observation may indicate heightened temperature seasonality due to a slight climate cooling and the intensification of the East Asian monsoon from the middle to late Miocene.

Publication information: He, Wenlong, Roth-Nebelsick, Anita, and Sun, Bainian. 2023. Leaf trait data of two Miocene floras from eastern China and its palaeoclimate implications. Palaeontologia Electronica, 26(2):a23. https://doi.org/10.26879/1262 palaeo-electronica.org/content/2023/3883-leaf-traits-of-miocene-floras.

29/05/2024, 08:30–09:50, Room: Nadir
T02 Cenozoic continental climate and vegetation patterns on both sides of the North Pacific-an open NECLIME symposium

O-118 - Evaluating the Paleogene successions of Garo Hills, Meghalaya, India – An Integrated palynology and geochemistry study

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This study includes the reconstruction of palaeoecological history based palynology and geochemical studies. Palynofossils taken from outcrops samples will allow us to identify the different environmental elements. The samples recovered a mixed kerogen types including pollen, spores and algae of both terrestrial and marine origin. The recovered palynofacies are indicative of terrestrial environment conditions and is further supported by the presence of *Hammenisporis* spp. which suggests the tropical and subtropical climate conditions during the Tura sedimentation. The Siju marls mainly consists of amorphous organic matter, black debris/charcoal, spore/pollen grains, dinoflagellate cysts and foraminiferal linings and restricted to tropical and subtropical, warm humid climate condition under a shallow coastal sea. The late Palaeogene of the Rewak Formation contains terrestrial organic matter with spores/pollen grains that indicates terrestrial deposition. Carbon isotopes ($\delta^{13}C$) values of Tura shales range from -23.62 to -31.15‰, Siju ranges from -3.45 to -25.49 ‰, and the Rewak ranges from -24.453 to -26.33‰. The Tura and Rewak shales belong to terrestrial C3 plants and suggest arid environment. The Siju marls are composed of C4 plants and indicative higher aridity and or a dramatic decrease in atmospheric CO_2 level. Biomarker signature of selected sample suggests suboxic to oxic and suboxic depositional environment respectively. Rock-Eval data of Tura and Rewak samples indicate immature, type III kerogen. Kerogen types III, immature and poor are indicative of the Siju Formation. Geochemical data (Ba/Sc, Ba/Co, Th/Sc, Th/Co, Th/Cr, Cr/Th, Cr/Zr, Th/U, U/Th, V/Cr and Ni/Co) shows felsic source rock in comparison with PAAS and UCC ranges.

29/05/2024, 08:30–09:50, Room: Nadir
T02 Cenozoic continental climate and vegetation patterns on both sides of the North Pacific-an open NECLIME symposium

O-119 - Plant community and climatic response to Miocene climatic changes in the U.S. Pacific Northwest within a refined chronological framework

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The US Pacific Northwest (PNW), including the states of Washington, Oregon, and Idaho, hosts a suite of well-preserved Oligocene–Miocene fossil plant sites representing temperate forests with notable floristic similarity to modern eastern Asia and North America. Importantly, these sites span Earth's most recent period of sustained global warmth, the Miocene Climatic Optimum (MCO; ca. 17–14 Ma), and the Middle Miocene Climatic Transition (MMCT; ca. 14–12 Ma), which is generally associated with global cooling, decreases in climate equability, and increased aridity. An understanding of how these global events manifested

in PNW terrestrial climates and ecosystems is currently limited by conflicting evidence from varying fossil plant types, a reliance on outdated methods, and a lack of precise age control in prior work. Here we address these limitations by integrating new and historic macrofossil, palynomorph, and phytolith records in a multi-proxy approach to reconstruct plant community ecology and climate across 14 PNW fossil sites spanning the MCO and MMCT. A chronological framework was first established with U-Pb of zircons using CA-ID-TIMS, resulting in highly precise dates (± 10^3–10^4 years) that revise those previously constrained by K-Ar and plant biostratigraphy. Within this framework, we will present preliminary results for patterns in vegetation structure, the composition and diversity of floras in terms of function and (para)taxonomy, and paleoclimate reconstructions using leaf physiognomy and nearest living relative based proxies. Taken together, this study adds to a growing collection of evidence disclosing the complexity of regional responses to global climatic change, with important implications for anthropogenic climate change.

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H02 Forward to the past-research development on quantifying land cover change and its implication for the biosphere

O-120 - Data-model biome comparisons over the last 21,000 years

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With a standard biomization approach we translated pollen data from LegacyPollen 2.0 – a global taxonomically and temporally standardized fossil pollen dataset of 3728 palynological records – into biomes for 43 time-slices throughout the last 21,000 years with a temporal resolution of 500 years. These biomes have been adapted to the categories used to biomized Earth System Model results so that reconstructed biome estimates can be directly compared to simulations. The accuracy of the new global biomization scheme was determined to be 80.1% by comparing the reconstructed biome distribution with the modern potential natural vegetation pattern derived from observations. Then, the distributions of pollen-based biomes were compared against an ensemble of model simulations for the last deglaciation using the Earth mover's distance. The overall global biome trend in the reconstruction is in line with the simulations, even if differences are visible at the continental scale. We are now able to identify regions and times with the greatest disparity between Earth System models and reconstructions, and to discuss better possible reasons for model-data mismatches based on regional characteristics.

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H02 Forward to the past-research development on quantifying land cover change and its implication for the biosphere

O-121 - Testing REVEALS-based vegetation reconstruction with absolute pollen productivity estimates around Lake Biwa, western Japan

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Lake Biwa pollen records and the REVEALS model provide a new insight into the dynamic shifts in the past Japanese vegetation. Instead of relying solely on pollen percentages we employed the REVEALS model with absolute pollen productivity estimates (aPPEs) derived from flower counting approaches (Hayashi et al. 2022). This methodology, coupled with a Lagrangian stochastic dispersal model (LSM), yielded results dramatically closer to the modern vegetation survey data within 100 km of the lake. For instance *Cryptomeria* pollen over-represents the true landscape composition greatly (63.8% pollen vs. 17.5% tree cover); however, the REVEALS-LSM estimate landed at a much more accurate 24.7%, mirroring the vegetation data far more faithfully. Importantly the Gaussian Plume model within REVEALS proved ineffective for the Lake Biwa pollen record, particularly for plants that produce heavy pollen, such as *Abies*. Unlike relative pollen productivity estimates obtained and applied in Europe, China and elsewhere,