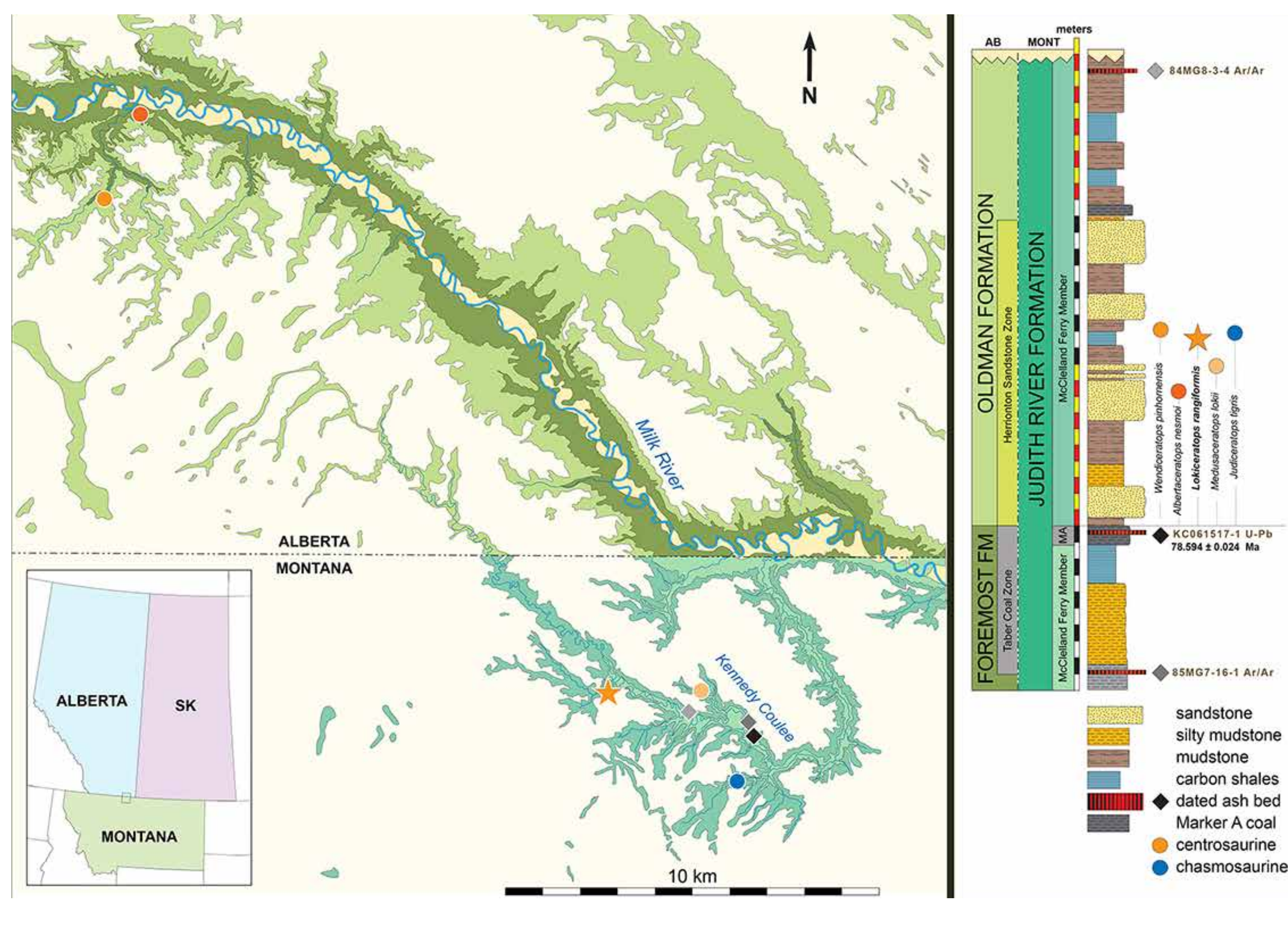


Lokiceratops rangiformis gen. et sp. nov. (Ceratopsidae: Centrosaurinae) from the Campanian Judith River Formation of Montana reveals rapid regional radiations and extreme endemism within centrosaurine dinosaurs

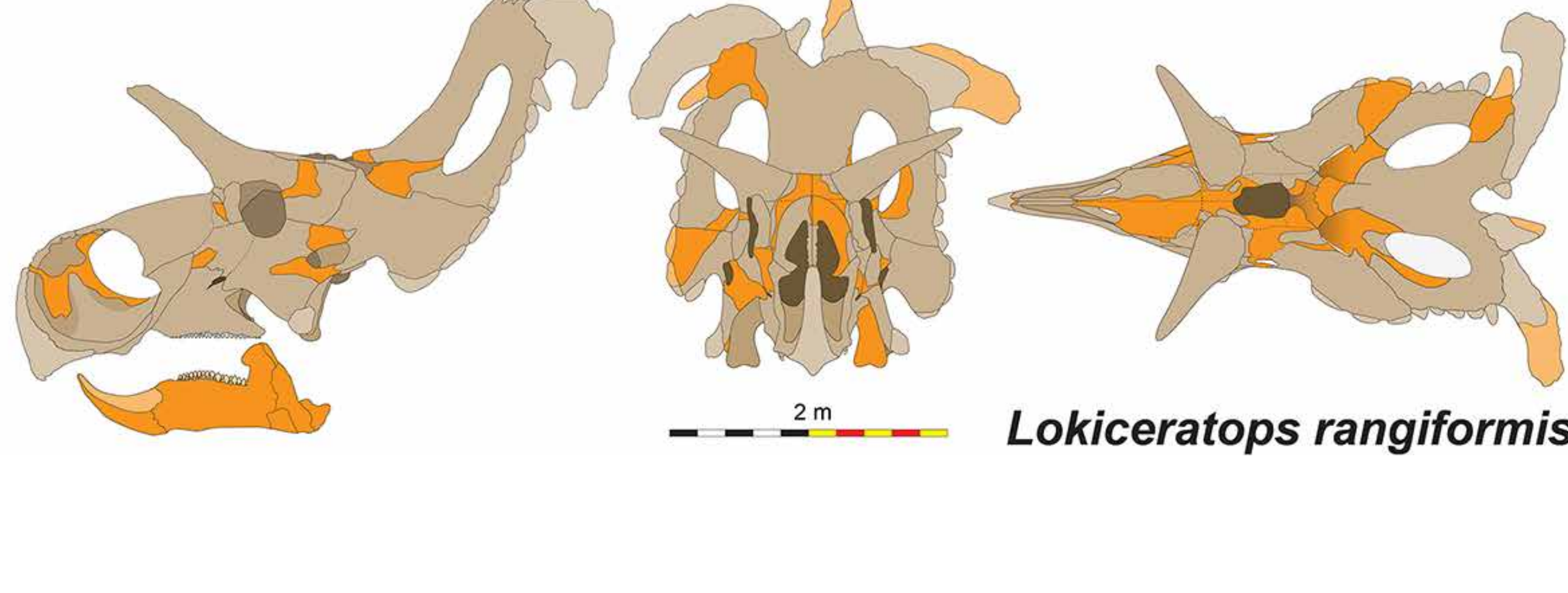


A new horned dinosaur discovered in the Cretaceous badlands of northern Montana reveals unexpected diversity suggesting high speciation rates and regional endemism in the group. *Lokiceratops* is part of a local centrosaurine fauna that includes three other closely related animals, and another that belongs to the chasmosaurine ceratopsids, living in a small geographic area. The high endemism seen in centrosaurines implies that dinosaur diversity is presently underestimated and contrasts with the large geographic ranges seen in most extant mammalian megafauna.

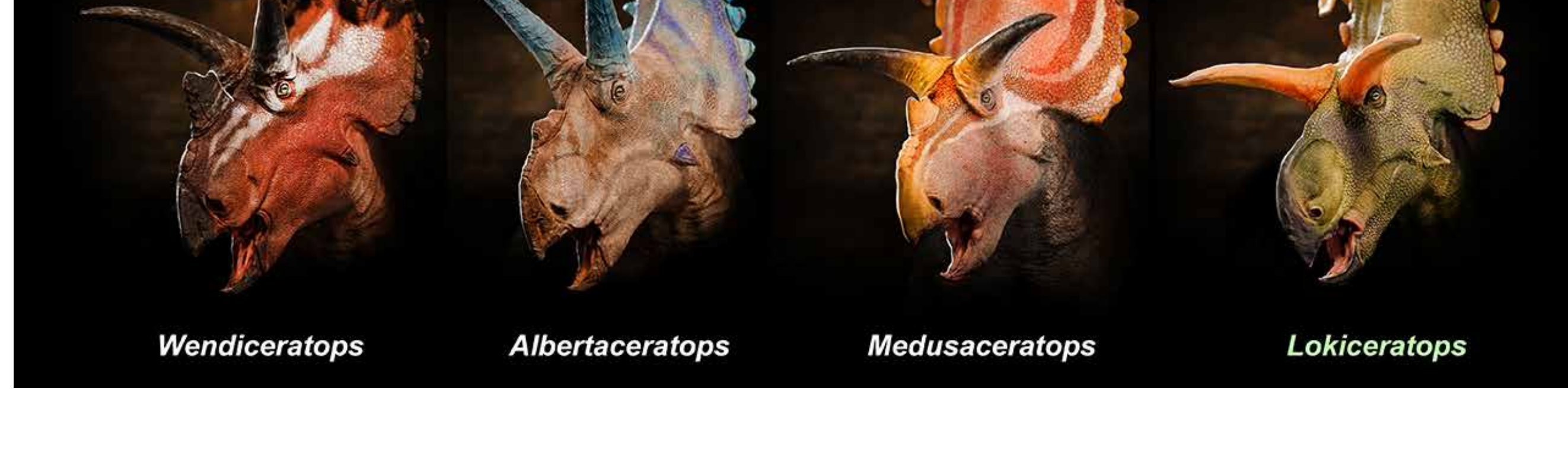
Laramidia, the island landmass representing the western part of North America, supported diverse dinosaur assemblages during the Late Cretaceous, although the specific patterns of dinosaur diversity, evolution, extinction and particularly, the existence and extent of faunal endemism along the eastern coastal plain of Laramidia continues to generate debate.



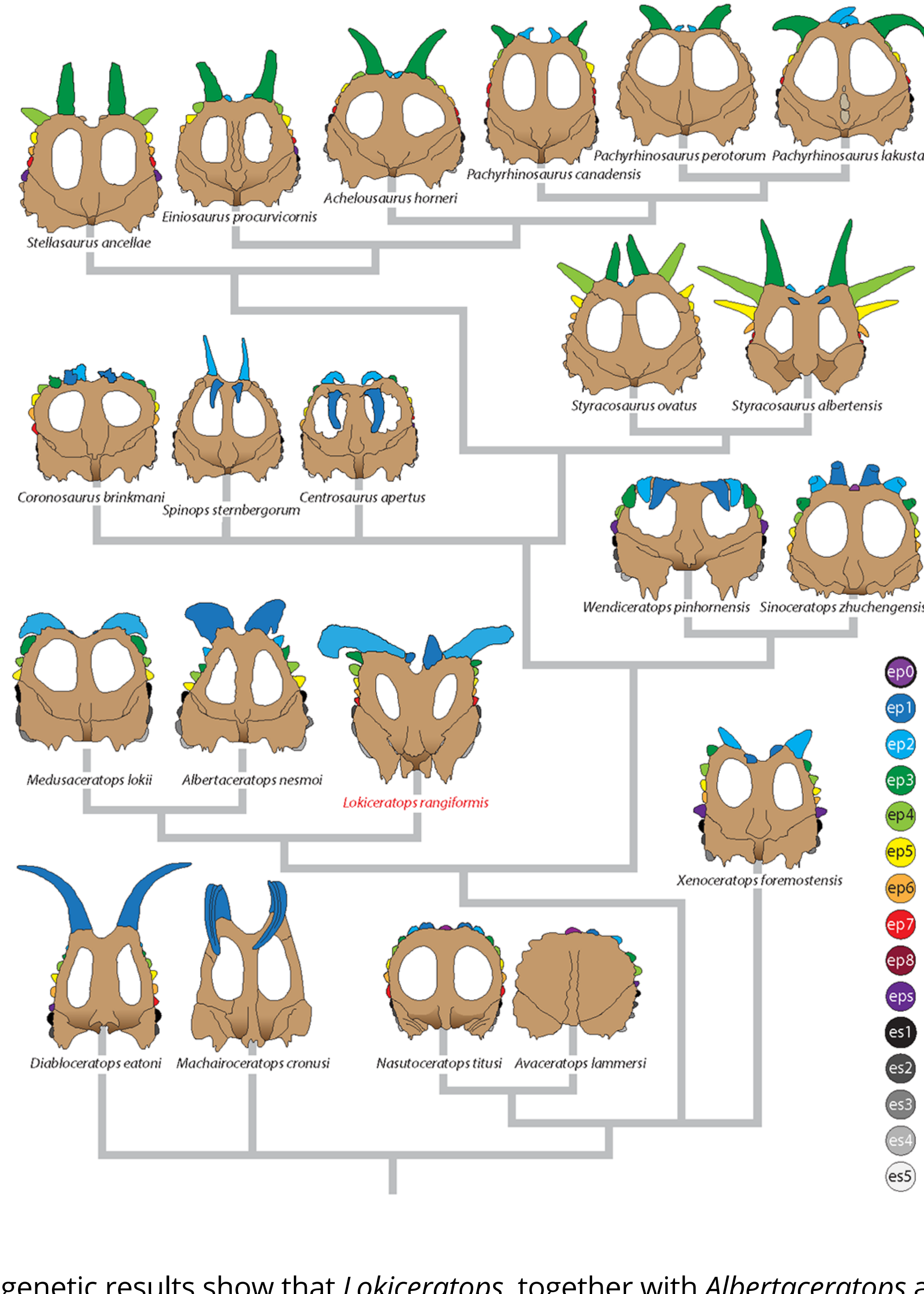
Campanian paleontological sites along the Milk River and in Kennedy Coulee show regional relationships in the Oldman and Judith River formations in Alberta and Montana. Dinosaurs from the same small geographic region reveal unprecedented ceratopsid richness, with four sympatric centrosaurine taxa and one chasmosaurine taxon.



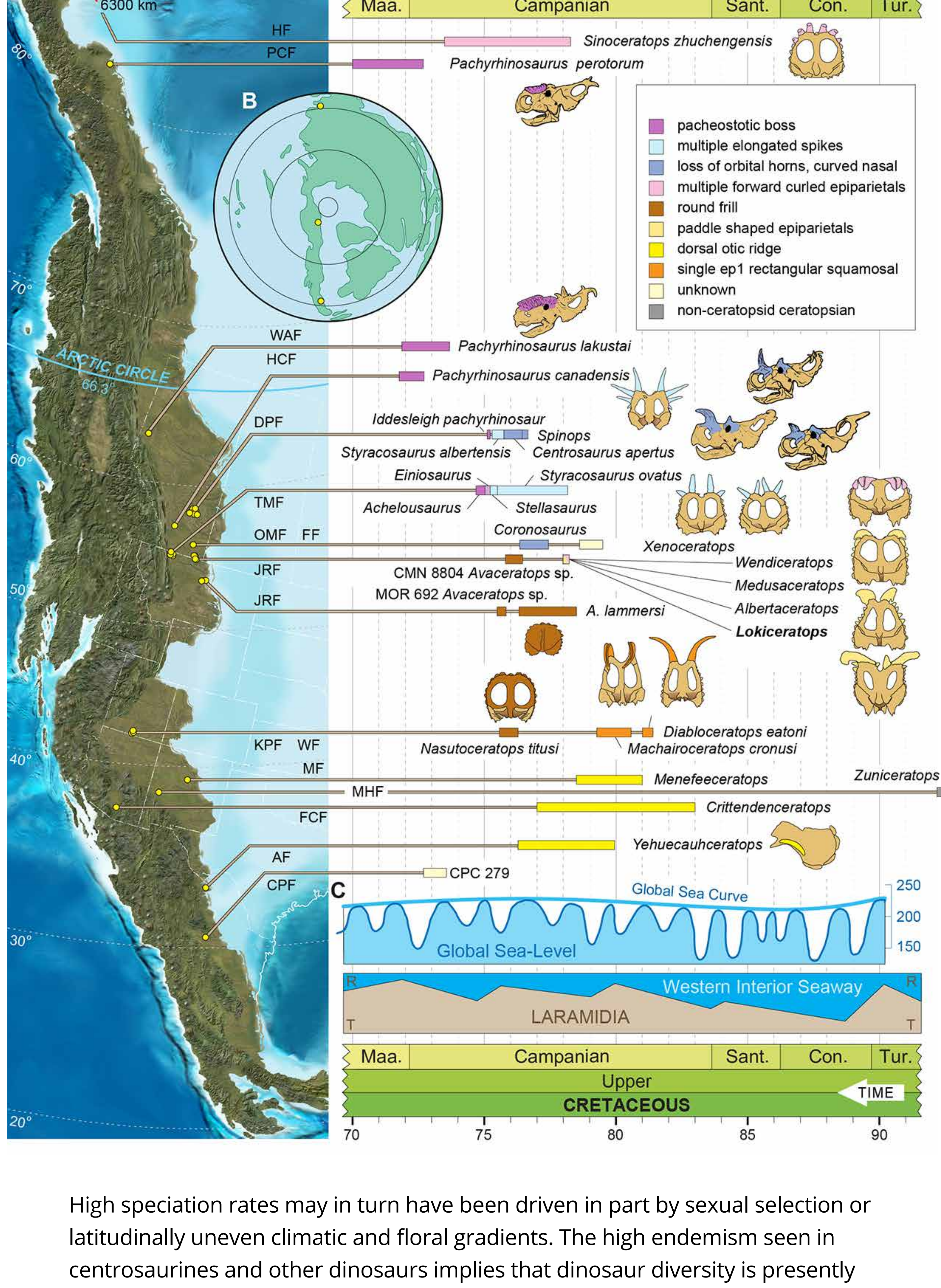
We report and describe in detail a new centrosaurine ceratopsid dinosaur, *Lokiceratops rangiformis*, from the lower portion of the McClelland Ferry Member of the Judith River Formation in the Kennedy Coulee region along the Canada-USA border.



The incredible centrosaurine diversity within the Kennedy Coulee approximately 78 million years ago is illustrated by variation in the horns and frill ornamentation on the four likely coeval taxa.



Phylogenetic results show that *Lokiceratops*, together with *Albertaceratops* and *Medusaceratops*, was part of a clade restricted to a small portion of northern Laramidia approximately 78 million years ago. This group, Albertaceratopsini, was one of multiple centrosaurine clades to undergo geographically restricted radiations, with Nasutoceratopsini residing to the south and Centrosaurini and Pachyrostra residing to the north. High regional endemism in centrosaurines is associated with, and may have been driven by, high speciation rates and diversity, with competition between dinosaurs limiting their geographic range.



High speciation rates and latitudinally uneven climatic and floral gradients in turn have been driven in part by sexual selection or regionally uneven climatic and floral gradients. The high endemism seen in centrosaurines and other dinosaurs implies that dinosaur diversity is presently underestimated and contrasts with the large geographic ranges seen in most extant mammalian megafauna.

