

Hue times two: A second look at the color of dinosaur eggs

June 24 2019, by Jim Shelton



From front to back: an emu egg, a eumaniraptoran theropod egg, and a crocodile egg. Credit: Jasmina Wiemann

After garnering worldwide attention last year for her research on the origins of egg color in birds, Yale paleontologist Jasmina Wiemann has taken a second look at her eggshells.

Wiemann had found that all colors and spots on modern birds' [eggs](#) derived from a single evolutionary source among dinosaurs. Part of the finding came from an analysis of pigments found in 18 fossil dinosaur [eggshell](#) samples from around the world. Wiemann's team tested for the presence of two eggshell pigments and found them in eggshells belonging to *Eumaniraptoran* dinosaurs, which include small, carnivorous dinosaurs such as Velociraptor.

But a lingering question within the scientific community had to do with whether pigments found in the shells of dinosaur eggs actually meant the eggs looked different to the naked eye. A certain level of pigment may have existed in the chemical make-up of the shells without manifesting in the outward color of the eggs, some observers noted.

A new, follow-up study published the week of June 20 in the journal *Nature* indicates that Wiemann's initial conclusion was correct.

"We demonstrate that our analytical approach actually targets egg color and not only egg pigmentation, as we need substantial concentrations of the red pigment, protoporphyrin, to elicit a positive signal for egg color," Wiemann said. "The result is the same. Egg color had a single evolutionary origin in eumaniraptorans."

A previous study by a different research team had analyzed pigmentation in the eggshells of Siamese [crocodiles](#). That study speculated that pigmentation, but not egg [color](#), may have originated with archosaurs (a group that includes [dinosaurs](#), birds, and crocodiles).

"We had the opportunity to directly address their question and test—thanks to the Yale Peabody Museum of Natural History's egg collection—if there is, indeed, evidence for the red [pigment](#) in Siamese crocodile eggshells," Wiemann said. "We showed that there are no detectable quantities of protoporphyrin in the eggshells of Siamese

crocodiles."

More information: Jasmina Wiemann et al. Reply to: Egg pigmentation probably has an Archosaurian origin, *Nature* (2019). [DOI: 10.1038/s41586-019-1283-3](https://doi.org/10.1038/s41586-019-1283-3)

Provided by Yale University

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