

Anchiornis huxleyi

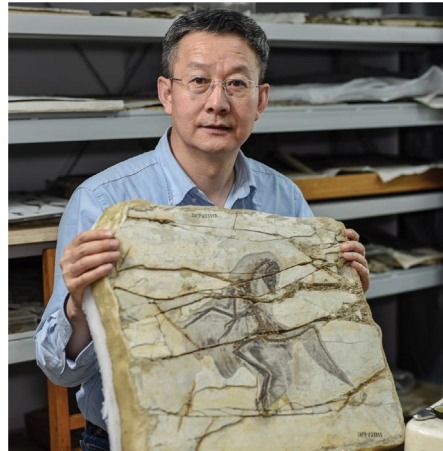
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Xing Xu picks a puzzler.

It is hard to choose just one favourite species because multiple dinosaurs have amazing features that capture my imagination. At this moment, however, I am going to pick *Anchiornis huxleyi* as my favourite dinosaur for two reasons: it is cute and it has been puzzling me since its birthday.

Anchiornis huxleyi is a tiny dinosaur. With an estimated body mass of several hundred grams, it is among the smallest dinosaurs (at least if we exclude the tiny birds, such as hummingbirds, that technically belong to Dinosauria). In life, *A. huxleyi* would have had a lovely external appearance. Its whole body, including the toes, would have been covered by feathers of various kinds and displayed a cartoon-style colour pattern: a showy red head crest, a black body, and limbs with black and white bands. These features make for a cute animal that lots of people would want to have as a pet!

Anchiornis huxleyi is also a puzzler. When my colleagues and I named this dinosaur on the basis of a partial skeleton in 2009, we thought it might be the first branch in the bird family tree. But soon we changed our minds and suggested that it was instead a close relative of either troodontid dinosaurs or *Archaeopteryx*, within a larger group known as Deinonychosauria. The shift in our thinking was due partly to new data from better-preserved fossils of *A. huxleyi* and some of its possible relations, and partly to the striking similarities shared by early birds and deinonychosauria, which make



The author holds an *A. huxleyi* fossil.

it challenging to definitively assign species close to the evolutionary divergence between these groups to one or the other.

Although *A. huxleyi* remains an intriguing species with respect to its relationships with other dinosaurs, an even more perplexing question concerns its lifestyle. *Anchiornis huxleyi* has proportionally long feathered wings, which suggests some flight capability. But its flight feathers are slender and have symmetrical vanes, features that are suggestive of flightlessness! Similarly, the proportionally long lower legs of *A. huxleyi* suggest it was a capable runner, but its extensive hindlimb plumage indicates the opposite.


There is a possible solution to the paradox of these functional capabilities. Fish seem to have been a big part of this little dinosaur's diet, which implies that it might have preferred to live near bodies of water. The elongate lower legs, together with other features (such as relatively long outer fingers and toes), are consistent with the possibility that *A. huxleyi* was a wader or swimmer, despite lacking many of the specialized traits seen in modern aquatic birds. Perhaps this species lived in a somewhat similar manner to nestlings of a South American bird called the hoatzin, which live in trees growing near water and use their clawed wings to both climb and swim.

If *A. huxleyi* really was both a tree-dweller and a swimmer, what are the implications for understanding how flight evolved? Could such a lifestyle have contributed to the emergence of wing flapping, and ultimately the origin of avian flight? *Anchiornis huxleyi* continues to pose plenty of mysteries that puzzle me, but in a good way.

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Published online: 11 June 2024

Competing interests

The author declares no competing interests.