

Birbal Sahni Institute of Palaeosciences
Monthly summary on Research Activities
(July 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.

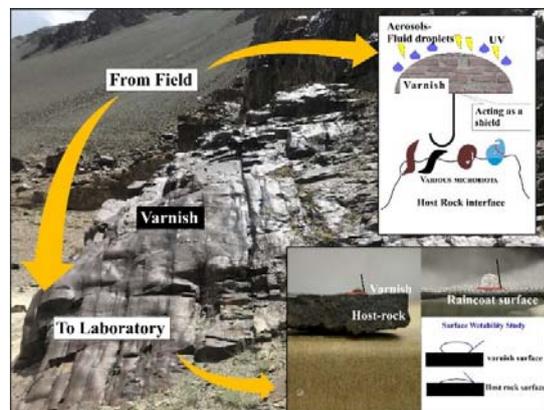
Key research activities under following objectives:

- 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 (July 2023)

- It is the first study to investigate the nature of organic biomarkers found in subaerial rock varnish in the extreme conditions of Ladakh, India, resulting from mineral-microbial interactions. It throws light on the unexplored surface hydrophobicity properties of rock surfaces and their role in microbial adhesion on the surfaces. The study's findings could have implications for the study of biogeochemistry as well as for the development of new techniques for studying microbial metabolites and interactions, along with the development of a new class of bioinspired geomaterials acting as a shield in harsh environments. The study also suggests the potential role of varnish formation in the biogeochemical cycling of Mn and Fe, as well as the potential use of varnish as a biomarker for past microbial activity on Earth and other planets.



b. Inauguration Ceremony of "Center for Promotion of Geoheritage and Geotourism" on June 28, 2023.

Inauguration of Centre for promotion of Geo-heritage at BSIP marked a significant milestone in promoting preservation of geo-heritage & sustainable geotourism in India. Prof. N.R. Karmalkar & Dr.Vandana Prasad graced the occasion, inspiring everyone with their visionary leadership.

c. INQUA (International Union for Quaternary Research) Congress 2023:

The 21st INQUA Congress was organized at Rome, Italy, during July 13–20, 2023. A group of scientists from BSIP including Dr Vandana Prasad, Director, BSIP, senior scientists and research scholars attended the congress and presented their research work. Scientists and students from other Institutions and universities of India also participated in the conference. BSIP along with the Department of Science and Technology (DST), Ministry of Earth Sciences (MoES), Indian National Science Academy (INSA), National Centre for Polar and Ocean Research (NCPOR) and Association of Quaternary Researchers (AOQR) participated and won the bid to host the 22nd INQUA Congress in BSIP, Lucknow. The Ambassador of India to Italy, Dr Neena Malhotra, delivered the acceptance speech at the event. Dr Binita Phartiyal, Scientist-F, BSIP has been appointed as organizing secretary for INQUA 2027. For the first time, India will host the prestigious International Union for Quaternary Research (INQUA) Congress in 2027.

d. Friday lecture series

S. No.	Speaker	Title of the talk	Date
1.	Dr. Suman Sarkar, Scientist BSIP	Benthic Foraminifera: their diversity & applications in Palaeogene Biostratigraphy	July 10, 2023

e. Campus visit outreach activity

- Students from K.N. Government PG College Gyanpur Bhadohi U.P. visited BSIP laboratories & Museum under the scientific outreach programme on July 19, 2023.

f. Outstation Scientific outreach Program

- Dr. (Mrs.) Shilpa Pandey, Scientist, BSIP has been elected as Vice President of Coastal and Marine Processes (CMP), International Union for Quaternary association (INQUA) for the period of 2023-2027.

- Dr Swati Tripathi, Scientist, BSIP presented a talk on 'Multiproxy analysis of endangered Yak dung from Indian Himalayas' at XXI International Union for Quaternary Research (INQUA) congress Roma 2023.
- Ms. Korobi Saikia, Research scholar, BSIP presented an informative talk on 'Analysis of phytoliths & Stable Carbon Isotopes of modern plants & surface soil from Bengal region' at XXI International Union for Quaternary Research (INQUA) congress Roma 2023.

List of research publications (July 2023):

- **Chaddha, A.S., Sharma, A.,** Singh, N.K., Patel, D.K., Satyanarayana, G.N.V. (2023). Rock Varnish: Nature's Shield. ACS Earth and Space Chemistry. DOI: 10.1021/acsearthspacechem.3c00071(**Impact factor: 3.556**).
- **Farooqui, A., Khan, S., Agnihotri, R., Phartiyal, B., Shukla, S.** (2023). Monitoring hydroecology and climatic variability since ~4.6 ka from palynological, sedimentological and environmental perspectives in an Ox-bowLake, Central Ganga Plain, India. The Holocene. DOI: 10.1177/09596836231183067(**Impact factor: 2.4**).
- Babushkina, E.A., Zhirnova, D.F., Belokopytova, L.V., **Mehrotra, N.,** Dergunov, D.R., **Shah, S.K.,** Vaganov, E.A. (2023). Conifer quantitative wood anatomy as proxy data: application in agricultural yield reconstruction. Trees. DOI:10.1007/s00468-023-02437-x(**Impact factor: 2.3**).
- Chinthala, B.D.,**Ranhotra, P.S.,** Griebinger, J., Singh, C.P., Bräuning, A. (2023). Himalayan fir reveals moist phase during Little Ice Age in the Kashmir region of the western Himalayas. Quaternary Science Reviews 312, 108167. DOI: 10.1016/j.quascirev.2023.108167(**Impact factor: 4**).
- Kumar, A., Maurya, D.M., **Phartiyal, B.,** Arif, M., Khonde, N.K., Bhushan, R., Jena, P.S., Dabhi, A., Chamyal, L.S. (2023). Holocene evolution of the Banni Plain at the north-east margin of the Arabian Sea: Constraints from a ca 50 m long sediment core. The Depositional Record. DOI: 10.1002/dep2.241(**Impact factor: 2.492**).
- **Choudhuri, A., Mandal, S.,** Bumby, A., &**Pillai, S.S.K.** (2023). Glacial sedimentation in Northern Gondwana: Insights from the Talchir formation, Manendragarh, India. Geological Magazine, 160(6), 1228–1240. DOI: 10.1017/S0016756823000353(**Impact factor: 2.3**).
- **Shekhar, M., Singh, A.,** Chinthala, B.D., **Tomar, N., Roy, I., Ranhotra, P.S., Bhattacharyya, A.** (2023). Tree Ring–Based Drought and Flood Analyses from the

Himalayan Region. In Book: Integrated Drought Management, Volume 2. DOI: 10.1201/9781003276548-19.

- Shukla, M.K., Halder, P., **Kumar, K., Sharma, A.**(2023). Fluid–rock interaction in the basement granitoids: A plausible answer to recurring seismicity. *Journal of Palaeosciences* 72(1), 1–8. DOI: 10.54991/jop.2023.1853.
- **Gautam, S.,** Ram–Awatar, **Sharma, A.**(2023). Evidence of an early Permian palynomorphs in Ophiolitic Mélange of the Shyok Suture Zone, Eastern Karakoram, Ladakh, India. *Journal of Palaeosciences* 72(1), 29–41. DOI: 10.54991/jop.2023.1856.
- **Verma, D., Govil, P., Kumar, B., Khan, H.**(2023). Variation in Dynamics, Controls and Impacts of Agulhas Leakage through Late Pleistocene: A Review. *Journal of Palaeosciences* 72(1), 43–54. DOI: 10.54991/jop.2023.1852.
- **Prasanna, K.**(2023). Diet of Indus Civilization: Reinterpretations from Multi–Site Stable Isotopic Mortuary Analysis. *Journal of Palaeosciences* 72(1), 55–58. DOI: 10.54991/jop.2023.1855.

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

