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Tag Archives: #lizard

PALEONTOLOGY

Study Presents New Species of Bizarre, Extinct Lizard Previously Misidentified As A Bird (Paleontology)

14 JUN 2021 | UNCOVER REALITY TEAM | LEAVE A COMMENT

An international research team has described a new species of Oculudentavis, providing further evidence that the animal first identified as a hummingbird-sized dinosaur was actually a lizard.

The new species, named Oculudentavis naga in honor of the Naga people of Myanmar and India, is represented by a partial skeleton that includes a complete skull, exquisitely preserved in amber with visible scales and soft tissue. The specimen is in the same genus as Oculudentavis khaungraae, whose original description as the smallest known bird was retracted last year. The two fossils were found in the same area and are about 99 million years old.

Researchers published their findings in *Current Biology (https://www.cell.com/current-biology/fulltext/S0960-9822(21)00738-7?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0960982221007387%3Fshowall%3Dtrue)* today.

The team, led by Arnau Bolet of Barcelona's Institut Català de Paleontologia Miquel Crusafont, used CT scans to separate, analyze and compare each bone in the two species digitally, uncovering a number of physical characteristics that earmark the small animals as lizards. Oculudentavis is so strange, however, it was difficult to categorize without close examination of its features, Bolet said.

"The specimen puzzled all of us at first because if it was a lizard, it was a highly unusual one," he said in an institutional press release.

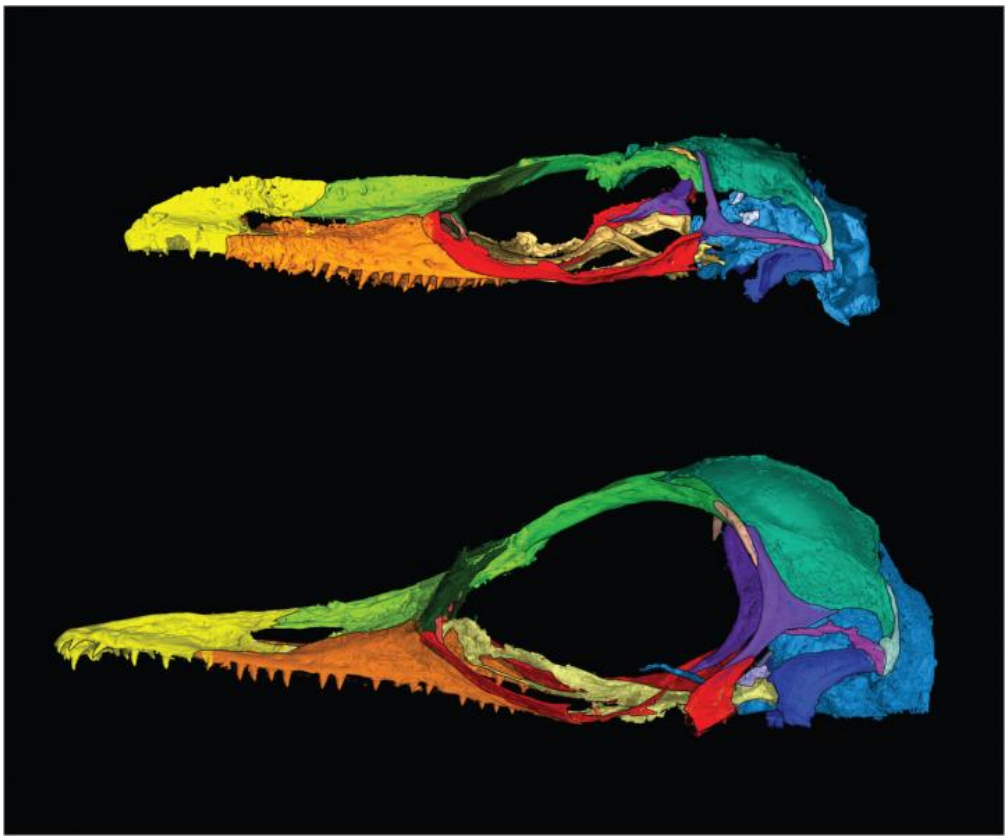
Bolet and fellow lizard experts from around the world first noted the specimen while studying a collection of amber fossils acquired from Myanmar by gemologist Adolf Peretti. (Note: The mining and sale of Burmese amber are often entangled with human rights abuses. Peretti purchased the fossil legally prior to the conflict in 2017. More details appear in an ethics statement at the end of this story).

Herpetologist Juan Diego Daza examined the small, unusual skull, preserved with a short portion of the spine and shoulder bones. He, too, was confused by its odd array of features: Could it be some kind of pterodactyl or possibly an ancient relative of monitor lizards?

"From the moment we uploaded the first CT scan, everyone was brainstorming what it could be," said Daza, assistant professor of biological sciences at Sam Houston State University. "In the end, a closer look and our analyses help us clarify its position."

Major clues that the mystery animal was a lizard included the presence of scales; teeth attached directly to its jawbone, rather than nestled in sockets, as dinosaur teeth were; lizard-like eye structures and shoulder bones; and a hockey stick-shaped skull bone that is universally shared among scaled reptiles, also known as squamates.

The team also determined both species' skulls had deformed during preservation. Oculudentavis khaungraae's snout was squeezed into a narrower, more beaklike profile while O. naga's braincase – the part of the skull that encloses the brain – was compressed. The distortions highlighted birdlike features in one skull and lizard-like features in the other, said study co-author Edward Stanley, director of the Florida Museum of Natural History's Digital Discovery and Dissemination Laboratory.



Oculudentavis naga, top, is in the same genus as Oculudentavis khaungraae, bottom, a specimen whose controversial identification as an early bird was retracted last year. Both specimens' skulls deformed during preservation, emphasizing

lizardlike features in one and birdlike features in the other. © Edward Stanley of the Florida Museum of Natural History/Peretti Museum Foundation/Current Biology

"Imagine taking a lizard and pinching its nose into a triangular shape," Stanley said. "It would look a lot more like a bird."

Oculudentavis' birdlike skull proportions, however, do not indicate that it was related to birds, said study co-author Susan Evans, professor of vertebrate morphology and paleontology at University College London.

"Despite presenting a vaulted cranium and a long and tapering snout, it does not present meaningful physical characters that can be used to sustain a close relationship to birds, and all of its features indicate that it is a lizard," she said.

While the two species' skulls do not closely resemble one another at first glance, their shared characteristics became clearer as the researchers digitally isolated each bone and compared them with each other. The differences were minimized when the original shape of both fossils was reconstructed through a painstaking process known as retrodeformation, conducted by Marta Vidal-García from the University of Calgary in Canada.

"We concluded that both specimens are similar enough to belong to the same genus, Oculudentavis, but a number of differences suggest that they represent separate species," Bolet said.

In the better-preserved O. naga specimen, the team was also able to identify a raised crest running down the top of the snout and a flap of loose skin under the chin that may have been inflated in display, Evans said. However, the researchers came up short in their attempts to find Oculudentavis' exact position in the lizard family tree.

"It's a really weird animal. It's unlike any other lizard we have today," Daza said. "We think it represents a group of squamates we were not aware of."

The Cretaceous Period, 145.5 to 66 million years ago, gave rise to many lizard and snake groups on the planet today, but tracing fossils from this era to their closest living relatives can be difficult, Daza said.

Amber can exquisitely preserve small forest animals that would have otherwise decomposed. CT scans of this fossilized Oculudentavis naga showcase the specimen's scales, skin and soft tissue. © Adolf Peretti/Peretti Museum Foundation/Current Biology

"We estimate that many lizards originated during this time, but they still hadn't evolved their modern appearance," he said. "That's why they can trick us. They may have characteristics of this group or that one, but in reality, they don't match perfectly."

The majority of the study was conducted with CT data created at the Australian Centre for Neutron Scattering and the High-Resolution X-ray Computed Tomography Facility at the University of Texas at Austin. O. naga is now available digitally to anyone with Internet access, which allows the team's findings to be reassessed and opens up the possibility of new discoveries, Stanley said.

"With paleontology, you often have one specimen of a species to work with, which makes that individual very important. Researchers can therefore be quite protective of it, but our mindset is 'Let's put it out there,'" Stanley said. "The important thing is that the research gets done, not necessarily that we do the research. We feel that's the way it should be."

While Myanmar's amber deposits are a treasure trove of fossil lizards found nowhere else in the world, Daza said the consensus among paleontologists is that acquiring Burmese amber ethically has become increasingly difficult, especially after the military seized control in February.

"As scientists we feel it is our job to unveil these priceless traces of life, so the whole world can know more about the past. But we have to be extremely careful that during the process, we don't benefit a group of people committing crimes against humanity," he said. "In the end, the credit should go to the miners who risk their lives to recover these amazing amber fossils."

Other study co-authors are J. Salvador Arias of Argentina's National Scientific and Technical Research Council (CONICET – Miguel Lillo Foundation); Andrej Cernansky of Comenius University in Bratislava, Slovakia; Aaron Bauer of Villanova University; Joseph Bevitt of the Australian Nuclear Science and Technology Organisation; and Adolf Peretti of the Peretti Museum Foundation in Switzerland.

A 3D digitized specimen of O. naga is available online via MorphoSource. The O. naga fossil is housed at the Peretti Museum Foundation in Switzerland, and the O. khaungraae specimen is at the Hupoge Amber Museum in China.

The specimen was acquired following the ethical guidelines for the use of Burmese amber set forth by the Society for Vertebrate Paleontology. The specimen was purchased from authorized companies that are independent from military groups. These companies export amber pieces legally from Myanmar, following an ethical code that ensures no violations of human rights were committed during mining and commercialization and that money derived from sales did not support armed conflict. The fossil has an authenticated paper trail, including export permits from Myanmar. All documentation is available from the Peretti Museum Foundation upon request.

Featured image: *Oculudentavis naga, as depicted in this artist's reconstruction, was a bizarre lizard that researchers initially struggled to categorize. They are still unsure of its exact position in the lizard family tree. © Stephanie Abramowicz/Peretti Museum Foundation/Current Biology*

Reference*: Arnau Bolet et al., "Unusual morphology in the mid-Cretaceous lizard Oculudentavis", Current Biology, 2021. DOI:https://doi.org/10.1016/j.cub.2021.05.040 (https://doi.org/10.1016/j.cub.2021.05.040)*

Provided by Florida Museum

#LIZARD

PALEONTOLOGY

Giant Sea Lizard Fossil Shows Diversity of Life Before Asteroid Hit (Paleontology)

12 MAY 2021 | UNCOVER REALITY TEAM | LEAVE A COMMENT

Scientists have identified the fossil of a giant mosasaur in Morocco that grew up to eight metres long.

A giant mosasaur from the end of the Cretaceous period in Morocco that could have reached up to eight metres long is the third new species to be described from the region in less than a year, bringing the total number of species up to at least 13.

The high diversity of the fauna shows how mosasaurs, giant marine lizards related to snakes and Komodo dragons, thrived in the final million years of the Cretaceous period before they, and most of all species on Earth, were wiped out by the impact of a giant asteroid 66 million years ago.

The new species, named *Pluridens serpentis*, had long, slender jaws with over a hundred sharp, fanglike teeth to grab small prey like fish and squid. Compared to related species, it had small eyes, suggesting poor vision. But the snout had dozens of openings for nerves, hinting at the ability to hunt by sensing water movements and changes in pressure. These nerves may have been sensitive to tiny variations in water pressure, an adaptation seen in sea snakes.

"Typically, when animals evolve small eyes, it's because they're relying more heavily on other senses," said Dr Nick Longrich, senior lecturer at the Milner Centre for Evolution (https://www.bath.ac.uk/research-centres/milner-centre-for-evolution/) at the University of Bath, who led the study.

The fact that *Pluridens* had so many nerves in the face may mean that it was using changes in water pressure to detect animals in low-light conditions, either at night or in deep, dark water. Mosasaurs may also have had other senses at their disposal.

"If it wasn't using the eyes, then it's very likely that it was using the tongue to hunt, like a snake," he said. "Many aquatic snakes and lizards – sea snakes, filesnakes, water monitors- flick their forked tongues underwater, using chemical cues to track their prey. Mosasaurs would have resembled whales and dolphins, so it's tempting to assume they lived like them.

"But they're very different beasts – they're huge lizards – so they probably acted like them."

While most of its relatives were small, just a few meters long, *Pluridens* got big, perhaps eight meters long. The largest individuals had thick, heavily built jawbones.

"It's possible that big males were fighting with these jaws," said Dr Longrich. "In some beaked whales, the males have massive jaws they use to fight with, and male sperm whales can be highly aggressive. Some *Pluridens* jaws show healing injuries, which suggests some violent fights."

The Moroccan mosasaurs were wildly diverse. Some had small teeth for seizing fish and squid, others evolved blunt teeth to crush crustaceans, clams, and ammonites, while others had teeth designed to cut or tear apart other marine animals – including other mosasaurs.

Pluridens brings the number of mosasaurs known from latest Cretaceous of Morocco up to 13, but the researchers suggest it's unlikely to be the last new species.

Dr Longrich said: "The diversity in these fossils is just astonishing. Far from declining in diversity, the mosasaurs seem to be peaking just before they went extinct.

"We're not seeing any evidence that this group was struggling before they went extinct – From an evolutionary standpoint, they were succeeding, they did everything right- but nothing can prepare you for an asteroid."

Co-author on the study, Dr Nour-Eddine Jalil from the Natural History Museum of Sorbonne University (France) said: "It's a new species of a large predator which, with its eight metre length, comes to confirm the diversity of the faunas of the seas just before the Cretaceous crisis.

"*Pluridens serpentis* highlights the importance of the paleontological heritage of Morocco to help illustrate the history of life."

Dr Nathalie Bardet, a specialist in mosasaurs, particularly those from the Phosphates of Morocco, at the Muséum National d'Histoire Naturelle of Paris, was also co-author on the paper.

She said: "Working on this group of marine reptiles since more than 20 years, I never stop being surprised by the incredible diversity of these predators, who all lived there and shared the available space and food resources.

"These latest discoveries show perfectly that the list of species present here is far from being closed and that the future still holds great surprises and discoveries!"

The study, done in collaboration with researchers from Natural History Museum of Sorbonne University (France), the Office Chérifien des Phosphates (OCP) and University Cadi Ayyad (Morocco), is published in *Cretaceous Research*:

Nicholas Longrich, Nathalie Bardet, Fatima Khaldoune Oussama, Khadiri Yazami Nour-Eddine Jalil (2021) "Pluridens serpentis, a new mosasaurid (Mosasauridae: Halisaurinae) from the Maastrichtian of Morocco and implications for mosasaur diversity" (https://doi.org/10.1016/j.cretres.2021.104882) DOI: 10.1016/j.cretres.2021.104882

Featured image: *Pluridens serpentis is the 13th species of mosasaur to be identified in Morocco, but probably not the last (Credit: Andrey Atuchin)*

Provided by University of Bath (https://www.bath.ac.uk/)

#ASTEROIDHIT #LIZARD

PALEONTOLOGY

New Australian Fossil Lizard (Paleontology)

17 FEB 2021 | UNCOVER REALITY TEAM | LEAVE A COMMENT

Oldest skink named after eminent biology professor

Some of Australia's most famous animals – wombat, platypus, kangaroos and the extinct marsupial tiger thylacine – have been traced back to their fossil ancestors in remarkable finds in central South Australia.

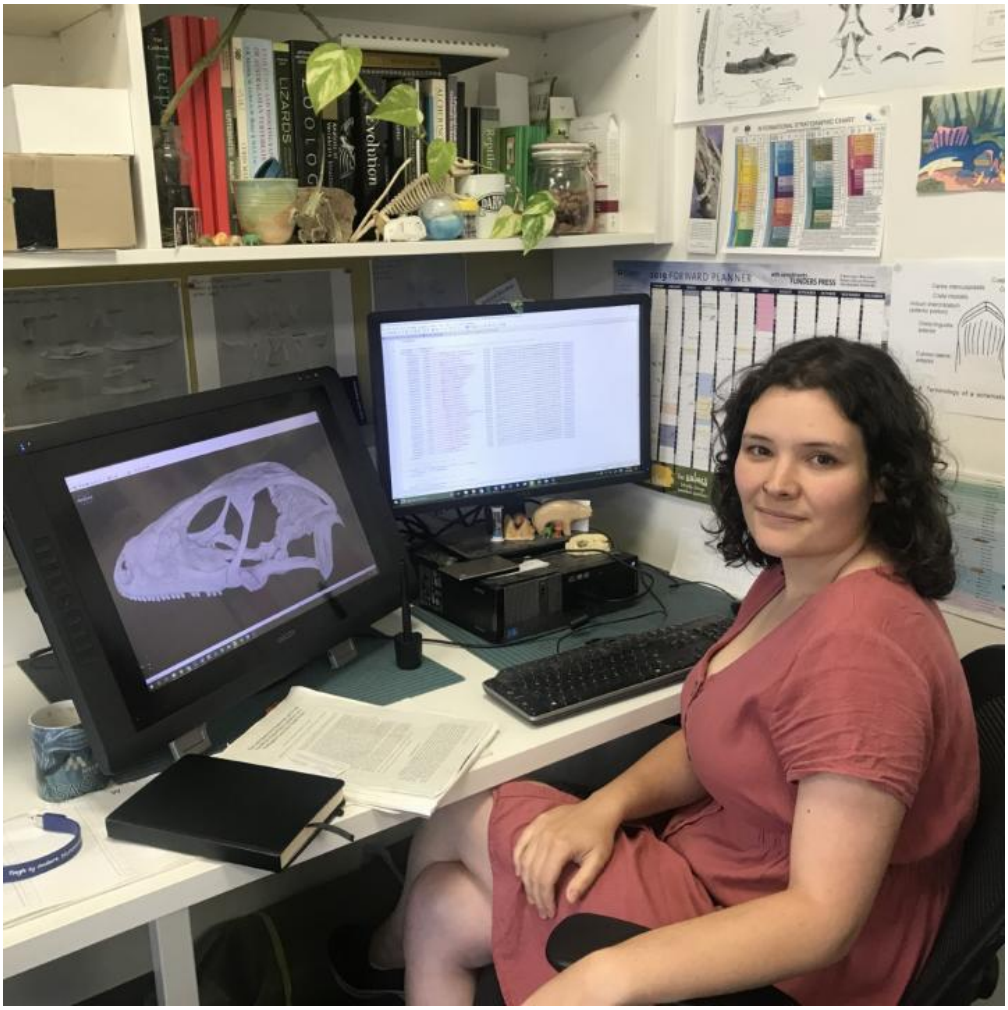
Now a remote expedition to a large inland salt lake in 2017 has sifted through remains unearthed in Namba Formation deposits to describe a tiny new skink, an ancestor of Australia's well-known bluetongue lizards – to be named in honour of world-renown Flinders University lizard researcher Professor Mike Bull.

The new species, unveiled in the Royal Society's Open Science today, is described as Australia's oldest – a 25 million-year-old skink named Proegernia mikebulli after the late Flinders University Professor Mike Bull.

It was found by Flinders University and South Australian Museum palaeontologists and volunteers at a rich fossil site on Lake Pinpa located on the 602,000 square hectare Frome Downs Station, seven hours drive north of capital city Adelaide.

Following the crusted shoreline of a salt lake, the team homed in on a cross section of sediments where fossil excavations of ancestors of koala, a predatory bird, and fragments of a thylacine were previously unearthed. Remains of prehistoric fish, platypus, dolphins and crocodilians have also been found nearby.

"It was 45°C in the shade that day and hard work digging through the clay, but it was definitely worth it once the tiniest of bone fragments turned out to be those of the oldest Australian skink," says lead author palaeo-herpetologist Dr Kailah Thorn, who conducted the research at Flinders University as part of her PhD.



Lead author Dr Kailah Thorn, who conducted the research as part of her PhD at Flinders University, South Australia © Kailah Thorn

The once-verdant interior of Australia is considered the cradle of Australia's unique fauna and in particular its reptile diversity.

"Fossil lizards are often too small to be identified when you're in the field. Lizard skulls are made of more than 20 individual bones that all disarticulate when they fossilise," says Dr Thorn, who now works as curator of the Edward de Courcy Clarke Earth Sciences Museum at the University of Western Australia.

The discovery of the tiny fossil lizards in an area the size of one million soccer fields was enabled by building an understanding of the geology of the region, and targeting fossiliferous bands of silt to thoroughly sieve and sort back at the lab, she explains.

"These lizard fossils owe their discovery to the patient sorting of tiny bones," says lead author, vertebrate palaeontologist Flinders University Associate Professor Trevor Worthy. "A teaspoon holds hundreds of tiny bones – all revealed in translucent splendour under a microscope."

"Once every 30 spoons something else is found among the fish – usually a tiny mammal tooth. But the 2017 discovery of the oldest skink was a golden moment for a palaentologist," he says.

Tiny fossil bones from the Lake Pinpa site. © Flinders University

When researchers placed the fossil in the evolutionary tree of lizards, it was found to be an early member of the Australian skink subfamily Egerniinae – the group now encompassing bluetongues, sleepy lizards (shinglebacks), land mullets and spiny-tailed skinks.

The newly described lizard Proegernia mikebulli is named after the late Flinders University Professor Mike Bull, who passed away suddenly in late 2016.

Inspired generations of Australian herpetologists, Professor Bull's wide-ranging research career centred on social skinks from the Egerniinae subfamily, their behaviour, parasites, and conservation.

"Our colleague Professor Bull's long-term ecological studies of sleepy lizards were a massive contribution to biology," says co-author Matthew Flinders Professor Mike Lee (Flinders University / SA Museum).

"The fossil record is essentially data from a long-term natural ecological study, so its fitting that this fossil lizards is named after in honour of Mike."

'A new species of Proegernia from the Namba Foundation in South Australia and the early evolution and environment of Australian egerniine skinks' (2021) by KM Thorn, MH Hutchinson, MSY Lee, N Brown, AB Camens and TH Worthy has been published in *Royal Society Open Science* DOI 10.1098/rsos.201686

Timelapse video and high-res photos available upon request. Also see https://youtu.be/7uTeCwLyFWY (https://youtu.be/7uTeCwLyFWY)

Featured image: *Swamp Skink (Lissolepis coventryi), which is probably the living lizard most similar to the new fossil. Photo: Dr Mark Hutchinson, SA Museum / Flinders University, a co-author. © Photo: Dr Mark Hutchinson, SA Museum / Flinders University*

#FOSSIL #LIZARD
PALEONTOLOGY

Dinosaur-era Sea Lizard had Teeth Like a Shark (Paleontology)

19 JAN 2021 | UNCOVER REALITY TEAM | LEAVE A COMMENT

New study identifies a bizarre new species suggesting that giant marine lizards thrived before the asteroid wiped them out 66 million years ago.

A new species of mosasaur – an ancient sea-going lizard from the age of dinosaurs – has been found with shark-like teeth that gave it a deadly slicing bite.

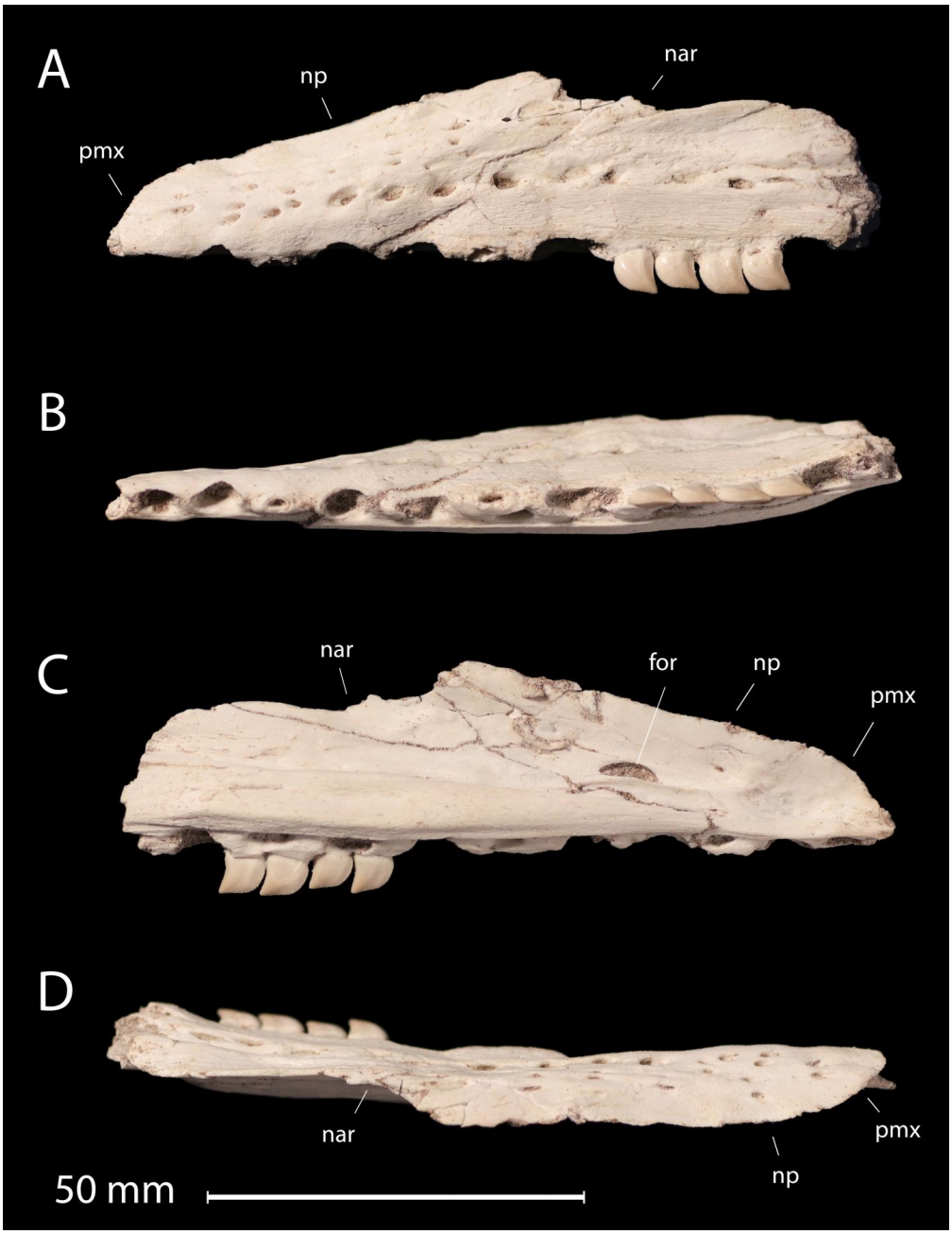
Xenodens calminechari was about the size of a small porpoise and had serrated shark-like teeth (credit: Andrey Atuchin).

Xenodens calminechari, from the Cretaceous of Morocco, had knifelike teeth that were packed edge to edge to make a serrated blade and resemble those of certain sharks. The cutting teeth let the small, agile mosasaur, about the size of a small porpoise, punch above its weight, cutting fish in half and taking large bites from bigger animals.

Dr Nick Longrich, Senior Lecturer at the Milner Centre for Evolution (https://www.bath.ac.uk/research-centres/milner-centre-for-evolution/) at the University of Bath and lead author on the paper, said: "66 million years ago, the coasts of Africa were the most dangerous seas in the world.

"Predator diversity there was unlike anything seen anywhere else on the planet. The new mosasaur adds to a rapidly growing list of marine reptiles known from the latest Cretaceous of Morocco, which at the time was submerged beneath a tropical sea.

"A huge diversity of mosasaurs lived here. Some were giant, deep-diving predators like modern sperm whales, others with huge teeth and growing up to ten meters long, were top predators like orcas, still others ate shellfish like modern sea otters – and then there was the strange little *Xenodens*.



Prepared fossils of xenodens, showing its saw-like teeth. © Dr Nick Longrich

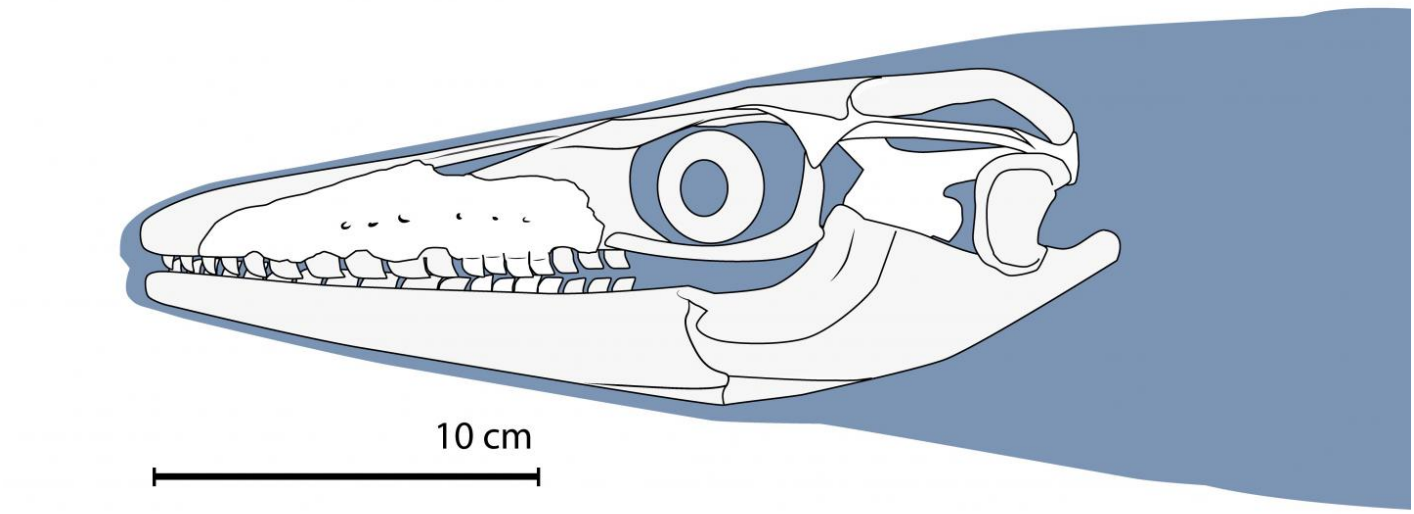
"They coexisted with long-necked plesiosaurs, giant sea turtles, and saber-toothed fish. The new mosasaur adds another dangerous predator to the mix."

The discovery also adds to the diversity of marine reptiles in the late Cretaceous. This suggests their diversity peaked just before an asteroid hit 66 million years ago, wiping out marine reptiles and the dinosaurs.

"We're still learning how diverse the mosasaurs were," said Longrich. "And whenever we think we have them figured out, another one turns up."

The fauna lived in the million years before an asteroid hit the earth at the end of the Cretaceous period, ending the reign of the dinosaurs and wiping out 90 per cent or more of all species on Earth. The high diversity found in the new study suggests that the ecosystem wasn't in decline before the asteroid hit; instead the ecosystem seems to suggest that marine reptiles were expanding in diversity before they abruptly went extinct.

The teeth seen in *Xenodens* are unlike those of any other reptile. But Dr Longrich, who worked on fishing boats growing up in Alaska, had seen something similar before.



Reconstruction of Xenodens skull © Dr Nick Longrich

He said: "It reminded me of the teeth in the jaws of the sleeper sharks we'd sometimes catch while fishing halibut on my brother's boat. I remember seeing what those sharks could do – they'd carve huge bolts of flesh out of the halibut, almost cutting them in half."

The authors suggest that, similar to sleeper sharks and related dogfish sharks, the unusual jaws allowed the animal to punch above its weight, cutting small fish in half, carving pieces out of larger prey, and perhaps even scavenging on the carcasses of large marine reptiles.

But rather than being an extreme specialist, the teeth probably let *Xenodens* eat a huge range of prey – "They're like the knives sold on those old late night TV commercial – they'll slice through anything," said Longrich.

Anne Schulp, researcher at Naturalis Biodiversity Center in Leiden and Professor of Palaeontology at Utrecht University, and an author on the paper, said: "I'm blown away by the new discovery.

"I've been working on closely related mosasaurs for a decade or two now, and *Xenodens* shows this group managed to exploit yet another food source. They clearly were even more successful than we thought."

Dr Nathalie Bardet from the National Museum of Natural History in Paris said: "I have been working on mosasaurs for over 20 years and more specifically on those from the Maastrichtian Phosphates of Morocco which I am familiar with.

"I must admit that among the ten species that I know, this one has a so unusual and extraordinary dentition that at the beginning I thought it was a chimera reconstructed with different fossils!"

Dr Nour-Eddine Jalil of the National Museum of Natural History in Paris and Universite Cadi Ayyad in Marrakech, said: "A mosasaur with shark teeth is a novel adaptation of mosasaurs so surprising that it looked like a fantastic creature out of an artist's imagination.

"*Xenodens calminechari* is further evidence of the extraordinary paleobiodiversity of the Phosphate Sea.

"It is as if nature is struggling to find all the combinations for an ever finer exploitation of food sources."

Nicholas R. Longrich, Nathalie Bardet, Anne S. Schulp, Nour-Eddine Jalil (2021) "*Xenodens calminechari*, a bizarre mosasaurid (Mosasauridae, Squamata) with shark-like cutting teeth from the upper Maastrichtian of Morocco, North Africa" is published in *Cretaceous Research* (https://doi.org/10.1016/j.cretres.2021.104764) (DOI: 10.1016/j.cretres.2021.104764).

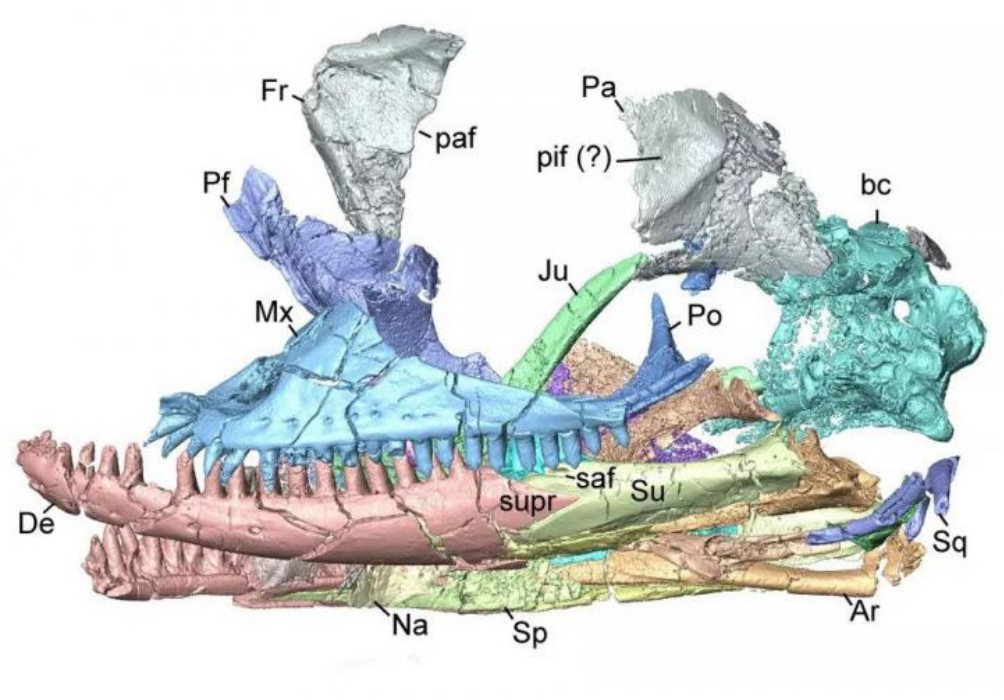
Provided by University of Bath (https://www.bath.ac.uk/)

#CRETACEOUS #DINOSAUR #LIZARD #MASOSAUR #SHARK #XENODENS PALEONTOLOGY

Lizard Skull Fossil Is New And 'Perplexing' Extinct Species (Paleontology)

3 NOV 2020 | UNCOVER REALITY TEAM | LEAVE A COMMENT

In 2017, while browsing the fossil collections of Yale's Peabody Museum of Natural History, University of Texas at Austin graduate student Simon Scarpetta came across a small lizard skull, just under an inch long.



A CT image of the Kopidosaurus perplexus skull in left lateral view. ©Simon Scarpetta.

The skull was beautifully preserved, with a mouth full of sharp teeth – including some with a distinctive curve.

Much to Scarpetta's surprise, no one had studied it. Since being discovered in 1971 on a museum fossil hunting trip to Wyoming, the 52 million-year-old skull had sat in the specimen drawer.

"Lizards are small and prone to breaking apart, so you mostly get these individual, isolated fragmented bones," said Scarpetta, who is studying paleontology at the UT Jackson School of Geosciences. "Anytime you find a skull, especially when you're trying to figure out how things are related to each other, it's always an exciting find."

Scarpetta decided to bring the skull back to the Jackson School for a closer look. And on September 2020, the journal Scientific Reports published a study authored by Scarpetta describing the lizard as a new species, which he named Kopidosaurus perplexus.

Kopidosaurus perplexus skull in left lateral view. ©Simon Scarpetta

The first part of the name references the lizard's distinct teeth; a "kopis" is a curved blade used in ancient Greece. But the second part is a nod to the "perplexing" matter of just where the extinct lizard should be placed on the tree of life. According to an analysis conducted by Scarpetta, the evidence points to a number of plausible spots.

The spots can be divided into two groups of lizards, representing two general hypotheses of where the new species belongs. But adding to the uncertainty is that how those two groups relate to one another can shift depending on the particular evolutionary tree that's examined. Scarpetta examined three of these trees – each one built by other researchers studying the evolutionary connections of different reptile groups using DNA – and suggests that there could be a forest of possibilities where the ancient lizard could fit.

The case of where exactly to put the perplexing lizard highlights an important lesson for paleontologists: just because a specimen fits in one place doesn't mean that it won't fit equally well into another.

"The hypothesis that you have about how different lizards are related to each other is going to influence what you think this one is," Scarpetta said.

Paleontologists use anatomical details present in bones to discern the evolutionary relationships of long-dead animals. To get a close look at the lizard skull, Scarpetta created a digital scan of it in the Jackson School's High-Resolution X-Ray CT Lab. However, while certain details helped identify the lizard as a new species, other details overlapped with features from a number of different evolutionary groups.

All of these groups belonged to a larger category known as Iguania, which includes a number of diverse species, including chameleons, anoles and iguanas. To get a better idea of where the new species might fit into the larger Iguania tree, Scarpetta compared the skull data to evolutionary trees for Iguania that were compiled by other researchers based on DNA evidence from living reptiles.

On each tree, the fossil fit equally well into two general spots. What's more, the lizard groupings in each spot varied from tree to tree. If Scarpetta had just stopped at one spot or one tree, he would have missed alternative explanations that appear just as plausible as the others.

Scarpetta said that Kopidosaurus perplexus is far from the only fossil that could easily fit onto multiple branches on the tree of life. Paleontologist Joshua Lively, a curator at the Utah State University Eastern Prehistoric Museum, agrees and said that this study epitomizes why embracing uncertainty can lead to better, more accurate science.

"Something that I think the broader scientific community should pull from this is that you have to be realistic about your data and acknowledge what we can actually pull from our results and conclude and where there are still uncertainties," Lively said. "Simon's approach is the high bar, taking the high road. It's acknowledg-

ing what we don't know and really embracing that."

***References**: Scarpetta, S.G. Effects of phylogenetic uncertainty on fossil identification illustrated by a new and enigmatic Eocene iguanian. Sci Rep 10, 15734 (2020). https://doi.org/10.1038/s41598-020-72509-2 (https://doi.org/10.1038/s41598-020-72509-2) http://dx.doi.org/10.1038/s41598-020-72509-2 (http://dx.doi.org/10.1038/s41598-020-72509-2)*

Provided by University of Texas at Austin (http://www.utexas.edu/)

#FOSSIL #KOPIDOSAURUSPERPLEXUS #KOPIS #LIZARD #PERPLEXING #SKULL #TEETH
PALEONTOLOGY

Paleontologist Reported New Genus of Mosasaurs, "Gnathomortis" (Paleontology)

25 SEP 2020 | UNCOVER REALITY TEAM | LEAVE A COMMENT

Gnathomortis stadtmani, the only species of the newly-described mosasaur genus, swam in the seas of North America between 79 and 81 million years ago (Cretaceous period).

A skeletal mount of the mosasaur Gnathomortis stadtmani at BYU's Eyring Science Center. Image credit: BYU.

The partial skull and skeleton of Gnathomortis stadtmani was discovered in the Mancos Shale of Delta County in western Colorado in 1975. In 1999, the specimen was assigned to the genus Prognathodon (https://en.m.wikipedia.org/wiki/Prognathodon) and named Prognathodon stadtmani.

In a new study, Dr. Joshua Lively (https://www.joshualively.com/) from the Jackson School of Geosciences at the University of Texas at Austin examined the original specimen and the recently-uncovered portions of the mosasaur's skull roof, jaw, and braincase. He determined the fossils are not closely related to other species of the genus Prognathodon and needed to be renamed.

The new name, Gnathomortis, is derived from Greek and Latin words for 'jaws of death'. It was inspired by the incredibly large jaws of this species, which measure 1.2 m (4 feet) in length.

An interesting feature of the mosasaur's jaws is a large depression on their outer surface, similar to that seen in modern lizards, such as the collared lizard (Crotaphytus collaris) (https://southwestexplorers.com/what-is-a-collared-lizard/). The feature is indicative of large jaw muscles that equipped the marine reptile with a formidable biteforce.

Gnathomortis swam in the seas of Colorado between 79 and 81 million years ago, or at least 3.5 million years before any species of Prognathodon.

***References**: Joshua R. Lively, "Redescription and phylogenetic assessment of 'Prognathodon' stadtmani: implications for Globidensini monophyly and character homology in Mosasaurinae. Journal of Vertebrate Paleontology", published online September 23, 2020; doi: 10.1080/02724634.2020.1784183 link: https://www.tandfonline.com/doi/full/10.1080/02724634.2020.1784183 (https://www.tandfonline.com/doi/full/10.1080/02724634.2020.1784183)*

#DINOSAUR **#GNATHOMORTIS** **#JAW** **#LIZARD** **#MASOSAURS**