

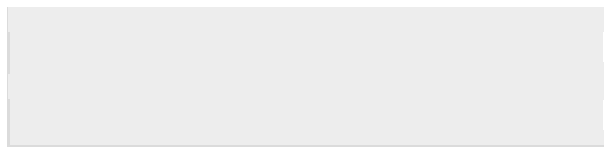
Dinosaurs sported red feathers, scientists say

Proof of pigmentation seen in Chinese fossils: Think Conan, not Barney



Chuang Zhao and Lida Xing

An artist's reconstruction shows two specimens of the dinosaur known as Sinosauropteryx, sporting their orange-and-white striped tails.



By Seth Borenstein

AP Associated Press

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Scientists have for the first time confirmed color in a dinosaur. Don't think purple Barney, but reddish-orange Conan O'Brien.

The first solid proof of pigmentation has been spotted in the fossilized tail feathers of a smallish meat-eating dinosaur found in China and named Sinosauropteryx. The creature seems to have russet colored rings, according to a paper published online Wednesday in the journal Nature.

That 125 million-year-old tail has the same internal cellular coloring agents as the hair of a red-haired person, said study lead author Mike Benton, a professor of paleontology at the University of Bristol in England. And the same finding provides what some outside experts say is even more conclusive evidence that some dinosaurs had feathers, further linking them to birds.

Benton and his colleagues didn't actually see the reddish color itself. Using an electron **microscope** 📷, they spotted the specific cellular signs of the color. An earlier study by another group of researchers and Benton's team found similar cellular color hints in prehistoric bird feathers.

Drawings of dinosaurs show them in all sorts of hues, usually duller Earth tones such as brown and gray, but scientists have only speculated on their coloring. As their connection to birds came to light, so did the idea of brighter colors. But until now, there was no proof of any coloring.

Before Benton's technique, which is likely to be copied with other dinosaur fossils, paleontologists had to look to a dinosaur's anatomy to guess at colors, said famed dinosaur expert Paul Sereno at the **University of Chicago** 📷. The color and the feathers were probably used for display, like a peacock, he theorized. Sereno, who wasn't part of Benton's team, called it a "landmark paper" that gives us "a sneak peek at how they might have appeared when alive."

"That's really cool just to be able to pin down this aspect," said University of Maryland **paleontologist** 📷 Thomas Holtz Jr., who wasn't part of the discovery team. "It does sort of help bring a more complete view of the living creature ... and further from just being a bunch of bones."

Long tail, long neck

This dinosaur was "a dinky little guy," Holtz said. Adult *Sinosauropteryx* were about three feet long (1 meter long), but the tail accounted for more than half of that length and it had a long neck, so "there's not a lot of dinosaur there," he said. It fed on small mammals, sort of like a prehistoric roadrunner, he said. While some dinosaurs are rather closely connected to birds evolutionarily, *Sinosauropteryx* is not. It was around earlier than the beginnings of birds and is the "most primitive feathered" dinosaur, Benton said. And those feathers, early in their evolutionary development, resemble tiny bristles, less than one-fifth of an inch (5 millimeters) tall, he said.

"They are stuffed with melanosomes just like any other feathers," Benton said. Melanosomes are molecules that contain color-producing pigments. With the pigment long gone in fossils, the

shape of the melanosome shows what color it used to be. Sinosauropteryx had sphere-shaped melanosomes which translate to red, and sausage-shaped ones which are whitish-gray.

He and other researchers say the findings also strongly suggest these are feathers and not cartilage or some other tissue. Benton said it disproves the concept that the material is bacteria, a theory floated by a handful of scientists who still disagree with the mainstream view that dinosaurs had feathers.

One of those feather skeptics, John Feduccia at the University of North Carolina, was not convinced by the Benton study. He said the melanosomes are not similar to those of other animals and doesn't disprove the bacteria concept.