

Палеоботанический онлайн семинар 2022

Палеоботаническая комиссия РАН



Дорогие коллеги!

В пятницу, 20 мая в 15.15 состоится доклад «**The (Harsh) Life and Times of Maastrichtian Arctic Dinosaurs**» (**Robert A. Spicer, Alexander Farnsworth**). Обратите внимание на тезисы на второй странице pdf-версии этого объявления. Подключиться можно по ссылке: <https://zoom.us/j/9104791704> Идентификатор конференции: **910 479 1704**. Пожалуйста, в своем профиле в zoom указывайте фамилию и имя.

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С наилучшими пожеланиями, Наталья Завьялова

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The (Harsh) Life and Times of Maastrichtian Arctic Dinosaurs

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Overall the Maastrichtian was the coolest Stage of the Late Cretaceous and yet the Arctic has a rich fossil record of Maastrichtian plants and dinosaurs that lived within a few hundred kilometres of the North Pole. To understand this extinct polar environment in detail requires combining the abundant fossil record of the region with the latest high spatial and temporal resolution climate modelling. At the highest latitudes where there was land (~ 80°N) deciduous conifer-dominated forests, periodically ravaged by fire, hosted a depauperate understory of predominantly herbaceous angiosperms with few woody taxa of flowering plants. Ground cover was mostly one of ferns and sphenophytes. Tree ring, sediment and paleomagnetism data suggest the magnetic and rotational poles were roughly coincidental, which means that continuous winter darkness lasted 3 months with 3 weeks of bounding twilight in spring and autumn. A combination of plant fossil paleoclimate proxies point to the mean annual air temperature being $7 \pm 2^\circ\text{C}$ with the warmest summer month being $14.5 \pm 3^\circ\text{C}$ and the coldest winter month $-2 \pm 4^\circ\text{C}$. Even during the summer there were periods when tree growth stopped, suggesting days or weeks with temperatures $< 10^\circ\text{C}$. At around 75°N light (only 1.5 months of continuous darkness) and temperature (MAT as high as 12°C depending on location) allowed the development of a more diverse woody angiosperm flora admixed with conifers, including some evergreen taxa. A relatively warm Arctic Ocean maintained winter coastal temperatures close to freezing, but also invigorated the hydrological cycle. Arctic air was humid year-round with near-constant fog, even with high winds, under a polar cloud cap. The only respite was in the summer. Winter snow storms were common, particularly away from the coast and in the mountains. Despite these conditions within the Maastrichtian Arctic circle there is evidence for dinosaur nesting behaviour and with embryo/egg shell isotope data suggesting long (~ 56 days) incubation periods at ~ $36\text{--}39^\circ\text{C}$, this implies sophisticated nest management strategies. Moreover, egg laying was in the early spring as isotope compositions suggest the parents were drinking cold meltwater. Living in large herds with high resource demands large-bodied herbivores would have had to have ranged over long distances and the paleogeography favoured access to the south where, although conditions were warmer, they encountered intense storms and higher fire-frequency. Using the latest climate modelling combining atmosphere, ocean and vegetation dynamics, we examine not just Maastrichtian climate but 'weather', stepping through a typical Maastrichtian year in 1 hour time increments, to share insights into life as a polar dinosaur.