

Birbal Sahni Institute of Palaeosciences
Monthly summary on Research Activities
(March, 2023)

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.

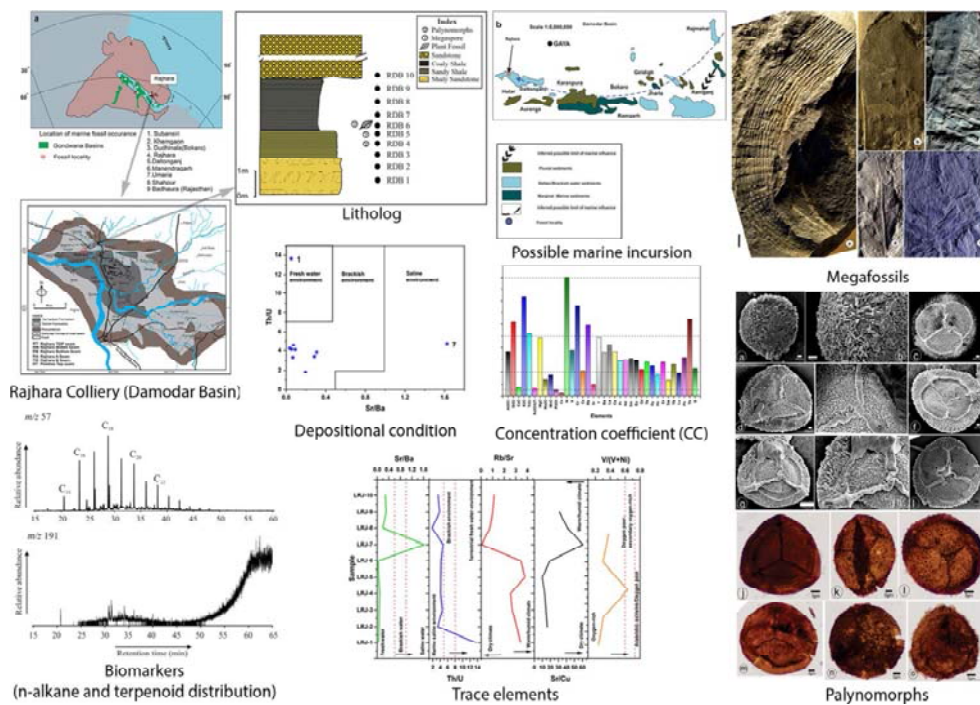
Key research activities under following objectives:

- 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.

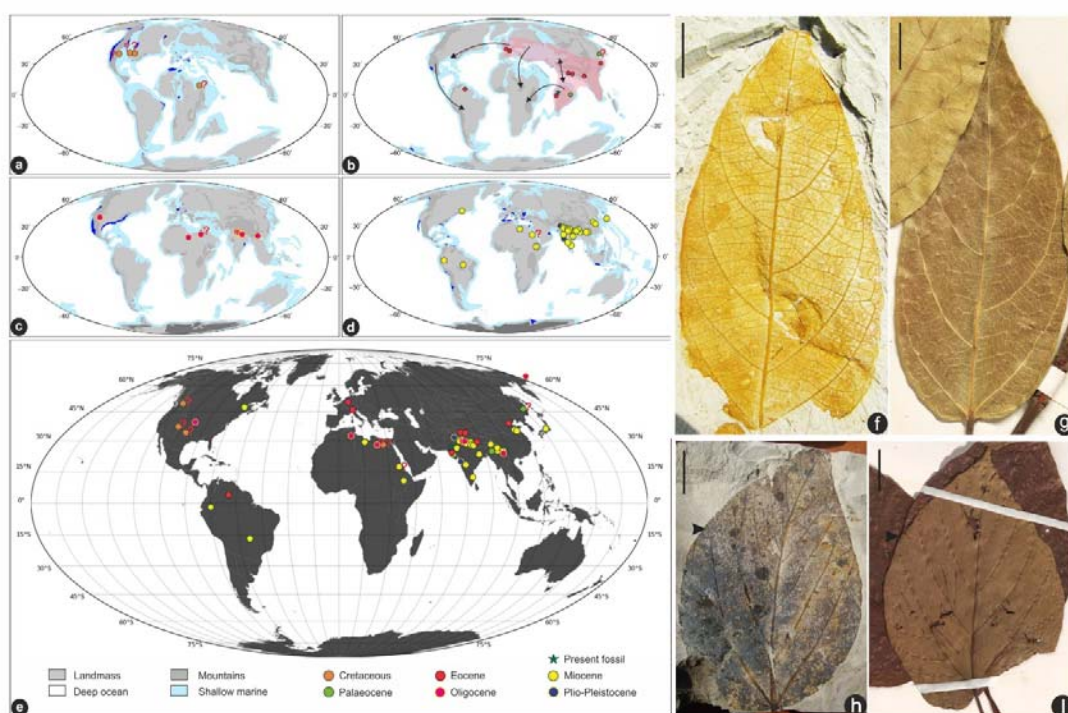
2. Important Highlights of Major Research Programmes

a. Key Scientific Findings of the Month (March 2023).

1) This study is a step towards delineating the Permian eustatic changes across the Gondwana continents that will be useful in inter-regional correlations and palaeogeographic reconstructions and discusses their palaeodepositional model. It highlights the diverse floral assemblage along with palynomorphs which is indicative of luxuriant vegetation during deposition of the lower Barakar Formation responsible for formation of thick coal seams in the Rajhara Colliery. The data reveals a freshwater environment for the top section (RDB-1) while the rest of the period is lightly freshwater-brackish in nature based on Th/U vs. Sr/Ba cross-plot thus establishing the presence of a brackish/saline environment in the Rajhara Colliery sequence. Further, the study concludes that the occurrence of dense forest with swampy vegetation having warm and humid condition during the deposition of the Barakar Formation (Lower Permian) in Rajhara Colliery with the subsequent marine incursion (Pillai et al 2023).



2) Fig fossils from the early Paleogene of the Indian subcontinent highlight the significant role of north moving Indian plate in its early diversification. The study suggests that the major proliferation of this genus took place around Paleocene and Miocene. This study would further help in better understanding of the historical biogeography of pan-tropical genus *Ficus* as there is a persistent incongruity between fossil data and existing molecular phylogenetic results (Chandra et al 2023).



b. 7th PAMC-Geosciences meeting on February 23-24, 2023

The 7th PAMC-Geosciences meeting of the Ministry of Earth Sciences (MoES) was held on February 23-24, 2023, at BSIP, Lucknow. Prof. AK Singhvi chaired the meeting which was attended by the Committee members of PAMC through hybrid mode.

c. National Science Day 2023 on February 28, 2023.

BSIP celebrated the National Science Day on 28th February 2023 with active participation of Mahatma Gandhi Institute of Management and Technology (MGIMT), Lucknow. Students from the institute visited the museum and different laboratories in BSIP and gathered information regarding the research activities conducted in BSIP. BSIP scientists also briefed the students about BSIP (importance & vision) & importance of National Science Day (Sir CV Raman & Raman Effect) through presentations.

d. National Geoheritage Field Workshop on 3-4 March 2023.

A Media briefing was conducted by BSIP scientists before the two-day (3-4th March) National Geoheritage Field Workshop jointly organized by BSIP, Society of Earth Scientists and Janardan Rai Nagar Rajasthan Vidyapeeth University in Zawar & Jhamarkotra region near Udaipur. On Day 1 of the Workshop eminent persons from different fields of geology, archaeology, biotechnology, media & digital media discussed preserving the geoheritage of Zawar region in line with archaeological &

cultural heritage. On Day 2 a field workshop was conducted on the conservation of phosphatic stromatolites & the oldest TTG rocks of Rajasthan state, India.

e. International School & Symposium (LEM) 2023 on 13-26 March

Inaugural ceremony for the workshop hosted by BSIP on "Landuse-landcover mapping & modelling using pollen & isotopic data in different ecological regions of the Monsoon (LEM) International School & Symposium, 2023 was held on 13th March in Western Vidarbha, Maharashtra. The participants were taken for field surveys and hands-on training was also provided for landcover mapping. Invited talks and sessions were also conducted by several BSIP scientists during the workshop.

- f. हिन्दीकार्यशाला के अंतर्गत, "हिंद महासागर द्विध्रुव का भारतीय मानसून पर प्रभाव" विषय पर श्री बृजेश कुमार, वरिष्ठ शोध छात्र (सीएसआईआर-एस आर एफ) ने 16 मार्च, 2023 को एक व्याख्यान प्रस्तुत किया

g. Friday lecture series talks

S.No.	Speaker	Title of the talk	Date
1.	Dr. JCKuniyal, Scientist G GB Pant National Institute of Himalayan Environment, Almora	Himalaya & ClimateChange: Adaptation & resilience building mechanism	March 03, 2023
2.	Ms. Pujarini Samal, SRF BSIP	Species distribution models to predict the priority conservation areas (PCAs) for mangrove ecosystem	March 17, 2023
3.	Dr. Divya Kumari Mishra, Scientist BSIP	Technological properties of coal in context to coal quality assessment	March 24, 2023

Scientific members of the Institute and Project staff members. Research Associates and Scholars attended the talks of the Friday Lecture series.

h. Outstation Scientific outreach Program

- Dr Anurag Kumar, Scientist BSIP delivered an invited talk at UP Ground Water Board on "Use of environmental isotopes in water resource management in Ganga River Basin" on 4th March 2023.
- Dr Binita Phartiyal Scientist BSIP was invited as Chief Guest by SEUZ India on the occasion of International Womens Day 2023 on 3rd March 2023 at Gurugram, Haryana.

- Dr Vandana Prasad, Director BSIP was invited as Chief Guest by Central Groundwater Board, India on the occasion of International Womens Day 2023 on 3rd March 2023 at Lucknow.
- Dr. Vandana Prasad, Director BSIP was invited as a Chief Guest by Geological Survey of India, Lucknow for the 173rd Foundation Day Function on 4th March 2023 at Lucknow.
- Dr Amritpal S Chaddha working under the guidance of Dr Anupam Sharma, Scientist BSIP and Dr NK Singh, Associate Professor, Lucknow University received the Udeepan Award for best research paper in the field of Chemistry 2021-22.

List of research publications (March 2023):

1. **Pillai, S.S.K., Manoj, M.C., Mathews, R.P., Murthy, S., Sahoo, M., Saxena, A., Sharma, A., Pradhan, S., Kumar, S.** (2023). Lower Permian Gondwana sequence of Rajhara (Daltonganj Coalfield), Damodar Basin, India: floristic and geochemical records and their implications on marine incursions and depositional environment. *Environmental Geochemistry and Health* DOI: 10.1007/s10653-023-01517-8. **(Impact factor: 4.898).**
2. **Chandra, K., Spicer, R.A., Shukla, A., Spicer, T., Mehrotra, R.C., Singh, A.K.** (2023). Paleogene Ficus leaves from India and their implications for fig evolution and diversification. *American Journal of Botany*. DOI:10.1002/ajb2.16145 **(Impact factor: 3.325).**
3. Dalal, V., Pasupuleti, N., Chaubey, G., **Rai, N.**, Shinde, V. (2023). Advancements and Challenges in Ancient DNA Research: Bridging the Global North–South Divide. *Genes*. 14(2) DOI:10.3390/genes14020479. **(Impact factor: 4.141).**
4. **Pandey, S.K., Sharma, M., Ahmad, S.** (2023). *Dickinsoniatenuis* reported by Retallack et al. 2021 is not a fossil, instead an impression of an extant ‘fallen beehive’. *Journal of Geological Society of India* 99, 311–316. DOI:10.1007/s12594-023-2312-2. **(Impact factor: 1.466).**
5. **Singh, Y.P., Verma, P., Singh, A., Bali, R.** (2023). Early Miocene (Burdigalian) Dinoflagellate Cysts from the Kerala Basin, Southwest India: Indicators of Marine Ingression at the Onset of the Mid-Miocene Climate Optimum (MMCO). *Journal of Geological Society of India* 99, 357–369. DOI:10.1007/s12594-023-2318-9. **(Impact factor: 1.466).**
6. Kotlia, B.S., Kukreti, M., Bisht, H., Singh, A.K., **Sharma, A.**, Kothiyari, G.C., Porinchu, D.F., Chand, P., Kashyap, R., Sharma, G.K. (2023). Palaeoenvironmental Reconstruction through Granulometric Analysis of a Palaeolake Deposit at Bhikiyasain, Kumaun Lesser Himalaya. *Journal of Climate Change* 9, 25-37. DOI: 10.3233/JCC230004.

Photographs showing important highlights of major programs/research activities organized during March, 2023:

