New species of dicynodont from the Karoo Basin of South Africa

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Reconstruction of what Bulbasaurus may have looked like while alive. Credit: Matt Celeskey

Let's go back to the Permian period, around 260 million years. Life was quite blissful, with no dinosaurs tearing up the turf as of yet.

Animals from this period were bizarre experimentations, with early ancestors evolving for some of the well-known groups still around today, like crocodiles, turtles and mammals.

Some of these include the dicynodonts, who despite looking more 'reptilian', are actually the precursors of early mammals. They were pretty weird looking, like a cross between a turtle and a wild boar. Dicynodonts, mammals and all other animals more closely related to mammals than any other egg-laying animals are called 'synapsids', and a pretty important group. Even humans are synapsids, so dicynodonts are like our great, great, great (etc.) grand-cousins.

A new species of dicynodont has been described from the Karoo Basin of South Africa, which researchers have dubbed Bulbasaurus phylloxyron. Pokémon fans around the world rejoice!

The name actually refers to the 'bulbous'-shaped nose that Bulbasaurus has, rather than being a fan-based dedication to the chubby but lovable lizard-like original starter Pokémon.

"There is nothing alive today quite like them, but they were the most successful herbivores of their time," said lead author Dr. Christian Kammerer of the Museum für Naturkunde Berlin.

The specimens were originally collected by Dr. Roger Smith of the Iziko Museums of South Africa and the University of Witwatersand. But while visiting the museum collections for research, Kammerer and his keen eye and love for synapsid taxonomy (his Twitter handle is even @synapsida), noticed something unusual about the specimens.

It was all in the tusks. Bulbasaurus has much larger tusks than any other species around at the time. "I knew that these skulls couldn't be from one of the usual species of that age, because their tusks were huge compared to other, co-existing dicynodonts," says Kammerer.

Bulbasaurus wasn't exactly a heavyweight, with a skull only 16 centimetres long, so about the same as a medium-sized dog. But its tusks were as large as the largest of the dicynodonts, showing that even the smaller dicynodont species were equipped with pretty awesome face gear.

Bulbasaurus is the oldest known member of a group of dicynodonts called geikiids. This is important, as it helps to fill a gap in the early fossil record of this group. Scientists have long recognised that geikiids should have been around in rocks older than those they are typically found in. This is because we find their closest relatives in those older rocks too.

This problem is known as a "ghost lineage", where we know that a group of organisms must have been present at a certain time as they share an equal origination time with their closest ancestors, but no fossils of that age have been found. Yet.

Bulbasaurus then is a delightful discovery to early synapsid researchers. "That specimens of a rare species like this were collected at all is a testament to the exhaustive, multi-decade field program of Roger Smith" said Kammerer. "Dicynodont skulls tend to look a lot alike, so if you are not a specialist in the group it is easy to overlook species-specific differences between specimens. I am sure that the solutions for a lot of gaps in the fossil record are already sitting in museums waiting to be studied, it just takes time and researcher expertise."

Kammerer's research highlights just how important preserving museum

collections can be, as well as how crucial taxonomical skills are to our basic understanding of the evolution of life.

Their research is published in the Open Access journal *PeerJ*.

More information: Christian F. Kammerer et al. An early geikiid dicynodont from theAssemblage Zone (late Permian) of South Africa, *PeerJ* (2017). DOI: 10.7717/peerj.2913