

**GOA UNIVERSITY
DEPARTMENT OF MARINE SCIENCES**

BEST POSTER AWARD

Research carried out in the Department of Marine Sciences, presented through a poster by Ms. Shabnam Choudhary in Summer School on ANTARCTIC CLIMATE VARIABILITY AND ICE DYNAMICS held at National Centre for Antarctic and Ocean Research (NCAOR) Vasco, Goa, India from 8-11 May 2017, organized by NCAOR and Norwegian Polar Institute, was awarded BEST PAPER AWARD among 35 poster papers. Copy of the Photograph receiving award, Abstract, Award Certificate is given below.





**SUMMER SCHOOL ON 'ANTARCTIC CLIMATE
VARIABILITY AND ICE DYNAMICS'**



08-11 May, 2017

ESSO - National Centre for Antarctic and Ocean Research, GOA



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Source and processes of the lacustrine sediments and their effect on productivity of Schirmacher Oasis and Larsemann Hills, East Antarctica

Shabnam Choudhary¹, G. N. Nayak¹, Anoop Kumar Tiwari²
and N. Khare³

¹Department of Marine Sciences, Goa University, Goa – 403 206

²National Centre for Antarctic and Ocean Research, Vasco, Goa

³Ministry of Earth Sciences, Govt. of India, New Delhi

Abstract:

With an aim to understand source and sedimentary processes and their possible effect on productivity with time in lacustrine environment, two sediment cores retrieved, one each from lake Vetehiya of Schirmacher Oasis and lake L-10 of Larsemann Hills, East Antarctica were investigated at 2 cm interval for sedimentological and geochemical parameters viz. grain size, total organic carbon, total nitrogen, phosphorus, biogenic silica and bulk metal concentration of Al, Fe, Mn, Cr, Co, Zn, Cd and Pb. In Lake L-10, average sand was higher than in Lake V-1 which indicated the high intensity of mechanical weathering releasing coarse grained material from the rocks in the catchment area of lake L-10. In both the lakes, higher than average sand content in major portion of the cores suggested warm conditions in the region due to which coarse grained particles were transported from the catchment area into the lake by glacial melt water while higher clay near the surface indicated deposition of fine grained particles supplied by ice-melt water owing to ice free conditions in the area. In both the lakes sand distribution was compensated by silt.

Total organic carbon and nitrogen were relatively higher in Lake V-1 and biogenic silica was found to be slightly higher in lake L-10. Relatively high total organic carbon associated with high clay indicated deposition of finer particles from suspension and high biogenic silica indicated high primary productivity in the upper 8 cm in core V-1 and 4 cm in core L-10 due to exposure of the lakes to the ice-melt water influx.

In both the lakes C/N ratio was found to much less than 10, indicating the major source of organic matter as autochthonous. However, N/P and N/Si ratios were lower than the Redfield ratio indicating significant limitation of P and N in the lake L-10. In this lake, total organic carbon and total nitrogen exhibited a poor correlation ($r^2=0.19$) which indicated that they originated from different source. In lake L-10, total nitrogen showed positive correlation (0.64) with Al suggesting the source of nitrogen to be terrestrial. In Lake L-10, concentration of almost all the metals was found to be low compared to Lake V-1. In Lake V-1 also, almost all the metals showed similar distribution with depth. Further, most of the metals namely Al, Fe, Mn, Co, Ni, Zn showed a peak value at 8 cm which coincided with upper higher values of sand.

These metals therefore seemed to have a common lithogenic origin from weathering of rocks namely gneisses and charnockites present in the catchment area. In Lake L-10, the metals Al, Fe, Mn and Zn showed gradual decrease after a peak at 8 cm, whereas Pb, Cd along with Co showed gradual increasing trend similar to that of organic carbon. In both the lakes Cd and Pb showed different distribution compared to other studied metals and therefore they might be from different source like biogenic and anthropogenic.



Certificate



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Antarctic Climate Variability and Ice Dynamics

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for her poster entitled

*Source and processes of the lacustrine sediments and their
effect on productivity of Schirmacher Oasis and
Larsemann Hills, East Antarctica*

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