

Birbal Sahni Institute of Palaeosciences

Monthly summary on Research Activities

(November, 2022)

1. Areas of Focus:

The institute carries out research on fundamental as well as applied aspects of Palaeosciences that includes Evolutionary history of biota, Paleoclimate, studies of past civilization, Human history and contemporary Climate Change issues, following an integrated and multi-disciplinary approach.

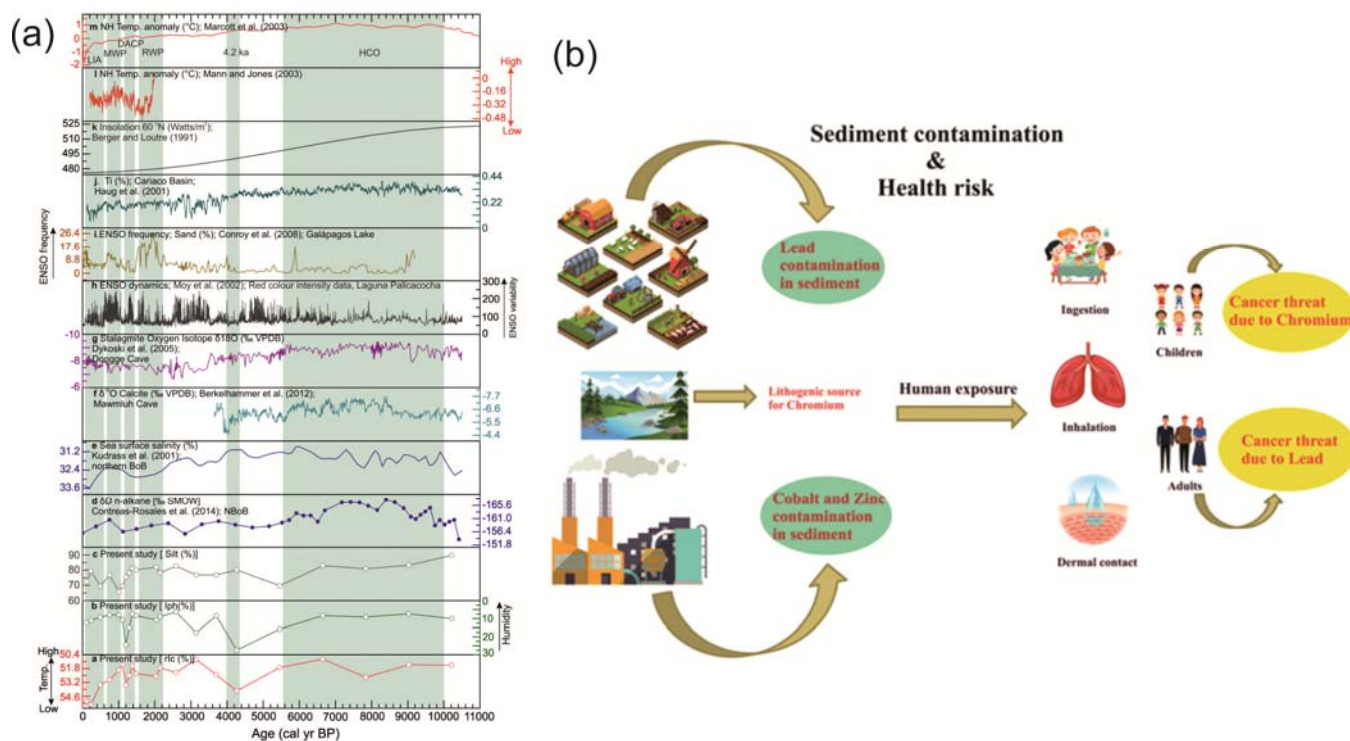
Key research activities under following objectives:

- Understanding origin and evolution of life through time and space.
- Understanding climate change in recent and deep geological times.
- Understanding past civilization and human history.
- Application of Palaeosciences in exploration of fossil fuel and coal industry.

2. Important Highlights of Major Research Programmes

a. Key Scientific Findings of the Month (November 2022)

1. The present study provides the last ~10, 200 years climatic history of the Bengal region. According to this research between ~10.2–5.6 ka, the region witnessed strong Indian summer monsoonal (ISM) rains which became weaker around 4.3 ka. The ISM again strengthened between ~3.7 and 2.1 ka following which it switched to a drier mode for some time. The ISM regains its strength during 0.2–0.1 ka. When the current findings are compared to existing records, the Holocene ISM variability over the Bay of Bengal (BoB) moisture supply regions appears to be coherent on a millennia-scale; however, the finer-scale disparities are probably caused by varying proxy responses and dating uncertainty (coarser sampling resolution; Fig A; *for details please see Ghosh et al. 2022*).
2. The deltaic areas of the Mahanadi River basin are densely populated and are prone to contamination due to sewage, industrial waste, and agricultural runoff. The study reveals a moderate heavy mineral contamination of Co, Pb and Zn indicating anthropogenic contamination, possibly from agriculture land due to extensive use of pesticides in the investigated region. The LCR values estimated for human health via ingestion pathway exhibited higher values for children (due to Cr) compared to the adults. This suggests that the children are more prone to risk compared to the adults in the Mahanadi Delta region. The results recommended implications of environmental consciousness on excess usage of pesticides on agricultural land and a regular monitoring of industrial effluents/municipal sewages to overcome the potential health risk in the future (Fig B; *for details please see Samal et al. 2022*).



b. National Unity Day (October 31, 2022)

To commemorate the birth anniversary of Sardar Vallabhbhai Patel, Rashtriya Ekta Diwas (National Unity Day) was celebrated on October 31, 2022 at the Institute. All the staff members including Director, scientists, students, technical and administrative staff took the unity pledge on this occasion.

c. Vigilance Awareness week (October 31-November 6, 2022)

Vigilance Awareness Week-2022 was observed during October 31-November 6, 2022. Staff members including Director, scientists, students, technical and administrative staff took the integrity pledge in English and Hindi both on October 31, 2022 at 11 am. A poster competition on the topic “Corruption free India for a developed Nation; भ्रष्टाचार मुक्त भारत-विकसित भारत” and an Essay writing competition on the topic “Role of citizens in eradicating corruption; भ्रष्टाचार उन्मूलन में नागरिकों की भूमिका” were organized within the Institute during the week. Winner of both the competitions received the prizes and certificates on the occasion of Founder’s Day of the Institute.

d. 4th Palaeobotanical Society Invited Lecture (November 10, 2022)

Fourth Palaeobotanical Society Invited Lecture was delivered by Dr. Om Prakash Thakur, Assistant Professor, Department of Geology, Kurukshetra University, Kurukshetra, India on 10th November 2022 (Online). The title of the lecture was “Hydrocarbon Source Rock Evaluation”. Dr. Vandana Prasad, Director, BSIP & President of the Society was the Chief Guest for the program. Members of the Palaeobotanical Society and scientists of BSIP

including Research Associates, Research Scholars and Project Staff carried out a fruitful discussion on source rock evaluation parameters.

e. Founder’s Day celebration (November 14, 2022)

BSIP celebrated Founder’s Day on November 14, 2022. The chief guest of the function was Prof. AlokDhawan, Director, Center for Biomedical Research (CBMR), Lucknow. Dr. Vandana Prasad (Director BSIP) walked the audience through memory lane of legacy and contributions of Late Prof. Birbal Sahni and also highlighted the achievements and research themes on which BSIP scientific staff is working. She also appreciated the institute contribution in Special cleanliness drive-2, Hindi Pakhwada and vigilance week celebrations. Professor Maharaj Krishan Pandit, Dean, Jindal School of Environment & Sustainability, Jindal Global University delivered 52nd Prof. Birbal Sahni Lecture on “A unified bio-geo-climatic framework for understanding evolutionary divergence of the Himalayan flora”. Professor Pandit discussed rich diversity of Himalayan flora and its changing dynamics with the effect of climate change. The institute’s annual report (2022-2023) and a three minute film showcasing Institutes contribution in Special Cleanliness drive-2 was also released on this occasion. The event was attended by all the scientists, technical staff and research scholars of the institute by their physical presence as well as through online platform.

f. Outreach Activity by BSIP (Nov 2022)

S. No.	University/College/School	Standard/Grad/Post-Grad	No. of Students	Details of Visit
01	Sunbeam women’s College, Varuna, Varanasi	B.Sc. Biology	30-40	Visit to Museum, SEM lab, Central Geochemical Facility
02	New Standard College of Higher Education, Salethu, Rae Bareli	B.Sc. Biology	20-25	Visit to Museum, SEM lab, Central Geochemical Facility and Radiocarbon lab
03	SantDwarika Post Graduate College, Ambedkar Nagar	B.Sc. Biology and M.Sc. Botany	50-55	Visit to Museum, SEM lab, Central Geochemical Facility and Radiocarbon lab

List of research publications (November, 2022):

1. **Singh, A.**, Jain, S., Benzaggagh, M., Schweigert, G., Salamon, M.A., Mulugeta, M. (2022). Late Tithoniannannofossils from Dejen area, the Blue Nile Basin, central western Ethiopia. *Palaeoworld*. DOI:10.1016/j.palwor.2022.10.003(**Impact factor: 2.717**).
2. **Ghosh, R., Saikia, K.**, Biswas, O., **Agrawal, S., Morthekai, P., Arif, M., Phartiyal, B., Sharma, A.**, Singh, N., Paruya, D.K., Maharana, P., **Shekhar, M.**, Bera, S. (2022). Last 10 millennial history of Indian summer monsoon in the Bengal region – a multi-proxy reconstruction from a lacustrine archive. *Palaeogeography, Palaeoclimatology, Palaeoecology* 609. DOI:10.1016/j.palaeo.2022.111308(**Impact factor: 3.565**).
3. Nguyen, H.B., Huang, J., Do, T.V., **Srivastava, G.**, Nguyen, H.M.T., Li, S., Chen, L., Nguyen, M.T., Doan, H.D., Zhou, Z., Su, T. (2022). Pod fossils of *Albizia* (Fabaceae: Caesalpinioideae) from the late Miocene of northern Vietnam and their phytogeographic history. *Review of Palaeobotany and Palynology* 308. DOI: 10.1016/j.revpalbo.2022.104801. (**Impact factor: 2.493**).
4. **Gautam, S.**, Mendhe, V.A., **Murthy, S., Mishra, D.P.**, Mishra, V.K. (2022). Palynoassemblages and depositional environment of the subsurface Permian sediments in Raniganj Coalfield, Damodar Basin, West Bengal, India. *Journal of Earth System Science* 131. DOI:10.1007/s12040-022-01937-7(**Impact factor: 1.912**).
5. Ambokar, M., Panchang, R., **Govil, P., Azharuddin, S.** (2022). Implications of finding *Peraclis* spp. in the Holocene sediments of the northeastern Arabian Sea. *Marine Micropaleontology* 177. DOI: 10.1016/j.marmicro.2022.102182(**Impact factor: 2.102**).
6. Dash, C., Dhal, S.P., Pati, P., **Agnihotri, R., Farooqui, A.**, Seong, Y.B. (2022). Climate-induced denudation of the Eastern Ghat during the Holocene: A multi-proxy study from Chilika Lagoon (India). *Catena* 221. DOI:10.1016/j.catena.2022.106754(**Impact factor: 6.367**).
7. Samal, P., Singarasubramanian, S.R., **Manoj, M.C., Srivastava, J.**, Dsouza, N., Balakrishna, K., Chauhan, M.M., **Ali, S.** (2022). Heavy metal contamination assessment and its associated human health risk evaluation in the Mahanadi River sediments, India. *International Journal of Environmental Science and Technology*. DOI:10.1007/s13762-022-04630-w(**Impact factor: 3.519**).
8. Ashutosh, A., Samal, A.K., **Singh, V.K., Sharma, M.**, Srivastava, R.K. (2022). Geochemistry and Petrogenesis of Mesoproterozoic Mafic Intrusive Rocks from the Singhora and Chandarpur Groups, Eastern Chhattisgarh Basin, Bastar Craton: Possible Implication for the Time of Sedimentation. *Journal of Geological Society of India* 98, 1486–1496. DOI: 10.1007/s12594-022-2203-y. (**Impact factor: 1.466**).

Photographs showing important highlights of major programs/research activities organized during October, 2022:

