

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

The articles highlight that finding in-situ organic molecules in Martian sedimentary rock samples has been extremely challenging. Nevertheless, Martian lander/ rover missions have successfully detected some light aliphatic and some complex aromatic hydrocarbons. The article adds that identifying target sedimentary rocks with better preservation potential for hydrocarbons on Mars is critical in reducing ambiguity in results, which can be achieved by studying numerous types of sediments and rock samples from Earth-based Martian analogues environment (Ansari, 2023; *Frontiers in Astronomy and Space Sciences*).

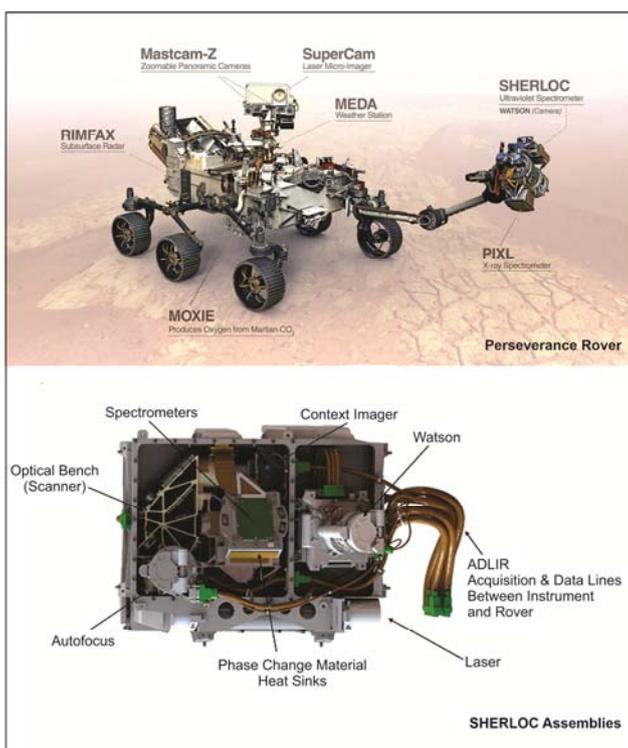


Figure: Perseverance rover with Scanning Habitable Environments with Raman & Luminescence for Organics & Chemicals (SHERLOC)

b. Annual General Meeting of the Association of Quaternary Researchers (AOQR) on January 24, 2023

Annual General Meeting of the Association of Quaternary Researchers (AOQR) was conducted successfully on the January, 24 at the Natural History Museum, Christ College, Thrissur, Kerala. The meeting was attended by several members of AOQR through both offline and online mode. Vice-President Dr. Pradeep Srivastava presided over the meeting and delivered the welcome address, which was followed by Secretary's Report and briefing about AOQR Activities, Remembering Professor S N Rajguru, discussions for Indian Quaternary Congress 2024 and Treasure's Report.

c. Friday lecture series talks

S.No.	Speaker	Title of the talk	Date
1.	Dr. Salman Khan, BSIP	Late Pliocene pollen-based vegetation record from ODP Hole 910C, Yermak plateau, Arctic Atlantic Gateway	January 27, 2023
2.	Dr. Ashish Kumar Mishra, BSIP	Cretaceous-early Paleogene biostratigraphy & paleoenvironment of the Krishna-Godavari Basin	February 3, 2023

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

d. Outstation Scientific outreach Program

- Dr. SK Shah visited the Department of Geology, Gauhati University, Assam and talked to the students briefing about BSIP, overview of proxies for Palaeoclimatic studies and the concept of tree rings and its applications.
- On World Wetlands Day 2023 (02/02/23), DrShilpa Pandey visited MaharanaPratap Inter College, Asti, Lucknow and delivered a talk on “Importance of the #Wetlands & urgent need of Wetlands Restoration. As a part of the outreach program Dr Pandey assigned a field task to the students to identify plants & birds found in the vicinity and had a face to face discussion with the students about how the wetland can be restored & conserved.
- DrBinitaPhartiyal delivered a talk titled "Late Quaternary hydroclimatic variations in the Ladakh sector of NW Himalaya as a part of Monsoon Geo Seminar on 8th February, 2023.
- Scientists of BSIP showcased the history, purpose and various researches of BSIP in India Energy Week 2023 from 6th Feb to 8th Feb 2023 at Bengaluru International Exhibition Centre.
- DrBinitaPhartiyal Scientist BSIP briefed the participants of National Training Workshop Paleoclimate Archives-Proxies & analysis techniques (NT-PALEO) at IITM Pune on the Geology,landform, evolution, climate proxies & neotectonics of Cold arid desert of Ladakh.
- Dr. BinitaPhartiyal delivered an invited talk on "The Landscape evolution & climatic variations in Ladakh, NW Trans-Himalaya during Late Quaternary" in the Conference on Geology: Emerging Methods & Applications (GEM-2023) Christ College, Thrissur, Kerala from January 23-25, 2023.
- Dr. Shilpa Pandey was invited as a guest speaker for Climate Action Now Workshop held at IIT Gandhinagar. She spoke on “Palaeosciences Research in Climate Change”.
- Dr. AnjuSaxena Scientist BSIP delivered the Prof. Birbal Sahni Memorial Lecture on 13th February, 2023 at Department of Botany, University of Lucknow. The title of the lecture was "Legacy & vision of Prof. Birbal Sahni: Journey from Palaeobotany to Palaeosciences".
- DrNivedita Mehrotra women scientist BSIP received Certificate of Appreciation for delivering a lecture on "Aspects of Palaeogeomorphology & its implications in palaeoclimatic studies" in a 3-day International Lecture Series on Applied Geomorphology.
- A science education program was conducted by BSIP at School of Scholars Amravati to disseminate science wakefulness in Amravati division, Maharashtra & to raise awareness among the students & the community.
- BSIP scientists participated in a 3 day Brainstorming session at IIT-Roorkee Noida center. Fruitful discussions amongst scientists of 16 institutions across India have led to formulating the key questions & their deliverables for “Integrating Molecular Biology & Geosciences in India”.

- Dr. Poonam Verma Scientist BSIP delivered an invited lecture on “Cenozoic Palaeopalynology & its applications” briefing PG students regarding the importance of Palaeosciences at K.S.K.V. Kachchh University, Bhuj.

e. Campus visit outreach activity

S. No.	University/College/School	Standard/Grade/Post-Grad	No. of Students	Details of Visit & Date
01	Unity Women's College, Manjeri, Kerala	M.Sc. Botany	50	Visit to Museum, SEM lab, Central Geochemical Facility (06-02-2023)

List of research publications (February, 2023):

1. **Tripathi, S., Thakur, B., Sharma, A., Phartiyal, B., Basumatary, S.K., Ghosh, R., Kumar, K., M.C. Manoj, Agrawal, S., Farooqui, A., Tiwari, P., Saikia, K., Tiwari, A., Pandey, A., Ali, N., Agnihotri, R., K. Prasanna, Morthekai, P., Ranhotra, P.S., Pandey, S., Bose, T.** (2023). Modern biotic and abiotic analogs from the surface soil of Ganga-Ghaghara-Gandak interfluves of the Central Ganga Plain (CGP), India: Implications for the palaeoecological reconstruction. *Catena* 224, 106975. DOI: 10.1016/j.catena.2023.106975. **(Impact factor: 6.36).**
2. **Ansari, A.H.** (2023). Detection of organic matter on Mars, results from various Mars missions, challenges, and future strategy: A review. *Frontiers in Astronomy and Space Sciences*. DOI: 10.3389/fspas.2023.1075052. **(Impact factor: 4.055).**
3. **Alam, M., Muguli, T., Gurumurthy, G.P., Arif, M., Sohrin, Y., Singh, A.D., Radhakrishna, T., Pandey, D.K., Verma, K.** (2023). Hydroclimatic conditions and sediment provenance in the northeastern Arabian Sea since the late Miocene: insights from geochemical and environmental magnetic records at IODP Site U1457 of the Laxmi Basin. *Geological Magazine*. DOI: 10.1017/S0016756822001273 **(Impact factor: 2.65).**
4. Lal, D.M., Sreekanth, G.B., Soman, C., **Sharma, A., Abidi, Z.A.,** (2023). Delineating the food web structure in an Indian estuary during tropical winter employing stable isotope signatures and mixing model. *Environmental Science and Pollution Research*. DOI: 10.1007/s11356-023-25549-w **(Impact factor: 5.190).**
5. Tiwari, J., Sur, S., Yadav, A., Kumar, R., **Rai, N., Rani, S., Malik, S.** (2023). Photoperiod-driven concurrent changes in hypothalamic and brainstem transcription of sleep and immune genes in migratory redheaded bunting. *Proceedings of Royal Society B: Biological Sciences*. DOI: 10.1098/rspb.2022.237 **(Impact factor: 5.530).**
6. McCartney, K., Chakraborty, A., **Ghosh, A.K., Soeding, E., Vishwadeep Rout, V.** (2023). Diversity and evolution of late Eocene to late Oligocene silicoflagellates from IODP

Expedition 378 Holes U1553A and U1553B, southwest Pacific Ocean. Marine Micropaleontology 179. DOI: 10.1016/j.marmicro.2023.102215. **(Impact factor: 2.10).**

7. **Pandey, U., Shah, S.K., Mehrotra, N.** (2023). Fluctuations of Kolahoi Glacier, Kashmir Valley, Its assessment with Tree-Rings of *Pinuswallichiana* and comparable satellite imageries and field survey records. In book: Pandey, M., Pandey, P.C., Ray, Y., Arora, A., Jawak, S.D., Shukla, U.K. (eds.) Advances in Remote Sensing Technology and the Three Poles. Wiley online library. DOI.:10.1002/9781119787754.ch13.
8. Gaire, N.P., Fan, Z., Chhetri, P.K., **Shah, S.K.**, Bhuju, D.R., Wang, J., Sharma, B., Shi, P., Dhakal, Y.R. (2023). In book: Singh, S.P., Reshi, Z.A., Joshi, R. (eds.) Ecology of Himalayan TreelineEcotone. Springer link. DOI.:10.1007/978-981-19-4476-5_22.
9. **Pandey, A., Tripathi, S., Basumatary, S.** (2023). Non-Pollen Palynomorphs from the Late-Holocene Sediments of Majuli Island, Assam (Indo-Burma Region): Implications to Palaeoenvironmental Studies. In book: Phartiyal, B., Mohan, R., Chakraborty, S., Dutta, V., Gupta, A.K. (eds) Climate Change and Environmental Impacts: Past, Present and Future Perspective. Society of Earth Scientists Series. Springer, Cham.DOI.:10.1007/978-3-031-13119-6_5.
10. Chinthala, B.D., **Singh, A., Shekhar, M., Tomar, N.**, Phulara, M., Yadav, A., Pandey, P., **Ranhotra, P.S.**, Bhattacharyya, A., Joshi, R., Singh, C.P. (2023). Age-Girth Stand Structure of Himalayan Fir and Growth-NDVI Relationship in the Treeline Transects of Western Himalaya: An Ecological Perspective. In book: Singh, S.P., Reshi, Z.A., Joshi, R. (eds.) Ecology of Himalayan TreelineEcotone. Springer link. DOI.: 10.1007/978-981-19-4476-5_22.

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

