

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

CRUISE No. 51

25th March to 10th April, 1989



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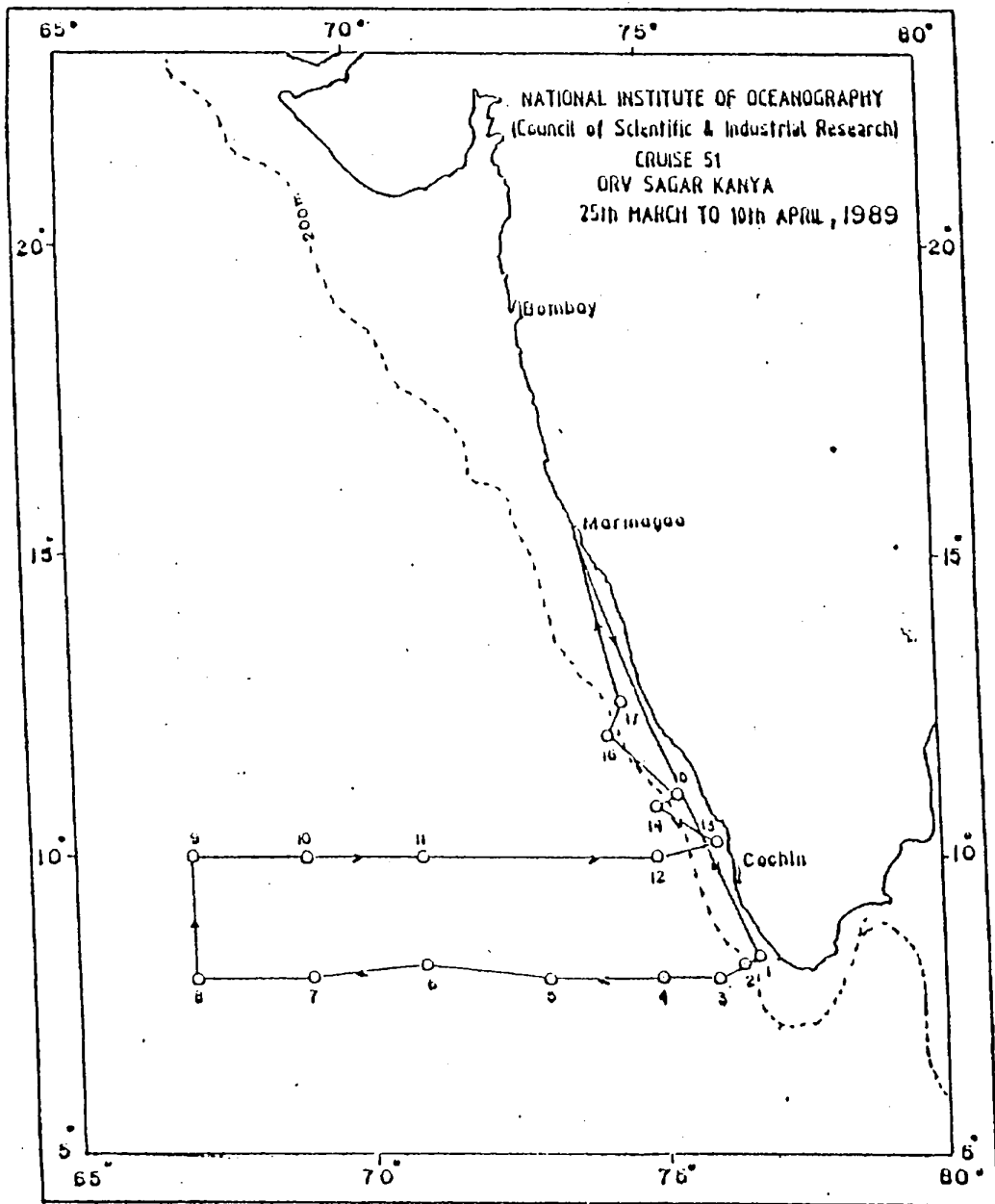
REPORT ON
51st OCEANOGRAPHIC CRUISE OF
O.R.V. SAGAR KANYA

(25 March to 10 April, 1989)

REPORT ON THE 51ST OCEANOGRAPHIC CRUISE OF
O.R.V. SAGAR KANYA

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Cruise Track

2. CRUISE SUMMARY

In all there were twelve participants on the cruise. This included nine scientists from the N.I.O. Goa and one from the University of Pune. The participants boarded the vessel on 25 th March, 1989 at 10.00 hrs and after all the necessary formalities at the port, the vessel sailed out at 1600 hrs. The cruise was of a multidisciplinary nature including scientists from chemical, biological and microfouling groups. The area of operation was Southern Arabian Sea between Mormugao to Cochin.

In all 24 oceanographic stations were planned for sampling. However since the vessel developed problems with the generator and was unable to make more than six knots speed, the programme was cut short to a total of seventeen stations. The area covered was between 7° - $57'6$ N to $12^{\circ} 30'$ N latitudes and between 67° E to $76^{\circ} 44'.98$ E longitudes. Coastal stations were at half degree and 1 degree intervals while the offshore ones were at 2 degree intervals. Samples for trace metal analyses were collected at those stations where all the other chemical parameters were analysed.

Station positions are represented in Fig.1. Table 1 shows the station positions and other details, while the number of samples collected is represented in table 2.

At thirteen stations oceanographic operations included hydrocasts (one shallow and one deep) for the analyses of chemical parameters. Two casts (one shallow and 1 deep) for trace metal analysis were operated on the PVC coated winch wire. Plankton nets were towed and biological observations were taken at eleven stations, sediment grabs were operated at three stations and microfouling observations were carried out at all the stations. Details are represented in Table 2.

3. PARTICIPANTS

a. Scientific Component

Sujata Sanzgiri	Chief Scientist
S.N. D'Souza	
M.D. Rajgopal	
S.D. Sardessai	
A.M. Mesquita	C.O.D., N.I.O., Goa
A.Sarkar	
H.S. Dalvi	
N.B. Bhosle	
K.Venkat	MCMRD, N.I.O., Goa
Ushadevi Muralidharan	
M.S. Hussain	B.O.D., N.I.O., Goa
Vidya Patwardhan	University of Pune

b. Ship's Complement

✓ M.S.L. Fernandes	Master
N.K.Paul	Chief Officer
✓ S.J. Shedhadmkar	Second Officer
✓ S.D.Warke	Chief Radio Officer
✓ N.K. Chatteraj	Radio Officer
✓ Dr.S. Gokulnath	Medical Officer
✓ R.V.Lad	Chief Engineer
V.K.Lakhanpal	Second Engineer
B.N.Mistry	Electrical Officer
R.M.Fernandes	Catering Officer
✓ B.G.S. D'Silva	Purser

4. OBJECTIVES

1. Mapping and profiling of trace metals in the Southern region of the Arabian Sea.
2. Determining the distribution of trace metals pesticides and humic substances in the sediments.
3. Chemical Characteristics of the coastal and offshore regions of Southern Arabian Sea.
4. Evaluation of biological production and microfouling biomass.

5. BRIEF DESCRIPTION OF THE WORK CARRIED OUT

Investigations were carried out to determine the chemical parameters like dissolved oxygen, nitrate, nitrite, silicate, ammonia and phosphate. Salinity was measured at some stations.

Water samples were collected for the analyses of trace metals. These were filtered on board the vessel and acidified and preserved for analysis in the laboratory. Samples for total mercury in water were processed on board and the final inorganic extracts preserved under refrigeration for measurements in the shore laboratory.

Sediment samples were collected for analysis of trace metals, pesticides and humic substances. These were preserved for analysis in the shore laboratory.

Seventeen stations were sampled to assess the microfouling biomass and productivity of the surface waters. The data will be utilised to develop a model for the prediction of microfouling productivity of the Arabian sea.

The extracellular production of oceanic phytoplankton from the Arabian sea was studied by radiolabelling of samples collected from four stations.

ETS activity of phytoplankton was measured for water samples collected from various depths in the euphotic zone at seven stations. Pigment and primary productivity estimates were carried out on samples from all depths and at all stations at which the above studies were carried.

Thirteen types of fishes were collected and their eye lenses decapsulated and preserved suitably in storage vials at -20°C for the extraction of water soluble lens proteins and characterization using biochemical techniques.

6. PRELIMINARY RESULTS

The area surveyed was divided into three transects two degrees apart; the transects running parallel and coastal stations linking them. Dissolved oxygen ranged between 4.16 ml/L to 4.49 ml/L in surface waters. Waters upto a depth of 100m were well oxygenated with the lowest and the highest oxygen concentrations being 2.5 ml/L and 4.49 ml/L respectively. Concentrations of nitrite nitrogen ranged between 0 to 1.28 $\mu\text{g.at/L}$, nitrate nitrogen between 0 to 42.6 $\mu\text{g.at/L}$ and ammonia nitrogen between 0 to 1.28 $\mu\text{g.at/L}$. Inorganic phosphate was between very low (non detectable) to 3 $\mu\text{g.at/L}$.

7. PROBLEMS ENCOUNTERED

On the very first day of sampling i.e., on the 27th of March, 1989 the winch on the portside of the vessel, on which the PVC coated wire was loaded could not be operated. As such, samples for trace metal analysis could not be collected at the first station. The winch was repaired on the next day and was made operational but its speed could not be increased beyond 50 metres per minute, specially below depths of 2000m. Hence sampling of close to bottom waters took much more time than expected. The other winch with metallic wire was also observed to be badly maintained.

Deep sea winch wire had developed kinks at several places during the previous cruises. Hence about 2000m of the wire had to be cut off to make the winch operational for our purpose.

Spade corer was operated at station 12 and while retrieving it, it was observed that the wire was in a very bad shape. The corer was successfully retrieved but could not be operated at other stations.

8. ACKNOWLEDGEMENT

The participants of the ORV Sagar Kanya, Cruise 51 would like to thank the Master, his officers and crew for the excellent help and cooperation extended throughout the cruise.

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Table 1 : Station positions with other details

Date	Station No.	Depth m	Time of collection		Position	
			From	To	Lat.	Long.
27.3.89	1	67	23.20	0230	8°20'.18N	76°44'.98E
28.3.89	2	940	0530	1230	8°12'N	76°27'E
28.3.89	3	1500	1630	1930	8°N	76°E
29.3.89	4	2500	0300	1115	8°N	75°E
30.3.89	5	2700	0030	0245	7°57'.6N	73°E
30.3.89	6	(4100)	1500	0045	8°6'N	71°E
31.3.89	7	(4600)	1300	1500	8°N	69°E
1.4.89	8	(4600)	0415	1515	8°N	67°E
2.4.89	9	(4700)	0700	1555	10°N	67°E
3.4.89	10	(4175)	0640	0840	10°N	69°E
3.4.89	11	(3450)	2315	0915	9°59'.6N	71°E
5.4.89	12	2170	1415	0015	10°N	71°E
6.4.89	13	26	1115	1300	10°14'.7N	76°E
7.4.89	14	1640	0240	0800	10°45'N	75°
7.4.89	15	50	1335	1545	11°N	75°25'E
8.4.89	16	1275	0930	1545	11°59'.9N	74°10'E
8.4.89	17	87	2055	0300	12°30'N	74°25'E

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Table 2 : Number of oceanographic operations carried out

Date	Station No.	Hydrocast Shallow	Hydrocast Deep	Trace metals	Sediments	Plankton net	ETS	Chlorophyll	Primary producti-	Extra-cellular	Micro Fouling
27.3.1989	1	7	-	-	1	1	1	1	-	-	1
28.3.1989	2	6	6	6	-	2	1	1	-	-	1
28.3.1989	3	-	-	9	1 (deep sea winch out of order)	2	1	1	1	1	-
29.3.1989	4	9	7	-	-	-	-	-	-	-	-
30.3.1989	5	-	10	10	-	2	-	-	-	-	1
30.3.1989	6	7	-	-	-	3	1	1	-	-	1
31.3.1989	7	7	10	-	-	-	7	7	1	1	1
1.4.1989	8	-	-	-	-	-	7	7	1	1	1
2.4.1989	9	-	-	-	-	3	-	1	1	1	1
3.4.1989	10	-	-	10	-	1	-	-	-	-	1
3.4.1989	11	9	7	7	Spade corer operated wire had to be cut	1	-	1	1	1	1
5.4.1989	12	-	-	-	-	-	-	-	-	-	-
6.4.1989	13	3	-	2	Grab 1	1	3	3	3	-	1
7.4.1989	14	5	-	7	-	1	-	-	-	-	1
7.4.1989	15	5	-	3	1	1	4	4	4	-	1
8.4.1989	16	7	7	6	-	1	7	7	7	-	1
8.4.1989	17	7	-	3	1	-	-	-	-	-	1