Some dino feather colors identified

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Courtesy Bristol University
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The colour of some feathers on dinosaurs and early birds has been identified for the first time, reports a paper published in the research journal *Nature* this week.

An analysis concluded that *Sinosauropteryx*, a much smaller relative of *Tyrannosaurus rex*, sported bristles that were precursors of feathers in alternate orange and white rings down its tail. And the early bird *Confuciusornis* had patches of white, black and orange-brown colouring, scientists said. Future work is expected to allow precise mapping of colours and patterns across the whole bird.

Fossil of the theropod dinosaur *Sinosauropteryx*. (Photo © The Nanjing Institute)

“Our research provides extraordinary insights into the origin of feathers. In particular, it helps to resolve a long-standing debate about the original function of feathers – whether they were used for flight, insulation, or display. We now know that feathers came before wings, so feathers did not originate as flight structures,” said paleontologist Mike Benton at the University of Bristol, U.K., one of the scientists.

“We therefore suggest that feathers first arose as agents for colour display and only later in their evolutionary history did they become useful for flight and insulation.” The researchers from the U.K., China and Ireland reported identifying two kinds of melanosomes, or cellular structures, in the feathers of many birds and dinosaurs from northeastern China’s famous Jehol fossil beds.

Melanosomes are colour-bearing compartments within the cells of feathers andhair in modern birds and mammals, giving black, grey, and tones such as orange and brown. Because melanosomes are part of the tough protein structure of the feather, they can survive for hundreds of millions of years.

A reconstruction of *Sinosauropteryx*. (Photo © Chuang Zhao and Lida Xing)

The findings confirm a widely accepted theory that birds evolved through from a long line of meat-eating dinosaurs called theropods, which include *T. rex*, the researchers said. It also shows, they added, that modern birds’ unique assemblage of traits – feathers, wings, light skeleton, enhanced metabolism, enlarged brain and visual systems – evolved step-by-step over some 50 million years of dinosaur evolution, through the Jurassic and Cretaceous periods.

“These discoveries open up a whole new area of research,” said Benton, “allowing us to explore aspects of the life and behaviour of dinosaurs and early birds that lived over 100 million years ago.

“Furthermore, we now know that the simplest feathers in dinosaurs such as *Sinosauropteryx* were only present over limited parts of its body – for example, as a crest down the midline of the back and round the tail.” They might have also had a limited function in heat regulation, he added.

“Feathers are key to the success of birds,” he continued. “We can now dissect their evolutionary history in detail and see how each feather type – and the fine detail of feather structure – was acquired through time. This will link with current work on how the genome controls feather development.”

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