

VISACOP 2023: A National Seminar on the Vindhyan Basin of India

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A one day national conference titled “Vindhyan Supergroup: Recent advances, Challenges and Opportunities (VISACOP 2023)” was held on 18th October, 2023 at Geological Survey of India (GSI), Lucknow, India. The seminar was based on the Vindhyan, one among the large-scale Proterozoic basins of the world. The conference was convened by Dr. Joyesh Bagchi (Deputy Director General, Geological Survey of India, Uttar Pradesh). The event started with a formal inauguration, lamp lighting ceremony and welcome of the dignitaries like Mr. N.V. Nitnaware (Addn. Director General, HOD, GSI, Northern Region), Dr. D.K Sinha (Ex-Director, Atomic Mineral Division (AMD)), Chief guest Prof. M.G Thakkar (Director, Birbal Sahni Institute of Paleobotany (BSIP)) and other delegates. The inaugural ceremony concluded with the release of the Abstract Volume (GSI, Special Publication No.128).

The symposium had participants from all over India, with a total of 86 contributions, of which 29 were oral presentations and the rest were displayed as posters. The delegates showcased their work in various themes like, Basin tectonics, Palaeo-environmental analyses, Stratigraphic correlations, Mineral potential and future possibilities, early life forms and evolution, Sediment geochemistry and provenance, Sub-surface structure of Vindhyan using geophysics, Scope of Geotourism, Engineering and Environmental geology. The plenary address was delivered by Prof. Subir Sarkar, Jadavpur University, Kolkata. He presented similarity in lithological features in the Lower Vindhyan successions of the Son Valley and Rajasthan sectors and highlighted the difference in sedimentation pattern between the two sectors in course of Upper Vindhyan sedimentation. Prof. Sarkar put forward a possibility that the two sub-basins (Son Valley and Rajasthan) were connected initially and later evolved as separate basins. Prof. Sarkar also pointed out that although a lot of work has been carried out in the eastern sector (Son Valley) of the basin, the western sector (Rajasthan/ Chambal Valley) needs attention. He mentioned that we have the initial age of Vindhyan sedimentation at 1.6 Ga but the closure age of this basin is still a dilemma.

The keynote address delivered by Prof. B.P Singh (HOD, Department of Geology, Banaras Hindu University (BHU)) was on soft sediment deformation structures in the Semri Group (Lower Vindhyan) of rocks that was probably formed due to tectonic-induced seismicity along the Son Lineament. Dr. Mukund Sharma (Ex-Scientist G, BSIP) in his keynote speech discussed various life forms in Vindhyan and pointed to uncertainties with the upper Vindhyan age. He focused on the Bhandar Group of rocks, the youngest stratigraphic unit in Vindhyan stratigraphy and explained that the Group was considered Neoproterozoic in age but recently available bio-, chemo-, chrono- and magneto-stratigraphy made it debatable. According to the new fossil record reported by him from the Bhandar Group, the deposition of Vindhyan Basin continued into the Ediacaran Period.

The keynote speaker, Dr. D.K Sinha reported that the pyroclastics present in the upper formations of Kaimur Group have potential for uranium deposit and revealed that the Vindhyan basin can be used for uranium extraction. This idea was also supported by other researchers. Many presentations were on glauconitic beds present in the Vindhyan sequence and a discussion took place on extraction of potash feldspar for use in the fertilizer industry. Some researchers identified laterite capping of the Kaimur Group in various areas as a source for critical minerals like vanadium, titanium and gallium apart from bauxite. Several geoscientists also showed interest in the biotic impressions from the Vindhyan in Proterozoic backdrop. The keynote speaker Dr. V. K. Sharma (Water Resources Department, Govt. of Bihar) explained that the entire Vindhyan Basin lies in the Seismic Zone II and with its shale, limestone and sandstone lithology should be thoroughly examined before construction of large-scale engineering projects. Talking about geotourism, a number of researchers envisaged a geoheritage site at Chitrakoot, Uttar Pradesh, the Sohagi Ghat, Madhya Pradesh, Kalinjar Fort, Uttar Pradesh, Mukundra hills, Rajasthan etc.. Dr. V.P. Gaur (GSI, Lucknow) highlighted the nature of contact relations between the Vindhyan Supergroup and Bundelkhand granitoid Complex, its basement. The author presented her work on the geochemistry and tectonic background for Kaimur Group of siliciclastics, the lowermost unit of Upper Vindhyan, exposed in the Son Valley and Rajasthan. Requirement of geochronological dates from the Rajasthan Vindhyan and further work to establish possible connectivity or not between the sub-basins (Son Valley and Rajasthan) of the Vindhyan was highlighted.

The venue of the seminar was amazing with a state-of-art and spacious auditorium for oral presentations and huge well lighted and ventilated area for poster presentations. The meeting was a wonderful gathering of experienced researchers, early to mid-career scientists, young scholars and a few master's students also. After the day long discussion on Vindhyan Basin it was recommended that rigorous and detailed sedimentological, palaeobiological and geochronological studies are required on the Rajasthan or Chambal basin to understand the stratigraphy, palaeotectonics, palaeoenvironment and its palaeo connectivity to the Son Valley. We need to make more fossil discoveries as biological proxies as well as generate more geochronologic systematics of Vindhyan basin to unravel the upper age of this basin. The seminar emphasized on the economic potential of Kaimur Group as a future source for uranium, glauconitic beds as source of potash feldspar for fertilizer industry, gold from basal conglomerate etc. It was also considered that the Vindhyan basin is the home for many geoheritage sites like in Chitrakoot that need proper conservation. Finally, the conference ended with the vote of thanks and all the delegates had a fruitful day with discussion on the Vindhyan mountains of India.