

**Birbal Sahni Institute of Palaeosciences**  
**Monthly summary on Research Activities**  
**(September 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:

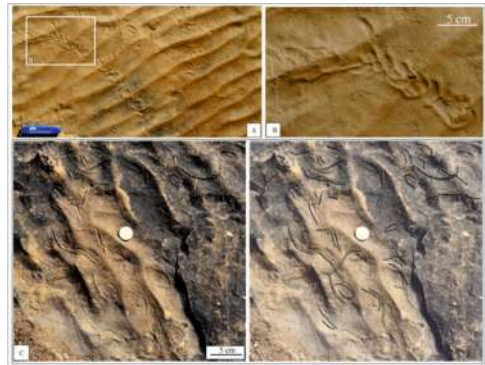
- Understanding origin and evolution of life through time and space.
- Understanding climate change in recent and deep geological times.
- Understanding past civilization and human history.
- Application of Palaeosciences in exploration of fossil fuel and coal industry.

**2. Important Highlights of Major Research Programmes**

**a. Key Scientific Findings of the Month (September 2023)**

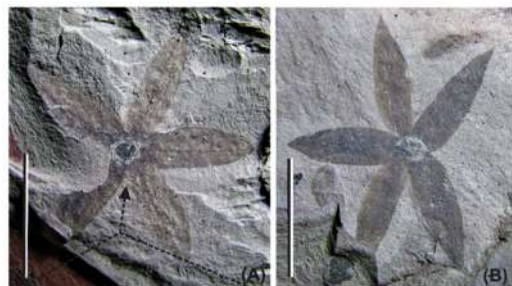
- i) Based on detailed morphological analysis, the origin of two unusual morphotypes from the 1.6 Ga old Chorhat Sandstone, Vindhyan Supergroup, India has been assessed, such as putative biological behaviors or motions of artefacts altering the bedding plane. There are no similar morphotypes in the Precambrian record reported thus far. All of the possible abiotic processes that may have produced these two morphotypes in-depth have been explored. Both the morphotypes might have resulted from the movement of amoeba-like organisms which were prevalent in connection with microbial mats during 1.6 Ga. The existence of a protective microbial mat on top of the sandstone bed surfaces aided in the preservation of such delicate characteristics. These morphotypes raise questions about the Precambrian biotic structures during the Boring Billion (1.8–0.8 Ga) and the consensus prevailing regarding the appearance of motile life during the Ediacaran.

Fig. (A) - Field photo of Morphotype C/1 characterized by A curvilinear row made up of several ridge-groove couplets perpendicularly crossing the wave-rippled sandstone bed surface; (B) Enlarged part of the white rectangle in (A); (C) Field photo of Morphotype C/2 characterized by meandering grooves on the rippled bed surface, hand sketches for better illustration on the right-hand side of (C).



(Choudhary *et al.*)

- ii) Eleven fossil flowers and three fossil fruits of the late Paleocene-early Eocene age have been reported from the Gurha lignite mine, Rajasthan. The fossils show tentative affinities with the modern plant family Anacardiaceae. These fossil evidences provide a cinematic picture of the beautiful flowering and fruiting phase in the early Paleogene time, commonly known for the major diversification of angiosperm.



(Chandra *et al.*)

**b. Prof.Mahesh G Thakkar, Director of Birbal Sahni Institute of Palaeosciences, Lucknow**

Prof.Mahesh G Thakkar, Head of the Department of Earth & Environmental Science & Dean of the Faculty of Science in KSKV, Kachchh University, Gujarat joined as the new Director of Birbal Sahni Institute of Palaeosciences, Lucknow.

**c. BSIP Foundation Day celebration, 10<sup>th</sup> September, 2023**

BSIP celebrated its 77<sup>th</sup> foundation day on September 10, 2023, at its campus by offering floral tribute to Late Prof. Birbal Sahni by Director, Prof. Mahesh G Thakkar along with other scientific, technical, and administrative staff members of the institute. On this auspicious occasion, Prof. Nitin R. Karmalkar, Chairman, Governing Body, BSIP delivered a lecture on "Flood Basalts - A Journey through the Deccan". The event was well attended by all the scientists, technical and research scholars of the institute. The second issue of "पुराविज्ञान स्मारिका पत्रिका" was also released during the event, showcasing the latest research in Palaeosciences.

**d. हिंदी पखवाड़ा समारोह (September 14-24, 2023)**

हिंदी पखवाड़ा के उद्घाटन समारोह में प्रो. ध्रुव सेन सिंह जी ने एक महत्वपूर्ण विचारशील विषय 'जलवायु परिवर्तन: प्राकृतिकया मानवजनित?' पर व्याख्यान दिया। हिंदी पखवाड़ा 2023 के अंतर्गत BSIP में टंकण, टिप्पण, अनुवाद प्रतियोगिता में BSIP के कर्मचारियों व शोधार्थियों ने प्रतिभाग किया और अपनी राजभाषा के प्रति अपना समर्पण दिखाया। "कृत्रिम बुद्धिमत्ता (आर्टिफिशियल इंटेलिजेंस) तकनीक: मानव संसाधन में सहायक या बाधक" विषय पर वाद-विवाद प्रतियोगिता में BSIP कर्मचारियों व शोधार्थियों ने उत्साह से प्रतिभाग किया जिससे दर्शक दीर्घा में भी रचनात्मक विचार-उत्तेजना का संचार हुआ।

**e. Outstation Scientific outreach Program**

- Dr Arvind Singh, Scientist BSIP delivered a talk on 'Sediment dynamics & basin tectonics of Vindhyan basin' on 29<sup>th</sup> August 2023 at KDMIPE ONGC Dehradun.
- STEMM Podcast interview of BSIP scientists was conducted on 5<sup>th</sup> September 2023 aiming to popularize and communicate Science and Technology in society.

**List of research publications (September 2023):**

1. **Choudhuri, A., Albani, A.E., Mandal, S., Sarkar, S. (2023).** Biotic vs abiotic origin of unusual features from Mesoproterozoic of Vindhyan Supergroup, India. *Annales de Paléontologie* 109, 102629. DOI: 10.1016/j.annpal.2023.102629 (**Impact factor: 1**).
2. **Arora, P., Trivedi, P.M., Bhatia, H., Agnihotri, P., Kapur, V.V. (2023).** A Survey of the Anticipated Role of the Indian Museum of Earth (TIME) to Foster Public Awareness Towards the Preservation of Palaeontological Relics. *Geoheritage* 15. DOI: 10.1007/s12371-023-00877-y (**Impact factor: 2.9**).
3. **Chandra, K., Verma, P., Shukla, A., Mehrotra, R.C. (2023).** Pentamerous fossil flowers and fruits from Rajasthan reveal the dominance of flowering plants in the early Palaeogene of India. *Current Science* 125 (3), 321–324. DOI: 10.18520/cs/v125/i3/321-324 (**Impact factor: 1.169**).

4. **Gupta, S., Saxena, A., Shabbar, H., Murthy, S., Singh, K.J., Bali, R.** (2023). First record of late Devonian-early Carboniferous palynoflora from the Lipak Formation, Spiti Basin, Tethyan Himalaya, India, and their biostratigraphic implications. *Journal of the Palaeontological Society of India*. DOI: 10.1177/05529360231182233 (**Impact factor: 0.652**).
5. **Tiwari, P., Srivastava, P., Thakur, B.** (2023). Diatom response in different climatic zones from west coast of India. *Journal of the Palaeontological Society of India* DOI: 10.1177/0552936023118226 (**Impact factor: 0.652**).
6. Chitkara, T., **Sharma, A., Thakur, O.P., Dogra, N.** (2023). Geochemistry of the BhorSaidan alluvial plains in Haryana state of north India: Implications for catchment weathering, provenance, and tectonic setting. *Journal of Earth System Science* 132. DOI: 10.1007/s12040-023-02155-5 (**Impact factor: 1.9**).
7. Paraskevopoulou, D., **Bikkina, S., Grivas, G., Kaskaoutis, D.G., Tsagkaraki, M., Tavernaraki, K., Mihelopoulos, N.** (2023). A direct method to quantify methanol-soluble organic carbon for brown carbon absorption studies. *MethodsX* 11, DOI: 10.1016/j.mex.2023.102313 (**Impact factor: 1.9**).
8. Kumar, C., **Shukla, Y., Sharma, M., Kumar, S.B.H., Malarkodi, N., Khan, S.A.** (2023). Neoproterozoic stromatolites from the Dharwar Supergroup, India. *Current Science* 125 (4), 435–441. DOI: 10.18520/cs/v125/i4/435-441. (**Impact factor: 1.169**).
9. Majeed, M., Stoica, E., Meko, D.M., Touchan, R., Sivrikaya, F., Alexandru, A.M., Arimon, L.C., Kvaratskhelia, R., Maglakelidze, S., Pacaldo, J.M., **Deeksha** (2023). Analysis of the Climate Signal in Subannual Width Measurements of *Pinus nigra* Tree Rings in Kastamonu Province, Turkey. *Tree-Ring Research*, 79(2), 50–59. DOI: 10.3959/2022-12. (**Impact factor: 1.6**).
10. Singh, P.P. **Kumar, S., Pasupuleti, N., Weerasooriya, P.R., van Driem, G., Tennekoon, K.H., Rai, N., Chaubey, G., R. Ranasinghe, R.** (2023). Reconstructing the population history of the Sinhalese, the major ethnic group in ŚrīLāṅkā. *iScience* 26 (10), 107797: DOI: 10.1016/j.isci.2023.107797.
11. Chakraborty, A., **Ghosh, A.K., Saxena, S., Dey, R., Ray, L.** (2023). Neogene biostratigraphy and paleoceanography of Andaman and Nicobar Basin: A reappraisal. *Stratigraphy & Timescales, Series 8* Publisher: Elsevier. DOI: Stratigraphy & Timescales, Series Volume 8 Publisher: Elsevier.

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

