

Report on Oceanographic Cruise of O. R. V. Sagar Kanya

CRUISE No. 38

7th January to 6th February, 1988



**National Institute of Oceanography
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NATIONAL INSTITUTE OF OCEANOGRAPHY
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REPORT ON
38TH ~~OCEANOGRAPHIC~~ OCEANOGRAPHIC CRUISE OF
O.R.V. SAGAR KANYA

(7 January to 6 February, 1988)

REPORT ON 38TH OCEANOGRAPHIC CRUISE OF
ORV SAGAR KANYA

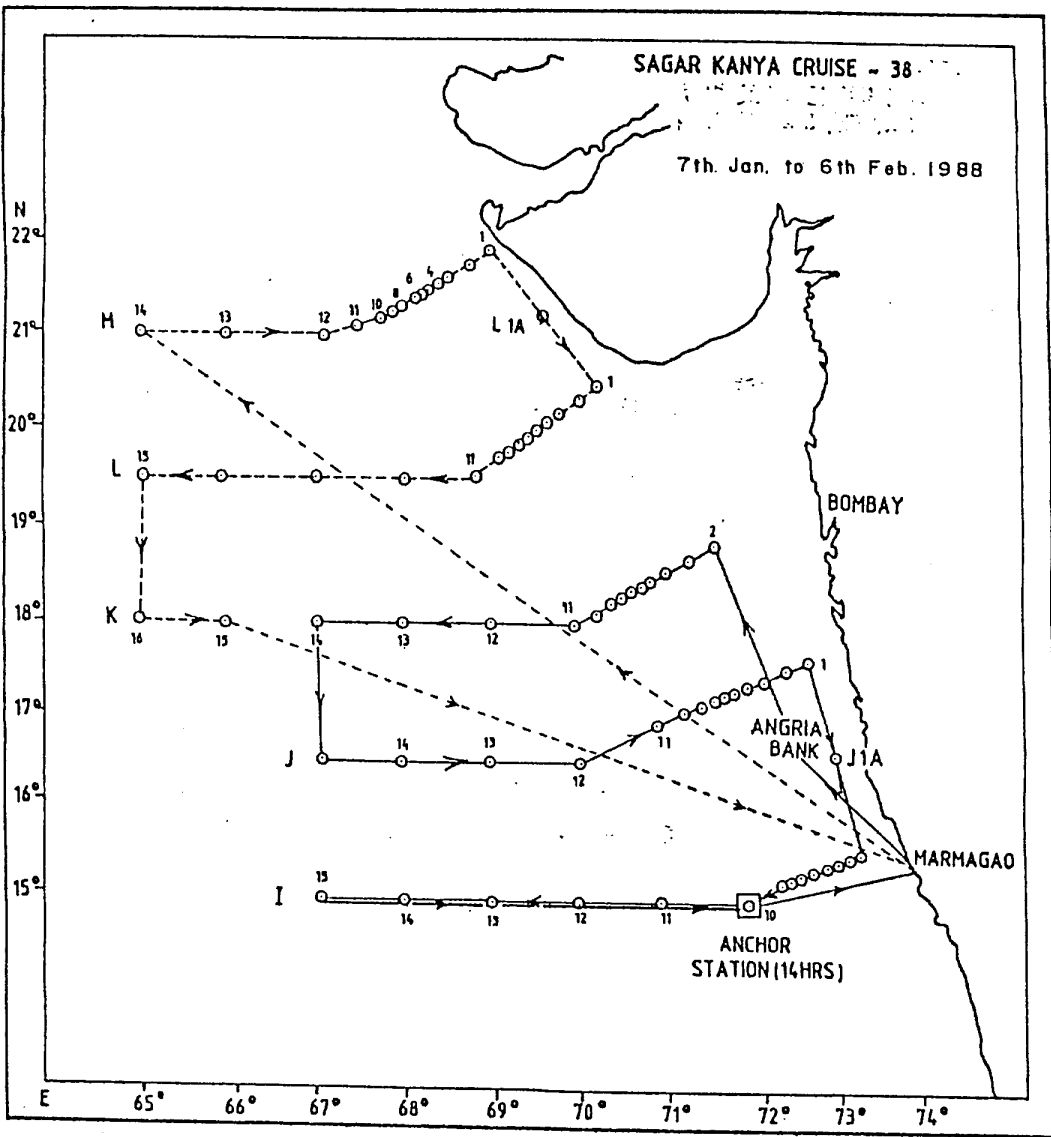
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SAGAR KANYA CRUISE - 38

7th Jan. to 6th Feb. 1988



2. CRUISE SUMMARY

The cruise left Mormugao Harbour on the 7th January, 1988. The area covered was between 15°N and 21°N, 74°E to 65°E. Physical, chemical and biological oceanographic data were collected from all stations as attached in the Annex. The ONGC representative on board collected tar samples in coordination with zooplankton hauls, and grab samples at selected shallow stations. The cruise returned to Mormugao harbour on the 6th February, 1988.

3. PARTICIPANTS

a) Scientific Component

Dr. A. Pant	...	Chief Scientist
S.C. Goswami)	
Helga Ho.R. Gomes)	Biological Oceanography
N. Ramaiah)	Division, NIO
G. Padnavati)	
Satish R. Shetye)	
S.S.C. Shenoy)	Physical Oceanography
D. Sunder)	Division, NIO
A.M. Almeida *)	
S.W.A. Naqvi)	
Ronald Noronha)	
A. Sarkar)	Chemical Oceanography
S. Upadhyaya)	Division, NIO
H.S. Dalvi)	
M.S. Shailaja)	
K. Somasunder)	
S. Virnodkar *)	Ship Cell, NIO
G. Mishra)	O.N.G.C.

* From 22.1.1988 to 6.2.1988

b. Ship's Complement

Capt. M.V. Agarkar	...	Master
Eul Carneiro	...	Chief Officer
M.A. Khot	...	Second Officer
A. Nayar	...	Second Officer
R.A. Bhatt	...	Chief Radio Officer
P.R. R. Nair	...	Radio Officer
D.K. Ghosh	...	Medical Officer
Aboo Md. Tharique	...	Purser
R.V. Lad	...	Chief Engineering Officer
K.I. Singh	...	Second Engineering Officer
C.T. Dharmik	...	Third Engineering Officer
T. Dasgupta	...	Fourth Engineering Officer
Mohan Awardi	...	Electrical Officer
Om. P. Bharadwaj	...	Electrical Officer
E.F.J. Faria	...	Catering Officer

4. OBJECTIVES

1. Study of the Arabian Sea as part of the Indian Exclusive Economic Zone in the post-monsoon.
 - a) Physical Oceanography
 - i) Circulation of the water, geostrophic flows using temperature-salinity data.
 - ii) Presence and extent of undercurrents at the shelf break and identification of water mass.
 - b) Chemical Oceanography
 - i) Nutrient studies; phosphate nitrate, nitrite, silicate
 - ii) Oxygen deficit
 - iii) Near-bottom nitrite & dissolved oxygen
 - iv) Nitrous oxide concentrations
 - v) Electron-transport activity in the water column
 - c) Biological Oceanography
 - i) Chlorophyll a distribution and primary productivity
 - ii) In situ growth rate measurement of phytoplankton.
 - iii) Secondary production: Species & Biomass
2. Tar pollution in sediments and water column.

The track was planned as a repeat of cruise 34 of ORV Sagar Kanya. The deep stations were 1° apart. The shallow stations were between 10 to 30 kms apart.

5. S SYNOPSIS OF OBSERVATIONS AND DATA COLLECTED

Temperature-salinity profiling was done at all stations using deep and shallow hydrographic casts with Nansen reversing bottles and protected and unprotected thermometers. Further processing of this data is in progress. No under-current is evident at this time of the year.

Chemical analyses were carried out at all stations for dissolved oxygen and nutrients. A near bottom sampler fabricated at NIO was successfully deployed to collect water samples from 1 m of the seafloor at depths less than 450 m.

Biological data shows that chlorophyll a distributions are patchy with values varying from 0.05 to 2.6 mg Chl a per litre. Zooplankton standing stock ranged from 1 to 140 ml/ haul (\bar{x} = 12.3) for the horizontal and 3 to 37 ml/ haul (\bar{x} = 12.7 ml) for vertical samples. K16 at 17°57.90'N, 65°02.48'E gave the highest biomass value (140 ml) and the sample contained an unusual abundance of Cypridine sp. The zooplankton biomass decreased with decreasing latitude. Zooplankton community was dominated by copepods and bioluminescent bacteria are associated with the common zooplank-

ton groups and species. Bacteriological studies were also conducted.

Tar ball samples were collected by the ONGC representative on board at a total of 31 stations of which no tar was found at 19 stations. Hexane extracts of seawater for hydrocarbon studies were done at 18 stations and bottom sediments for microbiological assays were carried out at 13 stations.

Bottom sampler, grab and corer were operated at 5, 11 and 9 stations respectively for sediment and bottom water assays.

6. ACKNOWLEDGEMENTS

We are grateful to the Master and crew of ORV Sagar Kenya for all their help in the successful completion of the cruise.

ORV SAGAR KANYA CRUISE 38

Summary of Observations

ALWAYS - US NAVY RECDEE PLAN OVERFLEW AT M-14
BETWEEN 1300 HRS - 1430 HRS

DEPARTURE MARAGAO, 07 JAN 1968 0600 HRS

STN	DATE	TIME ARRIVAL	LAT.	LONG.	DEPTH (m)	SHALLOW CAST	DEEP CAST	TRACE METAL CAST	PP CAST	SECOII	BACTERIAL CAST	COZIDE CAST	KITONSU CAST	BPM JAPPY NET	SCOPL NET	NEUSTON NET	GRAS	CORER	TIME DEP.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
M4	10 JAN	1330	21°01.60'N	65°00.11'E	2090	+	+	+	+	15 m					+				1832
M3	11 JAN	0030	20°59.64'N	65°59.46'E	2530	+	+	+	+						+				0431
M2	11 JAN	1015	20°58.78'N	67°00.07'N	2400	+	+	+	+	18 m					+				1816
M1	11 JAN	2130	21°06.66'N	67°30.21'E	2400	+	+	+	+						+				2400
M10	12 JAN	0158	21°13.57'N	67°46.94'E	2060	+	+	+	+						+				0615
M9	12 JAN	0725	21°17.29'N	67°57.46'E	1220	+	+	+	+						+				0500
M8	12 JAN	1005	21°19.85'N	68°02.82'E	370	+	+	+	+						+				1320
M7	12 JAN	1455	21°22.2'N	68°07.51'E	230	+	+	+	+						+				1630
M5	12 JAN	1737	21°25.83'N	68°13.16'E	158	+	+	+	+						+				1855
M4	12 JAN	1944	21°28.14'N	68°18.76'E	120	+	+	+	+						+				2145
M4	12 JAN	2260	21°38.08'N	68°24.20'W	102	+	+	+	+						+				0102
M3	13 JAN	0020	21°36.25'N	68°32.76'E	89	+	+	+	+						+				0315
M2	13 JAN	0250	21°44.10'N	68°48.02'E	66	+	+	+	+						+				0615
M1	13 JAN	0505	21°52.20'N	69°02.56'E	45	+	+	+	+						+				1800
L1A	13 JAN	0945	21°00.15'N	69°59.32'E	50	+	+	+	+						+				1530
L1	13 JAN	1730	20°28.78'N	70°16.22'E	64	+	+	+	+						+				2209
L2	13 JAN	2135	20°19.95'N	70°01.68'E	90	+	+	+	+						+				0625
L3	14 JAN	0002	20°10.09'N	69°47.97'E	83	+	+	+	+						+				0605
L4	14 JAN	0145	20°05.07'N	69°38.90'E	86	+	+	+	+						+				0505
L5	14 JAN	0312	20°00.87'N	69°34.02'E	94	+	+	+	+						+				0730
L6	14 JAN	0615	19°58.25'N	69°30.53'E	159	+	+	+	+						+				1145
L7	14 JAN	0935	19°56.03'N	69°24.98'E	307	+	+	+	+						+				1416
L8	14 JAN	1235	19°51.89'N	69°22.51'E	622	+	+	+	+						+				1730
L9	14 JAN	1500	19°50.12'N	69°16.23'E	938	+	+	+	+						+				2315
L10	14 JAN	1905	19°42.28'N	69°06.03'E	2210	+	+	+	+						+				2550
L11	15 JAN	0100	19°33.04'N	68°53.07'E	2690	+	+	+	+						+				1334
L12	15 JAN	1083	19°29.05'N	68°00.85'E	3200	+	+	+	+						+				0619
L13	15 JAN	2000	19°29.83'N	66°59.85'E	3000	+	+	+	+						+				1625
L14	16 JAN	1210	19°30.32'N	66°00.03'E	2850	+	+	+	+						+				0730
L15	16 JAN	2213	19°30.02'N	64°59.78'E	3134	+	+	+	+						+				1546
K16	17 JAN	1325	17°59.80'N	64°59.49'E	3400	+	+	+	+						+				0750
K15	18 JAN	0210	17°59.89'N	65°59.89'N	3260	+	+	+	+						+				
AGAO	21 JAN																		

RELEASES = CRUISE PROCEEDING TO AUSTRALIA WAGN AND KI (ETC.)

DEPARTURE:	MARINER	22 JAN	1730 HRS								
ANGRIA BK	23 JAN	0900	16°31.82'N	72°10.91'E	240						
NE CHARNEL	23 JAN	1015	16°33.61'N	72°10.39'E	230						0950
-	23 JAN	1311	16°35.03'N	72°08.53'E	200						1053
K2	24 JAN	0238	18°55.22'N	71°40.15'E	74						1207
K3	24 JAN	0710	18°42.18'N	71°16.01'E	82						0420
K4	24 JAN	0949	18°33.96'N	71°01.80'E	85						0806
K5	24 JAN	1205	18°26.89'N	70°45.93'E	86						1018
K6	24 JAN	1410	18°21.20'N	70°37.00'E	91						1447
K7	24 JAN	1545	18°18.71'N	70°32.09'E	317						1820
K8	24 JAN	1943	18°14.62'N	70°24.91'E	1025						2204
K9	24 JAN	2258	18°12.96'N	70°22.38'E	1668						0115
K10	25 JAN	0231	18°00.02'N	70°11.37'E	2300						0425
K11	25 JAN	0615	17°59.38'N	69°59.62'E	2700						1034
K12	25 JAN	1720	17°59.56'N	68°59.35'E	3385						2115
K13	26 JAN	0329	18°00.51'N	67°59.94'E	3440						0833
K14	26 JAN	1410	18°00.08'N	67°00.58'E	3470						2040
											(EFS)
											+

(2)

(11)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
J15	27 JAN	0505	16°30.10'N	66°53.74'E	+	+	3700	+	+	24 m	+	+	+	+	+	+	+	1254
J14	27 JAN	1910	16°30.13'N	68°00.64'E	+	+	3000	+	(2)	+	+	+	+	+	+	+	+	2315
J13	28 JAN	0540	15°30.32'N	68°57.50'E	+	+	3430	+	+	+	+	+	+	+	+	+	+	1045
J12	28 JAN	1912	15°39.71'N	69°59.27'E	+	+	3643	+	+	+	+	+	+	+	+	+	+	2158
J11	29 JAN	0435	16°55.77'N	70°54.00'E	+	+	2630	+	+	+	+	+	+	+	+	+	+	0945
J10	29 JAN	1143	17°03.10'N	71°10.89'E	+	+	2900	+	+	+	+	BTS	+	+	+	+	+	1500
J9	29 JAN	1643	17°09.03'N	71°26.02'E	+	+	1540	+	+	+	+	+	+	+	+	+	+	1751
J8	29 JAN	1940	17°12.07'N	71°36.98'E	+	+	390	+	+	+	+	+	+	+	+	+	+	1954
J7	29 JAN	2002	17°14.21'N	71°42.63'E	+	+	320	+	+	+	+	+	+	+	+	+	+	2330
J6	30 JAN	0010	17°16.08'E	71°46.04'E	+	+	250	+	+	+	+	+	+	+	+	+	+	0235
J5	30 JAN	0326	17°17.92'N	71°53.23'E	+	+	55	+	+	+	+	+	+	+	+	+	+	0405
J4	30 JAN	0456	17°20.03'N	71°57.00'E	+	+	39	+	+	+	+	+	+	+	+	+	+	0526
J3	30 JAN	0700	17°24.30'N	72°04.25'E	+	+	55	+	+	+	+	+	+	+	+	+	+	0713
J2	30 JAN	0915	17°30.09'N	72°14.13'E	+	+	84	+	+	14 m	+	+	+	+	+	+	+	0950
J1	30 JAN	1145	17°36.11'N	72°40.08'E	+	+	49	+	+	+	+	+	+	+	+	+	+	1310
J1A	30 JAN	1943	16°33.59'N	72°59.31'E	+	+	57	+	+	+	+	+	+	+	+	+	+	2000
I1	31 JAN	0219	15°31.14'N	73°19.04'E	+	+	60	+	+	+	+	+	+	+	+	+	+	0308
I2	31 JAN	0425	15°26.73'N	73°07.49'E	+	+	90	+	+	+	+	+	+	+	+	+	+	0510
I3	31 JAN	0605	15°25.24'N	73°00.65'E	+	+	105	+	+	+	+	+	+	+	+	+	+	0625
I4	31 JAN	0723	15°23.70'N	72°56.79'E	+	+	134	+	+	+	+	+	+	+	+	+	+	0754
I5	31 JAN	0912	15°21.58'N	72°52.79'E	+	+	320	+	+	+	+	+	+	+	+	+	+	1005
I6	31 JAN	1105	15°13.35'N	72°48.13'E	+	+	755	+	+	+	+	+	+	+	+	+	+	1317
I7	31 JAN	1414	15°16.20'N	70°48.00'E	+	+	900	+	+	+	+	+	+	+	+	+	+	1510
I8	31 JAN	1720	15°11.17'N	70°32.17'E	+	+	1400	+	+	+	+	+	+	+	+	+	+	1959
I9	31 JAN	2154	15°08.18'N	72°23.79'E	+	+	1794	+	+	+	+	+	+	+	+	+	+	0105
I10	01 FEB	0404	14°59.30'N	72°09.90'E	+	+	2070	+	+	+	+	+	+	+	+	+	+	0253
I11	01 FEB	1550	14°59.33'N	71°30.14'E	+	+	2603	+	+	+	+	+	+	+	+	+	+	1552
I12	02 FEB	0205	14°59.35'N	70°00.19'E	+	+	3400	+	+	+	+	+	+	+	+	+	+	0342
I13	02 FEB	1450	14°58.32'N	69°22.07'E	+	+	3900	+	+	+	+	+	+	+	+	+	+	1922
I14	03 FEB	0150	14°58.75'N	68°30.51'E	+	+	3955	+	+	+	+	+	+	+	+	+	+	0510
I15	03 FEB	1530	14°59.76'N	66°59.95'E	+	+	3953	+	+	+	+	+	+	+	+	+	+	2155
ANCHOK	04 FEB	2345	14°59.76'N	72°00.62'E	+	+	+	+	+	+	+	+	+	+	+	+	+	
	05 FEB	0030	14°59.23'N	72°00.31'E	+	+	+	+	+	+	+	+	+	+	+	+	+	
		0603	15°00.02'N	71°59.62'E	+	+	+	+	+	+	+	+	+	+	+	+	+	
		1200	15°00.05'N	72°00.03'E	+	+	+	+	+	+	+	+	+	+	+	+	+	
		1800	14°58.95'N	72°00.15'E	+	+	+	+	+	+	+	+	+	+	+	+	+	

ARRIVAL MARCAJAO 1 1000 HRL 6 FEB