Birbal Sahni Institute of Palaeosciences
Monthly Summary of Research Activities
(February 2025)

1. Area 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.

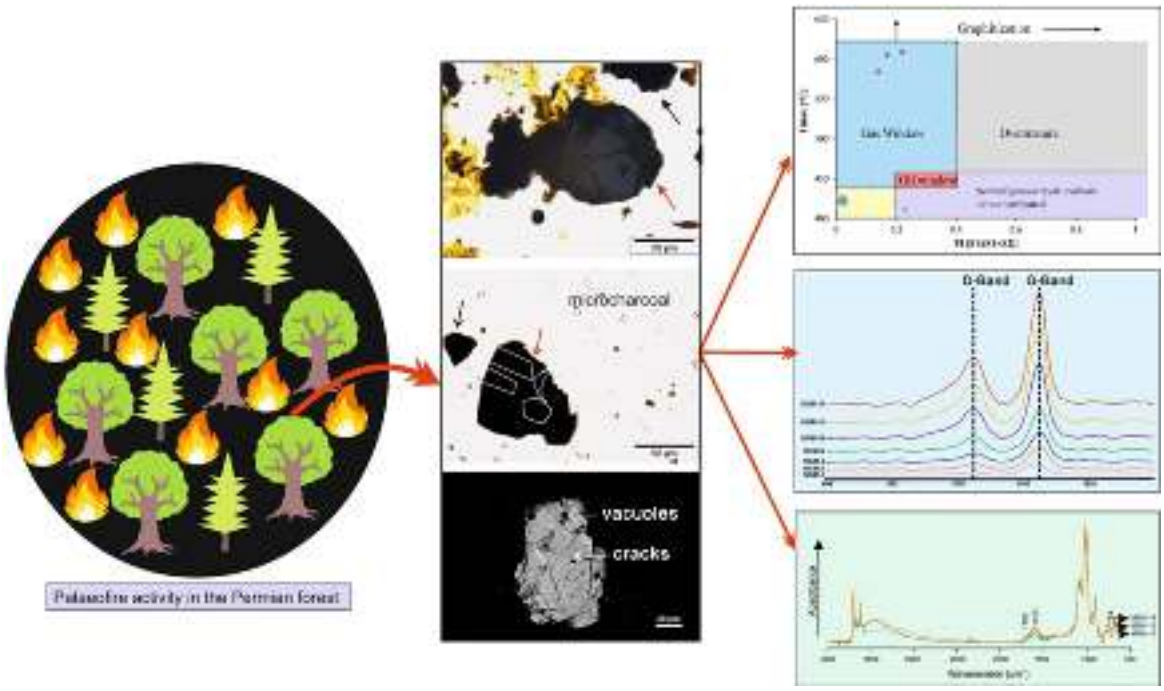
Key research activities under following objectives:

- □ 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.

1. Important Highlights of Major Research Activity

a. Key Scientific Findings of the Month (Feb 2025)

The study conducts a comprehensive palynofacies and geochemical analysis to characterize organic matter (OM) in shale samples from the Godavari Basin. Palynofacies analysis identified three types of organic matter under transmitted light: translucent organic matter (TrOM), comprising palynomorphs, structured phytoclasts, and degraded organic matter; and two types of opaque phytoclasts/charcoal (CH), distinguished as palaeofire-induced (PAL-CH) and oxidized (OX-CH). The multifaceted approach is applied through Raman spectroscopy, Rock-Eval, and Fourier transform infrared spectroscopy (FTIR) to assess organic carbon's thermal evolution and structural integrity required to substantiate the palynological evidence on microcharcoal. The presence of overmaturation of organic matter ranging from 411 to 609 °C indicates the alteration of organic matter due to the impact of heat causing the removal of hydrogen from the samples. FTIR spectroscopy suggests the presence of aromatic and aliphatic deformation due to thermal maturation. This integrated approach combining palaeofire history, Raman spectroscopy, and geochemical analysis provides valuable insights into the palaeofire history and structural evolution of charcoal in the Godavari Basin shales. (Aggarwal et al 2025).



b. 8th K. R. Surange Memorial Lecture (6th Febraury2025)

BSIP hosted 8th Dr. K.R. Surange Memorial Lecture on 6th February, 2025. Prof. Ajit Shasany, Director, CSIR-NBRI, Lucknow, delivered an enlightening talk on "Internal Immunity: Learnings from Plants," exploring nature's insights into immune resilience. He delivered his lecture in the august presence of the Director BSIP, Prof. Mahesh G. Thakkar along with scientists and research scholars.

c. Seeker's Interaction Forum (SIF) Lecture (06th Feb 2025)

S. No.	Name of the Speaker	Topic of Discussion	Date
01	Adhra Renny	Unscripted conversation on SK-257/02's 50 Ka sedimentation history	06 Feb 2025
02	Md Arif Ansari	High resolution monsoonal climatic changes in the eastern Arabian Sea during last 50 Ka	20 Feb 2025

d. Visit of INQUA Delegation and Invited lecture of INQUA President (17 Feb 2025)

BSIP welcomes the delegation of INQUA consisting of Professor Laura Sadori, President INQUA, Sapienza University of Rome, Italy; Professor Francesco Chiocci, Sapienza University of Rome, Italy (President of INQUA 2023); Professor Alessandro Maria Michetti, Dipartimento di Scienza e Alta Tecnologia, Università degli Studi dell'Insubria, Como; Dr. Ilaria Mazzini, Institute of environmental geology and geoengineering, National Research

Council of Italy. The delegation holds several meetings in the presence of Prof. Mahesh G. Thakkar, Director BSIP, to oversee and contribute towards preparation of International Conference of INQUA-2027 in Lucknow. Professor Laura Sadori, President INQUA, Sapienza University of Rome, Italy delivered an enlightening talk on the topic 'Southern European Holocene Lacustrine Pollen records: climate forcing vs. human impact' on 17th February 2025. The delegation along with BSIP Scientists also attended a field session in the Ganga-Yamuna Interfluve region near Kalpi, UP.

e. INQUA On-line Talk Series under INQUA India-2027

S. No.	Name of the Speaker	Topic of Discussion	Date
01	Prof. Lewis A. Owen NC State University, USA	Quaternary Glaciation of Himalaya and Tibet	01 Feb 2025
02	Dr. Thamban Meloth NCPOR, Goa	Exploring polar regions in a warming world- Indian endeavors and new opportunities	22 Feb 2025

f. Pre-PhD Seminar (31 Jan 2025)

Mr. Mukesh Yadav, PhD student under supervision of Dr. Anupam Sharma Scientist-G, and Prof. U K Shukla, BHU presented his pre-PhD presentation in the hybrid mode at Department of Geology, BHU auditorium for evaluation of his thesis and award of PhD degree under the aegis of BHU. The talk was attended by Profs of Geology Dept. BHU and BSIP scientific staff.

g. Man Power Training

S. No.	Name of Trainee	Mentor	Topic	Duration
01	Ms. Ankita Swaroop	Dr Yogmaya Shukla	Study of Precambrian life forms using advanced analytical techniques.	Jan 2025 and continuing
02	Ajith Kumar K.	Dr. Binita Phartiyal	Magnetic properties cores from Sandynallah valley and the Parson Valley, Western Ghats, Southern India	Jan 2025 and continuing
03	Dithya R. Kumar	Dr. Arvind K Singh	Sedimentology of Owk Shale, Kurnool Group, India	Feb 2025 and continuing

04	Utkarsh Tripathi	Dr Arvind K Singh	Process based physical sedimentology and stacking stratalpattren of Narzi Limestone, Kurnool Group, India	Feb 2025 and continuing

h. Outreach Activities and Conferences

1. Graduate and undergraduate students of Zoology and Botany from the Department of Science, Maharishi University, Lucknow, participate in an insightful educational visit to the BSIP Museum and Laboratories on 29th January 2025.
2. Dr. Shilpa Pandey, Scientist-E & Convener Outreach program, BSIP with her team Mr. Sangram Sahoo, Research Scholar and local resident Mr. Anil Singh, BKT, Lucknow celebrated the World Wetlands Day on 02 Feb 2025 and highlighted the critical role wetlands play in sustaining biodiversity, combating climate change, and supporting livelihoods. This year's theme, "Protecting Wetlands for Our Common Future," guided a series of activities, including wetland surveys, conservation assessments, and a cleanliness drive focused on removing harmful plastic waste. Dr. Pandey and her team identified key wetlands for protection, stressing the urgency of restoring these vital ecosystems.
3. डॉ. नीलम (वैज्ञानिक, बीएसआईपी) ने दिनांक 17.02.2025 को जयपुर में गृह मंत्रालय राजभाषा विभाग द्वारा आयोजित मध्य, पश्चिम एवं उत्तरी क्षेत्रों का संयुक्त क्षेत्रीय राजभाषा सम्मेलन 2025 में भाग लिया।
4. Undergraduate science students and faculty of Mahamaya Government Degree College, Mahona, Lucknow, explored ancient life and scientific wonders with BSIP scientists during their Museum & Laboratory visit on 18 February 2025.
5. Dr Runcie Matthews Scientist BSIP attended a National Conference on "Innovations in #Coal & Mineral Characterization for Sustainable Resource Utilization (ICMCS-2025)" from 30-31st January 2025 at Newtown, Kolkata organized by the Analytical and Applied Chemistry Division, CSIR-National Metallurgical Laboratory (NML) as a part of the Platinum Jubilee (75th Anniversary) Celebration of CSIR-National Metallurgical Laboratory.
6. Dr. Jyoti Srivastava, Scientist-E BSIP delivered a keynote lecture on the ecological models for drylands ecosystem in the International Conference on ecosystem functioning and sustainability in a changing environment (ESCE-2025) at the Department of Botany, Banaras Hindu University, Varanasi.
7. Dr. Jyoti Srivastava, Scientist-E BSIP delivered a keynote address in the 4th International Conference on Geology: Emerging Methods & Applications (GEM-2025) at Christ College Autonomous, Irinjalakuda, Kerala.
8. BSIP Scientists Dr. Anju Saxena and Dr. Jyoti Srivastava participated in the DST Training Programme on Advanced Technologies for Urban Development during February 17-21, 2025 at National Institute of Advanced Studies, Bengaluru.

List of Research Publications (Jan 2025)

Original Articles/Reviews/Book Chapters

1. Singh, N., Mitra, D., Lenka, R., Basumatary S.K., Tripathi Swati. Among hawkmoths (Sphingidae, Lepidoptera), Macroglossinae dominate pollen transportation in central and East Himalaya (North-East India). Arthropod-Plant Interactions 19, 20 (2025). https://doi.org/10.1007/s11829-024-10127-9.
2. Mohammad Firoze Quamar, Nagendra Prasad, Maneesha M. ET, Paulramasamy Morthekai, Anoop K. Singh, Lalit M. Joshi, Bahadur S. Kotlia, Dhruv Sen Singh, Mohammad Javed, Intensification of pastoralism ~8 ka: non-pollen palynomorphs analyses from the Rawatsera palaeolake sediments profile, Central Himalaya, India, Review of Palaeobotany and Palynology, 335, 2025, 105288, https://doi.org/10.1016/j.revpalbo.2025.105288.
3. Aggarwal, N., Mishra, D., Srivastava, S. and Mathews, R.P., 2025. Unraveling the Charred Past: Microscopic Insights and Advanced Techniques in Understanding Permian Palaeofires. ACS Omega Article ASAP, DOI: 10.1021/acsomega.4c08281.
4. Negi, R.S., Singh, B.P., Bhargava, O.N. et al. Psammichnites gigas gigas sub-ichnozone and microbially induced sedimentary structures (MISS) from Kunzam La Formation (Cambrian), Hojis Valley, Kinnaur, Himachal Himalaya. J Earth Syst Sci 134, 49 (2025). https://doi.org/10.1007/s12040-024-02503-z.
5. Sarkar, S., Allameh, M., Nasiri, Y., Hadi, M., 2025. Palaeogeographical implications of an ecological paradox: cool-water carbonates in an Early Miocene mid-latitude warm realm (Qom Formation, Central Iran). Lethaia (Impact Factor: 2.247), 58, 1-19.
6. Yogmaya Shukla, Sharma, M., Ansari, A.H., Noffke, N., Singh, V.K., 2025. Microbial Mat Textures from the Neoarchean Donimalai Formation (Sandur Schist Belt) in the Dharwar Craton India. Alcheringa DOI: 10.1080/03115518.2024.2427259.
7. Jordan K. Wright, Asish R. Basu and Yogmaya Shukla, 2025. Flood basalt origin for Earth's largest Palaeoarchaean banded Iron Formation 2024. Geology, https://doi .org /10 .1130 /G52728.
8. Sandhu, Sangram, Sachin Kumar, Paurabhi Singh, Balendra Pratap Singh, Sunit Kumar Jurel, Nand Lal, Varun Sharma, Niraj Rai*, and Pooran Chand. 2025. Metagenomic profiling of plaque microbiota in Indian subjects: identified hidden ecological tapestry. Current genetics 71(1), 3.
9. Debarati Nag, SJ Sangode; SP Singh; B Phartiyal. 2025. Magnetostratigraphic and Mineral Magnetic Characteristics of the Middle Eocene Climatic Optimum (MECO) from the equatorial pericratonic basin of Kutch in Panandhro mine, Gujarat, India. Geoscience Journal. https://doi.org/10.1007/s12303-025-00021-8.
10. Mohd Munazir Chauhan and Sajid Ali and Birendra P Singh and Vikas Adlakha and Mohammad Arif and Binita Phartiyal and Mamilla Venkateshwarlu and Sanjay Kumar. 2025. Reconstruction of the Late Miocene climate record in the Himalayan foreland Basin: The impact of Himalayan uplift and monsoon dynamics. Journal of Asian Earth Sciences, 280: 106445, https://doi.org/10.1016/j.jseaes.2024.106445.

Photographs showing important highlights of major programs/research activities organized during February 2025:


INQUA
Southern European Holocene pollen records
SAPIENZA
Standing Together for the future
INQUA 2027
Talk Series
Quaternary Glaciation of the Himalaya and Tibet
Standing Together for the future
INQUA 2027
Talk Series
Exploring Polar Regions in a Warming World – Indian Endeavours and New Opportunities
GEM 2025