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Four-legged snake found in South America first in the world

by Richard Melton

Snakes are one of the most diverse animal groups on the planet, in both the number of species and variety of habitats in which they live. However, little is known about how this legless reptile evolved into what it is today. *Tetrapodophis amplectus*, a fossil found in Brazil earlier this year, provides some answers. Described in the journal, *Nature*, this is a snake fossil with four legs, and it is the first of its kind since most snake fossils only have two legs. This fossil helps scientists understand how leglessness evolved and supports an evolutionary link between snakes and lizards.

One of the debates about the evolutionary history of snakes is from which habitat snakes originated. The two most popular theories are, of a marine origin or an underground origin. This fossil sheds light on the question of origin. For example, if snakes came from a marine environment one would expect certain adaptations to have arisen. These types of adaptations are absent in this fossil which would suggest modern adaptations to marine life came later in the evolutionary history of snakes.

Tetrapodophis amplectus also helps explain the function of the fossil legs. Since snakes have developed various forms of locomotion without legs, the fossil legs were probably not used for locomotion. In fact, the researchers that examined the fossil think that the limbs were probably used for holding on to prey rather than for moving. This would mean that snakes eventually lost the need to grip prey, perhaps as they became better adapted to grasp with their elongated bodies, as do modern constrictors. Another discovery was the presence of vertebrae in the body cavity, implying that *Tetrapodophis amplectus* preyed on other vertebrates, a characteristic that is common in modern snakes. This observation gives scientists further insight as to at what point in the evolution of snakes this hunger for vertebrates began.

> “This fossil… supports an evolutionary link between snakes and lizards.”

Overall the fossil of *Tetrapodophis amplectus* is an extremely important find of evolutionary biologists. It helps answer many of the questions about the evolutionary history of snakes, by showing the direct link between lizards and snakes, a link that had yet to be represented in the fossil record. Additionally, *Tetrapodophis amplectus* gives scientists insight into how early snakes behaved, such as how they hunted, how they moved, and what they ate. This explains many of the characteristics of modern snakes. Though there are many more questions yet to be answered this fossil is an important step in understanding the evolutionary history of our legless friends.