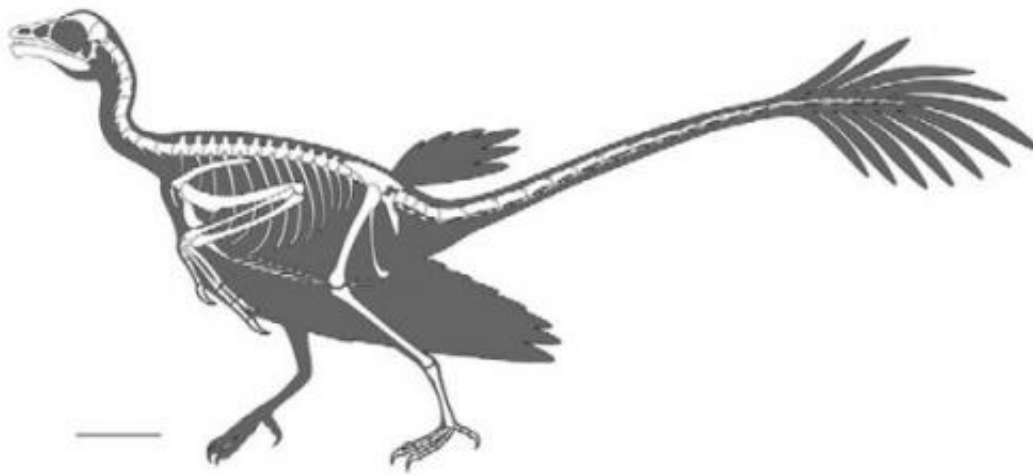


New analysis of fossils reveal ancient bird had two tails

October 8 2013, by Bob Yirka



Reconstruction of the plumage of Jeholornis. (Scale bar: 5 cm.) Credit: *PNAS*, Published online before print October 7, 2013, doi: 10.1073/pnas.1316979110

(Phys.org) —A team of researchers working in China has determined that previously found bird fossils show that *Jeholornis*, which lived in what is now China approximately 120 million years ago, had two tails. In their paper published in *Proceedings of the National Academy of Sciences*, the researchers describe their study of the fossils and the dual tails—one long with feathers near the end, the other short and more useful for flying.

The fossil specimens under study were part of a large group of fossils

found in a part of China known as Jehol—most of which were of different types of birds. *Jeholornis* was previously thought to have just one long ornamental tail. This new research indicates that another was present also, situated much closer to the spine and very likely useful as an aid in flight.

Prior efforts had led to finding 11 fossil specimens that had been identified as *Jeholornis*—four of them had feather and bone remains that showed the bird had a long tail with just a few feathers near the tip and also another tail that was much more like those of modern birds—a frond useful for steering while in flight. The team noted that some of the other fossils did not appear to have both [tails](#), suggesting that one of tails, likely the long ornamental one, existed in just one gender—a common occurrence in modern birds. Its purpose, like the large plumes on some [modern birds](#) such as peacocks, likely was for attracting a mate.

Scientists believe that *Jeholornis* likely belonged to a class of [birds](#) that never made it to the modern era, dying off millions of years ago. They note also that the bird had other notable characteristics as well—they had claws on their wing joints, out in front, and at least three teeth. Both traits are obviously very unusual, though clearly neither offered enough of an advantage to allow the bird to survive.

The team plans to continue studying the [fossil](#) remains, most particularly the aerodynamic properties of the tails to see if both worked to aid in flight, if one was truly ornamental, or if either was used in ways that have not been seen before.

More information: Unique caudal plumage of *Jeholornis* and complex tail evolution in early birds, *PNAS*, Published online before print October 7, 2013, [DOI: 10.1073/pnas.1316979110](https://doi.org/10.1073/pnas.1316979110)

Abstract

The Early Cretaceous bird Jeholornis was previously only known to have a distally restricted ornamental frond of tail feathers. We describe a previously unrecognized fan-shaped tract of feathers situated dorsal to the proximal caudal vertebrae. The position and morphology of these feathers is reminiscent of the specialized upper tail coverts observed in males of some sexually dimorphic neornithines. As in the neornithine tail, the unique "two-tail" plumage in Jeholornis probably evolved as the result of complex interactions between natural and sexual selective pressures and served both aerodynamic and ornamental functions. We suggest that the proximal fan would have helped to streamline the body and reduce drag whereas the distal frond was primarily ornamental. Jeholornis reveals that tail evolution was complex and not a simple progression from frond to fan.

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