

Scientists redefine horned dinosaur relationships by naming two new ceratopsian tribes

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Scientists have named two new clades, or tribes, of horned dinosaurs (ceratopsians) based on fossils collected from the United States and Alberta, Canada. The new tribes are Nasutoceratopsini and Centrosaurini. Research describing the updated relationships among horned dinosaurs appears online in the *Canadian Journal of Earth Sciences*.

Nasutoceratopsini includes [horned dinosaurs](#) such as *Avaceratops* from Montana and *Nasutoceratops* from Utah. These dinosaurs grew up to 6 meters (20 feet) long, weighed more than 2 tons, and had large shields extending from the back of their skulls like *Triceratops*. They lived about 74-76 million years ago during the Late Cretaceous Period.

Nasutoceratopsini belongs to the subfamily Centrosaurinae, which includes dinosaurs with the most elaborate head shield ornamentation ever developed, such as the spikey *Styracosaurus*. In contrast, nasutoceratopsins are distinguished by having large, broad frills that lacked well-developed ornamentation. Unlike their flashy contemporaries, these dinosaurs weren't dinosaurian show-offs, choosing instead to blend into their environments.

Work recognizing the new tribe is based on a fossil skull from the Canadian Museum of Nature in Ottawa, Canada, collected almost 80 years ago in southern Alberta. Although the skull is too fragmentary to

be given a new name, its distinctive unornamented shield allowed the scientists to tie it and horned dinosaur species from Utah and Montana together into a new grouping. Although all nasutoceratopsins lack shield ornamentation, they had two long brow horns above their eyes.

"Nasutoceratopsins took a different evolutionary path from their centrosaurine cousins, which typically have highly ornamented skulls" said lead author Dr. Michael Ryan, Curator of Vertebrate Paleontology at the Cleveland Museum of Natural History. "We believe that the skull ornamentation was important for attracting mates. If nasutoceratopsins lacked bony ornamentation, it's possible that they may have used distinctive coloration patterns, social behaviors or vocalizations, like modern birds do in their courtship behaviors. But we'll never know for sure since those latter features don't fossilize."

The second new tribe described by the scientists, Centrosaurini, formally acknowledges its members (such as *Centrosaurus*) as being a natural grouping of horned dinosaurs with highly ornamented frills and short brow horns.

The fact that the two tribes are found together over a great distance in rocks of the same age indicates that they would have overlapped in the same regions at the same time.

"It's probably similar to how two species of rhinoceros can broadly overlap in their geographic ranges, but do not actually compete with each other for resources," said Dr. Jordan Mallon of the Canadian Museum of Nature, a co-author on the paper. "Black rhinos will feed on woody browse, while white rhinos are primarily grass grazers. Thus, the two species tend to utilize different parts of the same environments. The assumption that centrosaurins and nasutoceratopsins may have had different feeding strategies is supported by the fact that the two tribes had different types of jaws, with the lower jaws of nasutoceratopsins

being shorter and deeper.

The description of the two new horned dinosaur tribes is the latest in a series of new finds being made by Ryan and Dr. David Evans of the Royal Ontario Museum as part of their Southern Alberta Dinosaur Project, which is designed to fill in knowledge gaps about Late Cretaceous dinosaurs and study their evolution. This project focuses on the paleontology of some of oldest dinosaur-bearing rocks in Alberta and neighbouring rocks in northern Montana that are of the same age.

More information: Michael J. Ryan et al, A basal ceratopsid (Centrosaurinae: Nasutoceratopsini) from the Oldman Formation (Campanian) of Alberta, Canada, *Canadian Journal of Earth Sciences* (2016). [DOI: 10.1139/cjes-2016-0110](https://doi.org/10.1139/cjes-2016-0110)

Provided by Cleveland Museum of Natural History

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