Report of the 2024 NECLIME annual conference

The 2024 NECLIME annual conference took place in Almaty, Kazakhstan, September 8-14, at the Institute of Geological Sciences, kindly organized by Saida Nigmatova, Aizhan Zhamangara and Svetlana Popova. 30 participants from nine countries presented their work with 23 oral talks and two posters. Very much appreciated was the keynote lecture by Oksana Marynirch on the modern vegetation of Kazakhstan. The location of our venue in the middle of Central Asia naturally created an (over)regional focus with many presentations dealing with the paleoclimate, paleovegetation and paleoenvironment of Central and East Asia.

Scientific contributions

The vegetation and climate history of Kazakhstan itself was presented in several talks on the Oligocene to Miocene with respect to the plant macro and microflora (Averyanova et al.), pft diversity (Popova et al.), and climate (Nesterova et al.; Akmagambet et al.), complemented by data on Neogene paleoecology based on Charophyte assemblages (Zhamangara et al.). Widening the view spatially and stratigraphically, pollen data from Pliocene deposits of Western Siberia in combination with micromammal stratigraphy indicate a relatively stable forest-steppe environment (Ivanova et al.), while Early Pleistocene pollen assemblages from South Ural reflect the Quaternary climate variability (Nosevich et al.).

A set of presentations introduced new data on the paleoenvironments of East Asia, including an overview on Eocene climate data from East Asia (Bondarenko & Utescher), and the introduction of morphological criteria for paleoclimatic implications of fossil bamboo (Wang et al.). A review of the Neogene vegetation history and plant diversity in Indochina shed light on the development of Tropical Monsoon Forest (Huang et al.). Other aspects of the evolution of plant diversity were considered by assessing the impact of the development of the East Asian Monsoon on the evolution of plant traits (Dong et al.) as well as by providing indicators for volcanic disturbances in fossil flora and vegetation based on the example of a Late Pleistocene volcanic eruption in Japan (Arata Momohara et al.).

Several contributions also shed light on the evolution of the Tibetan Plateau. This included new data on the plant diversity during the Eocene-Oligocene transition (Li et al.), new considerations on the paleoelevation of its southeastern margin (Huang et al.), and on the influence of anthropogenic climate change on glaciers of the Shangri-La Region (Zuo et al.).

Towards the west, news from the Caucasus comprised a talk on the diversity of Early Pleistocene fossil oaks of Armenia (Gabrielyan et al.) as well as a poster on a new palynological approach to reconstruct regional vegetation in the region (Schiersch and Bruch).

Further research contributed to understanding Cenozoic climate and vegetation history in Europe. This included new macro- and micropaleobotanical data on a Paleogene flora from Bulgaria (Bozukov at al.), the discussion of the Paleogene relict taxon *Rhodomyrtophyllum sinuatum* from the Miocene of Montenegro (Milutinovic), and the reconstruction of Early Miocene paleoenvironments of Spain based on a multi-proxy approach (Casas-Gallego et al.). Methner et al. introduced the method of clumped isotope analysis, applied on middle Miocene material from Central Europe, as an independent proxy for climate quantification. A poster by Höfer et al. complemented this overview with an update on the biostratigraphic potential of pollen data for the Central German Middle Pleistocene.

As one of the examples of getting added value from a compilation of NECLIME data, the large-scale review on the long-term impact of the Tethys/Paratethys retreat on the climate evolution in Eurasia assessed the potential of Mediterranean-like climate conditions in the coastal areas of the Paratethys during the Paleogene (Meng et al.).

Last but not least, Konrad et al. addressed another current NECLIME topic 'Extremes of climate and environments' by modeling physiological processes to explain the high productivity of deciduous broadleaf trees at high latitudes as seen in the Eocene fossil record.

Overall, the contributions highlighted the diversity and, at the same time, consistency of NECLIME research and opened new perspectives for fruitful collaborations. Taxonomical as well as methodological considerations discussed during the meeting gave new perspectives for future NECLIME research; some of them have already taken shape during the time spent together on the excursion.

Final discussion and announcements

At the final discussion, Shu-Feng Li raised the question to initiate a joint NECLIME database to compile the vast amount of data on Cenozoic floras at hand in our community. It is obvious that, without financial resources, building our own infrastructure to host such a database will exceed our financial and human resources capacities. An alternative may be to collaborate with the existing Neotoma Paleoecology Database (www.neotomadb.org) as Manu Casas suggested. He volunteered in getting in contact with them to explore the options.

Furthermore, Shu-Feng Li drew our attention to current postdoc opportunities at the XTBG in the fields of 'Paleobotany, Paleoclimate, and Vegetation Modeling' which will be announced separately. If you know potential candidates please spread this information and contact him directly. Also, if you are aware of any other open positions or funding opportunities please share this information with us and we will be happy to distribute it via our mailing list.

Jian Huang kindly offered to share his cuticle database, a collection of photos of cuticles from more than 300 genera of extant tropical species. Please contact him directly if you are interested.

As our NECLIME last special issue was published in 2021, it may be due time to summarize some of our current research in a new special issue. Such options were discussed, and we agreed to prepare a proposal to the new Elsevier journal 'Earth History and Biodiversity' (HISBIO) (https://www.sciencedirect.com/journal/earth-history-and-biodiversity) on the topics of ‚Cenozoic Plant Diversity'. This may include temporal and spatial patterns, approaches to quantify past plant diversity, the impact of climate on past plant diversity, physiological aspects and more. As one of the associated editors, Angela Bruch will start this initiative and distribute more details in a separate announcement soon.

Moreover, we can announce that the next NECLIME annual conference will be held in Zagreb, Croatia, in 2025, organized by Koraljka Bakrač, Marianna Kováčová, and colleagues. The first circular will be

available at the end of this year. For 2026, Jian Huang conveyed the kind invitation of the Xishuangbanna Tropical Botanical Garden to hold the NECLIME annual conference there.

Excursions

The conference was complemented by an amazing conference dinner and continued with a one-day excursion to the Medeu Valley and Chimbulak Mountain seeing the vegetation succession for the plain up to 3200 m altitude, and a visit to the Botanical Garden in Almaty in the evening including a dinner invitation by the director of the Botanical Garden, Gulnara Sitpaeva.

The next day, a 3-day excursion led us through stunning sub-desert landscapes to the Charyn Canyon and the Aktau Montains of the Altyn-Emel National Park with visits of Paleogene and Neogene outcrops, the grandiose Singing Dune, and a 700-year-old willow tree. On the way, cultural highlights as the Iron-Age Besshatyr Kurgans, the mosque of Zharkent, and the Tambaly tas Buddhist petroglyphs gave insights into the great diverse cultural heritage of the country.

We cordially thank the hosts, especially Saida and her team, for the hard work of organizing this event and for their warm welcoming attitude. Thank you very much for letting us be there!

Angela Bruch on behalf of the NECLIME coordination team