Cheekbone of ancient snake sheds light on snake evolution

Anna Junker | November 20, 2019

A 100-million-year-old fossil of a legged snake’s cheekbone discovered in Argentina provides new insight into how modern snakes evolved, thanks to new research from a collaboration between Argentinian and University of Alberta paleontologists.

Photo credit: Fernando Garberoglio

The jaw structure of an ancient legged-snake holds critical insight into the evolution of the slithering reptiles, according to joint research from Argentinian and University of Alberta paleontologists.

The “strikingly” well-preserved fossil is of the rear-limbed snake Najash rionegrina, found in Argentina. According to research from paleontologists Fernando Garberoglio and Michael Caldwell, nearly 100-million years ago, these legged snakes still had a cheekbone, also known as a jugal bone, which has all but disappeared in modern-day snakes.

“Our findings support the idea that the ancestors of modern snakes were big-bodied and big-mouthed — instead of small burrowing forms as previously thought,” said Garberoglio, from the Fundación Azara at Universidad Maimónides, in Buenos Aires, Argentina and lead author on the study in a release.

“The study also reveals that early snakes retained their hindlimbs for an extended period of time before the origin of modern snakes which are for the most part, completely limbless.”

Paleontologists’ understanding of how snakes evolved has been hindered due to a limited fossil record. However, the fossils in this study have been crucial in reconstructing snake evolution.

Using micro-computed tomography scanning, the researchers were able to visualize the skull structure. They could examine pathways of nerves and blood vessels as well as the skeletal structure that would otherwise be impossible to see without damaging the specimen.

“This research revolutionizes our understanding of the jugal bone in snake and non-snake lizards,” said Caldwell, a professor in the department of biological sciences and earth and atmospheric sciences at the University of Alberta. Caldwell is a co-author of the study.

“Aafter 160 years of getting it wrong, this paper corrects this very important feature based not on guesswork, but on empirical evidence.”

The snake fossils in the study are found in Northern Patagonia and are closely related to an ancient lineage of snakes that populated the southern hemisphere continents of Gondwana. The researchers believe they are related to only a small number of obscure, modern snakes.

Source: Edmonton Journal