

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

**CRUISE No. 18**

**1st September to 8th October, 1985**



**National Institute of Oceanography**

**Dona Paula-403 004, Goa**

**INDIA**

NATIONAL INSTITUTE OF OCEANOGRAPHY  
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Dona Paula, Goa-403 004

REPORT ON  
18th OCEANOGRAPHIC CRUISE OF  
O.R.V. SAGAR KANYA

(1st September to 8th October, 1985)

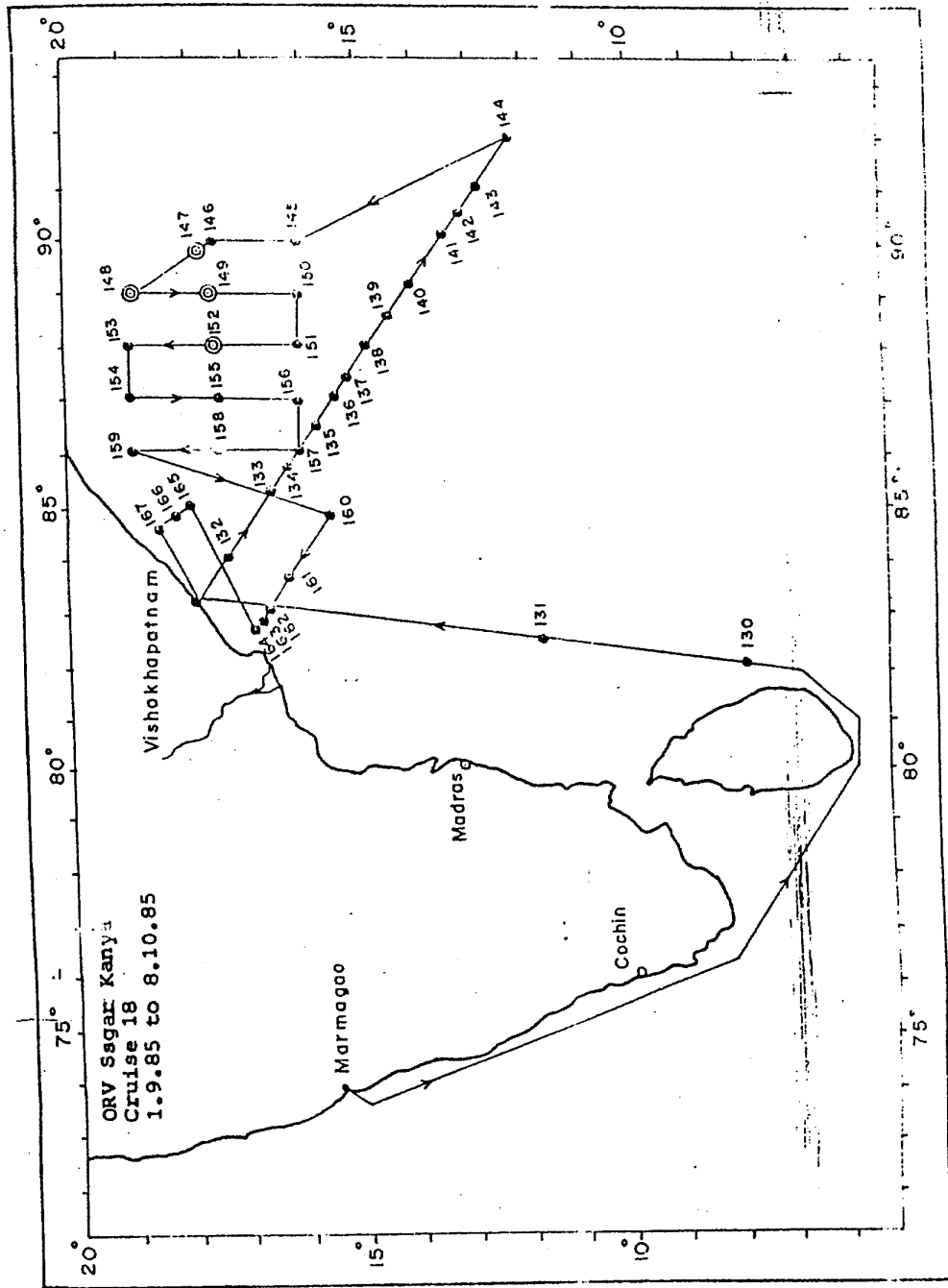
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O.R.V. SAGAR KANYA

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## 2. Cruise Summary

ORV SAGAR KANYA sailed off Mormugao harbour on 1st Sept. 1985 and reached Visakhapatnam harbour on 7th Sept. 1985. On 9th Sept. the ship left Visakhapatnam with the complement of scientists and two Engineers from FRG for repairs of equipment and ship's machinery. After the trial cruise, the ship returned to Visakhapatnam on 11th September to disembark the trial cruise participants and on the same day she headed towards Port Blair.

The cruise was organised for the studies on dynamics of monsoon and the cyclones in the central and north Bay of Bengal. Time series observations on temperature of the water upto 650 m every two hours and on temperature and salinity upto 2500 m using CTD every 6 hours were carried out at 4 stations. Nansen casts were taken at eight stations. Radio Sonde and Omega Sonde ascents were taken at several stations. Abnormal warm air temperature near surface were recorded when the ship was in the area of low pressure. This suggests the formation and growth of low pressure cyclone systems in the Bay of Bengal. After the observations, the ship returned to Visakhapatnam on 8th October, 1985.

### 3. PARTICIPANTS

#### (a) Scientific component

V.S. Rama Raju	...	Chief Scientist
Y.K. Somayajulu	Y	
T.V. Narasimha Rao	*****	
T.V. Ramana Murty	Y	National Institute of
B. Prabhakara Rao	*****	Oceanography, Goa.
A.P. Selvam	Y	
E.G. Namboothri	*****	
M.S. Kumar	Y	
M. Subba Rao	*****	Regional Centre of NIO,
Basil Mathew	Y	Waltair
M. S. Kumar	*****	
Rajni Kant	Y	
T.K. Joshi	*****	India Meteorological Deptt.
B.V. Potder	Y	
Amel Kumar Pal	*****	
K.R. Gopala Krishna	...	Naval Physical and Oceano- graphic Laboratory.
A.D. Rao	...	Indian Institute of Technology, Delhi
S.S.V.S. Rama Krishna	...	Andhra University
D. Panakala Rao	T	
B. Gopala Rao	R	
L.V. Subba Raju	I	
G.C. Bhattacharya	A	National Institute of
K. Santanam	L	Oceanography, Goa.
D. Gracious	Y	
G. Janakiraman	*****	
Rajeswa Rao	C	
R.D. Vasist	R	
Bokuli Valu	U	India Meteorological Dept.
Peter Otten	I	
Wolfram Budich	S	
	E	Federal Republic of Germany

(9th to 11th September, 1985)

(b) Ship's Complement

J.A. Antal	... Master
K.V. Pathak	... Chief Officer
A.M. Dube	... Second Officer
M.A. Gardonis	... Third Officer
J.A. Coutinho	... Fourth Officer
J.J. D'Sousa	... Chief Radio Officer
K.R. Srinivasan	... Radio Officer
Dr. S. Roy	... Medical Officer
P.P.S. Brar	... Chief Engineer
P. Mallaya B.	... Second Engineer
R.K. Talwar	... Third Engineer
M.C. Mouli	... Fourth Engineer
H.A. Dhamankar	... Fifth Engineer
N.A. Kapadi	... Electrical Officer
A.V. Ramdasan	... Electrical Officer
E. Syed	... Purser
P.R. Miranda	... Catering Officer
L.C. Dias	... Asst. Catering Officer

#### 4. OBJECTIVES AND ORIGINAL CRUISE PLAN

This cruise was earmarked for the studies on the dynamics of monsoon and the cyclones in the central and north Bay of Bengal. As the low pressure systems in the month of September and October usually form at the head of the Bay and in the central regions, the cruise was programmed, in consultation with the India Meteorological Department, to cover the areas of low pressure systems. At the same time physical oceanographic data collection on the sea surface waves, temperature, salinity and oxygen was also programmed. It was planned to cover a section for oceanographic work from off Visakhapatnam to Andamans and then proceed to 16°N to 19°N as proposed by IMD. The programme also included provision for the vessel to follow the low pressure system as and when it is formed and to cover the track proposed during the rest of the time including some time-series observations at stationary positions.

#### 5. CRUISE DETAILS

ORV Sagar Kanya left Mormugao Harbour on 1st September, 1985 and reached Visakhapatnam Harbour on 7th September. Leaving Visakhapatnam on 9th September with an additional complement of scientists and engineers including  
Dr.



Dr. Peter Otten and Wolfram Budich from Federal Republic of Germany, for repairs of equipment and ship's machinery, she sailed down south where the depth was more than 3400 m on trial cruise.

Various tests were carried out on the scientific equipment and faults were rectified. CTD probe was serviced and 200 m length of single core armoured cable was cut as it was found to have some broken strands obstructing the winch operations and found risky to lower CTD to the deeper depths. The deep sea winch was tested lowering to 3200 m depth and found to work satisfactorily. Sagar Kanya returned to Visakhapatnam harbour on 11th September, 1985 where all the trial cruise participants disembarked.

On the same day, i.e. 11.9.1985 ORV Sagar Kanya left Visakhapatnam and headed towards Port Blair. After the observations she returned to Visakhapatnam on 8th October, 1985 after successful cruise.

6. SYNOPSIS OF OBSERVATIONS AND DATA COLLECTED

a) No. of hydrographic stations worked	38	(From station 130 to 167)
b) Total No. of MBT operations	245	
c) Total No. of XBT operations	17	
d) Total No. of MICON BT operations	52	
e) Total No. of CTD operations	53	
f) Total No. of Nansen casts	8	
g) Total No. of Thermosalinograph operated	22	
h) Total No. of wave sample record obtained	92	
i) No. of days surface meteorological data hourly printout obtained on COMBIMET	31	
j) Total No. of Radio-sonde ascents	51	
k) Total No. Omega-sonde ascents	17	
l) Total No. of FAX charts received	58	
m) No. of weather reports sent		
i) 3 hourly	41	
ii) 6 hourly	122	
n) Total line kilometers covered during the cruise	7155	

Time series observations on temperature of the water upto 650 m every two hours and on temperature and salinity upto 2500 m using CTD every 6 hours were carried out at four stations. Nansen casts were taken at eight stations to make necessary corrections to the CTD data. A preliminary check on the CTD data with the temperature and salinity values obtained by Nansen casts indicated that while the depth and temperature values are

in agreement, the conductivity values showed variable correction factor both in time and space. As such, necessary corrections were applied in the computer processing of the CTD data to the extent possible using regression equations.

Additional radio-sonde and omega-sonde ascents were taken when the ship was in the low pressure areas and 3 hourly synoptic and 6 hourly upper air data were transmitted on such occasions.

During the cruise, two low pressure areas are formed on 18.9.1985 in the north Bay of Bengal and on 29.9.1985 in the Central Bay of Bengal. The earlier low developed into a cyclone and crossed the coasts near Paradeep on 21.9.1985. The latter low developed into a deep depression and crossed the coast near Machilipatnam on 2.10.1985. Valuable data on the meteorological and oceanographic parameters during the above periods have been collected.

While the ship was in the area of low pressure, interesting observations were recorded on the surface air temperatures. On 28th September, 1985 the dry and wet bulb temperatures have increased from 32.5°C and 30.9°C respectively to 40.2°C and 38.6°C respectively in a short interval of time at 17°35'N, 88°01'E. The normal dry bulb temperature during the cruise was around 30°C. The shortlived, transient, warm air pockets' existence also

followed with a drop of atmospheric pressure upto 2 mb within a few hours. On eight occasions such abnormal warm air temperatures were recorded suggesting that the presence of warm air near surface, a pre-condition, to trigger the formation and growth of low pressure cyclone systems in the Bay of Bengal.

The preliminary analysis of the vertical temperature structure of the sea indicated surface layer of 20 m depth with positive and negative gradients and thermocline layer below extending upto about 250 m depth, typical of the monsoon conditions. The positive and negative gradients in surface layer which usually occur during monsoon season reflect the alternate heating and cooling processes that might be related to the pulsatory character of the monsoon.

#### 7. LOSSES/DAMAGES

During the cruise, no loss of equipment occurred. As the single core armoured CTD cable has developed kinks and some strands are found broken first at a length of 200 m during the trial cruise and next again at a length of 200 m during the cruise, about 400 m of CTD wire was cut off. The remaining wire was in good condition.

8, ACKNOWLEDGEMENTS

The Chief Scientist and all the other participating Scientists express their sincere thanks to Master Antao, his officers and men on board for extending cooperation in the successful conduct of the monsoon cruise.