

The Mahajanga Basin produces yet another evolutionary weirdo.

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What has the teeth of a tyrannosaur, the frame of a crocodile, and a "ghost lineage" that dates back over a million years? The extinct Jurassic predator *Razanandrongobe sakalavae*, a mysterious extinct species unearthed in northwestern Madagascar that has finally found its place in the evolutionary tree of life, according to new research published Tuesday [in the open access journal PeerJ](#).

Nicknamed "Razana," this large carnivore was first identified [in a 2006 paper](#) authored by paleontologists Cristiano Dal Sasso and Simone Maganuco of the Museo Civico di Storia Naturale di Milano (Natural History Museum of Milan), along with researcher Giovanni Pasini. Based on the fossils, which consisted of large serrated teeth and some jawbone fragments, the researchers concluded that this was a major predator in this Madagascan ecosystem some 166 million years ago.

"Razana was probably an opportunistic animal, just like hyenas and lions," Dal Sasso told me over email. The meat-eater could probably swim, though it was built to walk on dry land, he said, noting that it was "not a very fast runner, but an ambush predator, and a scavenger."

However, Dal Sasso and his colleagues were unclear about the animal's place in the tree of life. Its bone-crushing teeth resemble those of colossal theropod dinosaurs like *T. rex*, but its squat frame suggests it could be a crocodylomorph, the ancient lineage from which all modern crocodylians descended.



Maganuco (left) and Dal Sasso (right) showcase skull bones of *Razanandrongobe sakalavae* at the Natural History Museum of Milan. Image: [Giovanni Bindellini](#)

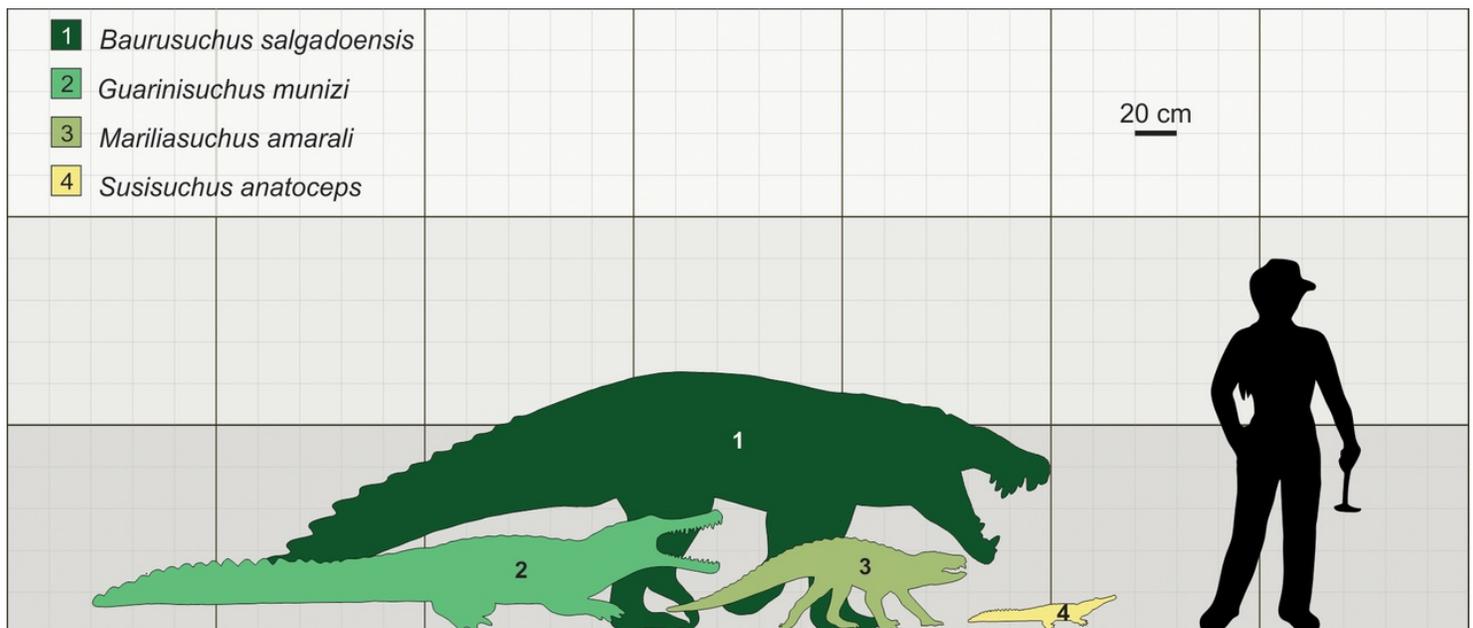
The trio of authors, along with paleontologist Guillaume Fleury of the Muséum d'Histoire Naturelle de Toulouse in France, have now resolved this phylogenetic enigma by presenting new cranial remains of the animal in their paper. The verdict: *Razanandrongobe sakalavae* is a crocodylomorph. And not just any crocodylomorph—this species "is clearly a Jurassic notosuchian," the team said, making it "by far the oldest representative of the group, predating the other forms by about 42 million years."

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Notosuchians are one of the most fascinating families in the fossil record. These croc relatives proliferated all over the bygone Gondwanan landmass, scattering their fossilized bones across South America, Africa, Europe, and Asia. They were a diverse bunch, producing herbivorous, omnivorous, and carnivorous offshoots, and evolving into a menagerie of assorted shapes and sizes dated to the Cretaceous period. *Razanandrongobe sakalavae* is the first Jurassic notosuchian ever identified, which "begins to fill the ghost lineage of notosuchians" in that period, the authors said.

At the time that Razana lived, its native Madagascar was starting to split from the Gondwanan supercontinent, a separation that would eventually produce the unique ecosystem we associate with the island today. Dal Sasso told me the predator likely feasted on sauropod stragglers (long-necked herbivores), small mammals, and pterosaurs, but it will require more fossil evidence to make any broader conclusions about this basal notosuchian's behavior and anatomy.

"It would be nice to find at least some bones of the postcranial skeleton, in order to confirm that Razana had a body construction similar to the sebecosuchian notosuchia," a group that includes the hulking predator *Baurusuchus salgadoensis*, Dal Sasso said.



The Mahajanga Basin, where Razana originates, is a promising hotspot for paleontological research, and is relatively under-explored by professional researchers. The region has already produced fossilized remains of the massive cannibalistic *Majungasaurus* dinosaur, the flying raptor *Rahonavis*, and the ten-pound frog *Beelzebufo*, so there's no reason to expect it to stop churning out the skeletons of weirdos from the distant past anytime soon.

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