THE FOSSIL remains of a cat-sized crocodile with canine teeth, a flexible backbone and armour-plated tail have been discovered by an international team of scientists in Tanzania.

University of Ohio palaeontologist Dr Patrick O’Connor said the 105 million-year-old crocodile had legs that “were longer and more slender” than those of modern crocodiles, suggesting the 50cm-long creature spent more time on land hunting for insects and small prey.

“Its head would fit in the palm of your hand,” he said.

The feline crocodile, Pakasuchus kapilimai, also had nostrils at the tip of its dog-like snout. Modern crocodiles have nostrils or nares, on the top of their heads to enable them to breathe while swimming.

“It was not like the crocodiles we know today, which are submerged much of the time. It was up, moving around on the land,” O’Connor said.

But perhaps the biggest difference from its modern relatives is the small creature’s mammal-like teeth, which gave it the ability to chew food.

“As we were able to get a close look at the teeth, we knew we had something new and very exciting,” O’Connor said.

“Chewing is a mammalian characteristic, almost by definition. Most people who do functional anatomy or palaeontology reserve the term for mammals only.”

The research team used computer imaging known as tomography to construct a series of three-dimensional images of the animal’s skull and to show how its jaws would have moved. This imaging showed its teeth were similar to those of modern mammals, with canines and molars. Crocodiles have simple, peg-like teeth which allow them to bite chunks to swallow whole.

Details of the remarkable discovery have been published in the latest issue of global science journal Nature.

The fossil is the most mammal-like form found so far of an extinct group of reptiles called the notosuchians, southern crocodiles. This group includes a large “buck-toothed” Chinese crocodile that may have been a herbivore, and a Brazilian species with thick body armour similar to an armadillo.

The fossil remains of Pakasuchus kapilimai were found in sandstone on a riverbank in the Rukwa Rift Basin in Tanzania. These small crocodiles date back to the mid-Cretaceous, when the southern supercontinent of Gondwana was breaking up into South America, Australia, Antarctica and Africa. University of Queensland palaeontologist Dr Steve Salisbury said the cat-odiles existed at a time when Australia was still connected to Antarctica, but had begun to drift away from Africa.

“It’s entirely possible that we could find fossils of Pakasuchus down in Antarctica. It was a very different place when these animals would have been around,” he said.

Fossil records from Antarctica show evidence of warmer climate trees such as hoop and kauri pines, and late flowering plants.

Salisbury and O’Connor worked together on a research ship in Antarctica earlier this year, and spent many hours discussing the unique fossil find.

“We don’t know why these animals died out, but it’s a shame they’re not around anymore. One theory is they may have come into direct competition with more advanced mammals, who were more efficient hunters.”