

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

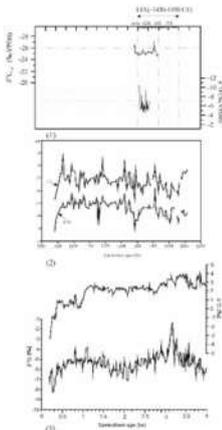
Key research activities under following objectives:

- 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**

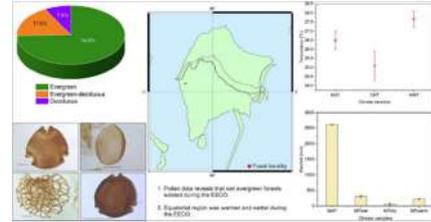
**a. Key Scientific Findings of the Month (August 2023)**

- (i) The Indian Summer Monsoon rainfall (ISMR) variability and the corresponding vegetation response were reconstructed during CE 1219-1942 from the Western Ghats, India, which receive monsoon rainfall from both the southwest summer monsoon (SWM; June to September: JJAS) and the northeast winter monsoon (NEM; October to December: OND). The study covers the last 723 years (CE 1219–1942) and is based on high-resolution lacustrine sediment pollen proxy data. Varying degrees of mixed moist/semi-evergreen–dry tropical deciduous forests were mainly recorded from the study area under a warm and moist climate, possibly indicating increased monsoon rainfall. Signatures of the global Medieval Climate Anomaly (MCA) during CE 1219–1374 and Little Ice Age (LIA) during CE 1671–1942 were recorded. The record of wet (moist) LIA, perhaps driven by the increased northeast monsoon (NEM), shows hydroclimatic contrast. The hydro-climatic variability during CE 1219–1942 offers valuable insights into the impact of monsoonal variability and human activities on ecosystems in the Western Ghats (India), which are subject to dual monsoon systems (SWM and NEM).



**Fig.**Wet (Moist) LIA, recorded 1). from Kumaun (Northwest Himalaya) (Kaushik et al.,2023), 2). from Kumaun Lesser Himalaya (Kotlia et al., 2012) and 3). from Indian CentralHimalaya (Kotlia et al., 2015).(Quamar et al.)

- (ii) Understanding the response of biota under a globally warm climate is important for their conservation. Fossil records are important to understand the biota-climate relationship in deep time. The fossil records suggest that evergreen forests existed in Gujarat ~50 million years back when the Earth was extremely warm. Our reconstructed climate data and modern analogs suggest that high rainfall afforded resilience to tropical evergreen forests by increasing the water use efficiency in trees(Srivastava et al.).



**b. Independence Day Celebrations (15<sup>th</sup> August 2023)**

BSIP celebrated 77<sup>th</sup> Independence Day by hoisting the national flag by Dr Anupam Sharma, the senior most scientist of the Institute and singing the national anthem on 15th August 2023 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.

**c. Friday lecture series**

S. No.	Speaker	Title of the talk	Date
1.	Ms. Vedika Gupta, PhD Scholar, Department of Geography, University of Delhi	UNESCO Global Geoparks & their potential in promoting geotourism	July 28, 2023
2.	Dr Srinivas Bikkina, Scientist BSIP	Source apportionment of atmospheric dust & particulate OM over the Indian Ocean	August 18, 2023

**d. Outstation Scientific outreach Program**

- Ms.Aparna Dwivedi, Research scholar BSIP presented an informative talk on 'Reconstructing the Genetic 3Ancestries of Neolithic & Megalithic Populations of Burzahom, Kashmir using AncientDNA analysis'at XXI International Union for Quaternary Research (INQUA) congress Roma 2023.

- Dr Md. Firoze Quamar, Scientist BSIP presented an enlightening talk on 'Vegetation dynamics & hydroclimatic variability since the LGM from the core monsoon zone of India' at XXI International Union for Quaternary Research (INQUA) congress Roma 2023.
- Ms Priyanka Singh Research scholar, BSIP presented an informative talk on 'Do anomalous fading limit the applicability of luminescence dating of Iron age urns of Sivagalai, South India' at XXI International Union for Quaternary Research (INQUA) congress Roma 2023.
- Dr. Shilpa Pandey, Scientist BSIP delivered a talk on "Millets as key solution to climate change & food security challenges in Uttar Pradesh" in the National Workshop & Expo on Millets-based products at Jabalpur to commemorate "International Year of Millets" on July 20, 2023.
- Dr. Shilpa Pandey Scientist BSIP delivered a lecture on "Mangroves as Solution to Climate Crisis" at Babasaheb Bhimrao Ambedkar University (BBAU) & University of Lucknow on August 2, 2023.
- Dr. Nivedita Mehrotra presented INQUA outreach & other activities as INQUA ECR in the 25th ICDP Conference at GFZ Potsdam, Germany.

#### **List of research publications (August 2023):**

1. **Quamar, M.F.,** Mir, I.A., Jaiswal, J., Bharti, N., Dabhi, A.J., Bhushan, R., Prasad, N., **Javed, M.** (2023). Hydro-climatic variability and consequent vegetation response during CE 1219–1942 from the Western Ghats, India. *Catena* 232, 107448. DOI.: 10.1016/j.catena.2023.107448 (**Impact factor: 6.2**).
2. **Srivastava, G., Bhatia, H., Verma, P., Singh, Y.P.,** Utescher, U., Mehrotra, R.C. (2003). High rainfall afforded resilience to tropical rainforests during Early Eocene Climatic Optimum. *Palaeogeography, Palaeoclimatology, Palaeoecology* 628, 111762. DOI.: 10.1016/j.palaeo.2023.111762. (**Impact factor: 3.0**).
3. **Ranveer, R.S.,** Singh, B.P., Bhargava, O.N. (2023). Integrated sedimentological and ichnological studies of the Cambrian of the Tidong Valley, Kinnaur, its correlation with Zaskar–Spiti regions, and reconstruction of the northern margin of Indian Plate. *Neues Jahrbuch für Geologie und Paläontologie - Abhandlungen* Band 309 Heft 1, 1–18. DOI.: 10.1127/njgpa/2023/1141 (**Impact factor: 1.042**).
4. **Dey R.,** Basso D., Chakraborty A., **Roy L.,** Bhaumik A. K. & **Ghosh A. K.** (2023). Rhodolith-forming coralline red algae in the CaCO<sub>3</sub> biofactory — A case study from the Serravallian of tropical northeastern Indian Ocean. *Comptes Rendus Palevol* 22 (26): 541-567. DOI.:10.5852/cr-palevol2023v22a26 (**Impact factor: 1.1**).

5. Pradhan, S., Goswami, S., **Aggarwal, N., Mathews, R.P., Manoj, M.C., Pillai, S.S.K., Pradhan, S.S.** (2023) Integrative study of Permian coal-bearing horizons: biostratigraphy, palaeovegetation, and palaeoclimate in the South Karanpura Basin. *Environmental Geochemistry and Health*. DOI.: 10.1007/s10653-023-01701-w (**Impact factor: 4.2**).
  
6. Biswas, S., Pandey, D.K., Nair, N., **Uddandam, P.R.** (2023). Stable  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  isotope and palynofacies study of the late Miocene to early Pliocene Nicobar Fan sediments, Indian Ocean: implication for organic matter provenance and depositional environment. *Geo-Marine Letters* 43. DOI.: 10.1007/s00367-023-00755-0 (**Impact factor: 2.1**).

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

