100
1605	17°14'	82°51'	21.01.89	0755	1035	58
1606	17°04'	83°07'	21.01.89	1650	1745	205
1607	18°02'	84°03.5'	22.01.89	0905	1125	67
1608	18°01'	84°22'	22.01.89	1330	1445	1100
1609	19°05'	85°09'	23.01.89	0845	1210	84
1610	19°20'	85°29'	23.01.89	1630	1725	205
1611	19°52'	86°31'	24.01.89	0855	1040	39
1612	19°53'	86°37'	24.01.89	1315	1355	112
1613	19°55'	86°45'	24.01.89	1515	1610	506
1614	19°55'	86°55'	24.01.89	1730	1850	940
1615	19°50'	86°31'	25.01.89	1500	1655	56



## OBSERVATIONS

### Fishing operations

Bottom trawling: Bottom trawl was operated at 5 stations with a total catch of 2,238 Kg. of fishes, prawns, crabs and cephalopods. The highest catch of 1992 kg. was recorded at 19°05'N, 85°05'E from the depth of 84 m. In the total landings Psenes indicus formed 53% and the next dominant component was Upeneus sulphurus (10%) followed by Sphyraena jello (9.8%), Lepturacanthus savala (5.3%), Lutjanus johnii (3.7%), Salaroides leptolepis (3.3%) and a wide variety of other fishes (8.7%). The bottom trawl operations indicated good grounds for Psenes indicus and Lutjanus johnii around 19°N and 18°N at depths of 80-85 m and 60-70 m respectively.

Zooplankton studies: Fifteen zooplankton samples were collected using Bongo-60 net off the east coast of India within 16°00'N-20°30'N and 81°24'E-86°28'E from 15-100 m depth. The volume of zooplankton biomass was minimum around 16°N in the oceanic waters and maximum around 20°00'N in the shelf waters ranging from 16.8 ml to 184.6 ml. In general zooplankton volume was found to increase progressively from 16°N to 20°N; with the maximum between 18°N and 20°N in the shelf and beyond to shelf edge in the oceanic region of EEZ. Copepods, chaetognaths and siphonophores were the major constituents. Other groups encountered were polychaetes, appendicularians, ostracods, mysids, salps, lucifers,

doliobids, pteropods, b. eteropods, gastropods, decapods,  
euphausiids and fish eggs and larvae.

Results of Fishing operations  
(Cruise No.57)

Bottom trawl

Station No.	Total catch (Kg)	Composition in percentage
1605	33	<u>Priacanthus hamrur</u> (26.2%); <u>Elasmobranchs</u> (16.8%); <u>Rastrelliger kanagurta</u> (12.2%); <u>Parastromateus niger</u> (9.2%); <u>Saurida sp.</u> (7.5%); <u>Decapterus russelli</u> (6%); <u>Lepturacanthus savala</u> (4.5%); <u>Sphyraena obtusata</u> (3.1%); <u>Seriolina sp.</u> (3.1%); <u>Tachysurus thalassinus</u> (1.7%)
1607	163	<u>Lutjanus johnii</u> (50.9%); <u>L. malabaricus</u> (2.6%); <u>Rastrelliger brachysoma</u> (24.6%); <u>Pomadasys hasta</u> (6.8%); <u>Epinephelus tauvina</u> (2.3%); <u>Argyrops spinifer</u> (2.5%); <u>Upeneus moluccensis</u> (3.1%); <u>Caranx sp.</u> (3.3%); <u>Psenes indicus</u> (1.3%)
1609	1992	<u>Psenes indicus</u> (59.3%); <u>Sphyraena jello</u> (11%); <u>Upeneus sulphureus</u> (11.1%); <u>Lepturacanthus savala</u> (5.5%); <u>Selaroides leptolepis</u> (3.7%); <u>Nemipterus japonicus</u> (2.3%); <u>Argyrops spinifer</u> (1.8%); <u>Pomadasys hasta</u> (1.5%); <u>Tachysurus thalassinus</u> (1.9%); <u>Priacanthus hamrur</u> (0.4%); <u>Acropoma japonicum</u> (0.5%)
1611	45	<u>Pampus argenteus</u> (31.5%); <u>Gazza achalmys</u> (22.8%); <u>Parastromateus niger</u> (10.4%); <u>Lepturacanthus savala</u> (16.9%); <u>Upeneus sulphureus</u> (4.5%); <u>Pomadasys hasta</u> (5%); <u>Saurida sp.</u> (2.2%)
1615	5	<u>Nemipterus japonicus</u> (30%); <u>Rastrelliger brachysoma</u> (30%); <u>R. kanagurta</u> (20%); <u>Upeneus sulphureus</u> (10%); <u>Tachysurus thalassinus</u> (10%)

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ACKNOWLEDGEMENT

The help and cooperation of the Master, Officers and crew of the vessel in carrying out the programme is acknowledged.

FORV SAGAR SAMPADA

CRUISE NO. 58

OBJECTIVES

: Survey of the pelagic and demersal fishery resources of the EEZ off the north east coast between 100 m and 1000 m depth zones and study of the variations in the physical, chemical and biological oceanographic parameters of the inshore and offshore waters.

AREA OF OPERATION

: 16°00'N to 20°30'E

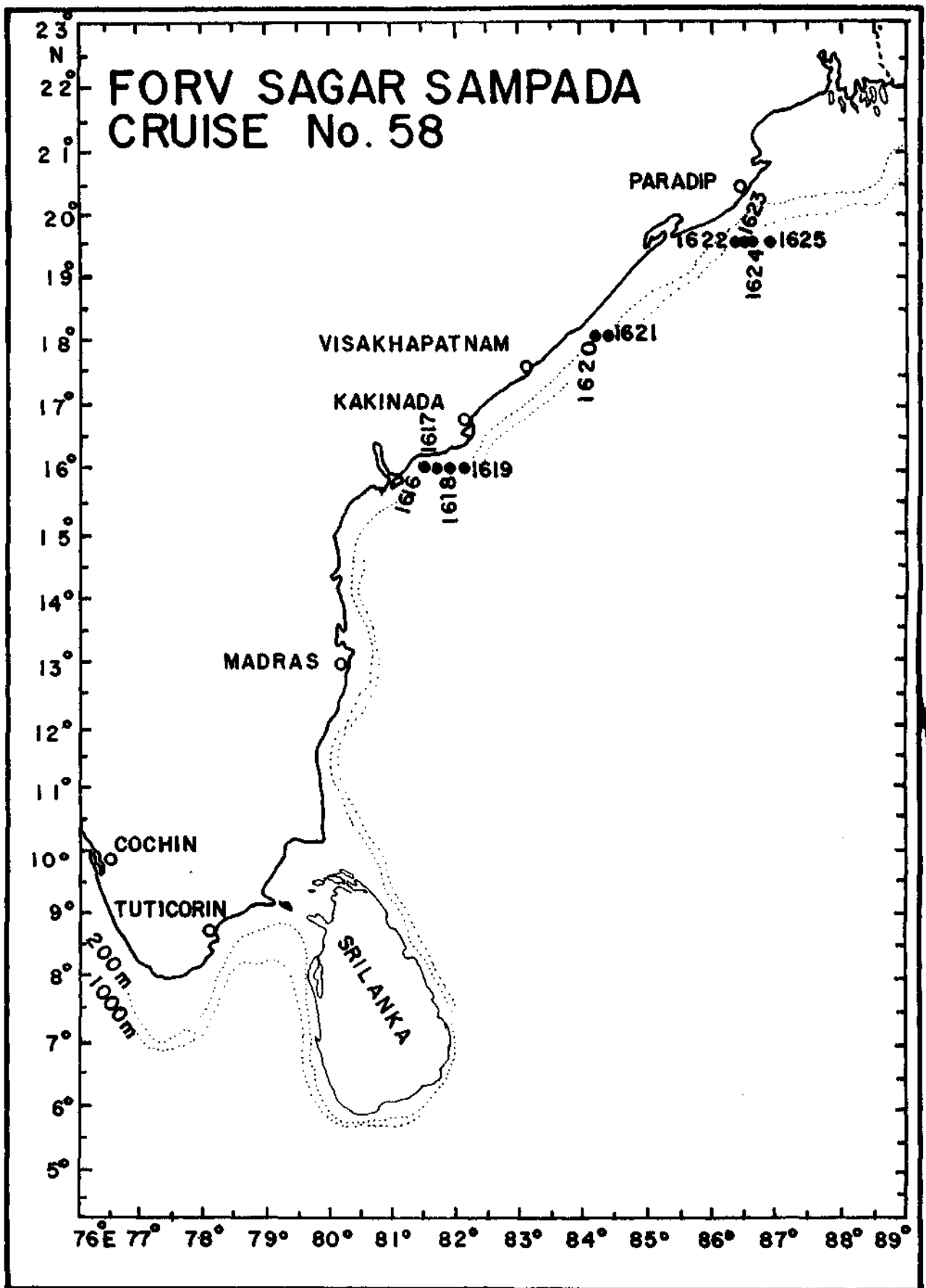
DURATION

: 3.2.1989 to 15.2.1989

COVERAGE:

- Track distance : 5154 Km

- Stations occupied : Nos. 161~~6~~ - 162~~6~~ (e)



STATION LIST

CRUISE NO. 59

Station No.	Position		Date	Time	Depth to Bottom (m)
	Lat. °N	Long. °E			
1616	16°04'	81°31'	05.02.89	1935	100
1617	16°04.5'	81°36'	05.02.89	2125	200
1618	16°03'	81°55'	06.02.89	0115	800
1619	16°01'	82°10'	06.02.89	0400	1000
1620	18°01'	84°17'	07.02.89	1100	250
1621	18°02'	84°23'	07.02.89	1340	1000
1621 (a)	19°19'	85°15'	08.02.89	1420	62
1622	19°51'	86°34'	09.02.89	0655	100
1623	19°51'	86°40'	09.02.89	0845	235
1624	19°51'	86°47'	09.02.89	1130	558
1625	19°49'	87°01'	09.02.89	1330	1000
1625 (a)	19°47'	86°25'	10.02.89	0810	68
1625 (b)	19°30'	85°36'	10.02.89	1715	65
1625 (c)	19°22'	85°03'	11.02.89	0745	65
1625 (d)	19°08'	85°19.5'	11.02.89	1600	65
1625 (e)	18°01'	84°07'	12.02.89	0900	64

## OBSERVATIONS

### Fishing operations

Bottom trawling: Bottom trawl was operated at 8 stations in the depth of 62-68 m with a total catch of 19,350 kg. The average catch rate was 2,419 kg/hr. The highest catch of 15,000 kg was recorded from 19°19'N, 85°15'E in 62 m depth. In the total landings Penaeus indicus was the most dominant component contributing about 50% of the total catch. The next dominant fish was Decapтерus russelli (24.5%) followed by Tachysurus thalassinus (8.5%), Decapтерus dayi (4.6%), Trichiurus spp. (2.6%), Upeneus spp. (1.7%), Argyropes spinifer (1.6%) and Priacanthus spp. (0.8%). The remaining 5.7% of the catch consisted of a wide variety of demersal fishes.

Zooplankton studies: Ten zooplankton samples were collected using Bongo-60 net within 16°01'-19°51'N and 81°01'E-86°46'E. The depth of collection ranged from 75 m to 200 m. The plankton volume ranged from 45 ml to 98.2 ml. Copepods, siphonophores, euphausiids, chaetognaths, amphipods, decapods, pteropods, salps and medusae were the common groups.



Results of Fishing Operations

(Cruise No.58)

Bottom trawl

Station No.	Total Catch (Kg)	Composition in percentage
1626	600	<u>Sphyraena bleekeri</u> (10%); <u>Lutianus malabaricus</u> (8.8%); <u>Pomadasys hasta</u> (7.5%); <u>Lutianus johnii</u> (6.3%); <u>Plectorhynchus lineatus</u> (6.3%); <u>Epinephelus tauvina</u> (6.3%); <u>Caranx crumnotthalmus</u> (6.3%); <u>Sphyraena obtusata</u> (5%); <u>Upeneus sulphureus</u> (5%); <u>Plectorhynchus diagramma</u> (5%); <u>Tachysurus thalassinus</u> (3.8%); <u>Pentaprion longimanus</u> (3.3%); <u>Argyrops spinifer</u> (2.5%); <u>Decapterus russelli</u> (2.5%); <u>Rastrelliger kanagurta</u> (2.5%); <u>Katsuwonus pelamis</u> (2%); <u>Decapterus rdayi</u> (1.3%); <u>Euthynnus affinis</u> (1.3%); <u>Psenes indicus</u> (1%)
1621(a)	15,000	<u>Psenes indicus</u> (50%); <u>Decapterus russelli</u> (30%); <u>Tachysurus thalassinus</u> (10%); <u>Decapterus dayi</u> (5%); <u>Upeneus vittatus</u> (2%); <u>Priacanthus hamrur</u> (1%)
1625(a)	800	<u>Lepturacanthus savala</u> (61.6%); <u>Psenes indicus</u> (35%); <u>Priacanthus hamrur</u> (1%); <u>Tachysurus thalassinus</u> (1.1%); <u>Decapterus sp.</u> (0.6%)
1625(b)	300	<u>Tachysurus thalassinus</u> (33.3%); <u>Nemipterus mesoprion</u> (31.7%); <u>Psenes indicus</u> (8.3%); <u>Upeneus vittatus</u> (1.7%);
1625(c)	2,000	<u>Psenes indicus</u> (90%); <u>Decapterus spp.</u> (7.5%); <u>Tachysurus thalassinus</u> (0.5%); <u>Stromateus spp.</u> (1%)
1625(d)	400	<u>Argyrops spinifer</u> (75%); <u>Psenes indicus</u> (12.5%); <u>Trygon sp.</u> (5%); <u>Epinephelus tauvina</u> (2.5%); <u>Tachysurus thalassinus</u> (1.3%); <u>Caranx malabaricus</u> (1.3%)
1625(e)	250	<u>Decapterus russelli</u> (72%); <u>D. dayi</u> (8%); <u>Psenes indicus</u> (16.8%); <u>Priacanthus hamrur</u> (0.8%)

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LIST OF PARTICIPANTS

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Shri Sunney Cherian		"
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Shri B.V.S.R. Murthy		Andhra Univ.
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Shri D. Sridhar		Madras Univ.
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Shri R. Balakrishnan		"
Shri R. Ayyappan		"
Shri Rajendran		"
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ACKNOWLEDGEMENT

Capt. S.K. Ghosh was in command of the vessel.

The help and cooperation of the Master, Officers and crew of the vessel in carrying out the programme is acknowledged.

FORV SAGAR SAMPAD

CRUISE NO. 59

OBJECTIVES

: Survey of the demersal and pelagic resources of the southeast coast between 100 m and 1000 m depth zones and study of the seasonal variations in the oceanographic parameters.

AREA OF OPERATION

: 10°30'N to 16°00'N Lat.

DU RATION

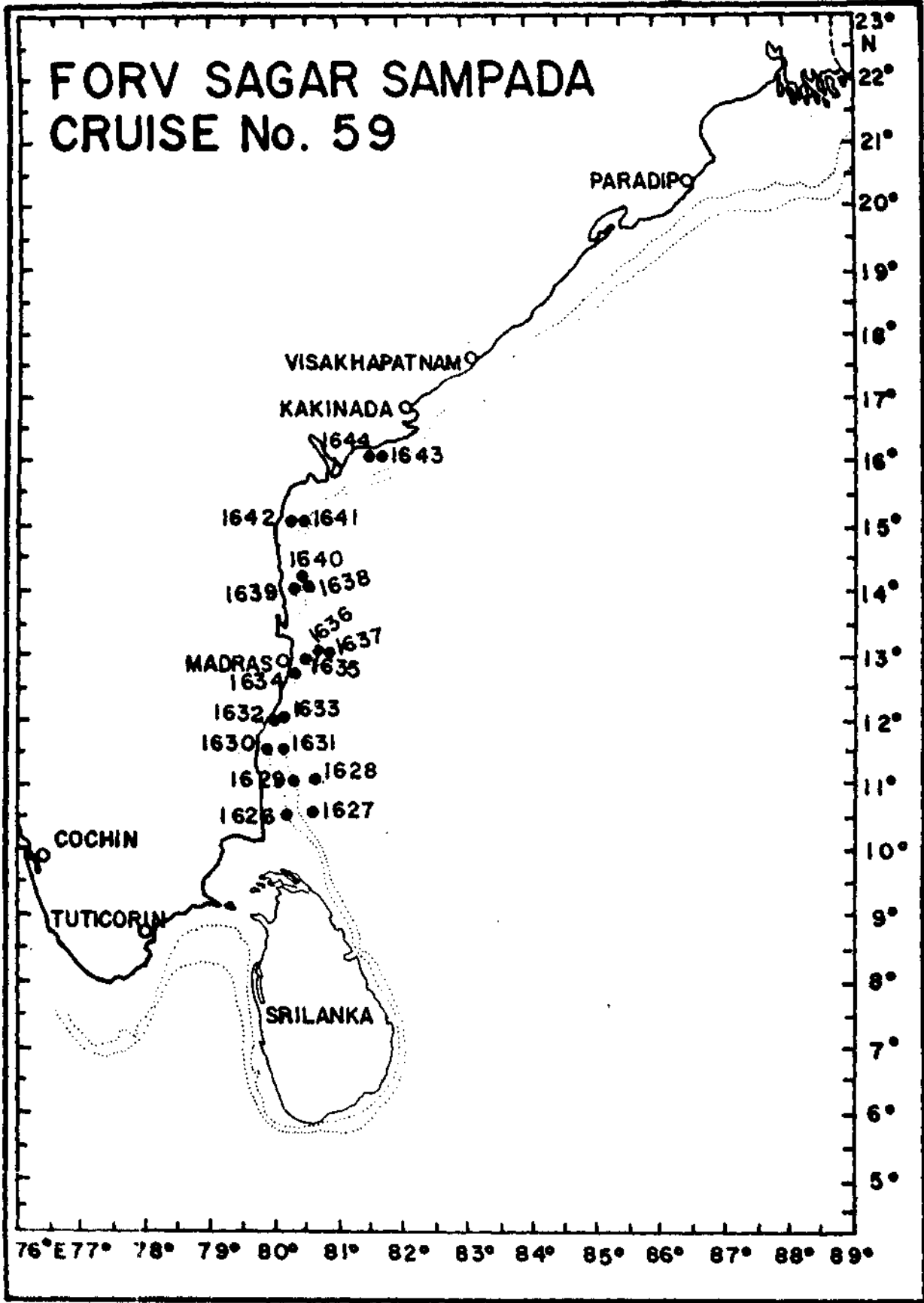
: 21.6.1989 to 29.6.1989

COVERAGE:

- Track distance :

- Stations occupied : Nos. 1627 - 1644

# FORV SAGAR SAMPADA CRUISE No. 59



STATION LISTCRUISE NO.59

Station No.	Position		Date	Time	Depth to Bottom (m)
	Lat. °N	Long. °E			
1626	10°30'	80°14'	22.06.89	1115	92
1627	10°30'	80°36'	22.06.89	1600	786
1628	11°02'	80°39'	23.06.89	0600	1768
1629	11°00'	80°14'	23.06.89	1050	201
1630	11°30'	79°58'	23.06.89	1735	100
1631	11°30'	80°07'	23.06.89	1815	825
1632	12°04'	80°10'	24.06.89	0630	1240
1633	12°02'	80°09'	24.06.89	0820	225
1634	12°41'	80°23'	24.06.89	1445	50
1635	13°02'	80°31'	24.06.89	1640	92
1636	13°03'	80°37'	24.06.89	1800	200
1637	13°05'	80°45'	24.06.89	1945	650
1638	14°06'	80°32'	25.06.89	0600	1200
1639	14°06'	80°26'	25.06.89	0600	200
1640	14°11'	80°22'	25.06.89	1210	100
1641	15°02'	80°29'	25.06.89	1700	1000
1642	15°02'	80°22'	25.06.89	2045	165
1643	16°04'	81°41'	26.06.89	0700	1329
1644	16°00'	81°32'	26.06.89	1945	222

## OBSERVATIONS

### Fishing operations

Bottom trawling: Bottom trawl operations in 55-161 m depth ranges at four stations yielded a total catch of 1130 kg. with an average catch rate of 377 kg/hr. The total catch from the station 10°30'N, 80°14'E by 30 minutes trawling yielded 200 kg; Pomadasys spp. formed 60% of the catch followed by Decapterus macrosoma (8%). Lethrinus spp. (4%), miscellaneous fishes (12%) and cephalopods (16%). A significant observation was the occurrence of 10 number of maturing oil sardine from the depth of about 100 m. Another half an hour operation at 11°00'N 80°09'E in 82 m depth caught only 30 kg of fishes composed of perches, Decapterus and Saurida. One hour trawling at 12°41'N 80°23'E (depth 58 m) landed 600 kg. of fishes comprised of Carangoides spp. (25%), Lutjanus spp. (17%) sharks and rays (22%), Epinephelus spp. (7%) and other fishes (29%). Operation at 14°11'N 80°22'E produced a catch of 300 kg/hr, about 80% of which consisted of Lethrinus spp and Lutjanus spp.

Only a single pelagic trawl operation was made at 15°02'N 80°22'E in the depth of 180 m and the catch was only 5 kg. fishes, dominated by Decapterus russelli.

Results of fishing operations  
(Cruise No. 59)

Bottom trawl

Station No.	Total catch (Kg)	Composition in percentage
1626	200	<u>Pomadasys</u> sp. (60%); <u>Decapterus macrosoma</u> (8%); <u>Lethrinus</u> (4%); Miscellaneous fishes (12%) and Cephalopods (16%)
1629	30	Perches (82%); Miscellaneous (11%); Cephalopods (7%)
1634	600	Carangids (25%); <u>Lutjanus</u> sp. (17%); Sharks and rays (22%); <u>Epinephelus</u> sp. (7%); Miscellaneous (29%)
1640	300	<u>Lutjanus</u> spp. (40%); <u>Lethrinus</u> spp. (17%); <u>Epinephelus</u> sp. (10%); Miscellaneous fish (29%); Cephalopods (4%)

Zooplankton studies: Nineteen zooplankton samples were collected using Bongo-60 net along the southeast coast of India, within  $10^{\circ}30'$ - $16^{\circ}00'$ N and  $19^{\circ}58'$ - $81^{\circ}41'$ E. The displacement volume varied from 5 ml to 70 ml. The plankton value was higher at stations 1642 to 1644 than of other stations. Copepods, chaetognaths, decapod larvae, amphipods, euphausiids and heteropods were the dominant plankters. Fish eggs and larvae were present in most of the collections.



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ACKNOWLEDGEMENT

The Help and cooperation of the Master, Officers and crew of the vessel in carrying out the programme is acknowledged.

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FORV SAGAR SAMPADA

CRUISE NO. 60

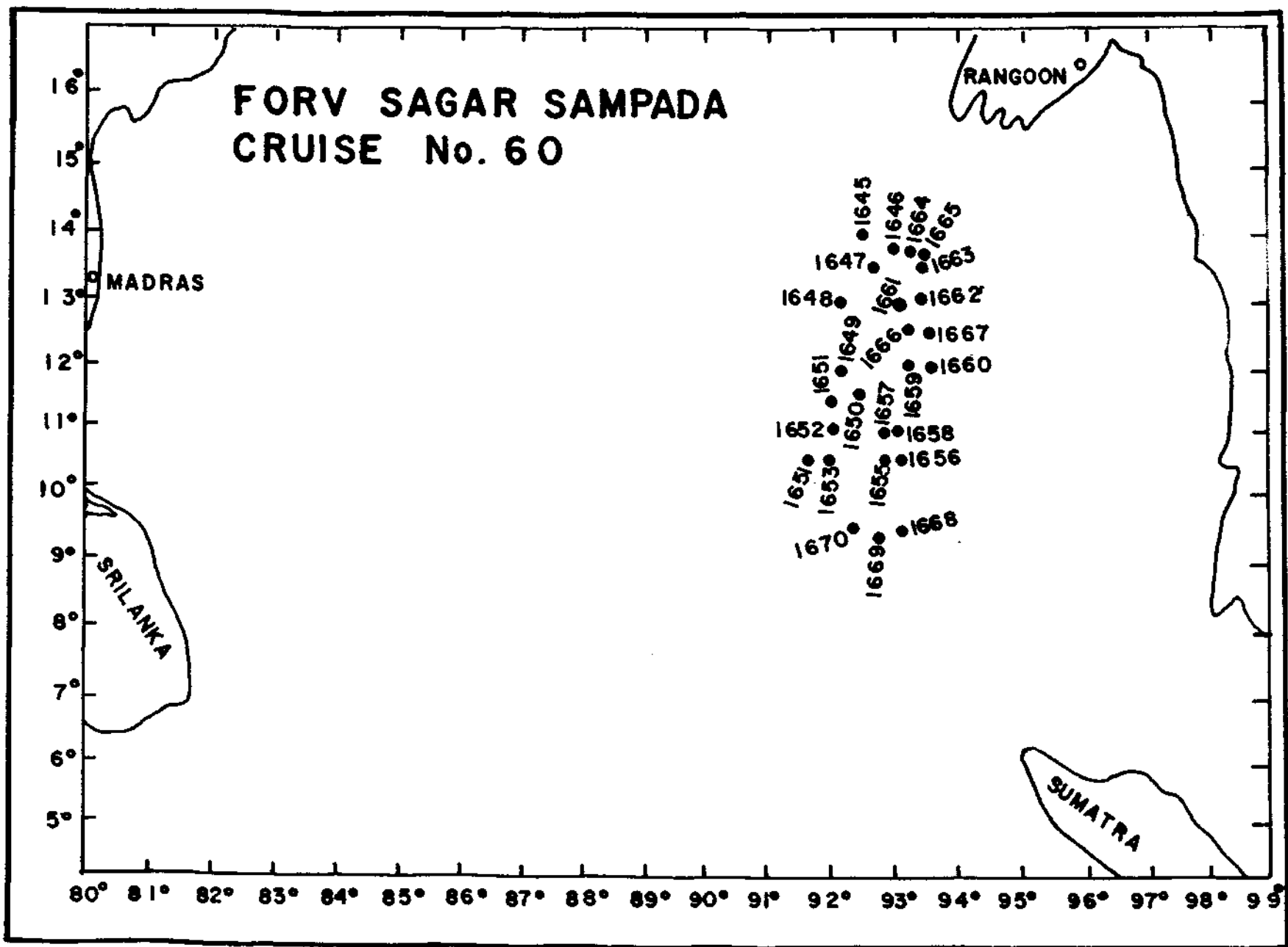
OBJECTIVES : Evaluating the Fishery resources  
around Andaman & Nicobar Islands  
and study of seasonal variations  
in the oceanographic parameters.

AREA OF OPERATION : 6°45'N to 13°41'N Lat.

DURATION : 7.7.1989 to 29.7.1989

COVERAGE:

- Track distance : 4853 Km.
- Stations occupied : Nos. 1645 - 1670



STATION LISTCRUISE NO.60

Station No.	Position		Date	Time		Depth to Bottom (m)
	Lat. °N	Long. °E		From	To	
1645	14°00'	92°30'	10.07.89	0600	0630	1010
1646	13°50'	92°56'	10.07.89	0905	0925	370
1647	13°30'	92°38'	10.07.89	1440	1505	188
1648	13°00'	92°08'	10.07.89	1915	1940	1000
1649	12°00'	92°08'	11.07.89	0530	0605	700
1650	11°30'	92°24'	11.07.89	1345	1400	128
1651	11°30'	91°59'	11.07.89	1640	1705	1000
1652	11°00'	92°00'	11.07.89	1855	1925	815
1653	10°30'	91°59'	12.07.89	0530	0605	900
1654	10°29'	91°40'	12.07.89	0930	1010	2100
1655	10°30'	92°45'	12.07.89	1640	1700	200
1656	10°29'	93°01'	12.07.89	1940	2010	1500
1657	11°00'	92°46.5'	13.07.89	0530	0555	400
1658	11°00'	92°57.5'	13.07.89	0730	0740	1200
1659	12°00'	93°15'	13.07.89	1655	1715	515
1660	12°01'	93°34.5'	13.07.89	1900	1930	615
1661	13°00'	93°04'	14.07.89	0525	0545	185
1662	13°00'	93°23'	14.07.89	0830	0855	1000
1663	13°38.5'	93°25'	14.07.89	1345	1410	950
1664	13°40'	93°17.5'	14.07.89	1520	1535	220
1665	13°29'	93°13'	14.07.89	1730	1745	250
1666	12°30'	93°10.5'	15.07.89	0500	0530	375
1667	12°31'	93°30'	15.07.89	0915	0940	1400
1668	09°29'	93°10'	26.07.89	0505	0550	1800
1669	09°23'	92°43'	26.07.89	1025	1055	294
1670	09°30'	92°17'	26.07.89	1530	1600	850

OBSERVATIONS

Fishing operations

Pelagic trawling: Pelagic trawl was operated in 7 stations. The total catch was very negligible. However, the following fishes and cephalopods were obtained in very small numbers ~~were encountered~~ Mene maculata, Psenes indicus, Caranx sp. Syngnathus sp., Caranx malabaricus, Priacanthus hamrur, Lutianus spp., Monocanthus spp., Trichiurus haumela, Leptocephalus larvae, and Doryteuthis sibogae, crabs, ~~phyllosoma~~, ~~Zoan~~ and ~~Megaloppe~~ larvae.

Zooplankton studies: Twentyfive zooplankton samples were collected using Bongo-60 net from the Andaman sea in an area within 9°29'-14°00'N and 91°40'-93°30'E from depths ranging between 50 m and 100 m. The major groups of zooplankters were copepods, chaetognaths, euphausiids, lucifers and fish eggs and larvae. Besides these, siphonophores decapods, amphipods, pteropods, polychaetes, doliolids and salps, ~~also~~ appendicularians, heteropods, cephalopods larvae and alima larvae were also present.