

Bird-like Dinosaur Is Oldest Raptor Discovered in South America

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Researchers have discovered the 90-million-year-old fossil remains of a previously unknown dinosaur species in Patagonia. Buitreraptor (pronounced bwee-tree-rap-tor) gonzalezorum -- the oldest member ever found in South America of the group of dinosaurs that includes the carnivorous Velociraptor -- was about the size of a very large rooster, but with a long head and very long tail.

Image: Buitreraptor is reconstructed in this illustration with a plumage similar to that of some closely related Chinese dromaeosaurids with preserved fossil feathers, and primitive birds like Archaeopteryx.

Buitreraptor has a long, thin snout that may have been used to catch primitive reptiles, like the baby sphenodontian (a relative of the tuatara) pictured here. Credit: Illustration by Jorge Gonzalez, The Field Museum

The find provides new evidence that dromaeosaurs, the group of carnivorous, bipedal dinosaurs that includes Velociraptor and is closely related to birds, may have originated much earlier than previously thought and may have evolved into a unique lineage in the southern hemisphere.

Buitreraptor gonzalezorum is described in the cover story of the October 13 issue of the journal *Nature*. It was excavated last year by a team of Argentine and American paleontologists, including Peter Makovicky, curator of dinosaurs at The Field Museum in Chicago and lead author of the *Nature* paper.

The new dinosaur's birdlike features--its huge, hollow "wishbone," long, winglike forelimbs, and bird-like pelvis--provide additional evidence linking dinosaurs to birds.

"This research is part of a larger, ongoing project to assemble the evolutionary family tree of dinosaurs and their relatives," says Richard Lane, program director in the National Science Foundation (NSF)'s division of earth sciences, which funded the research.

Buitreraptor differs from other known dromaeosaurs in its long, slender snout and relatively small, widely spaced teeth. Unlike most other theropods (the larger group of carnivorous dinosaurs with small forelimbs that walked or ran on two legs), the teeth of *Buitreraptor* lack "steak-knife" serrations along their edges. Although scientists are unsure why the animal evolved such peculiar head proportions and unusual dentition, it may have been an adaptation to hunt small prey, such as the abundant burrowing snakes, mammals, and lizards that have been

discovered alongside Buitreraptor, says Lane.

The skeleton was discovered in northwestern Patagonia about 700 miles southwest of Buenos Aires. Although Buitreraptor is small, the team needed 10 days to chisel out the 800-pound slab of rock containing the fossil.

The field team was led by Argentine paleontologist Sebastián Apesteguía. He and Federico Agnolin, both affiliated with the Museo Argentino de Ciencias Naturales and the Fundación Félix de Azara, are co-authors of the Nature paper.

"The preservation of Buitreraptor is superb, and the rock layer it comes from represents the oldest interval of the Late Cretaceous," Apesteguía says. (The Cretaceous period extends from 145 million to 65 million years ago.) "The rich fauna of this area, known as La Buitrera, includes other carnivorous dinosaurs, such as mid-sized abelisaurs and the gigantic Giganotosaurus. However, the most common animals are bulky herbivorous sphenodontids, snakes, terrestrial crocodiles and mammals."

"Except for its faunal composition, La Buitrera resembles the Gobi desert in its abundance of fossils and their exquisite state of preservation."

Buitreraptor is "one of those special fossils that tells a bigger story about the Earth's history and the timing of evolutionary events," says Makovicky. "It provides evidence for a more global distribution and a longer history for dromaeosaurs than was previously known, and also suggests that dromaeosaurs on northern and southern continents took different evolutionary routes after the landmasses they occupied drifted apart."

About 200 million years ago, Earth's land was amassed in one

supercontinent called Pangaea. During the Middle and Late Jurassic (the period prior to the Cretaceous), Pangaea split into two landmasses: Laurasia, comprising what are now North America, Asia and Europe, drifted to the north; Gondwana, containing the present southern hemisphere continents and India, drifted to the south.

Until recently, dromaeosaurs (swift-running, bipedal, birdlike dinosaurs) have been found only in the Cretaceous rocks of Asia and North America. Dromaeosaurs include the famous Velociraptor from the Gobi Desert, the large Utahraptor from the American West, and the recently discovered Microraptor and Sinornithosaurus from China, both of which preserve traces of bird-like plumage.

"This distribution led scientists to believe that dromaeosaurs originated in Laurasia after it drifted apart from Gondwana," says Lane. "In the last few years, a handful of specimens of possible dromaeosaurs or early birds have been discovered on southern continents, but their incomplete preservation led to debate regarding their identities."

The new discovery provides evidence that dromaeosaurs also lived in South America, which was part of Gondwana. As a result, dromaeosaurs must have originated when the continents were all assembled in a single landmass during the Jurassic as far back as 180 million years ago--much earlier than previously thought.

Results of an analysis of evolutionary relationships of advanced theropods undertaken as part of this research indicates that the Gondwanan dromaeosaurs and Rahonavis, an animal previously considered to be a very primitive bird, constitute a separate branch of the dromaeosaurid family tree.

This branch is distinct from Velociraptor and other Laurasian dromaeosaurids. Because Rahonavis has long and wing-like forelimbs,

this finding could imply that flight may have evolved twice, once in birds and once among this group of Gondwanan dromaeosaurs.

Source: NSF

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