International Field Workshop

on

the Vindhyan Supergroup, central India

January 20\textsuperscript{th}-31\textsuperscript{st}, 2010

Organized by

The Palaeontological Society of India
Centre of Advanced Study in Geology, University of Lucknow,
Lucknow 226 007, Uttar Pradesh, INDIA

Sponsored by

Birbal Sahni Institute of Palaeobotany
53 University Road,
Lucknow 226 007, Uttar Pradesh, INDIA

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Centre of Advanced Study in Geology
University of Lucknow,
Lucknow 226 007, Uttar Pradesh, INDIA
Introduction

The Palaeontological Society of India invites you to participate in a field-workshop on the Proterozoic Vindhyan Basin of India. Over the last one decade, studies on the Vindhyan basin in the field of biostratigraphy, sedimentology, geochronology, isotopic geochemistry, palaeomagnetism have posed many new challenges for the understanding of the Proterozoic biosphere, lithosphere, position of India during the Meso-Neoproterozoic and record of Neoproterozoic glacial signatures. The proposed field-workshop is intended to provide an opportunity to examine and discuss many of these issues.

Vindhyan Supergroup

The Vindhyan Basin is one of the largest intra-continental basins of the world which offers the varied facets of geological studies of the Proterozoic Eon. The Vindhyan rocks crop out over an area of 1,04,000 sq km with cumulative thickness of ~4,500m in the central peninsular region. It unconformably overlies the Bundelkhand massif and slightly metamorphosed rocks of the Bijawar Group (~2500 Ma, Crawford & Compston, 1970; Mondal et al., 2002). The rocks of the Vindhyan Supergroup are unmetamorphosed and have undergone minor tectonic deformation in certain sectors. Sedimentary successions of the basin, comprising a thick pile of sandstone, porcellanite, shales and limestone are broadly divisible into the Lower Vindhyan (the Semri Group) and Upper Vindhyan (the Kaimur, Rewa and Bhanwar Groups) (Fig.1). These sedimentary rocks are considered to have been deposited over a very long period of time from Palaeoproterozoic to Neoproterozoic (between ~1700 and 600 Ma). It shows development of well-preserved stromatolites, typical carbonate precipitate patterns of Mesoproterozoic Era, microfossils, carbonaceous megafossils, microbial mats, possibly trace-fossils and also Ediacaran metazoan fossils.

Background History

For a decade, the Vindhyan Supergroup had drawn global attention for various reports of biostratigraphic-radiometric age discordances. In the meantime, new radiometric data were generated that firmly established the age of the Lower Vindhyan (the Semri Group), negating the proposed Cambrian age for the upper part of the Semri Group (see Kumar, A et al., 2001; Rasmussen et al., 2002, Ray et al., 2002, 2003; Sarangi et al., 2004, Malone et al., 2008; and Bengston et al., 2009). Along with these radiometric data, new sets of fossils were also reported reiterating the presence of the Cambrian elements in the Lower Vindhyan (Joshi et al., 2006; Azmi et al., 2007, 2008). Characteristic Mesoproterozoic carbonate precipitate patterns were also reported in the Lower Vindhyan (Sharma & Sergeev, 2004). Some Ediacaran fossils were also recorded from the Upper Vindhyan (De, 2003, 2006). Isotopic studies (C, O, and Sr isotope) of the Lower and Upper Vindhyan successions also indicate possible glacial activity of post-Sturtian to Vendian age within the Upper Vindhyan sediments and even a unit of limestone (Lakhiri Limestone) has been considered as a Vendian ‘cap carbonate’ (Friedman et al., 1996; Friedman & Chakraborty, 1997; Kumar B. et al., 2002; Kumar S. et al., 2005).

Recent paper by Bengston et al. (2009) has once again revived the interest of palaeobiologists and geochronologists on the age and fossil contents of the Vindhyan Supergroup. It is claimed that their independent investigations have confirmed the presence of biomineralized fossils (Bengston et al., 2009) in the Tirohan Limestone (=Rohtas Formation, the Semri Group) but did not agree with the Cambrian age of the fossils as proposed by Joshi et al. (2006) and Azmi et al. (2007); instead they have provided the 1650 ± 89 Ma age for the fossil-yielding horizons. Biomineralization, an important event in the evolution of the biosphere, thus suddenly has been pushed deep
into time. Work of Malone et al. (2008) suggested the initiation of the Upper Vindhyian basins well before the Earth experienced Snowball phase. Their data on palaeomagnetic and detrital zircon geochronology indicate the age of the Upper Bhandar to be close to 1073 Ma. Newer data have brought forth the discordance between the biostratigraphy and geochronology as argued by Azmi et al., (2008) and Basu (2009). Such discordance is not only noted between palaeobiological and geochronological records but also in the fields of isotope-geochemistry and palaeomagnetism that are presently unexplained and need further exploration.

Field Workshop
The field-workshop would cover the entire succession of the Vindhyan Supergroup from the base to the top. It will provide an opportunity to examine the crucial sections of the Vindhyan Supergroup in central India to study sedimentological, palaeobiological and geochronological aspects spanning over Palaeoproterozoic to Neoproterozoic.

Field-workshop will allow observations as well as sample collections to be made from these sections for further studies. The workshop will focus on the condensed sequence of the Semri Group, best exposed around the Chitrakoot area, characterized by carbonate platform deposits with development of stromatolites and typical tidal flat deposits. The arenargillaceous successions of the Kaimur and Rewa Groups are the deposits of a tidal flat-lagoon-coastal sand complex. The youngest Bhandar Group is represented by arenargillaceous as well as carbonate platform facies. In this Group, there are several carbonate horizons showing development of stromatolites and a number of shale horizons which show well-preserved carbonaceous megafossils and metazoon fossils. Microbial mats are also recorded from the arenaceous facies.

Registered participants of the field-workshop will assemble at Lucknow and visit important Vindhyan localities in central India spread over Chitrakoot, Satna, Rewa, Chohat, Maihar, Katni and Panna in the states of Uttar Pradesh and Madhya Pradesh.
Complete succession from the basement rocks to the youngest horizon of the Bhandar Group will be examined during the 10-day fieldwork. The valedictory session will be conducted at Khajuraho, a world famous temple town of ninth to eleventh century in central India, from where the participant will disperse. The temples of Khajuraho are famous for their architectural design, sculptures of great aesthetic value with delicate sensuality and eroticism.

The field-workshop is being jointly sponsored by the Birbal Sahni Institute of Palaeobotany and the Centre of Advanced Study in Geology, University of Lucknow. Those interested in participation in the International Field-Workshop on Vindhyan Supergroup, central India should fill the Preliminary Registration Form, scan it and send the same as an email attachment or fax it to the undersigned latest by 15th August, 2009. Those who respond to the Preliminary Registration Form will receive the second circular with other relevant details of the field-workshop. Final Registration Form, along with the participation fee, must reach before 30th September, 2009. For the logistic reasons, the number of seats are limited to 20. Participation fee can be directly transferred into the bank account of the Palaeontological Society of India or remitted through Cheque/Draft in favour of the treasurer, the Palaeontological Society of India, payable at Lucknow.

**Important Details**


**Assembly** (20/01/2010)
- Birbal Sahni Institute of Palaeobotany, Lucknow-226 007, Uttar Pradesh, India
- Departure for Chitrakoot – 21/01/2010
- Disperse from Khajuraho on 31/01/2010

**Participation Fee**
- Foreign and Non-Resident Indian participant: US$ 1,000.00
- Indian Participant: Rs. 20,000.00

(Participation fee includes transport, stay, food and board during the field workshop form assembly point to dispersal point (i.e. from Lucknow to Khajuraho). Khajuraho is well connected by Air to New Delhi.

**Weather:** Weather remains cold and dry during the January in north India. All the spots that will be visited in course of the field workshop experience sunny days and cold nights.

**Stay Facilities:** Lucknow and Khajuraho have star grade hotel facilities, all other places to be visited during the workshop have reasonably good stay arrangements.

I look forward to your participation in the field-workshop.

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**Mukund Sharma**

**Organizing Secretary**

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Birbal Sahni Institute of Palaeobotany
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Lucknow-226 007, Uttar Pradesh, India
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Fax: +91-522-2740485, 2740098

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**References**


**International Field Workshop on the Vindhyan Supergroup, central India**

**Preliminary Registration Form**

Attention: Dr. Mukund Sharma

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Note: Completed form should be scanned and sent as an attachment through the E-mail or Faxed by 31st August 2009.

Fax: +91-522-2740485, 2740098  Email: sharmamukund1@rediffmail.com
International Field Workshop on the Vindhyan Supergroup, central India

Final Registration Form
Attention: Dr. Mukund Sharma

Family Name ____________________________________________

Middle Name __________________________________________

First Name ____________________________________________

Affiliation ____________________________________________

Mailing Address _________________________________________

________________________________________________________________________

Country __________________________________________________

E-mail: __________________________________ Fax: ___________________________

Telephone: Country Code _________ City Code _________ Number ______________

Male    Female

Nationality ____________________________________________

Passport No. __________________________________________

Date of Issue _________________________________________

Date of Expiry _________________________________________

Registration fee remitted vide cheque No. _________________

Swift Transfer No. ______________________________________

Date ____________________

Place ____________________ Signature of the participant

Note: Completed form should be scanned and sent as an attachment to the email by 30th September 2009.
Fax: +91-522-2740485, 2740098  Email: sharmamukund1@ediffmail.com