Alberta Palaeontological Society

Reconstructing forests in deep time: palaeoclimate and palaeoecology of early Cenozoic forests in Canada's High Arctic

Main Speaker: Dr. Christopher K. West, Curator of Palaeobotany at the Royal Tyrrell Museum of Palaeontology

Location: B108, Mount Royal University

Time: October 20, 2023, 7:30 pm MST

Abstract:

Fossil-rich early Palaeogene deposits on Ellesmere and Axel Heiberg islands, Nunavut, preserve a record of lush Arctic ecosystems rich in temperate and subtropical forest flora (e.g., dawn redwood, swamp cypress, alder, birch, sycamore, and magnolia) and fauna (e.g., tapirs, alligators, and terror birds). These fossil remains represent some of the best deep-time analogs for the globally warm late Palaeocene to early Eocene interval, a time when global temperatures were much higher than at present. This interval was also punctuated by several short-lived hyperthermal events—intense short-lived episodes of global warming that had a profound effect on terrestrial and marine ecosystems—that are potentially analogous to the pace and forcing of anthropogenic warming. Here, I will demonstrate how to reconstruct the palaeoclimate and palaeoecological aspects of an extinct ecosystem from plant fossils recovered from Ellesmere Island. Methods such as the Climate Leaf Analysis Multivariate Program (CLAMP) and Bioclimatic Analysis (BA) are used to provide quantitative estimates of temperature, precipitation, humidity, and length of growing season. Traditional taxonomic methods coupled with census sampling and rarefaction provide complementary evidence of forest composition and diversity. These results are then compared with contemporaneous fossil sites from lower latitudes in order to assess how these ancient polar ecosystems fit within the broader narrative of North American ecosystems and climate during a globally warm interval in earth history, with implications for understanding processes driving latitudinal diversity gradients and polar amplification of climate change.

Biography:

Dr. Christopher West is the Curator of Palaeobotany at the Royal Tyrrell Museum of Palaeontology. Originally from Manitoba, he earned a BSc in Earth Sciences from the University of Winnipeg and later earned a BSc (Hons) in Palaeobiology and a PhD in Palaeobotany and Geology from the University of Saskatchewan. He was the Climates of the Canadian North Postdoctoral Fellow at the University of Alberta in the Department of Earth and Atmospheric Science, where he worked on late Eocene plant fossils from western Yukon. Dr. West was awarded the Governor General's Gold Medal for his work on the early Paleogene fossil floras from the Canadian High Arctic. Dr. West has published on Cretaceous and Palaeogene plant fossils from Alberta, Palaeogene plant fossils from Ellesmere and Axel Heiberg Islands in the Canadian High Arctic, as well as Palaeogene and Neogene plant fossils from British Columbia. His research interests center around using plant fossils to reconstruct ancient climates and ecosystems, providing valuable insights into the development of the modern forest biome in North America.

Information:

This event is presented jointly by the Alberta Palaeontological Society, the Department of Earth and Environmental Sciences at Mount Royal University, and the Palaeontology Division of the Canadian Energy Geoscience Association. For details or to present a talk in the future, please contact CSPG Palaeontology Division Chair Jon Noad at jonnoad@hotmail.com or APS Coordinator Lacey Holoboff at lholoboff@gmail.com or contact programs1@albertapaleo.org. Visit the APS website for confirmation of event times and upcoming speakers: http://www.albertapaleo.org/.