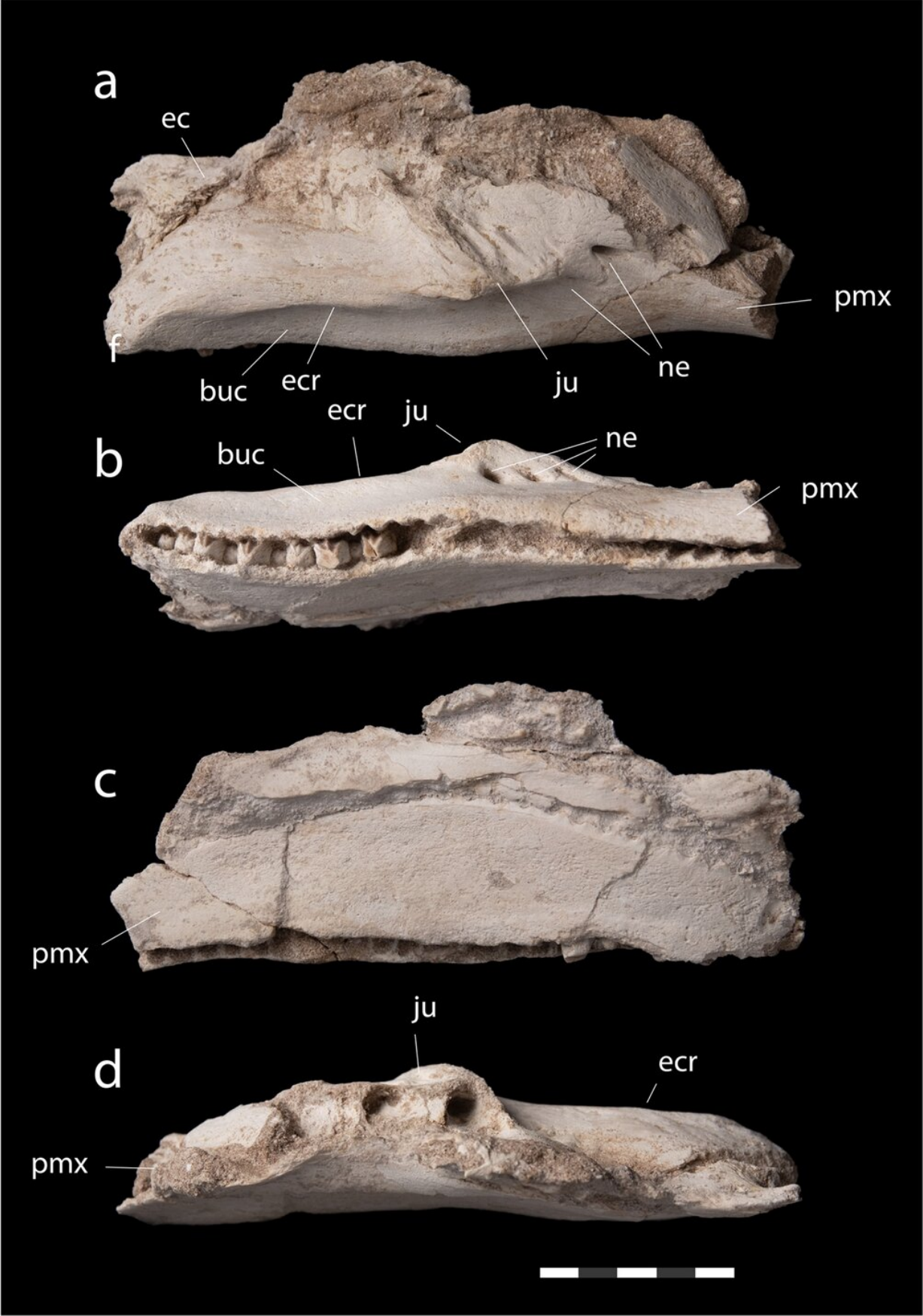


Little African duckbill dinosaurs provide evidence of an unlikely ocean crossing

February 20 2024, by Vicky Just



Minqaria bata nov. gen. et sp., MHNM.KHG.1395, holotype, Sidi Chennane, Oulad Abdoun Basin, Upper Couche III, late Maastrichtian. Right maxilla of in (a), lateral, (b), ventral, (c), medial, and (d), dorsal views. Abbreviations: buc, buccal fossa ec, ectopterygoid process, ecr, ectopterygoid ridge; ju, jugal articular facet, ne, neurovascular foramina, pmx, premaxillary process. Scale = 5 cm. Credit: *Scientific Reports* (2024). DOI: 10.1038/s41598-024-53447-9

Fossils of pony-sized duckbill dinosaurs from Morocco have been discovered by an international team of scientists. Their analysis reveals a surprising connection between the dinosaurs of Europe and Africa.

How did duckbill dinosaurs, a group that evolved in North America, end up in Morocco? At the end of the Cretaceous period, 66 million years ago, high sea levels and the breakup of the supercontinent Pangaea left Africa as an isolated island continent. It was surrounded on all sides by water.

Several years ago, remains of a member of the duckbill dinosaur family—a group that evolved in North America—were, however, found in Africa, raising the question of just how they got there.

Now, a new study [published](#) in *Scientific Reports* reveals that not only did duckbills manage to cross the Tethys Sea, but they became highly diverse once they colonized Africa, with at least three species inhabiting North Africa at the end of the Cretaceous.

The fossils from Morocco reveal a new species of duckbill dinosaur, *Minqaria bata*, which was around 3–4 meters long and weighed about 250kg, about the size of a pony. Even though the animal was tiny by the

duckbill standards, the bones of the skull were tightly knit together, showing it was mature.

The anatomy of the new duckbill closely resembles that of European species, suggesting that the duckbills swam or floated across several hundred kilometers of open water to colonize North Africa.

Furthermore, bigger bones suggest a third and larger species, about 5–6 meters long.

The study was conducted by Dr. Nicholas Longrich of the Department of Life Sciences and the Milner Center for Evolution at the University of Bath, Xabier Pereda-Suberbiola of the University of the Basque Country, Nathalie Bardet of the Muséum National d'Histoire Naturelle, and Nour-Eddine Jalil, of the Muséum National d'Histoire Naturelle and Museum of Natural History of Marrakesh, Universite Cadi Ayyad.

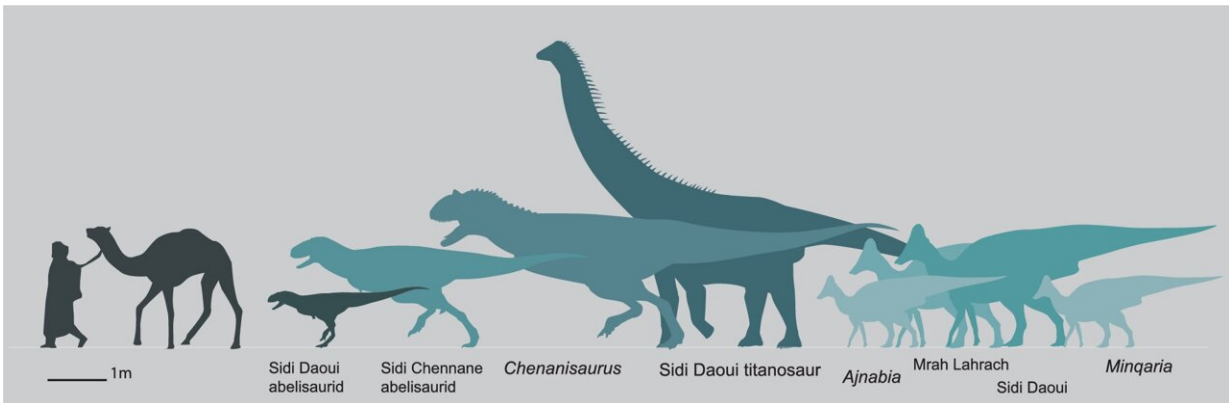
The new dinosaur is named *Minqaria bata* (Arabic for "beak" and "duck" respectively). *Minqaria* closely resembles the only previously known African duckbill, *Ajnabia odysseus*, but the shape of the jaws and teeth is distinct, showing it was a different species, and probably occupied a different ecological niche.

Both *Minqaria* and *Ajnabia* were part of the subfamily *Lambeosaurinae*, a group of duckbills known for their elaborate head crests. These crests weren't purely for show; they housed long nasal passages that could resonate like a horn.

"These were probably loud, vocal animals," said Dr. Longrich, who led the study. "Modern birds vocalize to find mates, or to declare territories. But they're especially vocal in flocks—a flock of flamingos or a nesting colony of pelicans is extremely noisy, constantly communicating.

"So it's likely that like birds, these duckbills were [social animals](#)."

The brain is also large by dinosaur standards, a feature associated with social animals like crows and primates. Dr. Longrich said, "There were probably very loud, noisy herds—or flocks if you prefer—of these little duckbills wandering the coasts of Morocco 66 million years ago."



Late Maastrichtian dinosaurs of the latest Cretaceous Phosphates of Morocco. Minqaria at far right. Credit: *Scientific Reports* (2024). DOI: 10.1038/s41598-024-53447-9

Minqaria was a small animal, but the bones surrounding the brain are tightly knit together and partially fused, showing that it was a fully-grown adult. The other Moroccan species, Ajnabia, was about the same size. Bigger bones also studied by the team, including an arm bone and a thigh bone, suggest a third, larger species.

"Not only did duckbills manage to reach Africa at the end of the Cretaceous," said Longrich, "But once they did, they quickly evolved to take advantage of open niches and became diverse."

At the end of the Cretaceous, sea levels were high, flooding much of the

continents, and the Earth's land was fragmented by the breakup of Pangaea and continental drift. That left Africa floating alone in the ocean, an island continent like modern-day Australia. But duckbill dinosaurs, evolving long after the land connections had been broken, somehow managed to get to Africa.

"It's extremely improbable that dinosaurs could cross water to get to Africa," said Longrich, "but improbable isn't the same as impossible. And given enough time, improbable things become probable. Buy a lottery ticket every day, and if you wait long enough, you'll win.

"These ocean crossings might be once-in-a-million-year events but the Cretaceous lasted nearly 100 million years. A lot of strange things will happen in that time—including dinosaurs crossing seas."

Modern animals, he noted, have sometimes been seen making unusual ocean journeys. Iguanas swept offshore by a hurricane in the Caribbean washed up on another island, hundreds of kilometers away. A tortoise from the island of Aldabra was washed out to sea and drifted ashore in Tanzania, 700 kilometers away. Deer, elephants, and hippos swam out to the island of Crete during the ice age.

"These duckbills are maybe the most surprising find of my career," said Longrich. "If you asked me what kind of dinosaurs we'd find in Africa, then a duckbill is the last thing I would have imagined, let alone three species.

"There's still so much unknown in the [fossil record](#), but if there wasn't, we wouldn't need to keep collecting fossils."

Dr. Nour-Eddine Jalil of the Natural History Museum in Paris and the Université Cadi Ayyad, said, "The phosphates of Morocco offers new images on past biodiversity in a key period of the history of life, the last

moments of the dinosaur age followed by the diversification of mammals, announcing a new era.

"Minqaria and its relatives are players that a few years ago we would never have supposed to be on the African continent at that time.

"Despite their marine origin, these phosphates of Morocco also contain remains of vertebrates that lived on land. They constitute one of the only windows on the terrestrial ecosystems in Africa. The dinosaur remains suggest a great diversity, all the three major groups of dinosaurs are represented, the abelisaurid carnivores and the sauropod and ornithischian herbivores."

More information: Nicholas R. Longrich et al, A new small duckbilled dinosaur (Hadrosauridae: Lambeosaurinae) from Morocco and dinosaur diversity in the late Maastrichtian of North Africa, *Scientific Reports* (2024). [DOI: 10.1038/s41598-024-53447-9](https://doi.org/10.1038/s41598-024-53447-9)

Provided by University of Bath

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