

Oculudentavis is Bizarre Lizard, Not Bird-Like Dinosaur

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In 2020, paleontologists described an ancient species, *Oculudentavis khaungraae*, based on a tiny skull trapped in a piece of Cretaceous-period amber from Myanmar. Several unusual features led to its identification as the smallest bird-like dinosaur on record, comparable to the smallest living hummingbirds. In a new paper published in the journal *Current Biology*, they describe a more complete specimen that demonstrates *Oculudentavis* is actually a bizarre lizard.



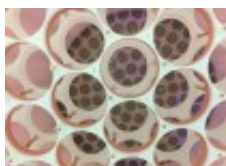
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An artist's impression of *Oculudentavis naga*, which was between 5 and 8 cm (2-3 inches) long, not including its tail. Image credit: Stephanie Abramowicz / Peretti Museum Foundation / Current Biology

The newly-identified reptile species, named *Oculudentavis naga*, is represented by a partial skeleton that includes a complete skull, exquisitely preserved in 99-million-year-old amber with visible scales and soft tissue.

Dr. Arnau Bolet from the University of Bristol and the Universitat Autònoma de Barcelona and colleagues used CT scans to separate, analyze and compare each bone in the two specimens digitally, uncovering a number of physical characteristics that earmark the small animals as lizards.

“*Oculudentavis* is so strange, however, it was difficult to categorize without close examination of its features,” Dr. Bolet said.

“The specimen puzzled all of us at first because if it was a lizard, it was a highly unusual one.”

“From the moment we uploaded the first CT scan, everyone was brainstorming what it could be,” said Dr. Juan Diego Daza, a researcher at Sam Houston State University.

“In the end, a closer look and our analyses help us clarify its position.”

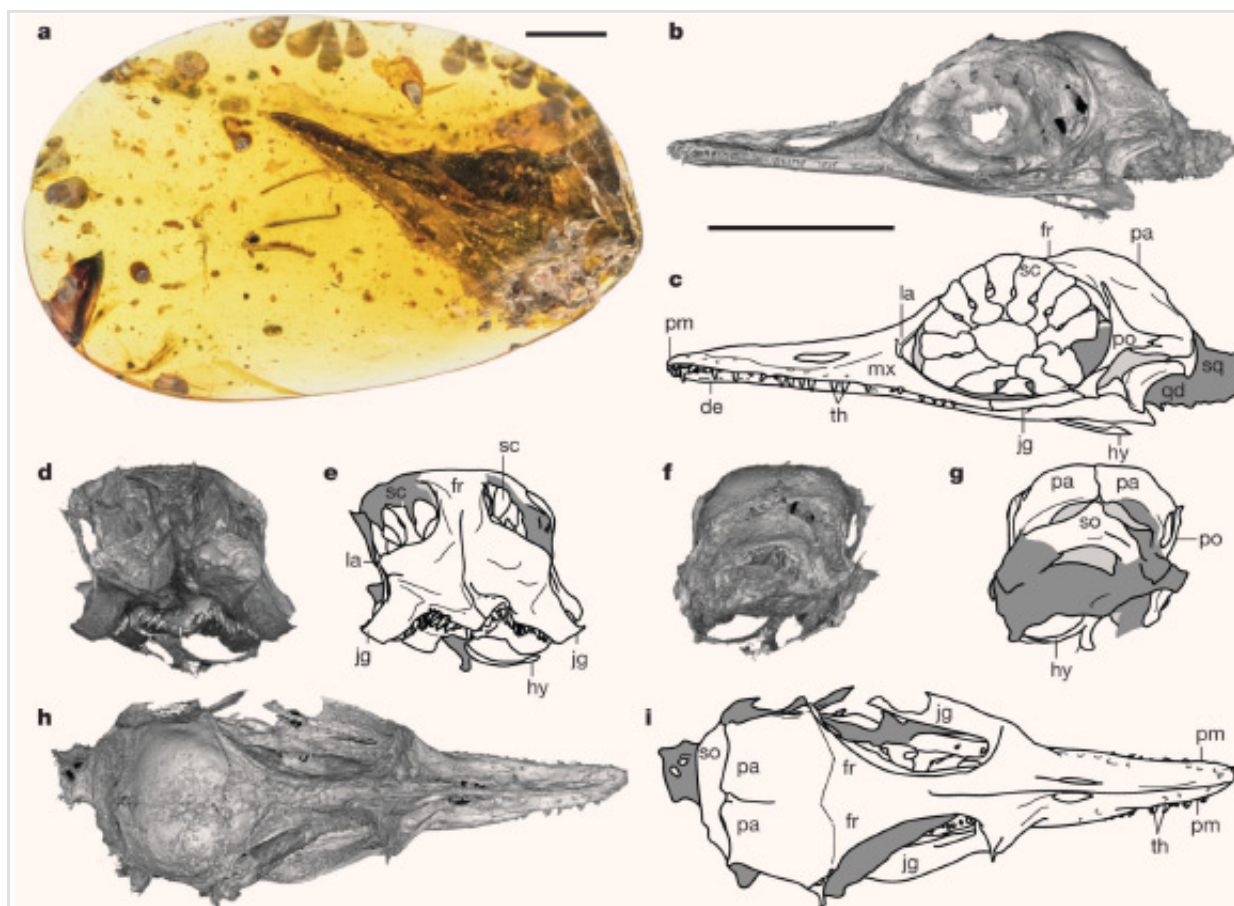


CT scans of this fossilized *Oculudentavis naga* showcase the specimen's scales, skin and soft tissue.
Image credit: Stephanie Abramowicz / Peretti Museum Foundation / Current Biology.

Major clues that the mystery animal was a lizard included the presence of scales; teeth attached directly to its jawbone, rather than nestled in sockets, as dinosaur teeth were; lizard-like eye structures and shoulder bones; and a hockey stick-shaped skull bone that is universally shared among scaled reptiles, also known as squamates.

The paleontologists also determined both species' skulls had deformed during preservation.

Oculudentavis khaungraae's snout was squeezed into a narrower, more beaklike profile while *Oculudentavis naga*'s braincase – the part of the skull that encloses the brain – was compressed. The distortions highlighted birdlike features in one skull and lizard-like features in the other.



Photograph, computed tomography scans and interpretive drawings of the *Oculudentavis khaungraae* specimen: (a) photograph of the amber piece with skull ventrolaterally exposed; scan (b) and drawing (c), left lateral view; scan (d) and drawing (e), rostral view; scan (f) and drawing (g), occipital view; scan (h) and drawing (i), dorsal view. Abbreviations: de – dentary, fr – frontal, hy – hyoid bone (or bones), jg – jugal, la – lacrimal, mx – maxilla, pa – parietal, pm – premaxilla, po – postorbital, qd – quadrate, sc – scleral ossicle, so – supraoccipital, sq – squamosal, th – teeth. Scale bars – 5 mm; longer scale bar below (b) applies to (b-i). Image credit: Xing *et al*, doi: 10.1038/s41586-020-2068-4.

“Imagine taking a lizard and pinching its nose into a triangular shape. It would look a lot more like a bird,” said Dr. Edward Stanley, director of the Digital Discovery and Dissemination Laboratory at the Florida Museum of Natural History.

In the better-preserved specimen of *Oculudentavis naga*, the researchers were also able to identify a raised crest running down the top of the snout and a flap of loose skin under the chin that may have been inflated in display.

However, they came up short in their attempts to find *Oculudentavis*' exact position in the lizard family tree.

“It’s a really weird animal. It’s unlike any other lizard we have today. We think it represents a group of squamates we were not aware of,” Dr. Daza said.

Arnau Bolet *et al.* Unusual morphology in the mid-Cretaceous lizard *Oculudentavis*. *Current Biology*, published online June 14, 2021; doi: 10.1016/j.cub.2021.05.040

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