

Study challenges bird-from-dinosaur theory of evolution - was it the other way around?

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An image drawn in 1915 by naturalist William Beebe suggests a hypothetical view of what early birds may have looked like, gliding down from trees - and it bears a striking similarity to a fossil discovered in 2003 that is raising new doubts about whether birds descended from ground-dwelling theropod dinosaurs. Photo courtesy of Oregon State University

(PhysOrg.com) -- A new study just published in the *Proceedings of the National Academy of Sciences* provides yet more evidence that birds did not descend from ground-dwelling theropod dinosaurs, experts say, and continues to challenge decades of accepted theories about the evolution of flight.

A new analysis was done of an unusual fossil specimen discovered in 2003 called "microraptor," in which three-dimensional models were used to study its possible flight potential, and it concluded this small, feathered species must have been a "glider" that came down from trees.

The research is well done and consistent with a string of studies in recent years that pose increasing challenge to the birds-from-dinosaurs theory, said John Ruben, a professor of zoology at Oregon State University who authored a commentary in PNAS on the new research.

The weight of the evidence is now suggesting that not only did birds not descend from dinosaurs, Ruben said, but that some species now believed to be dinosaurs may have descended from birds.

"We're finally breaking out of the conventional wisdom of the last 20 years, which insisted that birds evolved from dinosaurs and that the debate is all over and done with," Ruben said. "This issue isn't resolved at all. There are just too many inconsistencies with the idea that birds had dinosaur ancestors, and this newest study adds to that."

Almost 20 years of research at OSU on the morphology of birds and dinosaurs, along with other studies and the newest PNAS research, Ruben said, are actually much more consistent with a different premise - that birds may have had an ancient [common ancestor](#) with dinosaurs, but they evolved separately on their own path, and after millions of years of separate evolution birds also gave rise to the raptors. Small animals such as [velociraptor](#) that have generally been thought to be dinosaurs are more likely [flightless birds](#), he said.

"Raptors look quite a bit like dinosaurs but they have much more in common with birds than they do with other theropod dinosaurs such as Tyrannosaurus," Ruben said. "We think the evidence is finally showing that these animals which are usually considered dinosaurs were actually descended from birds, not the other way around."

Another study last year from Florida State University raised similar doubts, Ruben said.

In the newest PNAS study, scientists examined a remarkable fossil specimen that had feathers on all four limbs, somewhat resembling a bi-plane. Glide tests based on its structure concluded it would not have been practical for it to have flown from the ground up, but it could have glided from the trees down, somewhat like a modern-day flying squirrel. Many researchers have long believed that gliders such as this were the ancestors of modern birds.

"This model was not consistent with successful flight from the ground up, and that makes it pretty difficult to make a case for a ground-dwelling theropod dinosaur to have developed wings and flown away," Ruben said. "On the other hand, it would have been quite possible for birds to have evolved and then, at some point, have various species lose their flight capabilities and become ground-dwelling, flightless animals - the raptors. This may be hugely upsetting to a lot of people, but it makes perfect sense."

In their own research, including one study just last year in the *Journal of Morphology*, OSU scientists found that the position of the thigh bone and muscles in birds is critical to their ability to have adequate lung capacity for sustained long-distance flight, a fundamental aspect of bird biology. Theropod dinosaurs did not share this feature. Other morphological features have also been identified that are inconsistent with a bird-from-dinosaur theory. And perhaps most significant, birds were already found in the fossil record before the elaboration of the [dinosaurs](#) they supposedly descended from. That would be consistent with raptors descending from [birds](#), Ruben said, but not the reverse.

OSU research on avian biology and physiology has been raising questions on this issue since the 1990s, often in isolation. More scientists and other studies are now challenging the same premise, Ruben said. The old theories were popular, had public appeal and "many people saw what they wanted to see" instead of carefully interpreting the data, he said.

"Pesky new fossils...sharply at odds with conventional wisdom never seem to cease popping up," Ruben wrote in his PNAS commentary.

"Given the vagaries of the fossil record, current notions of near resolution of many of the most basic questions about long-extinct forms should probably be regarded with caution."

Provided by Oregon State University

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