

New dinosaur discovered in China shows dinosaurs grew up differently from birds

January 16 2020



Wulong bohaiensis. The skeleton described in the new paper is remarkably complete. The name means "Dancing Dragon" in Chinese and was named in part to reference its active pose. Credit: Ashley Poust

A new species of feathered dinosaur has been discovered in China, and described by American and Chinese authors and published today in the journal, *The Anatomical Record*.

The one-of-a-kind specimen offers a window into what the earth was like 120 million years ago. The fossil preserves feathers and bones that provide new information about how dinosaurs grew and how they differed from birds.

"The new dinosaur fits in with an incredible radiation of feathered, winged [animals](#) that are closely related to the origin of birds," said Dr. Ashley Poust, who analyzed the specimens while he was a student at Montana State University and during his time as a Ph.D. student at University of California, Berkeley. Poust is now postdoctoral researcher at the San Diego Natural History Museum.

"Studying specimens like this not only shows us the sometimes-surprising paths that ancient life has taken, but also allows us to test ideas about how important bird characteristics, including flight, arose in the distant past."

Scientists named the dinosaur *Wulong bohaiensis*. *Wulong* is Chinese for "the dancing dragon" and references the position of the beautifully articulated specimen.

About the Discovery

The specimen was found more than a decade ago by a farmer in China, in the fossil-rich Jehol Province, and since then has been housed in the collection of The Dalian Natural History Museum in Liaoning, a northeastern Chinese province bordering North Korea and the Yellow Sea. The skeletal bones were analyzed by Poust alongside his advisor Dr. David Varricchio from Montana State University while Poust was a student there.

Larger than a common crow and smaller than a raven, but with a long, bony tail which would have doubled its length, *Wulong bohaiensis* had a

narrow face filled with sharp teeth. Its bones were thin and small, and the animal was covered with feathers, including a wing-like array on both its arms and legs and two long plumes at the end of its tail.

This animal is one of the earliest relatives of Velociraptor, the famous dromaeosaurid theropod dinosaur that lived approximately 75 million years ago. Wulong's closest well-known relative would have been Microraptor, a genus of small, four-winged paravian dinosaurs.

The discovery is significant not only because it describes a dinosaur that is new to science, but also because it shows connection between birds and dinosaurs.

"The specimen has feathers on its limbs and tail that we associate with adult birds, but it had other features that made us think it was a juvenile," said Poust. To understand this contradiction, the scientists cut up several bones of the new dinosaur to examine under a microscope. This technique, called [bone](#) histology, is becoming a regular part of the paleontology toolbox, but it's still sometimes difficult to convince museums to let a researcher remove part of a nice skeleton. "Thankfully, our coauthors at the Dalian Natural History Museum were really forward thinking and allowed us to apply these techniques, not only to Wulong, but also to another dinosaur, a close relative that looked more adult called Sinornithosaurus."

The bones showed that the new dinosaur was a juvenile. This means that at least some dinosaurs were getting very mature looking feathers well before they were done growing. Birds grow up very fast and often don't get their adult plumage until well after they are full sized. Showy feathers, especially those used for mating, are particularly delayed. And yet here was an immature dinosaur with two long feathers extending beyond the tip of the tail.

"Either the young dinosaurs needed these tail feathers for some function we don't know about, or they were growing their feathers really differently from most living birds," explained Poust.

An additional surprise came from the second dinosaur the scientists sampled; *Sinornithosaurus* wasn't done growing either. The bone tissue was that of an actively growing animal and it lacked an External Fundamental System: a structure on the outside of the bone that vertebrates form when they're full size. "Here was an animal that was large and had adult looking bones: we thought it was going to be mature, but histology proved that idea wrong. It was older than *Wulong*, but seems to have been still growing. Researchers need to be really careful about determining whether a specimen is adult or not. Until we learn a lot more, histology is really the most dependable way."

In spite of these cautions, Poust says there is a lot more to learn about dinosaurs.

"We're talking about animals that lived twice as long ago as *T. rex*, so it's pretty amazing how well preserved they are. It's really very exciting to see inside these animals for the first time."

About the Jehol Biota

The area in which the specimen was found is one of the richest fossil deposits in the world. The Jehol biota is known for the incredible variety of animals that were alive at the time. It is also one of the earliest bird-rich environments, where [birds](#), bird-like [dinosaurs](#), and pterosaurs all shared the same habitat.

"There was a lot of flying, gliding, and flapping around these ancient lakes," says Poust. "As we continue to discover more about the diversity of these small animals it becomes interesting how they all might have fit

into the ecosystem." Other important changes were happening at the same time in the Early Cretaceous, including the spread of flowering plants. "It was an alien world, but with some of the earliest feathers and earliest flowers, it would have been a pretty one."

More information: Ashley W. Poust et al, A new microraptorine theropod from the Jehol Biota and growth in early dromaeosaurids, *The Anatomical Record* (2020). [DOI: 10.1002/ar.24343](https://doi.org/10.1002/ar.24343)

Provided by San Diego Natural History Museum

Citation: New dinosaur discovered in China shows dinosaurs grew up differently from birds (2020, January 16) retrieved 3 May 2024 from <https://phys.org/news/2020-01-dinosaur-china-dinosaurs-grew-differently.html>

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