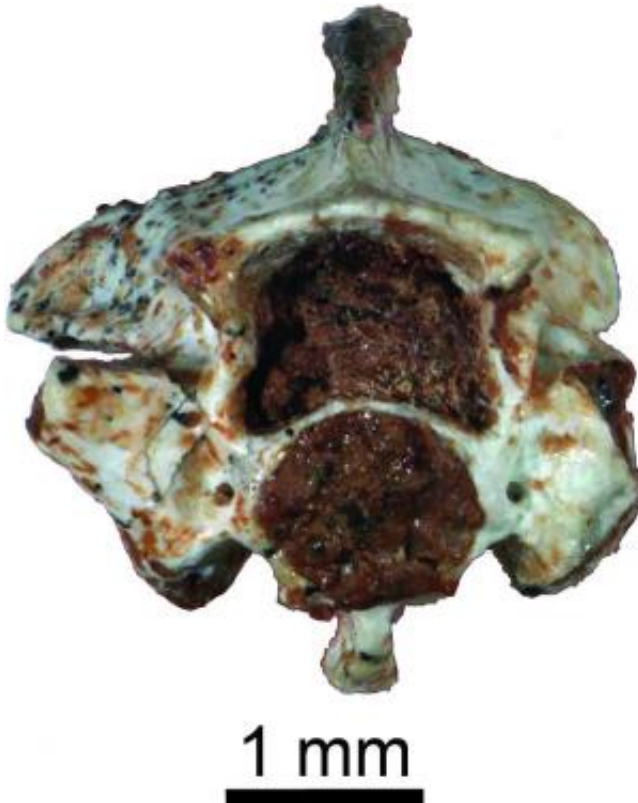


Researchers find oldest fossil evidence of modern African venomous snakes

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Ohio University scientists have found the oldest definitive fossil evidence of modern, venomous snakes in Africa, according to a new study published March 19 in the journal *PLOS ONE*. Credit: Jacob McCartney, Ohio University Heritage College of Osteopathic Medicine

Ohio University scientists have found the oldest definitive fossil evidence of modern, venomous snakes in Africa, according to a new study published March 19 in the journal *PLOS ONE*.

The newly discovered fossils demonstrate that elapid snakes—such as cobras, kraits and sea snakes—were present in Africa as early as 25 million years ago, said lead author Jacob McCartney, a postdoctoral researcher in the Ohio University Heritage College of Osteopathic

Medicine. He's part of a team that has been examining the Rukwa Rift Basin of Tanzania over the last decade to understand environmental change through time in the East African Rift System.

Elapids belong to a larger group of snakes known as colubroids, active foragers that use a variety of methods, including venom, to capture and kill prey.

Colubroid fossils are documented as early as 50 million years ago. But they weren't expected to constitute such a large part of the African snake fauna 25 million years ago, as they became dominant in Europe and North America much later.

"In the Oligocene epoch, from about 34 to 23 million years ago, we would have expected to see a fauna dominated by booid snakes, such as boas and pythons. These are generally 'sit and wait' constricting predators that hide and ambush passing prey," McCartney said.

In fact, the recent study includes a description of the oldest evidence of African booid snakes, he said. The researchers have named this new species *Rukwanyoka holmani*; the genus name combines the Rukwa region name with the Swahili word for snake, and the species name is in honor of J. Alan Holman, a paleontologist and mentor.

However, the team was surprised to discover that the fauna actually revealed more colubroids than booids. That higher-than-expected concentration of colubroid snakes suggests that the local environment became more open and seasonally dry—and, in turn, more hospitable to these active foraging types of snakes that don't require cover to hide and ambush prey—at an earlier time in Africa than in most other parts of the world, as documented in previous studies.

"This finding gives further strength to the idea that tectonic activity in the East African Rift has helped

to shape animal habitats in fascinating ways," said Nancy Stevens, an associate professor of biomedical sciences at Ohio University and co-author of the study. "The fossils suggest a fundamental shift toward more active and potentially venomous snakes that could exert very different pressures on the local fauna."

More fossils from additional locations should indicate whether colubroid snakes dominated all of Africa during the Oligocene or just the local region around the Rukwa Rift, McCartney said.

The study published in *PLOS ONE* describes eight different types of fossil snakes from the Rukwa Rift (five colubroid and three booid), with vertebrae ranging in length from 2.6 mm to just over 5 mm.

More information: The *PLoS ONE* paper is available online at:
[dx.plos.org/10.1371/journal.pone.0090415](https://doi.org/10.1371/journal.pone.0090415).

Provided by Ohio University

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