

SK-294


LEG I.

28 May to 12 June 2012

## DAILY OPERATION

Station	C1	C2	C3	C4
Date	02/06/2012	02/06/2012	02/06/2012	02&03/06/2012
Time(Gmt)	9:39	13:00	15:85	17:48
Latitude	8°59.960'n	8°58.808'n	8°55.662'n	8°49.742'n
Longitude	76°25.250'e	76°18.731'n	76°07.581'e	75°57.634'e
Maximum Depth(M)	25.91	49.00	64.63	1)329.8 2)327.5
Operations	Duration(GMT)	Duration(GMT)	Duration(GMT)	Duration(GMT)
1.Ctd1	9:50-10:8	12:58-13:15	15:54-16:05	17:49-18:20
2.Ctd2	10:38-10:48	-	-	19:00-19:08
3.Ctd3	-	-	-	19:20-19:30
4.Ctd4	-	-	-	19:45-20:15
5.Ysi	11:31-11:54	-	-	19:45-20:15
6.Grab	11:14-11:18	-	-	-
7.Mpn	-	13:30-13:55	-	20:42-20:46

Station	M1	M3	M 6	M 8
Date	4/6/2012	4/6/2012	4/6/2012	4&5/6/2012
Time (GMT)	9:24	11:57	22:09	18:46
Latitude	13°7.776'n	13°6.005'n	12°54.582'n	12°52.153'n
Longitude	74°38.221'e	74°34.258'e	74°14.467'e	74°6.690'e
Maximum Depth (M)	26.38 24.52	36.98 34.22	72.26 71.34	115.9 114.6
Operations:	Duration	Duration	Duration	Duration
Ctd 1	9:30-9:36	12:30-12:42	16:49-16:59	18:54-19:58
Ctd 2	9:55-10:00		17:26-17:29	19:35-19:40
Ctd 3	-		-	19:55-20:30
Grab 1	10:48-11:05		-	21:06-21:16
Grab 2	-		-	-
Apt	10:15-10:35		-	-
Mpn	-	12:55-13:6	-	20:42-20:50

  
T. Surek

12 June, 2012.

Line Scientist  
ORV SAGAR KANYA



Station	ASTS
Date	07/06/2012
Time(GMT)	4:44
Latitude	17°0.121'n
Longitude	67°59.772'e
Maximum Depth(M)	3603
Operations:	Duration (GMT)
1.Ctd1	4:55-6:50
2.Ctd2	7:55-8:08
3.Mpn1	8:25-9:00
4.Ctd3	9:18-9:30
5.Ctd4 +Ysi	9:40-10:06
6.Ctd5	10:30-10:45
7.Ctd6	10:56-11:00
8.Ctd7	13:50-14:20
9.Ctd8	14:44-15:03
10.Mpn2	15:13-16:00
11.MPN3	18:37-19:18
12.CTD9	19:25-19:42
13.CTD10	22:37-22:46
14.MPN4	22:58-23:58
15.CTD11 + YSI	00:46-01:15



Station	G13	G12	G11	G9
Date	09/06/2012	10/06/2012	10/06/2012	10/06/2012
Latitude	15°16.131'N	15°21.408'N	15°20.33'N	15°24.65'N
Longitude	72°40.982'E	72°50.049'E	73°00.07'	73°17.03'
Max Depth	951.8m	288m	120m	73.87m
Operations	Duration (IST)	Duration (IST)	Duration (IST)	Duration (IST)
CTD 1	21:02-21:13	07:00-07:15	13:40-13:50	17:12-17:32
CTD2	21:55-22:28	07:47-07:52	14:18-14:20	18:04-18:25
CTD3	23:00-23:10	08:08-08:10		
CTD4	23:32-23:45	09:28-10:06		
CTD5	23:53-00:28			
CTD6	00:36-00:45			
CTD7	00:52-00:55			
MPN	01:14-01:36	10:14-10:30		18:35-18:25
Grab1		10:43-10:57	14:28-14:50	17:44-17:50
Grab2		11:03-11:18		
Grab3		11:21-11:32		

Station	G8	G6	G5	G7
Date	10/06/2012	10/06/2012	11/06/2012	11/06/2012
Latitude	15°27.01'N	15°30.03'N	15°30.86'N	15°32.23'N
Longitude	73°24.30'E	73°34.86'E	73°39.56'E	73°39.00'E
Max Depth	61m	37m	26.37m	47.28m
Operations	Duration (IST)	Duration (IST)	Duration (IST)	Duration (IST)
CTD 1	20:00-20:08	23:22-23:29	07:45-07:58	11:37-11:48
CTD2 + YSI	20:40-20:51	00:05-00:22	09:05-09:07	13:50-14:10
Grab1	21:00-21:04	23:37-23:39	08:13-08:17	14:40-14:56
Grab2	21:10-21:20	23:47-23:55		15:00-15:05
MPN				14:21-14:28

High volume sampler was operated all throughout the cruise, except at stations when the ship was not sailing.



**ORV SAGAR KANYA**

**CRUISE REPORT**

**SK 294 Leg-II**

Submitted to

**NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH,  
HEAD LAND SADA, MORMUGAO, GOA,  
Ministry of Earth Science, New Delhi**

By

**Mr. B.R. Thorat**

**Chemical Oceanography**

**National Institute of oceanography**

**CSIR**

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Email: [thorat@nio.org](mailto:thorat@nio.org)

Vessel : ORV Sagar Kanya

Cruise No : SK 294 Leg -II

Chief Scientist : Mr. B.R. Thorat

Institution : NIO, Goa

Embarkation : Goa

Disembarkation : Chennai

Period : 12.06.2012 to 23.06.2012



## Acknowledgement

I Mr. B.R. Thorat chief scientist onboard, thank the scientific team for their support and extending their knowledge during the course of our research activities onboard.

We thank the Captain, ship staff and crew for their active support and care during the voyage.

The co-ordination and support of Director, NCAOR and his colleagues are gratefully acknowledged.

WE thank the Norinco Engineers team for their support and extending their knowledge during the course of our servicing activities onboard.

Chief scientist

## **Introduction**

### **Cruise number SK 294 leg II**

Cruise number 294 is the part of ongoing project SIBER – INDIA which was taken over from chief scientist Mr. T. Suresh on the 12<sup>th</sup> June 2012 with an objective to study the Biogeochemical parameter during the monsoon season.

There were total 20 participants from different university and Institute, we were having total 14 student from Goa University and Andhra University and 6 scientists from different institute such as National institute of oceanography (Goa), National centre for Antarctic and ocean research (Goa) and physical research laboratory (Ahmadabad). Total station covered during the said cruise was 26 in Arabian Sea between 17°deg lat to 8° and 6 locations in Bay of Bengal off Chennai. During said cruise we have collected samples for Phytoplankton, chlorophyll, Total bacterial count, pigment for biological analysis and nutrient samples for Chemical analysis. We had collected the sediment sample for the diversity of the Macro and Meio benthos and analysis of the Organic Matter and Sediment Chlorophyll.

Water samples were collected for Ra isotopes for water masses and different studies.

Simultaneously aerosol samples were collected by using the high volume sampler throughout the path of the vessel for and these samples were carried to the lab for different studies of the marine environment.

## List of participants

### National Institute of Oceanography, Goa

Mr. Babasaheb Thorat	Chief scientist
Dr. Ayaz Ahmed	Scientist
Mr. Lakshmikant J. Jadhav	Project Asst

### National Centre for Antarctic and Ocean Research

Dr. Vikramaditya	Project scientist
Dr. Dinesh Pandit	Project scientist

### Physical Research Laboratory, Ahmedabad

Mr. Aslam Y. Mohammed	Project Asst
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### Andhra University

Mr. Sanjeevi Pagoti	Project Asst
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### Goa University (M.Sc –Marine Science)

Miss Aabha S. Deshpande  
Miss Abigail Susan Marie Moniz  
Miss Ankita Padelkar  
Miss Heloise Angie Barreto  
Miss Nikita S. Gadkar  
Mr. Claroy Joseph Gomes  
Mr. Rushikesh V. Kannaik  
Miss. Nandini P. Naik  
Miss Reena R. Tari  
Miss. Nikita N. Naik  
Miss Saili S. Naik  
Mr. Sachin A. Porob  
Mr. Satyam P. Shirvoiker

STATION	SB1	SB2	SB3	SB4
DATE	13/06/2012	13/06/2012	13/06/2012	14/06/2012
LATITUDE	17°00.15N	16°30.04N	15°59.94N	15°30.14N
LONGITUDE	071°52.49E	71°51.96E	72°24.07E	72°41.00E
MAXIMUM DEPTH(m)	680M	776M	750M	700M
WATER TYPE	DEEP BLUE	BLUE	BLUE	BLUE
SKY	Cloudy	Cloudy	Clear	Cloudy
SEA STATE	Rough	Calm	Calm	Calm
ARRIVAL TIME(IST)	11:45AM	4:36PM	10:14 PM	2:35AM
DEPARTURE TIME(IST)	12:35PM	5:26PM	10:30 PM	2:55AM
WIND SPEED(m/s)	0.3	0.5	0.5	0.1
DIRECTION	288.0°	328.0°	277.0°	93.0°
TEMPERATURE:				
DRY(°C)	28	29	28	29
WET(°C)	26	26.5	25	26
PRESSURE	1003.3	1001.2	1003.8	1003.0
OPERATIONS:	CTD	CTD	CTD	CTD

STATION	SB5	SB6	SB7	SB8
DATE	14/06/2012	14/06/2012	14/06/2012	14/06/2012
LATITUDE	15°00.11N	14°29.99N	14°00.27N	13°30.30N
LONGITUDE	72°49.08E	73°03.42E	73°11.09E	73°21.06E
MAXIMUM DEPTH (m)	740M	760M	750M	700M
WATER TYPE	Blue	Blue	Blue	Blue
SKY	Rainy	Cloudy	Cloudy	Cloudy
SEA STATE	Calm	Slight to moderate sea	Slight to moderate sea	Slight to moderate sea
ARRIVAL TIME	6:40AM	10:56AM	3:05PM	07:05 PM
DEPARTURE TIME	7:15AM	11:30AM	3:40PM	07:30 PM
WIND SPEED(m/s)	0.2	0.4	0.4	3.5
WIND DIRECTION	273.0°	322.0°	298.0°	351.0°
TEMPERATURE				
Dry (°C)	28	29	28	29
Wet(°C)	25	26	25.5	26
PRESSURE	1004.0	1005.7	1004.1	1004.4
Operations:	CTD	CTD	CTD	CTD

STATION	SB9	SB10	SB11	SB12
DATE	14/06/2012	15/06/2012	15/06/2012	15/06/2012
LATITUDE	13°00.37N	12°29.98N	12°00.03N	11°30.55N
LONGITUDE	73°45.74E	74°05.33E	74°19.38E	74°37.94E
MAXIMUM DEPTH (m)	790M	600M	600M	650M
WATER TYPE	Blue	Blue	Dark Blue	Deep blue
SKY	Cloudy	Cloudy	Cloudy	Clear
SEA STATE	Calm	Calm	Moderately rough	Calm
ARRIVAL TIME	11:53PM	4:49AM	09:10 AM	01:40 PM
DEPARTURE TIME	12:40AM	5:20AM	09:25 AM	02:05 PM
WIND SPEED(m/s)	4.0	0.1	2.1	2.6
WIND DIRECTION	325.0°	255.0°	321.0°	324.0°
TEMPERATURE				
Dry (°C)	27	26.5	28	30
Wet(°C)	24	24	25	28
PRESSURE	1006.8	1004.9	1007.5	1006.9
Operations:	CTD	CTD	CTD	CTD

STATION	SB13	SB14	SB15	SB 16
DATE	15/06/2012	15/06/2012	16/06/2012	16/06/2012
LATITUDE	11°29.01N	11°29.01N	10°0.306N	09°30.138N
LONGITUDE	74°39.02E	74°39.02E	75°30.982E	75°34.849E
MAXIMUM DEPTH (m)	700M	600M	600M	650M
WATER TYPE	Blue	Blue	Blue	Blue
SKY	Cloudy	Clear	Clear	Clear
SEA STATE	Calm	Calm	Slight to moderate	Slight to moderate
ARRIVAL TIME	06:35 PM	11:26 PM	03:50 AM	08:03 AM
DEPARTURE TIME	07:22 PM	12:15 PM	04:15 AM	08:30 AM
WIND SPEED(m/s)	4.0	4.0	4.0	4.0
WIND DIRECTION	326.0°	326.0°	326.0°	326.0°
TEMPERATURE				
Dry (°C)	29	27	28	27
Wet(°C)	26	25	25	24
PRESSURE	1006.2	1006.2	1006.2	1006.2
Operations:	CTD	CTD	CTD	CTD

STATION	SB17	SB18	SB19	
DATE	16/06/2012	16/06/2012	18/06/2012	
LATITUDE	8°59.99N	8°30.00N	8°00.32N	
LONGITUDE	75°26.80E	76°13.68E	76°36.23E	
MAXIMUM DEPTH (m)	650M	620M	680M	
WATER TYPE	Blue	Deep blue	Deep Blue	
SKY	Cloudy and rainy	Cloudy	Cloudy	
SEA STATE	Rough	Calm	Rough	
ARRIVAL TIME	12:30 PM	07:22 PM	01:30 AM	
DEPARTURE TIME	01:00 PM	08:15 PM	02:30 AM	
WIND SPEED(m/s)	0.2	1.5	5.6	
WIND DIRECTION	324.0°	301°	315°	
TEMPERATURE				
Dry (°C)	28.5	28	28	
Wet(°C)	26.5	26	25	
PRESSURE	1007.5	1008.0	1007.7	
Operations:	CTD	CTD	CTD	

#### Off Trivendrum

STATION	T1	T2	T3	T4
DATE	17/06/2012	17/06/2012	17/06/2012	17/06/2012
LATITUDE	8°34.65N	8°42.25N	8°46.840N	8°50.023N
LONGITUDE	75°26.51E	75°38.25E	75°48.455E	75°57.822E
MAXIMUM DEPTH (m)	1250M	300M	375.6M	328M
WATER TYPE	Blue	Blue	Blue	Blue
SKY	Cloudy	Cloudy	Cloudy	Cloudy
SEA STATE	Moderate	Moderate	Rough	Rough
ARRIVAL TIME	08:30 PM	06:40 AM	08:55 AM	11:39 AM
DEPARTURE TIME	09:27 PM	07:41 AM	10:35 AM	12:15 PM
WIND SPEED(m/s)	0.3	1.1	15.2	0.6
WIND DIRECTION	327.0°	257.0°	280°	284.0°
TEMPERATURE				
Dry (°C)	27	28	27	27
Wet(°C)	24	25	24	24
PRESSURE	1006.9	1007.7	1013.0	1008.7
Operations:	CTD	CTD	CTD	CTD

STATION	T5	T6	T7
DATE	17/06/2012	17/06/2012	18/06/2012
LATITUDE	8°55.6N	8°58.49N	8°59.81N
LONGITUDE	76°06.9E	76°18.18E	76°24.68E
MAXIMUM DEPTH (m)	66M	45M	20M
WATER TYPE	Blue	Blue	Blue
SKY	Cloudy	Cloudy	Cloudy
SEA STATE	Rough	Rough	Rough
ARRIVAL TIME	01:45 PM	03:50 PM	05:35 PM
DEPARTURE TIME	2:20 PM	04:10 PM	06:30 PM
WIND SPEED(m/s)	10	8	4.7
WIND DIRECTION	70.0°	265.0°	249.0°
TEMPERATURE			
Dry (°C)	28	27.5	26.5
Wet(°C)	25	25	24
Operations	CTD	CTD/Grab	CTD/Grab

#### Off Chennai

STATION	CH-1	CH-2	CH-3	CH-4
DATE	22/06/2012	22/06/2012	22/06/2012	22-06-12
LATITUDE	13°05.546N	13°05.314N	13°04.82N	13°3.892N
LONGITUDE	80°30.070E	80°40.282E	80°49.85E	81°0.275E
MAXIMUM DEPTH (m)	80m	310m	2000m	3400m
WATER TYPE	Blue	Blue	Deep Blue	Blue
SKY	Clear	Clear	Clear	Clear
SEA STATE	Moderate	Moderate	Moderate	Moderate
ARRIVAL TIME	9:15 PM	7:45 PM	6:15 PM	03:45 PM
DEPARTURE TIME		8:00 PM	6:45PM	04:15 PM
WIND SPEED(m/s)	0.6	7.2	0.6	7.2
WIND DIRECTION	133°	160°	66.0°	215°
TEMPERATURE				
Dry (°C)	29°C	29°C	29.5°C	30°
Wet(°C)	26°C	26°C	27°C	27°
Pressure(mbars)	1003.8	1006.0	1002.1	1006.0
Operations	CTD	CTD	CTD	CTD

STATION	CH-5	CH-6
DATE	22-06-12	21-06-12
LATITUDE	13°03.97N	13°03.824N
LONGITUDE	82°12.56E	82°59.319E
MAXIMUM DEPTH (m)	3200M	3300M
WATER TYPE	Blue	Blue
SKY	Clear	Clear
SEA STATE	Very rough	Moderate
ARRIVAL TIME	06:00 AM	9:28 PM
DEPARTURE TIME	07:20 AM	10:05 PM
WIND SPEED(m/s)	6.8m/sec	10.3m/sec
WIND DIRECTION	91.0°	220.0°
TEMPERATURE		
Dry (°C)	30°	30°
Wet(°C)	27°	27°
Pressure(mbars)	1001.2	1009.0
Operations	CTD	CTD



**All Station Position:**

Station No.	Long degE	Lat degN	Sounding(m)	Operations
SB1	071°52.49E	17°00.15N	680	CTD
SB2	71°51.96E	16°30.04N	776	CTD
SB3	72°24.07E	15°59.94N	750	CTD
SB4	72°41.00E	15°30.14N	700	CTD
SB5	72°49.08E	15°00.11N	740	CTD
SB6	73°03.42E	14°29.99N	760	CTD
SB7	73°11.09E	14°00.27N	750	CTD
SB8	73°21.06E	13°30.30N	700	CTD
SB9	73°45.74E	13°00.37N	790	CTD
SB10	74°05.33E	12°29.98N	600	CTD
SB11	74°19.38E	12°00.03N	600	CTD
SB12	74°37.94E	11°30.55N	650	CTD
SB13	74°39.02E	11°29.01N	700	CTD
SB14	74°39.02E	11°29.01N	600	CTD
SB15	75°30.982E	10°0.306N	600	CTD
SB16	75°34.849E	9°30.138N	650	CTD
SB17	75°26.80E	8°59.99N	650	CTD
SB18	76°13.68E	8°30.00N	620	CTD
SB19	76°36.23E	8°00.32N	680	CTD
T1	75°26.51E	8°34.65N	1250	CTD
T2	75°38.25E	8°42.25N	300	CTD
T3	75°48.455E	8°46.840N	375.6	CTD
T4	75°57.822E	8°50.023N	328	CTD

T5	76°06.9E	8°55.6N	66	CTD
T6	76°18.18E	8°58.49N	45	CTD, Grab
T7	76°24.68E	08°59.81N	20	CTD, Grab
CH1	80°30.070E	13°05.546N	80	CTD
CH2	80°40.282E	13°05.314N	310	CTD
CH3	80°49.85E	13°04.82N	2000	CTD
CH4	81°0.275E	13°3.892N	3400	CTD
CH5	82°12.56E	13°03.97N	3200	CTD
CH6	82°59.319E	13°03.824N	3300	CTD

B.R. Thorat  
Chief Scientist