Curriculum Vitae

Sanjay Kumar Singh Gahlaud
Scientist 'B'

Radiocarbon and Isotopic Characterization Laboratory
Birbal Sahni Institute of Palaeosciences (BSIP)
53, University Road, Lucknow-226007, India

Contact: +91-8090230913
Email: sksgahlaud@bsip.res.in; sanjay.bhu.0013@gmail.com

About my research: I am an aspiring isotope geochemist with a keen interest in sedimentary biogeochemistry and paleoenvironmental reconstruction. My work primarily focuses on analyzing stable carbon ($\delta^{13}C$), nitrogen ($\delta^{15}N$), and sulfur ($\delta^{34}S$) isotopes, along with radiocarbon (^{14}C) dating of minute organic phases preserved in geological, archaeological, and environmental samples. I study the biogeochemistry of coastal sediments to understand past and present coastal dynamics and assess their implications on biodiversity, ecosystem services, and human livelihoods. My research integrates multi-proxy approaches to decode environmental changes across different timescales, with applications in Quaternary paleoclimate, geoarchaeology, and coastal resilience.

Education:

- B.Sc. (Hons.): 2013, Department of Geology, Banaras Hindu University, Varanasi (U.P.), India
- M.Sc. (Tech): 2016, Department of geology, Banaras Hindu University, Varanasi (U.P.), India

Awards/ Achievements:

- Qualified GATE 2016 in the subject 'Geology and Geophysics'
- Qualified GATE 2017 in the subject 'Geology and Geophysics'
- Qualified CSIR-JRF (NET) fellowship in June 2016 in the subject 'Earth, Atmosphere, Ocean Planetary Science'

Research Interests:

- Accelerator Mass Spectrometry (AMS) and conventional radiocarbon (^{14}C) dating for chronological reconstruction of archaeological, geological, and environmental archives.
- Stable isotope geochemistry ($\delta^{13}C$, $\delta^{15}N$, $\delta^{34}S$) applied to understand:
    - Paleoenvironmental and paleoclimatic shifts.
    - Ancient agricultural practices and land-use patterns.
    - Coastal biogeochemical processes.
- Multi-isotopic and elemental tracers to reconstruct historical human activity and climate-society interactions.

Ongoing Research Project

- Investigating coastal sediment cores from lagoons, estuaries, and mangrove systems to reconstruct ecosystem responses to changes in sea level, salinity gradients, sedimentation rates, and monsoonal variability.
- Studying Quaternary fluvio-deltaic processes through geochemical and isotopic analysis of sediment archives from the Ganga Plain, with a focus on hydrological dynamics and organic matter sources.
- Reconstructing past agronomic conditions and domestic/industrial human activities using isotopic and elemental analyses of archaeological materials (e.g., charred grains, bone collagen, tooth enamel).

Instrument Experiences:

- Coupled EA-CHS-IRMS-Age
- IRMS (Isotope-ratio mass spectrometer) (Elementar®)
- Elemental Analyzer (Elementar® and Thermo scientific®)
- Carbonate Handling System (Ionplus®)
- Automated Graphitization Equipment (Ionplus®)
- Liquid Scintillation Counter (Perkin Elmer®)

Total Citations so far (Google Scholar)

Cited by

	All	Since 2020
Citations	106	106
h-index	5	5
i10-index	4	4

Publications

1. Rajesh Agnihotri, **Sanjay Kumar Singh Gahlaud**, N Patel, R Sharma, Pankaj Kumar, S Chopra (2020) Radiocarbon measurements using new automated graphite preparation laboratory coupled with stable isotope mass-spectrometry at Birbal Sahni Institute of Palaeosciences, Lucknow (India). Journal of Environmental Radioactivity. Volume 213, 106156 doi.org/10.1016/j.jenvrad.2019.106156

2. Anjum Farooqui, Rajesh Agnihotri, Salman Khan, **Sanjay Kumar Singh Gahlaud**, MU Sharief (2021) Temporal variability in carbon and nitrogen stable isotopes of *Strobilanthes kunthianus* leaf: Its photosynthetic efficacy and water-use efficiency in a warming climate. Journal of Earth System Science 130, 241. doi.org/10.1007/s12040-021-01737-5

3. Nikhil Patel, **Sanjay Kumar Singh Gahlaud**, Anju Saxena, Biswajeet Thakur, Nisha Bharti, A.K.J. Dabhi, Ravi Bhushan, and Rajesh Agnihotri (2022) Revised chronology and stable isotopic (Carbon and Nitrogen) characterization of Lahuradewa lake sediment (Ganga-plain, India): Insights into biogeochemistry leading to peat formation in the lake. Journal of the Palaeontological Society of India. Volume 67(1), 113-125. DOI: 10.1177/0971102320220110

4. Agnihotri, Rajesh & Farooqui, Anjum & Khonde, Nitesh & Mathews, Runcie & Sharma, Shalini & **Sanjay Kumar Singh Gahlaud** & Manjul, Sanjay & Manjul, Arvin & Sawlani, Ravi. (2021) Microscopic, biochemical and stable isotopic investigation of seven multi-nutritional food-balls from Indus archaeological site, Rajasthan (India). Journal of Archaeological Science: Reports. 37. 102917. doi.org/10.1016/j.jasrep.2021.102917

5. Ghosh, Avijit, Amit K. Singh, Sunil Kumar, M. C. Manna, Ranjan Bhattacharyya, Rajesh Agnihortri, **Sanjay Kumar Singh Gahlaud** (2020) Differentiating Biological and Chemical Factors of Top and Deep Soil Carbon Sequestration in Semi-Arid Tropical Inceptisol: An Outcome of Structural Equation Modeling. Carbon Management 11(5) 441–53. doi.org/10.1080/17583004.2020.1796143

6. Choudhurimayum Pankaj Sharma, Suman Lata Rawat, Pradeep Srivastava, Narendra K Meena, Rajesh Agnihotri, Anil Kumar, Poonam Chahal, **Sanjay Kumar Singh Gahlaud**, UK Shukla (2019) High-resolution climatic (monsoonal) variability reconstructed from a continuous~ 2700-year sediment record from Northwest Himalaya (Ladakh). The Holocene, Vol 30 (3) 441-457. doi.org/10.1177/0959683619887426.

7. Phartiyal, Binita & Singh, Randheer & Nag, Debarati & Sharma, Anupam & Agnihotri, Rajesh & Prasad, Vandana & Yao, Tandong & Karthick, Balasubramanian & Joshi, Priyanka & **Sanjay Kumar Singh Gahlaud** & Thakur, Biswajeet. (2021). Reconstructing climate variability during the last four millennia from trans-Himalaya (Ladakh-Karakoram, India) using multiple proxies. Palaeogeography Palaeoclimatology Palaeoecology. Volume 562, 110142. doi.org/10.1016/j.palaeo.2020.110142.

8. Sagwal, S., Sengupta, D., Kumar, A., Dutt, S., Srivastava, P., Agnihotri, R., **Sanjay Kumar Singh Gahlaud**, Sarathi Jena, P., Shivam, A., & Bhushan, R. (2023). Late-Holocene wildfire record from the Stagmo peat section, Leh valley, NW Himalaya. The Holocene, 33(6). https://doi.org/10.1177/09596836231157066

9. Shalini Sharma, Anil K Pokharia, **Sanjay Kumar Singh Gahlaud**, Nikhil Patel, S K Manjul, Ruchita Yadav and Rajesh Agnihotri (2024) Royal burials and chariots from Sinauli (Uttar Pradesh, India): Radiocarbon dating and isotopic analysis based inferences. Radiocarbon 66(4):1-9. doi.org/10.1017/RDC.2024.89.

10. Mohd Munazir Chauhan, Sajid Ali, Birendra P. Singh, Vikas Adlakha, Mohammad Arif, Binita Phartiyal, Mamilla Venkateshwarlu, **Sanjay Kumar Singh Gahlaud** (2024) 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. doi.org/10.1016/j.jseaes.2024.106445

11. Pooja Tiwari, Biswajeet Thakur, Purnima Srivastava, **Sanjay Kumar Singh Gahlaud**, Trina Bose, Anurag Kumar, Ravi Bhushan, Rajesh Agnihotri (2024) Was LIA synchronous with equa-tropical climate? A multiproxy study from the southwest coast of India. Quaternary International, Vol 709, 66-81. doi.org/10.1016/j.quaint.2024.09.004.

12. Ravi Bhushan, **Sanjay Kumar Singh Gahlaud**, Vijay Kumar, Amit Rai Jain (2024) Carbon Dates of Copper Hoard Weapons found from Nigohi Area, District Shahjahanpur U.P. India. Indian Journal of Archaeology, Vol. 7, No 4, (2022), 70-98.

13. Pooja Tiwari, Biswajeet Thakur, Purnima Srivastava, **Sanjay Kumar Singh Gahlaud**, Ravi Bhushan and Rajesh Agnihotri (2025) Paleolimnology and Natural Versus Anthropogenic Influx During the Late Holocene from Vembanad Wetland, Ramsar Site, Kerala, India. Quaternary 2025, 8, 3. https://doi.org/10.3390/ quat8010003.

14. Anil K. Pokharia, Alka Srivastava, Pushp Lata Singh, Ruchita Yadav, Mansi Swaroop, Shalini Sharma, Anoop Kumar, Dipak Shukla, Upendra Singh, Chandrabhushan Gupt, Mohd Afroz and **Sanjay Kumar Singh Gahlaud** (2025) Archaeological and archaeobotanical investigations in Tamsa region of Ganga Plain, Uttar Pradesh, India. Journal of the Palaeontological Society of India, 1–15. DOI: 10.1177/05529360251349023

Abstract Submitted

- **Sanjay Kumar Singh Gahlaud***, Rajesh Agnihotri, Bindhyachal Pandey, Abha Singh, Deo Brat Pathak, Ishwar Chandra Rahi, and Siby Kurian. Record of the Oceanic Anoxic Event in the Upper Jurassic sedimentary successions of the Spiti Himalaya (India) and its implications to palaeo-redox environments. Presented in 3rd Frontiers in Geosciences Research Conference, Physical Research Laboratory (PRL), Ahmedabad, 5–7 February 2025.

- Anand Rajoriya*, **Sanjay Kumar Singh Gahlaud**, Biswajeet Thakur, Srinivas Bikkina, Arvind Singh, Rajesh Agnihotri. Unravelling the lake history from central Ganga plain (CGP): Insights from Biogeochemical records. Presented in 3rd Frontiers in Geosciences Research Conference, Physical Research Laboratory (PRL), Ahmedabad, 5–7 February 2025.

- Anand Rajoriya*, **Sanjay Kumar Singh Gahlaud**, S. Bikkina, S. Senthil Kumar, Biswajeet Thakur, Shilpa Pandey, Arvind Singh, Anjum Farooqui, Late-Rajesh Agnihotri. Multiproxy study from the Cauvery River coastal plain (India): biogeochemical evidence for anoxic event during Holocene. Presented for Indian Quaternary Congress (IQC) organized by IISER Mohali and Association of Quaternary Researchers (AOQR) during 3-5 June 2024

- Anand Rajoriya, Biswajeet Thakur, Arvind Singh, **Sanjay Kumar Singh Gahlaud**, Anjum Farooqui, Shilpa Pandey, Rajesh Agnihotri*. Sediment dynamics in coastal ecosystem unravelled by biogeochemical and sedimentological investigation. Presented in 40th Convention of Indian Association of Sedimentologists & National Conference on An Odyssey of Sedimentology from Precambrian to Anthropocene: Significant contributions in Environmental Climatic and Energy Research held during December 11-13, 2024. Organized by Birbal Sahni Institute of

Palaeosciences, Lucknow. Abstract: 153 Sedimentology, BSIP Lucknow, 11–13 December 2024.

- Anand Rajoriya, **Sanjay Kumar Singh Gahlaud**, Biswajeet Thakur, Srinivas Bikkina, Shilpa Pandey, Anjum Farooqui. Late Holocene geochemical and environmental changes inferred from multiproxy investigation in sediments from Khondagai Lake, Tamil Nadu, India. Presented in GEM_2025 (Geology: Emerging Methods and Applications), Christ Autonomous College, Kerala, 28–30 January 2025.

- P. Morthekai, Nawaz S. Ali, Nithesh Khonde, Priyanka Singh, Korobi Saikia, Pooja Tiwari, Masud Kawsar, Ruby Ghosh, Md. Arif, **Sanjay Kumar Singh Gahlaud,** B. Karthik, Biswajeet Thakur, Manoj M. C. Lowering sea-level and siltation jointly caused abandonment of Korkai Port (India): inference from a multi-proxy palaeoenvironmental record. Presented in INQUA Conference.

- Kishor Katange, Niteshkumar Khonde, Gursewak Singh, **Sanjay Kumar Singh Gahlaud**, Deepak M. Maurya, Ravi Bhushan, Partha Sarathi Jena, Ankur Dabhi, Rajesh Agnihotri, L. S. Chamyal. Geochemical and Isotopic studies on the mid-late Holocene sediments from western Great Rann of Kachchh (GRK) basin, western India. Presented in Goldschmidt 2023.

- Anjum Farooqui, Rajesh Agnihotri, **Sanjay Kumar Singh Gahlaud** Biswajeet Thakur, S. Senthil Kumar, Anand Rajoriya. Records for anoxic seawater transgression during early to mid-Holocene on the coast of Tamilnadu (India): Implications on biogeochemical interactions. Presented in Geoyouth-2023.

- Anand Rajoriya, **Sanjay Kumar Singh Gahlaud**, Nikhil Patel, Biswajeet Thakur, Rajesh Agnihotri, Anju Saxena, Nisha Bharti, Ravi Bhushan. Evidence of green algae (Botryococcus) from the past: its biogeochemical implications and potential for bioenergy. Presented in National Conference on Advances in Chemical Engineering and Science (ACES 2023), IISER Bhopal.

- Anjum Farooqui, Rajesh Agnihotri, Biswajeet Thakur, Shilpa Pandey, Niteshkumar Khonde, **Sanjay Kumar Singh Gahlaud**, S. Senthil Kumar, Anand Rajoriya. Records for anoxic seawater transgression during early to mid-Holocene on the coast of Tamilnadu (India): Implications on biogeochemical Interactions. Presented in 11th All India Students Symposium on Geology, Udaipur, 25–26 February 2023.

Dissertation & Internship

1. Guided Ms. Shakshi Singh, student of Institute of Hydrocarbon, Energy and Geo-Resources, ONGC Centre of Advanced Studies, Lucknow University for the dissertation during May- June 2022
2. Guided Ms. Riba Khan, Student of Chemistry Department, Isabella Thoburn College, Lucknow, for the dissertation thesis during April- June 2023.
3. Guided Ms. Vasundhara Shukla, student of Chemistry Department, Lucknow University, for the dissertation thesis during April-June 2024.
4. Guided Mr. Ram Murti, student of Chemistry Department, Lucknow University, for the dissertation thesis during April-June 2024.
5. Guided Ms. Shweta, student of Institute of Hydrocarbon, Energy and Geo-Resources, ONGC Centre of Advanced Studies, Lucknow University for the internship during July- September 2024.
6. Guided Mr. Akhil Mishra, student of Department of Chemistry, National PG College, Lucknow for the internship during September- October 2024.
7. Guided Ms. Debarpita Sahoo, student of SOS in Earth Science, Jiwaji University, Gwalior, Madhya Pradesh for the dissertation thesis during March-May 2025.

Workshop & Training

- Hands-on training on the Accelerator mass spectrometry (AMS) Radiocarbon dating facility and its peripherals at the Inter-University Accelerator Centre (IUAC), New Delhi during July 25, 2022 to July 29, 2022.
- Short course on Isotopes in Nature organized by the Physical Research Laboratory (PRL), Ahmadabad on 7-9 March 2024.
- Hands-on training on the Accelerator mass spectrometry (AMS) Radiocarbon dating facility and its peripherals at the Physical Research Laboratory (PRL), Ahmadabad on 5-7 February 2025
- **Wokshop:** One day acquaintance program (Online mode) on Accelerator Mass Spectrometry jointly organized by IUAC and Mumbai University on 08 Feb, 2022.
- **Workshop:** National Workshop on ‘Chronological systematics and their applications in Earth Sciences’ Organized by Inter-University Accelerator Centre (IUAC), New Delhi during 19-21 April, 2022.
- **Webinar:** Radiocarbon dating by AMS method opens up windows of opportunities in various scientific disciplines: Few case studies from

Archaeological Sciences organized by NIO on April 21, 2022. Speaker: Dr. Rajesh Agnihotri

- **Webinar**: Subsistence, Climate-culture relationships and cultural veracity of various ruling regimes since the last ~2500 years at Vadnagar, Gujarat jointly organized by Directorate of Archaeology and Museums, Government of Gujarat Speaker; Speaker: Dr. Rajesh Agnihotri on May 18, 2022. Speaker: Dr. Rajesh Agnihotri.
- **Workshop:** Radiocarbon dating and decoded history of past ecology, environment and agriculture through usage of stable Carbon and Nitrogen isotopes for Vadnagar archaeological settlements (spanning last ~2500 years) on July 06, 2021.
- **Webinar:** Radiocarbon dating from conventional to AMS methods: Impacts on Indian Archaeological Sciences organized by Bhishma School of Indic Studies on November 26, 2021.
- **Workshop:** One day workshop to commemorate the “International Mangrove Day 2021” on 26th July, 2021 in coordination with MSI, Goa (on virtual mode).
- **Workshop:** “One Week One Lab Programme (OWOL)" at CSIR-NBRI on 16 August 2023

Awards and Honors

1. Life Member “The Palaeobotanical Society of India”

Name: Sanjay Kumar Singh Gahlaud
Place: BSIP, Lucknow **Date:** 15 June 2025