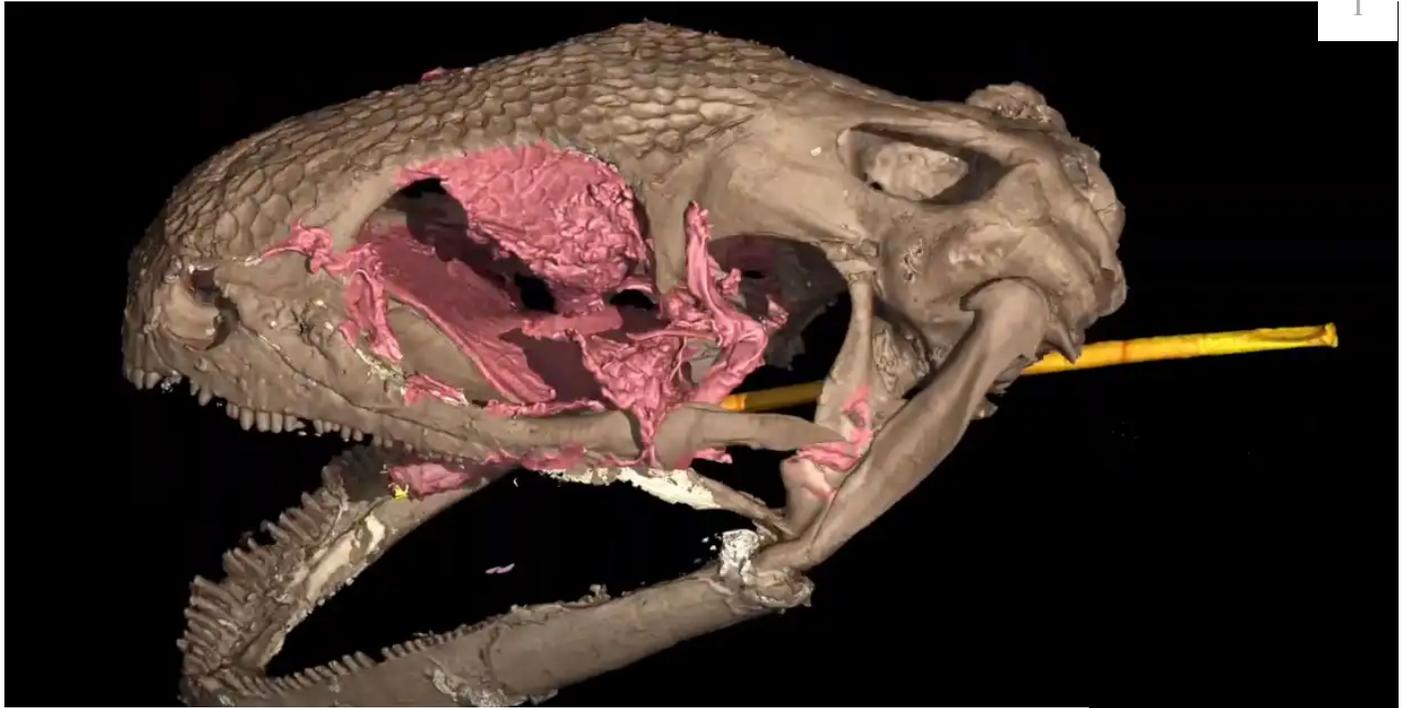




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FROGS POSSIBLY GOT THEIR FREAKY TONGUES FROM AN EVEN FREAKIER EXTINCT CREATURE



Elizabeth Rayne
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Nov 10, 2020, 1:25 AM EST (Updated)

There have been weirder things found trapped in amber than **Hammond's mosquito in *Jurassic Park***. The 99-million-year-old skulls that are now the oldest evidence of creatures with freakish fly-catching tongues have been discovered in pieces of Burmese amber.

Albanerpetontids (albies) are extinct amphibians that used to be mistaken as underground burrowers, but scientists who took a closer look at that skull have now redefined them as predators that would wait for a meal to buzz by before firing their tongue at it. Now that scientists know **albies had a projectile tongue** that saw plenty of action, it is changing what we know about how amphibians such as frogs could have gotten theirs.



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Why is Earth still habitable after billions of years? In part, we're just lucky.

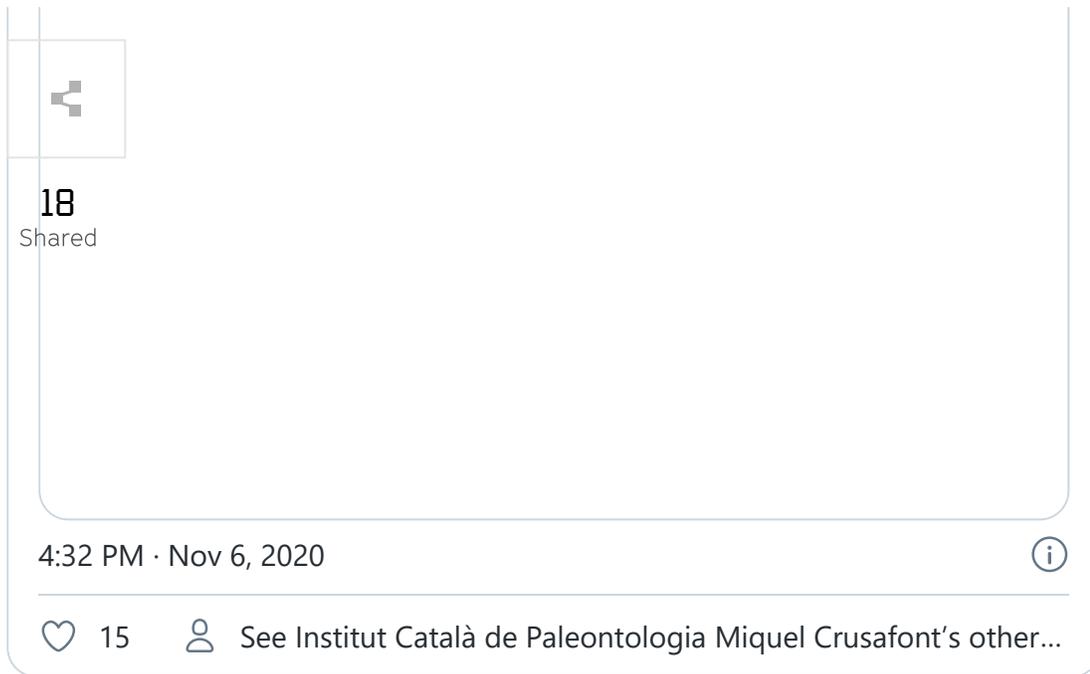
The albie fossils frozen in amber are also an entirely new species, *Yaksha peretti* (Yakshas appear in Hindu literature as spirits that guard treasure).



Institut Català de Paleontologia Miquel Crusafont
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A new [@ScienceMagazine](#) study shows that albanerpetontids, a group of rare extinct amphibians that lived more than 100 million years ago, were sit-and-wait hunters that snatched preys with a projectile firing of their tongue. The new species *Yaksha perettii* has been described



Albies had a more lizard-like look to them than frogs. No wonder they were previously thought of as prehistoric salamanders. This also explains why one of the specimens, a juvenile was first mistaken for a primitive chameleon, even though chameleons are reptiles, despite the tongue they have in common with these ancient amphibians. They also go back further in time than chameleons, up to 250 million years ago as opposed to 120 million years ago when the first chameleons are thought to have shown up.

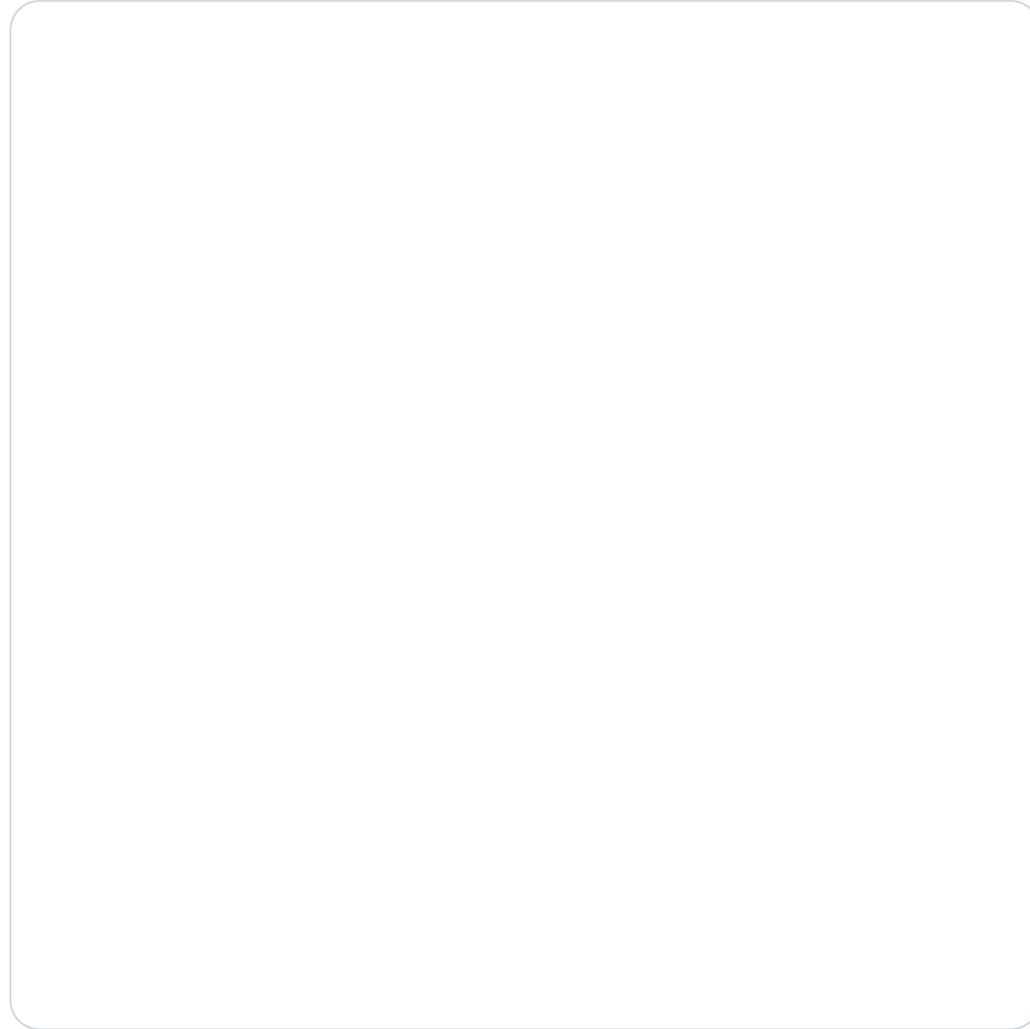
“Living amphibians have sticky tongues that they can flip quickly out of their mouths. If this was the ancestral condition, then what we see in albies, and in plethodontid salamanders, may represent a further adaptation of this strategy,” biologist Juan Diego Daza, who led a study recently published in **Science**, told SYFY WIRE.

Though albies were amphibians, their features are so bizarre that they are not easily categorized, and remains are often obscured by the ravages of time. They were first thought to be **salamanders** because of their textured and reinforced skulls. It was the salamander theory that led to the misconception of them being diggers. The juvenile specimen that was mistaken for a chameleon had been miscategorized because of specialized bone that helped it grab prey with its tongue. The adult specimen studied by Daza’s research team was preserved so well that none of its bones had degraded and even some soft tissue, including parts its of eyelids, jaw muscles and — most importantly — the tongue pad, was also still there.



Fossil specimens from Myanmar were extremely well preserved in amber, but initially were thought to belong to a chameleon. Despite having lizard-like claws, scales and tails, albanerpetontids – mercifully called “albies” for short – were amphibians, not reptiles.

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Projectile tongues are **thought to have evolved** as a response to hunting on land after **tetrapods first emerged from the water**. They needed to develop different ways of feeding if they wanted to survive. It is possible that albies are the descendants of such tetrapods, though their confusing features mean that much remains unclear about their origin and evolution. Even less is known about how the sticky pad on the end came into being. Tongues that can shoot out so fast and so far had to have come from an evolutionary need to catch prey that was not exactly convenient to grab.

catching prey and can be done from a distance," biologist Juan Diego Daza, who led a study recently published in *Science*, told SYFY WIRE. "It is ideal for a 'sit-and-wait' predator because of minimal energy expenditure."

Chameleons are the outliers here. Though they are reptiles, Daza believes their tongues probably ended up the way they are because of convergent evolution, when two species that are not related to each other develop a similar feature because of similar environmental conditions. Though some aspects of their lifestyle differ from albies and modern amphibians, especially chameleons they spend their lives climbing branches, they are still the same kind of predators that albies (and the frogs, toads and salamanders that followed them) were.

"Chameleon tongues are the result of convergent evolution," Daza said. "However, we think it is possible that albies may have somewhat resembled chameleons in their lifestyle. Chameleons move slowly and very steadily. Like many iguanians, they are 'sit-and-wait' predators. They don't spend a lot of energy actively hunting for prey, but stay still—camouflaged —waiting for prey to come close enough to be caught by the tongue."

Oldest example of rapid-fire tongue found in amphibian



So what else can these unusual life-forms tell us about frogs, toads, and **some types of salamanders** with projectile tongues? They are thought to give insight into what ancestral amphibians looked like, but they are so high specialized that their mashup of unusual features has made the especially difficult for scientists to figure out where exactly they

features, like their jaws, teeth and necks deviate from anything that is now crawling around.

Some scientists **have considered them to be** stem-batrachians (predecessors of frogs or toads) while others have placed them in the more general category of stem-lissamphibians (predecessors of all modern amphibians). Daza prefers to hold back on coming to a conclusion until more evidence is found.

"The ancestry of modern amphibians (lissamphibians such as frogs, salamanders and caecilians) remains uncertain," he said, "and there are arguments about the relationships of modern lineages to different fossil amphibian groups because so much of the early history of lissamphibians is missing from the fossil record. We need to fill in those gaps to have a clearer idea of what ancestral lissamphibians looked like.

Albies probably fall somewhere in the complex genetic lineage that eventually extended to extant amphibians with ballistic tongues, but more research is needed to find out where they belong in the overall amphibian lineage. Even after coding the physical characteristics of the specimens and running them through four models of amphibian relationships, the researchers' results were inconclusive. These creatures were just too strange.

"We need to find early albie fossils to see what they were like. Currently, the first albies are known from the Middle Jurassic – about 165 million years ago," Daza said. "We also need to find some more adult specimens in amber so that we can better understand their postcranial skeletons. However, as we have protofrogs as early as 250 million years ago, albies much have branched from the lissamphibian stem before 250 million years. Thus we are missing at least 100 million years of their history."

Someday, the albies trapped in amber may give up more secrets—just don't expect another John Hammond to extract their DNA and bring them back to life.

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