

Glyptodontidae

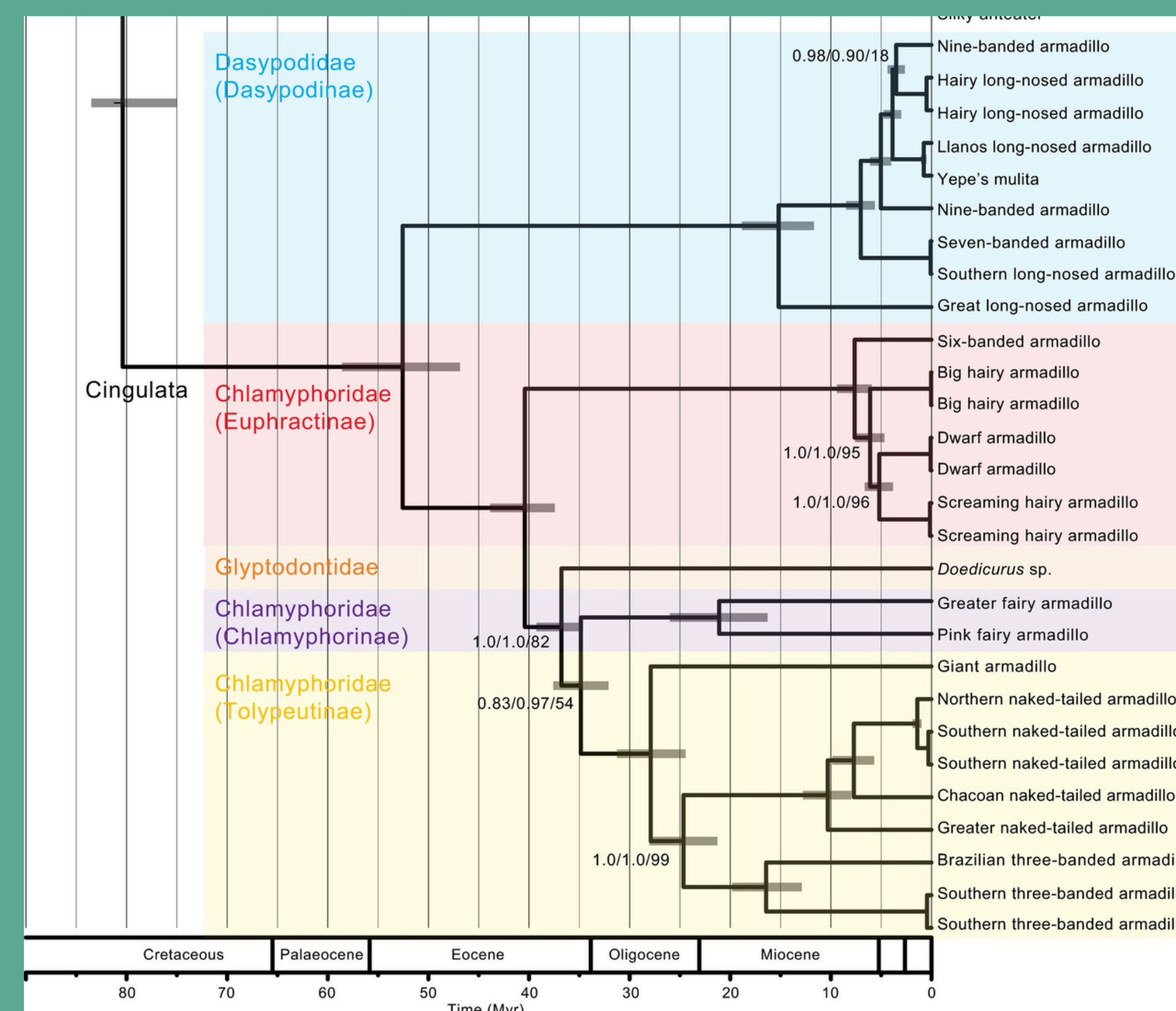
Glyptodonts are giant armadillos from the past. More specifically, they're **cingulates**: the group consisting of armadillos and their extinct kin. Glyptodonts first evolved during the Eocene Epoch in South America before spreading to North America and eventually going extinct towards the end of the Cenozoic.

The Origins: Glyptodont Phylogeny

Glyptodonts were once considered to be their own family, but are now believed to be a sub family of Chlamyphoridae due to molecular analyses that suggested that glyptodonts diverged from other cingulates around 35 Ma. This means that they evolved their giant size and other unique traits in a very brief span of geologic time!

The close relationship between glyptodonts and Chlamyphorinae is also supported by comparisons of inner ear anatomy and cavities/canals in the skull.

This means the closest relatives of glyptodonts are the giant armadillos, three-banded armadillos, naked armadillos, and fairy armadillos!

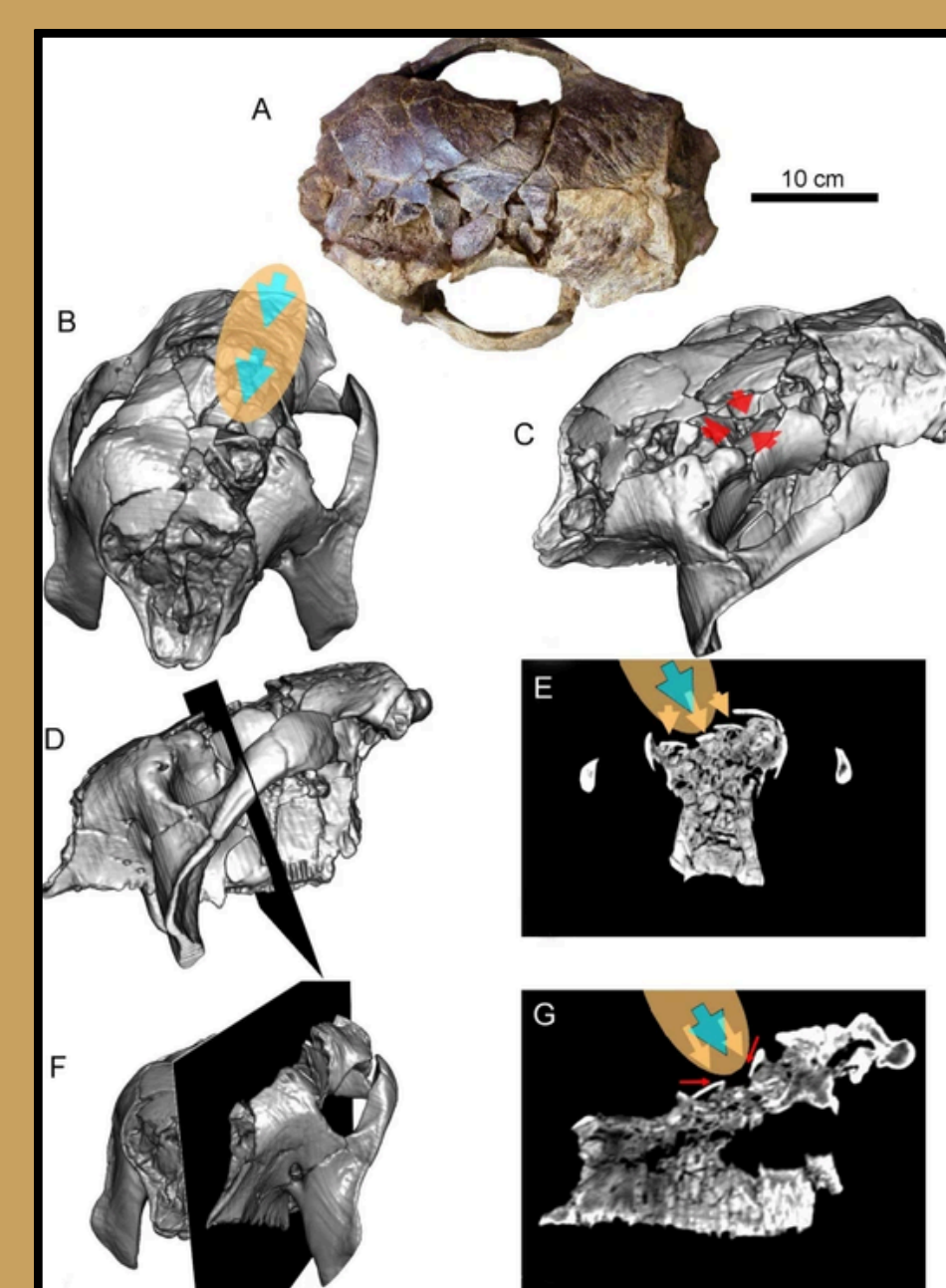


Where Are They Now? --> EXTINCT Human Predation:



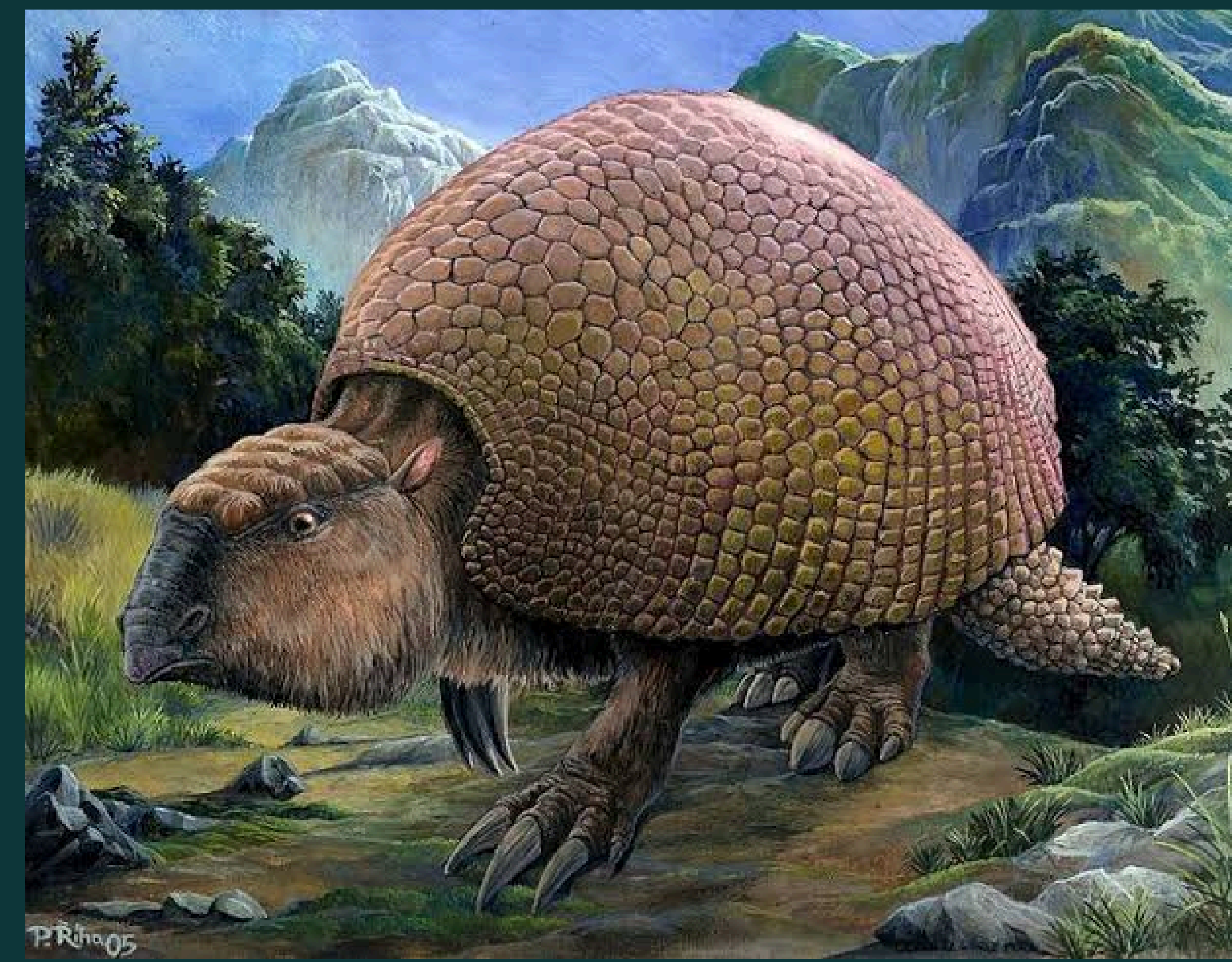
Another contributing factor was predation by humans. There is evidence of tools being used in the hunting of Glyptodonts, specifically in skull remains showing many impacts (pictured below). It is also suspected that the human predation was the final straw that led to Glyptodonts going extinct after the climate changed too much for them to be supported.

Pictured to the left are impact markings on the the Glyptodont skull show impacts potentially from human interaction.



Climate:

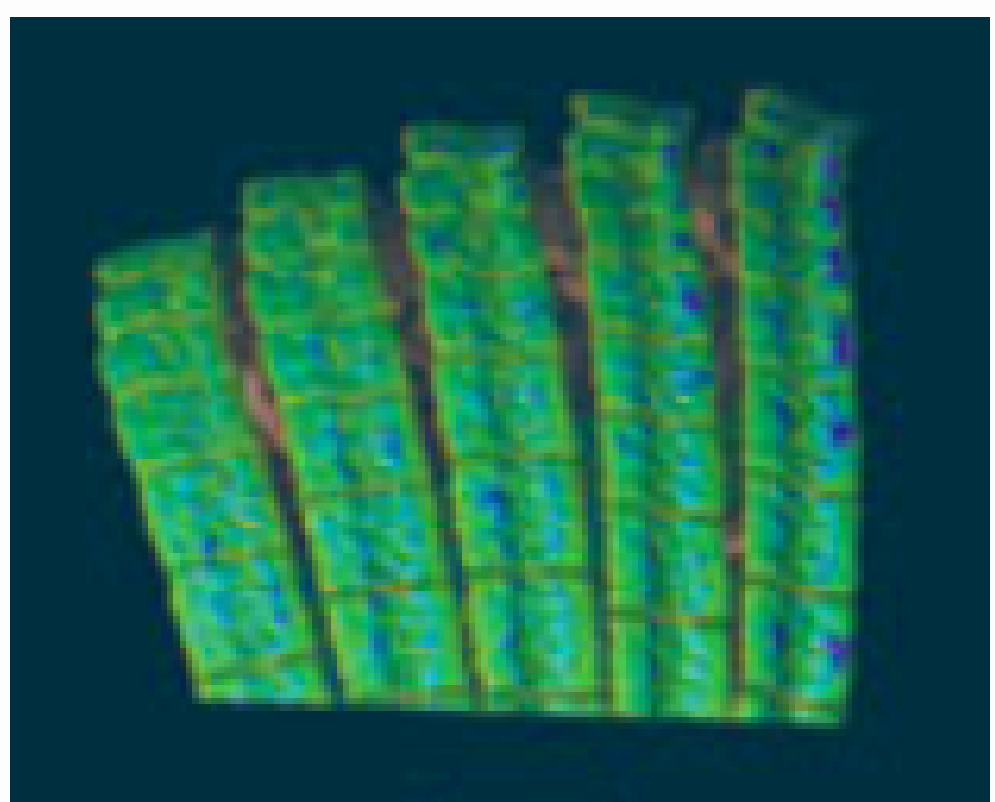
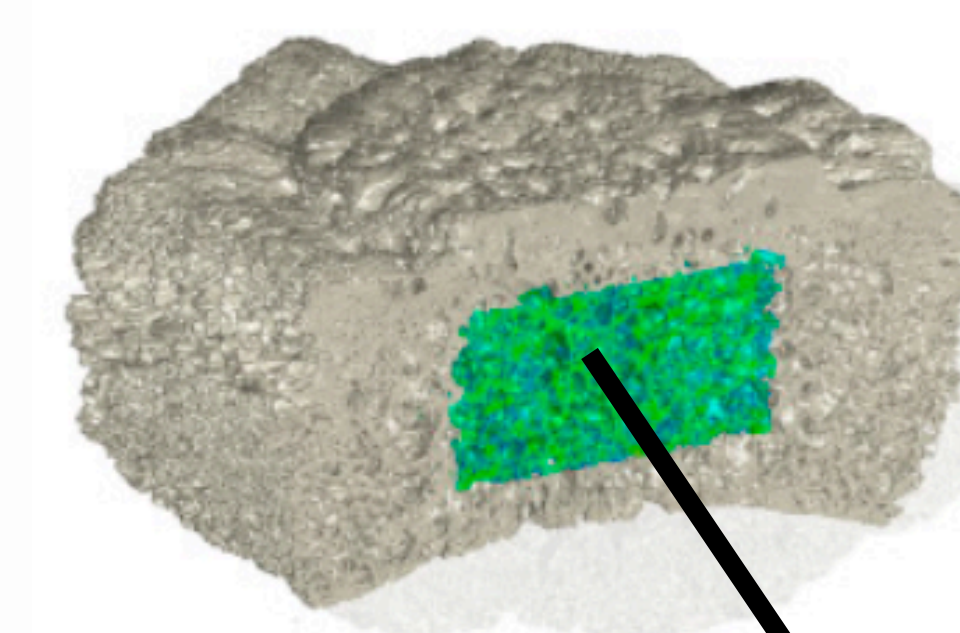
Part of the reason Glyptodontidae went extinct was due to the changes in the climate which the Glyptodontidae had trouble adapting to. A problem megafauna have with climate change is that it can make their food sources less abundant thus leading to them dying off which severely affected the glyptodonts.



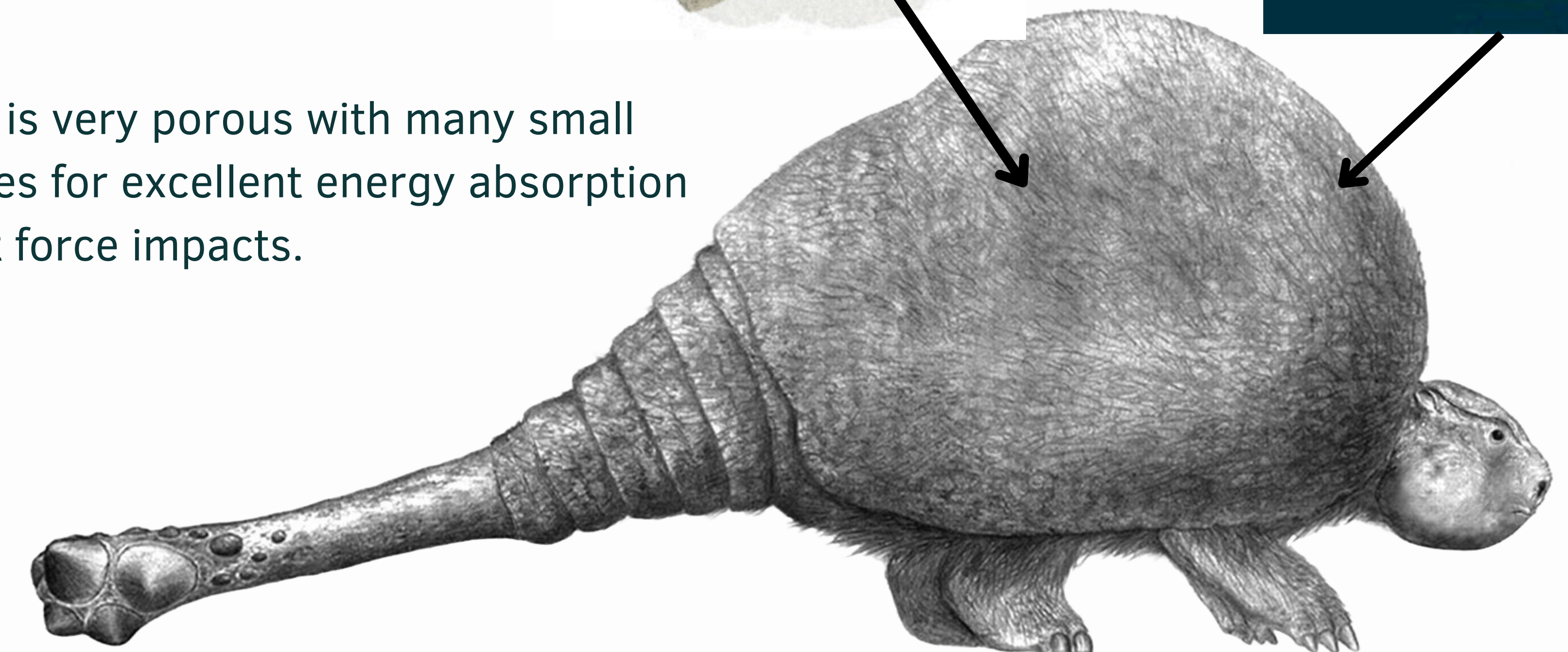
Armored Giants

While glyptodonts have great shock absorption for blunt force impact, their armor is not as easily able to withstand smaller load areas. As seen to the right, when force is concentrated to a small load area, the armor becomes more stressed. This means that glyptodont armor was likely not meant to withstand punctures from claws or teeth, but rather it served as protection against the powerful tail-blows of other glyptodonts during fights.

Glyptodonts have carapaces (shells) formed from fused, interlocking osteoderms, like the ones pictured here. These are osteoderms of an extant armadillo, which are more flexible compared to the rigid osteoderms of glyptodonts, but this is what osteoderms look like.



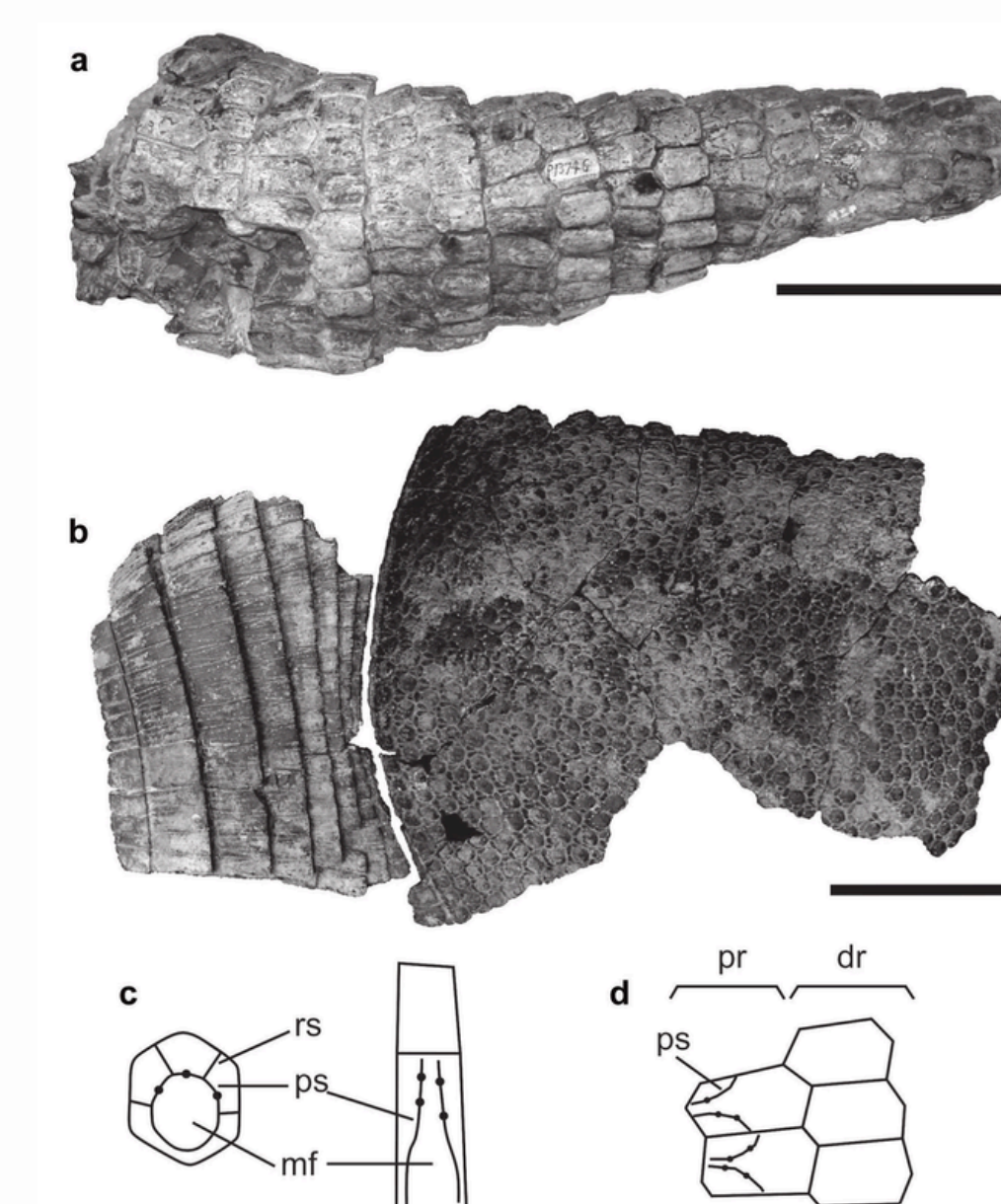
Glyptodont armor is very porous with many small cavities. This makes for excellent energy absorption to withstand blunt force impacts.



Glyptodont Tail Clubs

The tail of a Glyptodont is muscular and forms a bony sheath.

- Flexible due to protection by rings of dermal bony scutes
- The scutes of the distal (farther) end fuse and form a tail club
- The tail club reached more than 1 meter in length
- Delivered an energetic blow without damage to caudal vertebrae



The tail was used as a weapon for intraspecific competition between males and in territorial fights.

The tail club was not used as a defense against predators. This ritual fighting suggests sexual dimorphism within Glyptodonts, but that is not the case!

Total mass of tail muscle - 54 kg
Estimated blow of 3000 J with a velocity of 12 m/s