

**SCIENTIFIC REPORT OF
TWENTY FOURTH
INDIAN ANTARCTIC EXPEDITION**

TECHNICAL PUBLICATION No. 22



सत्यमेव जयते

NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH
(MINISTRY OF EARTH SCIENCES)
HEADLAND SADA, VASCO-DA-GAMA, GOA-403804

2012

ISBN : 978-81-906526-5-0

Report Prepared by : Rajesh Asthana
Under the Supervision of : Sh Rasik Ravindra, Director
National Centre for Antarctic &
Ocean Research
Headland Sada, Vasco, Goa-403 804

Printed at : National Institute of Science Communication And
Information Resources, CSIR
Dr K.S. Krishnan Marg, New Delhi-110 012



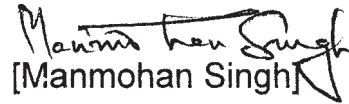
प्रधान मंत्री
Prime Minister

MESSAGE

Dated : June 1, 2005

I am delighted to send my warm greetings to the Indian Antarctic Station 'Maitri', on the occasion of the Antarctic Mid Winter Day. The National Antarctic Programme owes its success to the sincerity and devotion displayed by you all. I have no doubt that your relentless effort and pursuit of scientific knowledge in the harsh conditions of Antarctica will achieve fruitful results. The people of India admire your courage and determination.

Best wishes for a successful stay and safe return home.


[Manmohan Singh]

Shri Rajesh Asthana
Station Commander and
All the members of the XXII Winter Team
'Maitri', Antarctica

कपिल सिब्बल
KAPIL SIBAL



राज्य मंत्री (स्वतंत्र प्रभार)
विज्ञान एवं प्रौद्योगिकी एवं महासागर विकास
भारत सरकार, नई दिल्ली
MINISTER OF STATE (INDEPENDENT CHARGE) FOR
SCIENCE & TECHNOLOGY AND OCEAN DEVELOPMENT
GOVERNMENT OF INDIA
NEW DELHI

19th April 2005

Dear Shri Asthana,

I hope this communication finds you and other team members in the best of health and spirits.

2. The Memorable moments which myself and other members of the delegation spent at Antarctica would remain vivid in our memory for long. I compliment you and your team members for the excellent arrangements made at the Indian base at Maitri and onboard M.V. Emerald Sea.

3. The National Antarctic Programme owes its success to the devotion and courage displayed by you all. Your relentless efforts in pursuit of scientific knowledge in the harsh conditions of Antarctica will certainly keep India's image bright and high in the international arena. The people of India admire your determination and grit.

4. In this connection, I would also like to place on record the appreciation of the flying skills and behaviour of Capt. Craig Rose, Senior Pilot and Mr. Bruce Towers, Pilot, the two helicopter pilots. It was amazing to see them flying the choppers in the hills and the hostile environment with such perfection.

5. Wishing you and your team members the best of luck and safe journey back home.

With warm regards,

Yours sincerely

(KAPIL SIBAL)

Shri Rajesh Asthana,
24th Summer Team Leader
Indian Antarctic Expedition
Station Commander, Maitri
Antarctica



डॉ. शैलेश नायक
DR. SHAILESH NAYAK

सचिव
भारत सरकार
पृथ्वी विज्ञान मंत्रालय
महासागर भवन, ब्लॉक-12, सी.जी.ओ. कॉम्प्लेक्स,
लोदी रोड, नई दिल्ली-110 003
Secretary
Government of India
Ministry of Earth Sciences
'Mahasagar Bhavan' Block-12, C.G.O. Complex,
Lodhi Road, New Delhi-110 003

FOREWORD

The Antarctic continent, though an epitome of adjectives for harsh isolated conditions, yet is pivotal to enduring science to know the unknown and document the delicate changes recorded due to natural variability of climate on different scales. The contribution of the continent in understanding the crustal evolution and establishing pre-Gondwana linkages are also well known.

India's presence in Antarctica since 1981 is a testimony to the commitment of the nation towards unraveling the unresolved mysteries of the Earth by carrying out research in these areas. The logistics and infrastructure facilities are being upgraded continuously by NCAOR to achieve the desired results. As a result, more and more institutions are becoming interested to join this national scientific endeavor.

The members of the XXIV team under the leadership of Shri Rajesh Asthana - a geologist from the Geological Survey of India, have covered vast panorama of scientific subjects ranging from atmosphere to biological to earth sciences. The team has achieved all the targets set for it displaying a deep determination to perform and achieve the goals against all odds. The outcome in the form of present report speaks for itself.

The expedition team also included a Task Force for the Larsemann hills which initiated scientific studies and placed the first Igloo structure on the site.

My congratulations to Shri Rajesh Asthana and his team for their achievements and for bringing out of excellent document.

(SAILESH NAYAK)

राष्ट्रीय अंटार्कटिक एवं
समुद्री अनुसंधान केन्द्र
पृथ्वी विज्ञान मंत्रालय
(भारत सरकार)
हेड लैण्ड सडा,
वास्को-डा-गामा
गोवा-403 804, भारत



**NATIONAL CENTRE FOR
ANTARCTIC & OCEAN RESEARCH**
Ministry of Earth Sciences
(Government of India)
Headland Sada, Vasco-da-Gama,
Goa - 403 804, INDIA.

Rasik Ravindra
Director

Tel: 0832-2525500
0832-2525501
Fax: 0832-2520877
Email: rasik@ncaor.org

PREFACE

The XXIV Indian Scientific Expedition to Antarctica that made way to the icy continent under the leadership of Shri Rajesh Asthana of the Geological Survey of India, was historic in more than one way. For the first time, an Indian Minister set his foot on the icy continent along with senior officers from Ministry when a high level delegation led by Hon'ble Minister of Earth Sciences, Shri Kapil Sibal along with Dr. Harsh K. Gupta, the then Secretary, Department of Ocean Development and Dr. P.C. Pandey, former Director NCAOR visited Maitri. The Indian station also hosted three scientists from Malaysia who wanted to work on biodiversity of lakes of Schirmacher oasis.

It was again during this expedition that the first structure in form of a Melon hut was placed at Larsemann Hills to mark beginning of setting up of India's third Antarctic Station.

New projects that were completed successfully included the magneto telluric surveys conducted jointly by NGRI and NCAOR to understand the nature of crust below the exposed rock surface. The wintering period was very judiciously utilized for intensive coring for sediments from the fresh water lakes for deciphering past climatic changes and limnological studies.

The leader and the team deserve all accolade for achieving the objectives set for the Expedition and bringing the results forward in the form of this technical publication.

I would like to thank Shri Rajesh Asthana Leader and Dr. C.T. Achutankutty & Dr. Rahul Mohan of NCAOR for compiling, getting the papers reviewed, carrying out proof reading and coordinating the publication with NISCAIR (CSIR).


(Rasik Ravindra)

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THE TEAM

XXIV Indian Scientific Expedition to Antarctica (2004-06)

WINTER TEAM

Sr. No.	Name	Institution
1.	Rajesh Asthana	Expedition Leader and Station Commander (GSI)
2.	Kandasamy Ramar	GSI
3.	A. Nageswara Rao	NGRI
4.	Sanjay Bist	IMD
5.	Amalendu Barua	IMD
6.	Paramasivam Elango	IIG
7.	Moushum Bhattacharyya	DIPAS
8.	Maj. Rajendra Sial	Indian Army (EME)
9.	Sub. Mahendra Kumar Sharma	Indian Army (EME)
10.	Nb. Sub. Arputham Joseph	Indian Army (EME)
11.	HMT. Gowardhan Gurjar	Indian Army (EME)
12.	Hav. Azad Singh Chahal	Indian Army (EME)
13.	Hav. Baddira Chengappa Ponnappa	Indian Army (EME)
14.	Nk. Pratap Ram	Indian Army (EME)
15.	L/Nk. Sundaraju Raja	Indian Army (EME)
16.	Maj. Balakrishnan Palani Muthu Kumaran	Indian Army (Engrs.)
17.	Hav. Muthurakkan Balasubramanian	Indian Army (Engrs.)
18.	L/ Hav. Muni Rathinam Mani	Indian Army (Engrs.)
19.	Nk. Sivan Santhosh Kumar	Indian Army (Engrs.)
20.	L/Nk. Surender Singh	Indian Army (Engrs.)
21.	Bhagwati Prasad Semwal	DEAL
22.	Rajesh Dabral	DEAL
23.	Dr. Gautam Bandyopadhyay	Northeast Frontier Railways Hqtrs.
24.	Dr. Rajeev Kumar Kotnala	ITBP
25.	Vijay Kumar	ITBP

THE TEAM

XXIV Indian Antarctic Expedition to Antarctica (2004-06)

WINTER TEAM



KANDASAMY RAMAR



A. NAGESWARA RAO



SANJAY BIST



AMALENDU BARUA



PARAMASIVAM ELANGO



MOUSHUM BHATTACHARYYA



MAJ. RAJENDRA SIAL



SUB. M. K. SHARMA



NB. SUB. A. JOSEPH



HMT. G. GURJAR



HAV. A. S. CHAHAL



HAV. B. C. PONNAPPA



NK. PRATAP RAM



L/NK. S. RAJA



MAJ. BPM KUMARAN



HAV. M. BALASUBRAMANIAN



L/ HAV. M. RATHINAM MANI



NK. SIVAN SANTHOSH K.



L/NK. SURENDER SINGH



B. PRASAD SEMWAL



RAJESH DABRAL



Dr. G. BANDYOPADHYAY



Dr. RAJEEV KOTNALA



VINAY KUMAR

THE TEAM

XXIV Indian Scientific Expedition to Antarctica (2004-05)

SUMMAR TEAM

Sr. No.	Name	Institution
1.	Mirza Javed Beg	Deputy Leader and Leader—Task Force
2.	Prakash Kumar Shrivastava	GSI
3.	Dr. Durbhakula Narasimha Murthy	NGRI
4.	Dr. Koppireddi Veeraswamy	NGRI
5.	Poikayil Sunil Sukumaran	IIG
6.	T. Vijaya Kumar	NPL
7.	Prof. (Smt.) Laxmi Bishnoi	NPL
8.	Mahendra Singh	SOI
9.	Jaikrit Singh Tariyal	SOI
10.	Mihir Kumar Dash	NCAOR
11.	Dr. Upendra Kumar Singh	NCAOR
12.	Lt. Cdr. Srikanth Mukku	NHO
13.	Rokkam Madhu	NHO
14.	Comdt. (JG) Manoranjan Srivastava	ICG
15.	Dr. Swapan Kumar Mandal	ZSI
16.	Dr. Ashwani Wanganeo	Dept. of Limnology, BU.
17.	Shailendra Saini	Space Science Lab, BU.
18.	Dr. Jaswant Singh	Dr. RML Avadh University
19.	Abhishek Bharadwaj	DIPAS
20.	Dr. Devendra Kumar Singh	IITM
21.	Sunil Manohar Sonbawne	IITM
22.	Vimlesh Pant	IITM
23.	Jagat Bhushan	DEAL
24.	NK. Amrik Singh	Indian Army (Engrs.)
25.	NK. Jaswinder Singh	Indian Army (Engrs.)
26.	Surendra Kumar	ITBP
27.	Dr. Clemente Michael Won Vui Ling	Universiti Malaysia Sabah
28.	Dr. Baba Bin Musta	Universiti Malaysia Sabah
29.	Leelatulasi Salwoom	Universiti Malaysia Sabah

THE TEAM

XXIV Indian Scientific Expedition to Antarctica (2004-05)



PRAKASH K.
SHRIVASTAVA



Dr. D. NARASIMHA
MURTHY



Dr. K.
VEERASWAMY



POIKAYIL SUNIL
SUKUMARAN



T. VIJAYA KUMAR



PROF. (SMT.)
LAXMI BISHNOI



MAHENDRA SINGH



JAIKRIT SINGH
TARIYAL



MIHIR KUMAR DASH



Dr. UPENDRA
KUMAR SINGH



LT. CDR. SRIKANTH
MUKKU



ROKKAM MADHU



COMDT. (JG)
M. SRIVASTAVA



Dr. SWAPAN
KUMAR MANDAL



Dr. ASHWANI
WANGANEO



SHAIENDRA SAINI

THE TEAM

XXIV Indian Scientific Expedition to Antarctica (2004-05)



Dr. JASWANT SINGH



ABHISHEK
BHARADWAJ



Dr. DEVENDRA
KUMAR SINGH



SUNIL MANOHAR
SONBAWNE



VIMLESH PANT



JAGAT BHUSHAN



NK. AMRIK SINGH



NK. JASWINDER
SINGH



SURENDRA KUMAR



Dr. C. MICHAEL WON
VUI LING



Dr. BABA BIN MUSTA



LEELATULASI
SALWOOM

ADDRESSES OF PARTICIPATING ORGANIZATIONS

1. National Centre for Antarctic and Ocean Research, Headland, Sada, Vasco-da-Gama, Goa-403804.
2. Geological Survey of India, Antarctica Division, NH 5 - P, N.I.T., Faridabad-121001.
3. Indian Institute of Geomagnetism, Plot 5, Sector- 18, New Panvel (West), Navi Mumbai-4102118.
4. India Meteorological Department, Mausam Bhawan, Lodhi Road, New Delhi-110003.
5. Indian Institute of Tropical Meteorology, Dr. Homi Bhabha Road, Pashan, Pune-411008.
6. National Physical Laboratory, Dr. K.S. Krishnan Marg, New Delhi-110012.
7. National Geophysical Research Institute, Uppal Road, Hyderabad- 500007.
8. Survey of India, 17 E.C.Road, P.B. No. 77, Dehra Dun-248001.
9. National Hydrographic Office, P.B.No. 75, 107 A, Raipur Road, Dehradun-248001.
10. Indian Coast Guard, Coast Guard Headquarters, National Stadium Complex, New Delhi-110001.
11. Zoological Survey of India, M-Block, New Alipore, Kolkata-700053.
12. Barkatullah University, Bhopal-462026.
13. Dr.Ram Manohar Lohia Avadh University, Faizabad-224001.
14. Defence Institute of Physiology and Allied Sciences, Lucknow Road, Timarpur, Delhi-110054.
15. Defence Electronics Application Laboratory, P.B. No. 54, Raipur Road, Dehra Dun-248001.
16. Indian Army, Directorate General of EME, Army Headquarters, Room No. 102, B-Block, DHQ-PO, New Delhi-110011.
17. Indian Army, Engineer-in-Chief's Branch / ES-3, Army Headquarters, Kashmir House, New Delhi - 110001.
18. Indian Railways, Baroda House, New Delhi-110011.
19. Indo Tibetan Border Police, Block No. 2, CGO Complex, Lodhi Road, New Delhi-110003.
20. University Malaya, Kuala Lumpur, Malaysia-52300.
21. Universiti Malaysia Sabah, Locked Bag 2037, 88999 Kota Kinabalu, Sabah, Malaysia-88999.