

Reports

CONCLAVE ON UNDERSTANDING THE LIFE OF BYGONE ERAS: EMERGING TRENDS

14–15 November, 2013

Over the years, considerable progress has been made by the BSIP in describing the fossil remains of plants, assigning them taxonomic positions, evolutionary history based on the palaeobotanical data, and palaeoclimatic interpretations. It is generally recognised that in order to give shape to a larger, clearer picture of the past, classical palaeobotany has to be buttressed with diverse lines of investigation. This basic realisation gave birth to the idea of a Conclave that should bring together seemingly different specialisations that though look far apart at times, are in reality knitted together, and when worked upon together, show considerable promise in solving issues of global importance. In order to achieve the set goals for the Conclave, experts from different fields were invited for delivering a series of lectures on 14–15th November on the

occasion of Founder's day celebration. Thirteen talks were delivered on this occasion from various scientists.

Biomechanics is one of the new tools in the area of palaeontology that has gained significance during the last decade. Dr Sanjay Mishra of the Department of Science & Technology, Ministry of Science and Technology, New Delhi talked about potential of biomechanics in the evolutionary studies. He showed that biomechanical investigations can be used to study the relationship between environmental demand and the physical or mechanical design of an organism; mechanical constraints under which the organism lived emphasising functional significance with respect to evolutionary change.

Palaeobiogeography, an integrative field of inquiry that unites palaeoecology, evolutionary biology and plate tectonics, was put on view by Dr Praveen Karanth of the IISc, Bengaluru, who talked about combining fossil studies with molecular systematics to date evolutionary divergence events. In his talk with few case histories he stressed that molecular phylogeny in conjunction with biogeographical



analysis helps to better understanding of the origin and evolution of Indian biota. Dr Manoj Prasad, from National Institute of Plant Genome Research, New Delhi, talked about phylogenetic methods in plants that are now being used for estimating the relationships amongst the plant species. Organic biomarkers, also known as “geochemical fossils”, are molecules that have lost their functional groups but whose basic skeleton is preserved and can provide information of the class of organism from which they have derived. Dr Suryendu Dutta of IIT Mumbai spoke about the utilisation of organic biomarkers in palaeochemotaxonomic studies in solving palaeobiogeography of Dipterocarpaceae plant family. Knowledge of extant plant and animal diversity patterns along with their ecological preferences are a prerequisite to correctly understand the past ecosystem. Dr Jayshree Ratnam from NCBS, Bengaluru, illustrated the functional ecology of mixed tree–grass ecosystem and described how fossil studies can help in understanding the long term effect of climate change on mixed tree grass Savannah ecosystem.

Identification of facies and sedimentological studies help in the correct assessment of depositional environment in plant and animal fossil studies. Palaeosol, or fossil soil, is soil that formed on a landscape of the past. Dr B P Singh of the Geology Department, Banares Hindu University explained the use of palaeosol studies in palaeoclimatology. He illustrated how palaeosol studies can be utilised for the estimation of ancient mean annual precipitation and pCO₂ values. Dr Subir Sarkar from Geology Department, Jadhavpur University emphasised significance of microbial studies in Precambrian rocks.

Climate change is one of the major concerns for humans today. Dr D K Upreti, NBRI, showed that lichenometry is an upcoming potential tool to document climate change in Alpine regions of India. Dr Nelay Khare from Ministry of Earth Sciences brought out the use of multiproxy studies in palaeoclimatology. Dr Rajeev Saraswat illustrated the use of Ba/Ca ratio of foraminifera in ocean studies for higher resolution palaeoclimatic interpretations. Since the cryosphere plays a significant role in global climate and in climate model

response to global changes, Dr Thamban Meloth from National Centre for Antarctic and Ocean Research, Goa, making use of geochemical investigations showed that Antarctic ice core records can provide reliable proxy data of atmospheric circulation, temperature, precipitation and sea–ice condition of the past that effectively extend beyond the instrumental records. Dr Debajyoti Paul, Indian Institute of Technology, Kanpur showed that stable carbon ($\delta^{13}\text{C}$) and oxygen ($\delta^{18}\text{O}$) isotopic compositions of carbonate nodules and $\delta^{13}\text{C}$ values of bulk sediment organic matter of alluvial sediments from Ghaggar plains, NW India can be utilised for the interpretation of variability in the intensity of SW Indian monsoon and palaeovegetation patterns during Late Quaternary. Finally, Dr Shailesh Agrawal from Birbal Sahni Institute of Palaeobotany by providing a case history from Ganga plains showed that the $\delta^{13}\text{C}$ values of selected long–chain fatty acids can help in the reconstruction of palaeovegetation.

The Conclave on Understanding the Life of Bygone Eras: Emerging Trends thus contributed significantly towards understanding how biotic and abiotic researches may be used for the benefit of the BSIP.

Vandana Prasad

Birbal Sahni Institute of Palaeobotany,
53 University Road, Lucknow 226007

FIRST INTERNATIONAL SYMPOSIUM OF THE INTERNATIONAL GEOSCIENCE PROGRAMME PROJECT 608 (“ASIA–PACIFIC CRETACEOUS ECOSYSTEMS”)

20–27 December, 2013

The IGCP 608 (2013–2017) is a newly approved and supported project in March, 2013, by International Geoscience Programme (IGCP). The project IGCP 608, entitled “Cretaceous ecosystems and their responses to palaeoenvironmental changes in Asia and the Western





Pacific”, aims to enhance understanding of the Asia–Pacific Cretaceous marine and terrestrial ecosystems and their responses to palaeoenvironmental changes based on the study of well preserved geological records of Asia and the Western Pacific region through a variety of lithological, biotic and geochemical proxy data. The major objective of this project (short title: *Asia–Pacific Cretaceous Ecosystems*) is to understand variations and evolution of the Cretaceous terrestrial and marine ecosystems in Asia and the Western Pacific. The project has an important role in promoting communication among scientists from various Asian countries, including some countries outside Asia, following the pattern of previous East Asian Cretaceous IGCPs (245, 350, 434 and 507).

The organisation of the First International Symposium entitled “Cretaceous ecosystems and their responses to palaeoenvironmental changes in Asia and the Western Pacific” (*Asia–Pacific Cretaceous Ecosystems*) was entrusted to Prof. Sunil Bajpai, Co–Leader of the project in India. Birbal Sahni Institute of Palaeobotany, Lucknow was privileged to host the meeting during December 20–27, 2013, India. The current state–of–the–art knowledge of Cretaceous geology and palaeontology in Asia, especially south Asia was reviewed in the First International Symposium as part of the first year activities under IGCP 608. The symposium provided a unique opportunity for discussions and overviews on diverse aspects of the Indian and other Asian Cretaceous marine and terrestrial successions.

The Symposium and the post–symposium field trip brought together more than 45 earth scientists, research scholars from different countries and representatives of the petroleum companies from India. The delegates were from India (30), Japan (6), South Korea (6), Mongolia (2) and Vietnam (1). Altogether 35 scientific papers were presented including 4 poster presentations. Several other scientists and students from BSIP and Geological Survey of India also attended the scientific sessions. The scientific sessions were followed by the business meeting to plan and discuss future

course of activities regarding scientific meetings and field excursions under this project in other countries.

An abstract volume with 41 contributions (Abstracts of First International Symposium of the International Geoscience Programme Project 608, December 20–27, 2013, Birbal Sahni Institute of Palaeobotany, Lucknow, India, 78p.) and a Field Guide (Field Guide: Bagh–Lameta Sequences of Central and Western India prepared by Bajpai, S., Garg, R., Tripathi, S. C. and Mohabey D. M., 2013) were published during the Symposium.

During the Symposium, presentation of papers was spread over seven scientific sessions during December 20–23, 2013. The inaugural function was presided over by the Chief Guest, Mr. Subodh K. Sharma, Deputy Director General, Northern Region, Geological Survey of India. Prof. Sunil Bajpai welcomed the delegates, scientists and research scholars attending the symposium. Prof. Hisao Ando, Department of Earth Sciences, Ibaraki University, Japan introduced the theme of IGCP 608 and released the Abstract Volume. Prof. GVR Prasad, Regional Co–ordinator from India also addressed the audience highlighting significance of research activities on the Indian Cretaceous successions under the project. The Field Guide for the post–Symposium Field excursion was released Prof. Yong Il Lee, Seoul National University, Korea.

Scientific presentations and deliberations covered diverse themes including invertebrate and vertebrate palaeontology, micropalaeontology, palaeobotany (fossil flora & palynology), palaeobiogeography, biotic evolution, taphonomy, palaeoecology, sedimentology, geochemistry, palaeoenvironment, tectonic evolution, oceanic anoxic events, mass extinctions and time boundaries of terrestrial and marine Cretaceous sedimentary records from Japan, South Korea, Vietnam, Mongolia and India. All the presentations generated very lively discussions and interaction amongst the participating delegates. Finally, Dr. Tohru Ohta, Department of Earth Sciences, Waseda University, Japan made an excellent presentation welcoming delegates to the next 2nd International

any tangible results. In the light of this, a nine days field workshop was organised by the *Society of Earth Scientists* on the Marwar Supergroup of western Rajasthan from 20th to 28th January, 2014. In recent years, the Marwar Supergroup has acquired a special status in the Indian Geology for several reasons; it has Ediacaran to Lower Cambrian age successions with Precambrian–Cambrian boundary within the Marwar Basin, and has a good economic potential not only in having building stone, limestone and evaporite deposits but potential for the discovery of hydrocarbons. Recent discovery of Ediacaran fossils, microbial mats and trace fossils add global importance and interest in the Marwar deposits. In this light, Society of Earth Scientists and Birbal Sahni Institute of Palaeobotany took a lead and did a commendable job in organising the field workshop which attracted 34 participants including researchers from Argentina, Germany, Oman, Spain, U.K. and USA. Different scientific institutions from India, i.e. NGRI, PRL, ISI, BSIP, ISI and IIT–Roorkee, and universities of Lucknow, Delhi, Panjab, Jodhpur and Jaipur were represented in the field workshop. Oil Companies were also represented by ONGC, Oil India, Cairn India and Shell. A redeeming feature of the workshop was the participation of young research scholars who were encouraged to interact with senior workers for which the Organising Committee is to be commended. The workshop was inaugurated in the evening of 20th January by Prof. B.S. Rajpurohit, the Vice Chancellor of the Jai Narain Vyas University, Jodhpur in the premises of it's Geology Department. Inaugural function was followed by a curtain razor, which was also organised in the department,

consisting of technical papers on the different aspects of the geology of the Marwar Basin. Dr. S.K. Bhushan, Prof. Shuhai Xiao, Prof. Joe Meert, Dr. Mukund Sharma, Prof. Ulf Linnemann and Prof. S.C. Mathur made the presentations.

The geology of the Marwar Basin including the basement rocks was introduced to the participants through a well prepared coloured guide book authored by M. Sharma, S.K. Pandey and S. Kumar. The guide book also included 25 sites which were to be visited during the field workshop. These sites were referred as 'Stops' in the guide book. The stops covered all the important stratigraphic horizons of the Marwar Supergroup and the basement rocks. Selection of stops was done meticulously which were well marked in the field. Such well marked stops were well appreciated as they are seldom seen in most of the field workshops. Sufficient time was given for discussion on each stop. Due to scanty exposures in a desert setting on many occasions participants have to travel a long distances for observations. But selection of excellent outcrops helped overcome the fatigue of the journey.

The field work commenced on the morning of 21st January and ended in the evening of 27th January. Each day the work started at 9 AM and ended only in late evenings. No doubt the field work was very tiring but nevertheless very fruitful and rewarding. Logistics were very meticulously planned and well executed. The workshop not only gave academic input but also gave glimpses of local setting including a camel ride to sand dunes, cultural heritage of Rajasthan including dance and music and a visit to famous Havellies of Jaisalmer. The valedictory session was held in Hotel Rajputana, Jodhpur



Standing first row from left: Bivin George; Arif H. Ansari, Dilip Saha, Joseph G. Meert, Daniel G. Poiré, Mukund Sharma, Balram Bhadu, Arjun S. Rathore, Jamie Stewart, **Standing 2nd row (banner row) from left:** Pitamber Pati, Ramson Asher, Rajesh Awasthi (Attendant), Rajni Tewari, Zhenbing She, S.D. Burley, Shamim Ahmad, Ulf Linnemann, **Sitting 1st row from left:** Ajanta Goswami, Uday Bhan, Veeru Kant Singh, S Kumar, S.C. Tripathi, Shuhai Xiao, Bandana Dimri, **Sitting 2nd row from left:** Pranjal Saikia, Irene Gomez, S.K. Pandey. **Venue:** Pokaran Boulder Bed, Gafur Khan Ki Dhani, Pokaran, Jodhpur

which was presided over by Prof. S. Kumar in the morning of 28th January. Every participant invariably praised the leadership of Dr. Mukund Sharma and his team from the Birbal Sahni Institute of Palaeobotany, Lucknow for the overall arrangement and manner in which the workshop was conducted during the entire period. With excellent interaction during the workshop among the participants, many agreed to join hands in joint research projects related to the Marwar Supergroup. It is felt by many workers that more research inputs, especially in the fields of sedimentology and palaeontology are needed for understanding the evolution of the Marwar Basin. It is also suggested that such field

workshops should be regularly organised after a gap of four or five years to update the available information. It is a matter of great appreciation that inspite of difficulties the *Society of Earth Scientists* extended full support for the participation of a few young research students and senior scientists in the field workshop.

Surendra Kumar¹ and Shamim Ahmad²

¹Centre of Advanced Study in Geology,
University of Lucknow, Lucknow 226007

²Birbal Sahni Institute of Palaeobotany,
53 University Road, Lucknow 226007