

TRILOBITES

The Biggest Penguin That Ever Existed Was a ‘Monster Bird’

Fossils found in New Zealand highlight an era after the dinosaurs when giant flightless birds prowled the seas for prey.

By Jack Tamisiea

Feb. 8, 2023, 12:00 p.m. ET

Sign up for Science Times Get stories that capture the wonders of nature, the cosmos and the human body. [Get it sent to your inbox.](#)

New Zealand has been a haven for earthbound birds for eons. The absence of terrestrial predators allowed flightless parrots, kiwis and moas to thrive. Now researchers are adding two prehistoric penguins to this grounded aviary. One species is a beefy behemoth that waddled along the New Zealand coastline nearly 60 million years ago. At almost 350 pounds, it weighed as much as an adult gorilla and is the heaviest penguin known to science.

Alan Tennyson, a paleontologist at Museum of New Zealand Te Papa Tongarewa, discovered the supersize seabird’s bones in 2017. They were deposited on a beach known for large, cannonball-shaped concretions called the Moeraki Boulders. The churn of the tide cracked open several of these 57-million-year-old boulders, revealing bits of fossilized bones inside.

Dr. Tennyson and his colleagues identified the fossilized remains of two large penguins. The humerus of one, at more than nine and a half inches long, was nearly twice the size of those found in emperor penguins, the largest living penguin. Other boulders yielded bones from a smaller, more complete penguin species that also appeared to be larger than a modern emperor penguin.

The researchers described the ancient birds Wednesday in the *Journal of Paleontology*. They named the larger penguin *Kumimanu* (a mash-up of the Maori words for “monster” and “bird”) *fordycei* and named the smaller penguin *Petradyptes* (“rock diver”) *stonehousei*.

By creating 3-D models of Kumimanu's humongous humerus and comparing its size and shape with the flipper bones of prehistoric and modern penguins, the researchers estimate that the "monster bird" weighed a whopping 340 pounds — 15 pounds heavier than Lane Johnson, the right tackle anchoring the Philadelphia Eagles offensive line in the Super Bowl.



A cast of Kumimanu's humerus, left, created from 3-D scans, alongside a humerus of an emperor penguin.

Daniel Ksepka

According to Daniel Ksepka, a paleontologist at the Bruce Museum in Greenwich, Conn., and an author of the new study, the Kumimanu's fragmented skeleton makes it difficult to pinpoint its height. Dr. Ksepka estimates that it stood around 5 feet 2 inches, giving it a stocky build. *Petradyptes* was not a lightweight, either. It weighed 110 pounds, making it heftier than modern emperor penguins, which top out at 88 pounds.

Both Kumimanu and *Petradyptes* plied the waters off New Zealand during a sweet spot in oceanic history, according to Dr. Ksepka. The asteroid impact that ended the dinosaur era had wiped out most marine reptiles while the ancestors of seals and whales were still on land. This meant there were few things that would mess with a black-bear-size penguin.

"If you're a little one-pound penguin, a gull can just rip your head off," Dr. Ksepka said. "But a 300-pound penguin is not going to worry about a sea gull landing near it because it would just crush it."

Despite their prodigious size, Kumimanu and *Petradyptes* possessed primitive flippers

reminiscent of modern seabirds like auks and puffins that fly and dive. Julia Clarke, a paleontologist at the University of Texas at Austin who studies the evolution of diving in birds and was not involved in the new study, said it would make sense for early penguins like Kumimanu and Petradypetes to retain several features left over from their ancestors' airborne lifestyle.



A skeletal sketch comparing, from left, Kumimanu, Petradypetes, the two new fossil penguins, and an emperor penguin. Simone Giovanardi

The new species add evidence that prehistoric penguins became huge before they fine-tuned their flippers into paddle-like appendages. Heavier seabirds are able to dive deeper and longer than their lighter counterparts, Dr. Ksepka said. The extra paunch would also have helped these penguins stay warm in the water.

While Kumimanu was mighty, it didn't crowd out its smaller penguin cousins. "You have super large penguins eating the largest prey items and you also have mid-sized and smaller-bodied penguins, and they can all specialize within a crowded penguin environment," Dr. Clarke said.

Despite plenty of seafood and little competition, these penguins could probably grow only so big.

"I believe that Kumimanu is close to the upper limit of a flightless seabird and I do not expect substantially larger penguins to be found," said Gerald Mayr, a paleontologist at

the Senckenberg Research Institute in Frankfurt who described the closely related 220-pound *Kumimanu biceae*. Dr. Mayr, who was not involved in the new study, notes that heavier birds would most likely crush their eggs into yolky smithereens.

As some of the earliest fossil penguins, *Kumimanu* and *Petradyptes* reveal just how quickly penguins packed on pounds after they stopped taking to the skies.

“Once you know you’re not flying anymore,” Dr. Ksepka said, “the sky’s the limit.”