

DR. HUKAM SINGH

Scientist 'E'

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Field of specialization: Amber biological inclusions/ Palaeobotany/ Vertebrate Paleontology

Education:

- **M.Sc. Ph.D.** HNB Garhwal University Srinagar Garhwal Uttarakhand, India.
- **Ph.D. in Geology** 2005 from HNBGU Srinagar Garhwal Uttarakhand, India.
- **Ph.D. thesis title:** Early Tertiary **vertebrate** fauna from Barmer Basin, western Rajasthan, India and their palaeoenvironmental implications.
- **Thesis supervisor:** **Professor R.S. Rana**, HNBGU Srinagar Garhwal Uttarakhand, India.
- **Research Interest:** Multidisciplinary fields of research.
- **Research work done:** Cambay Basin (Vastan, Tarkeshwar, Mangrol, Valia) and Kutch Basin (Umarsar, Panandhro, Matanomadh lignite deposits) Gujarat and Barmer, Bikaner, Nagaur and Jaisalmer Basin Rajasthan and Darjeeling District, West Bengal.
- **Field Experience:** Covered Palaeogene Paleontology, Entomology and Palaeobotany.

Residential as well Official addresses:

- **Official address:** Birbal Sahni Institute of Palaeobotany, 53 University Road Lucknow.
- **Phone:** +91(522) 274930 (Office), **Fax:** +91(522) 2740485 (Office), **Mobile:** 9919401173.
- **Residential address:** House No. 610/1828, Keshav Nagar, Sitapur Road, Lucknow, 226021.

Research Interest:

More than 20 years research experience in the field of scientific carrier, I have covered nearly most of the field areas of Palaeontology (vertebrates, invertebrates) amber biota (plant, arthropods, insects) as well as palaeobotany (mega, macro and micro plant fossils) of the sequences associated with Rajasthan Basin (Barmer, Bikaner, Nagaur) and Cambay Basin (Tarkeshwar, Vastan, Valia and Mangrol) and recently Kutch Basin (Umarsar, Panandhro, Matanomadh (lignite deposits) Gujarat, India. I have studied the diverse Tertiary vertebrates, invertebrates, teredolite ichnofossils, amber embedded inclusions and also various mega and micro floral assemblages from different Tertiary deposits of Rajasthan and Gujarat province. I have made significant contribution to the biogeography, stratigraphy, palaeoecology, palaeoenvironment, age and phytogeography of the Tertiary sequences of these areas. In addition to the aforementioned contribution, I have to my credit, the first reporting of Dipterocarp fossil from Early Eocene of Cambay Basin, Gujarat and the discovery of dammarane type of terpanoid

compound preservation in the amber from Matasukh Lignite mine, Nagaur Basin, Rajasthan. I have reported various groups of significant amber embedded social insects (ant, bees, and termite), even spore and pollen remains recorded for the first time in amber from Cambay Basin Gujarat India and also some of the new shark fish assemblages (species) were reported first time in the Indian subcontinent in the sedimentary sequences of Cambay Basin, Gujarat and Barmer, Bikaner and Jaisalmer Basins of Rajasthan. One of the biogeographically significant contributions of my work is the finding of fossil bat record which dates back to Early Eocene. I am continuing palynological studies in Himalaya regions of Lower Siwalik in Darjeeling district also. I have been working on the multidisciplinary research in Cambay Basin which has attracted well reputed international scientists from diverse field. The contribution along with all these scientists has brought out exciting findings (ant, bee, termite, spider, mosquito, fly, bugs, scorpions, beetle, web spinners), more than 150 species and in fossil plants (leaf impression, seed, wood, spore, pollen, flowers etc) the research is still under way towards the progress of new exciting fossil findings.

- **Project area:** Presently working in the Institute project (Project no. 3.8): Analysis of Amber biota from early Palaeogene sedimentary sequences of Gujarat and Rajasthan basins: Palaeoclimatic and palaeoecological perspectives. Excluding the Institutes (In-house) Project working in Collaboration with the well reputed scientists with India, US and Germany to cover overall diverse biotic assemblages on Cambay Basin (Surat District) and Kutch Basin (Bhuj District) Gujarat as well as Rajasthan Basin (Barmer, Bikaner, Nagaur and Jaisalmer).

Awards Certificate:

- **Received most cited research paper Certificate (September 19, 2019) from the Editor** (International Journal): “**PLOS ONE**” on the investigation of ‘Biting Midge (Diptera: Ceratopogonidae) from Cambay Amber Indicate that the Eocene Fauna of the Indian Subcontinent was not Isolated’. (Article was published in 2017).
- **Received most cited research paper Certificate (Year 2010) from the Editor** (International Journal): “**Acta Palaeontologica Polonica**” on the discovery of ‘Diverse snake fauna from the Early Eocene of Vastan Lignite mine Surat District, Gujarat, India’. (Article published 2008).

Awards Medals:

- **Awarded ‘S. N. Singh Memorial Gold Medal in the Year 2020’** from Palaeontological Society of India, Lucknow for the best scientific contribution among the paper published in the Journal Palaeontological Society of India (2019),V. 64 (2), 184-226.

- **Awarded ‘Team Medal 2018’** for high quality research work including high quality Impact Factor publications of the several research articles in Refereed Journal viz. Scientific Report PLOSONE etc. **(Impact Factor: 13) ♣**

- **Awarded ‘Team Medal 2010’ in the year 2013** for high quality/ high Impact Factor publishing papers in Refereed Journal **(PNAS, US and New Phytologist, Fungal Biology etc).** **Impact Factor: 18 ♣.**

Major International Collaboration and Research Experience:

1. Worked in National and International Collaboration with **National Geographic** team India, US and Belgium, (Year 2002 to 2007).
2. International Collaborative research on **amber** is still in excellent progress with International well reputed scientists from India, US and Germany, (Year 2008 to till date, continued).
3. National Collaboration with the scientist **Wadia Institute of Himalayan Geology Dehradun, Department of Geology, Punjab University, Chandigarh, Department of Geology, IIT Bombay** and Inter institutional Scientist **BSIP, Lucknow** is still continued.

Field workshop: Attended International field workshop at Vastan Surat, Gujarat. Participated in the field workshop (17th to 19th January, 2012) and is organized by (PSI) Department of Geology, University Lucknow.

Professional Membership:

1. Life member of the **‘Journal Palaeontological Society of India’** Lucknow, India.
 2. Life member of the **‘Journal Himalayan Geology’** Dehradun, India.
 3. Life member of the **‘The Palaeobotanical Society’** Lucknow, India.
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- **Project work experience:** Worked as Project Fellow/Senior Research Fellow in Department of Geology, University Srinagar Garhwal, engaged in DST sponsored project on faunal investigation of Barmer District, western Rajasthan during Ph.D. Course.

 - **♣ Sponsored Project:** Working on mega DST Sponsored Project on the title: Analysis of Early Eocene Amber from Cambay and Kutch Basin, Gujarat, Western India: Palaeoecological, Environmental and Climatic Significance. It begins from 07/03/2017 to continue.

Published Research Articles: (74♣):

(♣) Indicates National/International well reputed (Impact factor) Journals and (*) indicates corresponding author.

- [1]. **Singh, H. Agnihotri, P. Sharma, J. (2022).** Amber flora and fauna from Early Eocene Vastan Lignite, Mine, Cambay Basin, Gujarat: Ecological Diversity and Environmental Significance. *Journal Geological Society of India*.98, 661-668. **(Impact Factor: 1.4).**
- [2]. ♣**Umamaheswaran, R. Dutta, S. Singh, H. Kumar, S. (2022).** Pyrolysis-GC×GC-TOFMS as a tool for distinguishing the macromolecular structure of nitrogen-bearing animal biopolymers in fossil tissues. *Journal of Analytical and Applied Pyrolysis*. 161, 105362. **(Impact Factor: 5.5).**
- [3]. **Wood, H.M. Singh, H. Grimaldi, D.A. (2021).** Another Laurasian connection in the Early Eocene of India: Myrmecarchaea spiders (Araneae, Archaeidae). *ZooKeys*. 1071, 49-61. **(Impact Factor: 1.5).**
- [4]. ♣**Singh, V.P. Singh, B.D. Mathews, R.P. Mendhe, V.A. Agnihotri, P. Mishra, S. Radhwani, M. Dutta, S. Subramanian, K.A. Singh, A and Singh, H*.(2021).** Petrographical-geochemical characteristics and floral-faunal compositions of the Valia lignite deposits from Cambay Basin (Gujarat), western India. *International Journal of Coal Geology*. 248, 103866. **(Impact Factor: 6.3).**
- [5]. ♣**Singh, H. Judd, W. Samant, B. Agnihotri, P. Grimaldi, D. Manchester, S. (2021).** Flowers of Apocynaceae in amber from the early Eocene of India. *American Journal of Botany*.108 (5), 1-10, doi:10.1002/ajb2.1651. **(Impact Factor: 3.8).**
- [6]. **Farooqui, A. Singh, H*. Prasad, M. Singh, V. K (2021).** Morphometry and morphology of Testate amoebae from the Miocene sub Himalayan zone of Darjeeling, India. *Himalayan Geology*. 42, (1): 137-154. **(Impact Factor: 1.3).**
- [7]. **Agnihotri, P. Singh, H. (2020).** Eocene biodiversity of arthropods in amber from the Umarsar lignites, Kutch basin, Gujarat, India. *Journal Palaeontological Society of India*. 65, (2): 214-218. **(Impact Factor: .8).**
- [8]. **Singh, H*. (2020).** Palaeoenvironmental and taphonomic biases in palynological assemblages preserved in amber versus sediments from the Umarsar Lignite, Kutch

- [9]. Agnihotri, P. Chandra, K. Shukla, A. Singh, H. Mehrotra, R.C. (2020). First fossil record of a nymph (Ephemeroptera, Teloganellidae) from the Indian subcontinent. *Zootaxa*. 4838, 137-142. (Impact Factor:1.09).
- [10]. Basumatary, S.K. Singh, H. Asperen, E.N. Tripathi, S. McDonald, H.G. Pokharia, A.K. (2020). Coprophilous and non-coprophilous fungal spores of *Bos mutus* modern dung from the Indian Himalaya: Implications to temperate paleoherbivory and palaeoecological analysis. *Review of Palaeobotany and Palynology*. V, 277, 104208. (Impact Factor: 1.9)].
- [11]. ♣ Mathews, R.P. Singh, B.D. Singh, V.P. Singh, A. Singh, H. Shivanna, M. Dutta, S. Mendhe, A. Chetia, R. (2020). Organo-petrographic and geochemical characteristics of Gurha lignite deposits, Rajasthan, India: Insights into the palaeovegetation, palaeoenvironment and hydrocarbon source rock potential. *Geoscience Frontiers*. 11, 965-988. (Impact Factor: 4.2)].
- [12]. Dutta, S. Kumar, S. Singh, H. Khan, M.A. Barai, A. Rana, R.S. Tewari, A. Bera, S. Sen, S. Sahni, A. (2020). Chemical Evidence of Preserved Collagen in 2.5 Ma and 54 Ma old Fossilized Fish Remains. *Palaeontology*. 1-8. (Impact Factor: 2.6)].
- [13]. Zakrzewska, M. Singh, H. Wagner-Wysiecka, E. Gilka, W. (2020). Minute and diverse in fossil sticky stuff: Tanytarsini (Diptera: Chironomidae) from early Eocene Indian Cambay amber. *Zoological Journal of the Linnean Society*. XX, 1-28. (Impact Factor: 2.9).
- [14]. Singh, H*. Prasad, M and Wappler, T. (2019). An early Eocene floral assemblage from the Cambay Shale (Tarkeshwar Lignite Mine) Formation, Gujarat: palaeoclimatic and phytogeographical implications. *J. Palaeontol. Soc. India*. 64 (2), 184-226. (Impact Factor:.8)
- [15]. Patel, R. Singh, H. Prasad, M. Rana, R.S. Waqas, M. (2019). Diversified Early Eocene floral and faunal assemblage from Gurha, western Rajasthan: Implications for palaeoecology and palaeoenvironment. *Geophytology*. 49, (1&2): 49-72.
- [16]. Shukla, A. Singh, H. Mehrotra, R.C (2019). Fossil Wood of Subfamily Detarioideae (family Fabaceae) from the Palaeogene of the Indian Subcontinent: Origin and Palaeo-dispersal Pathways. *Jour. Geol. Soc. India*. V. 94, 411-415. (Impact Factor: .9).
- [17]. Basumatary, S.K. Singh, H. McDonald, H.G. Tripathi, S. Pokharia, A.K. (2019). Modern botanical analogue of endangered Yak (*Bos mutus*) dung from India: Plausible

linkage with extant and extinct megaherbivores. PLOS ONE. 14 (3), e0202723. (Impact Factor: 2.8).

- [18]. Mathews, R.P. Singh, B.D. Singh, H. Singh, V.P. and Singh A. (2018). Characterization of Panandhro Lignite Deposits (Kachchh Basin), western India: Results from the Bulk Geochemical and palynofloral Composition. *Jour. Geol. Soc. India*. 91, 281-289. (Impact Factor:1.8)
- [19]. Zakrzewska, M. Stebner, F. Puchalski, M. Singh, H. Gika, W. (2017). A peculiar leg structure in the first non-biting midge described from Cambay amber, India (Diptera: Chironomidae). *Earth and Environmental Science Transaction of the Royal Society of Edinburg*. 107, 255-261. (Impact Factor:2.8)
- [20]. Kania, I Krzemuski, W. Stebner, F. Singh, H. (2017). A first representative of Tipulomorpha (Diptera) from Early Eocene Cambay amber (India). *Earth and Environmental Science Transaction of the Royal Society of Edinburg*. 107, 263-269. (Impact Factor:2.8)
- [21]. Singh, H* and Prasad, M. (2017). First report of fossil wood from Khadsalia Lignite Mine, Saurashtra, Gujarat, India, and its Significance. *Geophytology*. 47, (2): 213-220.
- [22]. Shukla, A. Mehrotra, R.C. Singh, H*. (2017). A fossil wood from the Cambay Shale Formation of Mangrol Lignite Mine, Gujarat. *Geophytology*. 47, (2): 203-207.
- [23]. ♣ Stebner, F. Singh, H. Rust, J. Grimaldi, D. (2017). Lygistorrhinidae (Diptera: Bibionomorpha: Sciaroidea) in early Eocene Cambay amber. *Peer, J*. 5:e3313; DOI 10.7717/peerj.3313. (Impact Factor:2.9)
- [24]. ♣ Stebner, F. Baranow, V. Zakrzewska, M. Singh, H. Gilka, W. (2017). The Chironomidae diversity based on records from early Eocene Cambay amber, India, with implications on habitats of Diptera. *Palaeoeco, Palaeoclimat, Palaeoecol*. 475, 154-161. (Impact Factor: 3.3).
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- [27]. ♣ Stebner, F. Szadziwski, R. Singh, H. Gunekel, S. Rust, J. (2017). Biting midge (Diptera: Ceratopogonidae) from Cambay amber indicate that the Eocene fauna of the Indian Subcontinent was not isolated. *PLOS ONE*. 12 (1): 1-24. **(Impact Factor: 3.2)**.
- [28]. ♣ Stebner, F. Szadziwski, R. Rühr, P. T. Singh, H. Hammel, J. Kvifite, G. M. Rust, J. (2016). A fossil biting midge (Diptera: Ceratopogonidae) from early Eocene amber with a complex pheromone evaporator. *Scientific Reports*. DOI: 10.1038/SREP34352, pp. 1-6. **(High impact Factor Journal: 5.2)**.
- [29]. Heinrichs, J. Scheben, A. Bechteler, J. Lee, G.E. Verwimp, A.S. Hedenas, L. Singh, H. Pocs, T. Nascimbene, P.C. Peralta, F. Renner, M. Schmidt, A. R. (2016). Crown Group Lejeuneaceae and Pleurocarpous Mosses in Early Eocene (Ypresian) Indian amber. *PLOS ONE*. DOI: 10.1371, pp 1-15. **(Impact Factor: 3.2)**.
- [30]. Shivanna, M. Singh, H. (2016). Depositional environment and hydrocarbon potential of marginal marine sediments of Eocene from western India: A palynofacies perspective. *Marine and Petroleum Geology*. 73, 311-321. **(Impact Factor: 2.6)**.
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- [34]. ♣ Singh, H. Prasad, M. Kumar, K and Singh, S.K. (2015). Early Eocene Macro flora and associated palynofossils from the Cambay Shale Formation, Western India: phytogeographic and palaeoclimatic implications. *Palaeoworld*. 24, 293- 323. **(Impact Factor: .9)**.
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- [37]. ♣ Dutta, S. Saxena, R. and Singh, H. (2014). Exceptional preservation of angiosperm markers in Miocene and Eocene ambers. *Geology* 42, 155-158. [Geological Society of America (GSA)]. **(High Impact Factor: 4.6) ♣**.

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- [39]. ♣ **Singh, A. Mahesh, S, Singh, H. Tripathi, SKM and Singh, B.D. (2013).** Characterization of Mangrol lignite (Gujarat), India: Petrography, palynology and palynofacies. *Int. J. Coal Geology.* 120, 82-94. **(High Impact Factor: 3.3) ♣.**
- [40]. ♣ **Engel, M.S. Ortega-Blanco, J. Nascimbene, P.C. and Singh, H. (2013).** The bees of Early Eocene Cambay amber (Hymenoptera: Apidae). *Jour. Melittology.* 25, 1-12. **(Impact Factor: .7).**
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- [42]. ♣ **Grimaldi, D. Engel, M. and Singh, H. (2013).** Bugs in the Biogeography: (Hepteroptera: Leptopodidae) in amber from the Miocene of Hispaniola and Eocene of India. *Journal of the Kansas Entomological Society.* 86, (3), 226-243. **(Impact Factor: .4).**
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- [46]. **Mahesh, Prasad. Singh, H*. and Sanjai K. Singh, (2013).** Middle Miocene palynoflora from the Lower Siwalik sediments of Darjeeling District, West Bengal and their palaeoenvironmental implications. *Himalayan Geology.* Vol. 34 (1), 9-17.
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- [48]. ♣ Eva-Maria Sadowski, Christina Bemforde, Matthias Gube, Jouko Rikkinen, **Singh, H.** Leyla J. Seyfullah, Jochen Heinrichs, Paul C. Nascimbene, Joachim Reitner, Alexander R. Schmidt. (2012). The anamorphic genus *Montosporella* (*Ascomycota*) from Eocene amber and from modern *Agathis* resin. *Fungal Biology*. 116, 1099-1110. (Impact Factor: 2.9).
- [49]. ♣ Grimaldi and **Singh, H.** (2012). The extinct Genus *Pareuthychaeta* in Eocene Ambers (*Diptera : Schizophora : Ephydroidea*) *Canadian Entomologist*. Vol. 144, pp.17-28. (Impact Factor: .69).
- [50]. ♣ Christina Beimforde, Nadine Schäfer, Heinrich Dörfelt, Paul C. Nascimbene, **Singh, H.** Jochen Heinrichs, Joachim Reitner, Rajendra S. Rana and Alexander R. Schmidt (2011). Ectomycorrhizas from a Lower Eocene angiosperm forest. *New Phytologist*. 192: 988-996. Impact Factor: 7.6.
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- [59]. ♣ **Rage, J.C., Folie, A., Rana, R.S., Singh, H., Rose, K.D., and Smith, T. (2008)** A diverse snake fauna from the early Eocene of Vastan Lignite mine, Gujarat, India. *Acta. Palaeontologica Polonica* 53, (3) : 391-403. **(Impact Factor: 1.9).**
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Co-Supervised two Master's Dissertation:

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