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## The Red Lake Fossil Flora: A Miocene forest from the Interior Plateau, British Columbia

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The Miocene epoch (23.03 to 5.3 million years ago) was a time of modernization for North American vegetation, with many plant communities reaching a near-modern composition by the middle to late Miocene.

In North America during the Miocene the Sierra Nevada, Cascade, and Coastal Mountain ranges underwent significant uplift. As a result of these episodes of mountain-building, the North American climate saw an overall decrease in rainfall and a shift towards drier climates. This favoured the expansion of grasslands but also helped to expand the deciduous forest ecosystem. Excellent fossil evidence of these fossil ecosystems can be found in sedimentary deposits in the modern-day Pacific Northwest region in North America.

Fossil plant localities of middle to late Miocene are well-known and well-described from the Pacific Northwest region of the United States, such as those from Idaho, Oregon, and Washington. However, the Miocene fossil plants from Canada have received considerably less attention. Very few systematic accounts of the Miocene fossil plants of British Columbia—or elsewhere in Canada—have been published since the pioneering studies of J.W. Dawson and his contemporaries in the late 19th century.

Here I will discuss recent research based on fossil plant specimens preserved in sediments of the middle Miocene Deadman River Formation exposed at the Red Lake diatomite mine, which is found about 46 km northwest of Kamloops, British Columbia. This research was based on fossil plant specimens previously collected that are housed in the Thompson Rivers University Institute of Palaeontological Research (TRUIPR), and the University of Saskatchewan Palaeobotanical Collection (USPC).

The results of the study provide new insight into the character and composition of middle Miocene forests near Kamloops, British Columbia. The study revealed that the Miocene forests north of Kamloops were composed of a mixture of plants common to many modern forests in North America,

such birch, oak, maple, beech, sycamore, and chestnut; but also contained relict plant members whose native range is now confined to East Asia, such as *Ginkgo* and the dawn redwood.

Although the Red Lake forest was compositionally similar to Miocene forests from the U.S. Pacific Northwest, the overall diversity was much lower. The Red Lake fossil assemblage also lacks certain plants, such as pine trees, that are commonly found in similar aged Miocene fossil assemblages from the Pacific Northwest. These differences, however, may be the result of differences in sample sizes, as the number of Red Lake fossil plants available for study were limited. In addition, the fossil plants reveal that the middle Miocene climate in British Columbia was temperate, warm, wet, with mild winters and moderate seasonality. This climate may have been the result of limited influence from the nearby Coastal Mountain Ranges, which were not yet at their present elevation.

The results of this research were recently published in the open source journal *Acta Palaeobotanica* and may be downloaded for free from the following link: <https://acpa.botany.pl/The-Miocene-Red-Lake-macroflora-of-the-Deadman-River-Formation-Chilcotin-Group-Interior,128366,0,2.html>