



Report on the 17th Annual NECLIME Meeting, Lucknow, 2016

The 17th Annual NECLIME Meeting 2017 was held in Lucknow, India, from February 23 to 27. With the conferences in Kunming and Nanjing, it was the 3rd Asian conference of NECLIME. The meeting, kindly hosted by Sunil Bajpai and Vandana Prasad, was held at the Birbal Sahni Institute of Palaeobotany in Lucknow, a renowned place of palaeobotanical research. The meeting included a guided visit to historical sites of Lucknow, a field trip to the Quaternary of the Indo-Gangetic Plain, and an excursion to the Nawabganj nature reserve where modern vegetation and palynological studies of a Holocene sequence were presented. Moreover, a half-day short course on the application of the Coexistence Approach was offered.

Thanks to the excellent organization provided by our Indian colleagues and their kind hospitality our NECLIME meeting was a great success. Above all we thank Vandana Prasad for her commitment and Sunil Pajpai for offering all facilities and for kindly supporting us.

We are very grateful to Vivek for taking us around historical Lucknow, Pradeep for introducing to us outcrops on the Indo-Gangetic Plain with great expertise, and Anjum for showing us around the Nawabganj Lake. Thank you all for that!

More than 200 participants joined the meeting which included 5 keynotes on various core topics, 16 oral and 28 poster contributions. The contributions were arranged in topical sessions (I – V) covering the topics palaeobiogeography/biodiversity, climate/fauna, palaeoclimate reconstruction, coastal and marine records, as well as Quaternary climate and vegetation dynamics.

Session I focussed on past migration patterns of tropical floral elements (David Dilcher) and the history of geo-biodiversity hotspots and their threats (Volker Mosbrugger), including an outlook to other current NECLIME activities in co-operation with Chinese colleagues (Yunnan geo-biodiversity hotspot), complemented by contributions on modern and quaternary phylogenetic diversity of Indian vegetation (Divya Bhaskar). Session II focussed on the mammalian Cenozoic record of India in general and climatic implications (Sunil Bajpai, Rajeev Patnaik) and included a special emphasis on environmental conditions of low latitude *Homo erectus* (Angela Bruch and Christine Hertler, Susanne Haupt et al.). Session III dealt with the methodology used in NECLIME for Cenozoic climate and



vegetation reconstruction (Torsten Utescher) and environmental reconstructions for low latitude areas throughout the Cenozoic (Kern et al., Prasad and Utescher, Rao and Verma, Srivastava and Prasad). Session IV was dedicated to the links between ocean and configuration of gateways and continental climate change throughout the Cenozoic (A.D. Singh), climate evolution inferred from coastal marine records (Anjum Farooqui and T.Y. Naidu, Amit K. Ghosh and Arindam Chakraborty, Suman Sarkar), including an overview on late Pleistocene monsoon dynamics on the Indian subcontinent (G. Srivastava). Session V focussed on Holocene climate and vegetation change in India, partly under anthropogenic disturbance, reconstructed at different scale and from various proxies (Pradeep Srivastava et al., Rajesh Agnihotri and Koushik Dutta, Martina Stebich et al., Santosh K Shah and Nivedita Mehrotra), and reconstructions based on grass phytoliths along an elevational gradient (Oindrila Biswas et al.). Eva Niedermeyer outlined the potential of geochemical proxies in the reconstruction of past continental climates.

The numerous posters mainly presented studies on the Indian Cenozoic, mainly related to climate and vegetation dynamics as reconstructed from various proxies. The posters were presented and discussed in a poster session, connected to a competition relating to quality scientific content and design (prizes were awarded to the three best posters).

Due to the relatively broad topical spectrum of the contributions, covering the entire Cenozoic and the Quaternary, and mainly focussing on India and other low latitudinal areas provided an excellent introduction for NECLIME into a region that so far represents an almost white area on NECLIME maps and in our data bases. This introduction was greatly promoted by the excellent key notes presented. The usefulness of having various keynotes in the schedule of our annual meeting had already been proven most effective on the Madrid meeting and we will try to stick to this arrangement, also in future annual meetings of NECLIME.

Details on the meeting and field trips can be obtained from the abstract volume and excursion guide available for download from our homepage.

Topics addressed in the final discussion

- Bilateral Palaeogene / Neogene scientific co-operations on Cenozoic climate and biotic evolution of the Indian Peninsula in space and time [organized S. Bajpai and V. Mosbrugger]



Bilateral co-operations on NECLIME topics involving India and the low latitudes of East Asia were appointed. The intended research will primarily be based on the palaeobotanical record but will include as well data from other proxies such as mammals, and isotopes. Phylogenetic studies will also be considered.

At present, the Indian Subcontinent and neighbouring regions of Central Asia represent a gap in the NECLIME data base and in any spatial palaeoclimate and vegetation reconstructions available to the network. The intended joint project initiative will help to close this gap.

The research can be conducted in bilateral projects between BSIP and Senckenberg Research Institute. Regarding funding the existing agreement between the INSA and DFG can be employed, Humboldt fellowship is considered a further suitable tool [co-ordination: Vandana Prasad, Sushma Prasad (French Institute of Pondicherry), A.A. Bruch, T. Utescher].

- 2nd Asian NECLIME synthesis volume on

The participants of the conference largely agreed on the usefulness of another Synthesis Volume of NECLIME – tying up to our successful Palaeoworld issue - focussing on the research of our members in Asia. Having initially planned to base it on the contributions of the Lucknow conference only, it is now intended to combine contributions from this meeting and our annual meeting next year in Armenia in order to broaden the regional context and to have the possibility to include also West and Central Asia and to attract additional contributions from our Chinese colleagues. Details on possible journals and the intended schedule will be communicated in the circulars for the 2017 NECLIME Meeting in Yerevan.

- other topics

Co-operations on various topics most relevant for NECLIME research were discussed and appointed

- identification of suitable PFTs to assess arboreal diversity in tropical regions (e.g., raingreen moist, raingreen dry, etc.)
- modern analogues of fossil pollen referred to tropical plant genera (also relevant for central European Palaeogene materials)
- extension of the climate database of NECLIME including compilation of climate data for additional tropical taxa so far not represented in the Palaeoflora database; compilation of additional data on rainfall seasonality (e.g., length of the dry season)



[work in progress and proposals submitted; V. Prasad, T. Utescher, M.R. Rao, G. Srivastava]

- climate reconstructions from the Palaeogene palaeobotanical record of India [work in progress and proposals submitted; V. Prasad, T. Utescher, M.R. Rao, G. Srivastava]
- quantifying openness of palaeovegetation via pollen-vegetation-climate relationships: comparing Southern Caucasus and Eastern Himalayas [R. Ghosh, A.A. Bruch: work in progress]