

Birbal Sahni Institute of Palaeosciences

Monthly Summary of Research Activities (August 2024)

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.

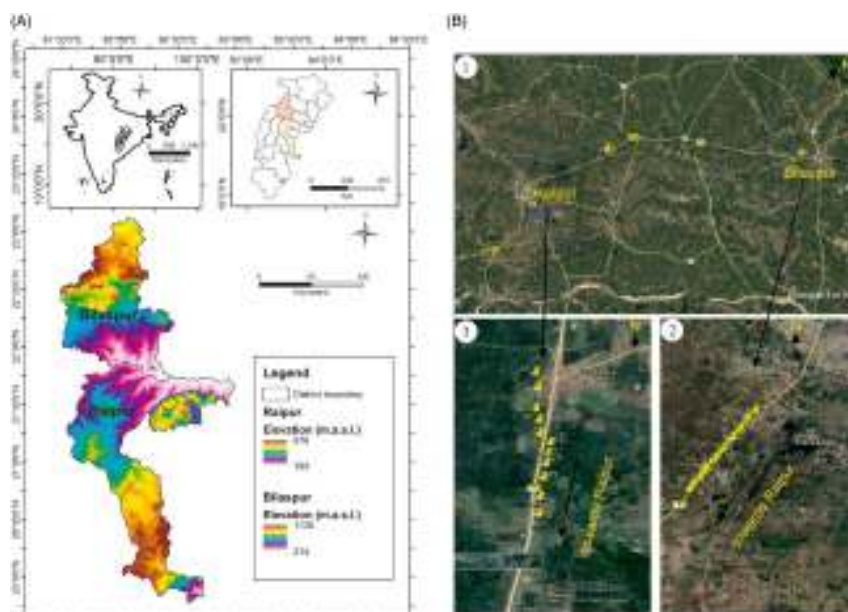
Key research activities under following objectives:

- ☐ 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 Activity

a. Key Scientific Findings of the Month (August 2024)

Interpretation of past vegetation using pollen analysis depends on our understanding about the relationship between the modern vegetation and surface pollen assemblages. In the present study, we sampled the modern pollen-rain in a mixed environment of cultivated land and dry and wet tropical forests in central India. We established to which extent modern vegetation types are reflected in the pollen-rain and explained biases in the modern pollen spectra. Our study revealed that the modern pollen assemblages do not fully represent the extant regional vegetation, as many of the forest components, especially trees and shrubs, are either under-represented or remained palynologically silent in the pollen records. Low pollen productivity of most of the tropical deciduous taxa, owing to entomophily, as well as low preservation potential of some tree pollen are primarily responsible for this irregularity in their representation in the pollen spectra. Moreover, *Shorea robusta* and *Tectona grandis* pollen, despite being high pollen producers, are not encountered in any sample, which could be further attributed to their poor preservation in surface soil samples, as well as to their low (pollen) dispersal efficiency. *Cerealia*, *Amaranthaceae*, *Caryophyllaceae*, *Brassicaceae*, *Cannabis sativa*, *Artemisia* spp. and *Alternanthera* spp. indicate agricultural practices and other human activities around the respective study areas. Moreover, the consistent presence of *Asteroidae* pollen indicates pastoral activities, whereas *Sporormiella* spp., *Sordaria* spp., *Podospora* spp., *Delitschia* spp., and *Cercophora* spp. indicate local grazing and herbivory (Quamar et al 2024).



b. Student Interaction Forum (SIF) Lecture (August 2024)

P. Morthekai, Scientist-D, BSIP, delivered a lecture on “Diversity and dissimilarity indices as climate "proxies" on 22nd August 2024 in BSIP auditorium under SIF. The SIF is a forum for discussion on various aspects of science, completely managed by PhD students with faculty coordinator. The lecture was attended by institute scientists, post-doctoral fellows and research scholars.

Dr Trina Bose, Scientist-C, BSIP, delivered a lecture on “Linux: Basics" on 08th August 2024 in BSIP auditorium under SIF. The SIF is a forum for discussion on various aspects of science, completely managed by PhD students with faculty coordinator. The lecture was attended by institute scientists, post-doctoral fellows and research scholars.

c. Organization of Pre-PhD Seminar

S. No.	Name of PhD Students	Supervisor/Co-supervisor	Title of the Thesis	Date
01	Divya Singh	Prof. Bindhyanchal Pandey (BHU) Prof. Mukund Sharma (BSIP) Dr. Santosh Kumar Pandey (BSIP)	Palaeobiology and Geochemistry of Carbonate Rocks of the Semri Group, the Vindhyan Supergroup, Sonbhadra District, Uttar Pradesh, India.	10.08.2024

d. Acquisition of Unmanned surface Vehicle for Lake Bathymetry Analysis

Birbal Sahni Institute of Palaeosciences (BSIP) Lucknow acquired a state-of-the-art, first-in-India unmanned surface vehicle (USV) dedicated to the bathymetry to estimate lake volume and glacial lake outburst flood (GLOF) risks in Himalaya. Director BSIP, Prof Mahesh Thakkar inaugurated the state of the instrument and dedicated the facility to lake investigation team of BSIP.

e. Pledge taking ceremony (12 August 2024)

Under the Nasha Mukht Bharat Abhiyan campaign, BSIP Director and its scientific, administrative and student staff tool pledge to make BSIP campus, city and India Nasha Mukht under the theme “Viksit Bharat ka Mantra, Bharat ho Nasha se Swatantra”. The event was attended by entire institute in person and took the pledge on 12th august 2024.

f. Independence Day celebrations (15 August 2024)

BSIP celebrated 78th Independence Day by hoisting the national flag by Prof. Mahesh Thakkar, Director BSIP and singing the national anthem on 15th August 2024 within its campus followed by various performances by the institute staff members. All the BSIP staff including research scholars and associates participated in flag hoisting ceremony.

g. Celebrations of 1st National Space Day (23 August 2024)

BSIP celebrated its national space day on its campus by organizing keynote lecture followed by essay writing and quiz competition for school students. The chief guest of the occasion was Prof. A K Singh, Department of Physics, Lucknow University who delivered a keynote address on “Sun-Earth Interactions and Climate Variability”. On this occasion, ‘Earth and Planetary Exploration Group’ was launched for Astrobiological research in the institute.

h. Campus Outreach Activity

S. No.	University/College/School	Standard/Grade/Post-Grad	No. of Students	Details of Visit & Date
01	R.R.P.G. College, Amethi, UP	M.Sc. Botany	45	Visit to Museum, SEM lab, Central Geochemical Facility (31-07-2024)

i. Participation in National/International conferences/workshops/Symposium

During the International Geological Congress (IGC), 2024 at Busan, South Korea in the Busan exhibition centre and convention hall, BEXCO, the scholars from BSIP, Lucknow, India presented their work through oral and poster presentations. The participants

presenting their work are Dr. Pooja Tiwari, BSIP, Mr. Deveshwar Prakash Mishra, Mr. Piyal Halder, Mr. Suraj Kumar, and Ms. Nidhi Tomar. Their work showcased Exploring Palynofacies and sediment texture dynamics in subtropical floodplains along the Gomati River, Lucknow, India: Transition from suburban to urban environments (Pooja Tiwari), Organo-floral characteristics of the Jagannath coal mine (Talcher Coalfield) from Mahanadi Basin: Implications to Paleoecology, Paleovegetation and depositional settings (Deveshwar Prakash Mishra), and Intracrystalline deformation may explain the recurrence of small-magnitude tremors in an intraplate region- A case study from the Koyna-Warna Seismogenic Region, Western India (Piyal Halder).

List of Research Publications (August 2024)

Original Articles/Reviews/Book Chapters

1. Ansari, A.H., Das, A., Sonker, A., Ansari, N.G., Ansari, M.A., Morheikai, P. (2024). Assessment of the health risks associated with heavy metal contamination in the groundwaters of the Leh district, Ladakh. *Environ Geochem Health* 46, 369 (2024). <https://doi.org/10.1007/s10653-024-02149-2>.
2. Khan, F. A., Gurumurthy GP, Muguli, T., Alam, M., & Sharma, A. (2024). Ganga Basin Sediment (GBS): A Potential Geological Reference Material for Tropical Rivers. *Journal of Geological Society of India*, 100(8), 1189–1199. <https://doi.org/10.17491/jgsi/2024/173966>.
3. Goswami, S., Swain, R.R. Aggarwal., N., and Pradhan, S., Tripathi, M., Nanda, S., and Mishra, M., 2024. Lower Gondwana palaeobotany and geochemistry of phosphorite occurrence in the north-western part of Ib-River Coalfield, Odisha, India, and their implications. *Geological Journal*, 1–28. <https://doi.org/10.1002/gj.5029>.
4. Mohammad Firoze Quamar, Ratan Kar & Biswajeet Thakur. 2024. Modern pollen and non-pollen palynomorphs from sub-tropical central India: discerning anthropogenic signal in surface pollen assemblages. *Grana*, <https://doi.org/10.1080/00173134.2024.2350537>.
5. Singh, S. P., Singh, A. K., Arif, M., Prasad, V., Venkateshwarlu, M., Naik, A. S. 2024. Magnetostratigraphy and Sedimentology of Deccan Intertrappean Succession from Sagar, Central India: Insights into Palaeoenvironment and End-Cretaceous Palaeogeography. *Journal of Geological Society of India*, 100(8), 1129–1139. <https://doi.org/10.17491/jgsi/2024/173961>.

Photographs showing important highlights of major programs/research activities organized during August 2024:

