

A small lizard-like animal whose fossil remains were found in an ancient Scottish lakebed may have been one of the first creatures to live on dry land, according to United Kingdom scientists.

The 15-centimetre specimen, named *Casineria kiddi*, dates from almost 340 million years ago, a dark age of animal evolution about which little is known. All life on earth can ultimately be traced back to the sea. Creatures with limbs and digits rather than fins had evolved from fishes by the end of the Devonian period, about 365 million years ago.

But there is a yawning gap between this point in time and the appearance of fully terrestrial animals in the late Carboniferous period, about 335 million years ago, which remains largely a mystery.

The new fossil, found in a rock formation called the Cheese Bay Shrimp Bed, near Edinburgh provides one of the few clues to what was happening during these 30 million years. The creature's remains consist of a number of fossilised skeletal fragments but the skull is missing. Its most important feature is a five-digit limb, the earliest known in the fossil record.

This marks out *Casineria kiddi* as a land-dweller, placing it closer to amniotes - the group of animals that include modern reptiles, mammals and birds - than aquatic amphibians. The discovery suggests that

amniotes go back a long way, to an era of rapid evolution early in the Carboniferous period.

A team of English and Scottish experts led by Tim Smithson, from Cambridge Regional College described the find recently in the journal *Nature*. He wrote: "The degree of terrestriality exhibited by *Casineria* indicates that the transition to land-dwelling may ... have taken place within a period of about 20 million years.

"The physical resemblance of *Casineria* to known true amniotes from the Late Carboniferous (period) and its apparent phylogenetic relationship to these forms indicates that the split between amphibians and amniotes probably also occurred rapidly within this time span."

Amniotes are all vertebrates that possess an extraembryonic layer called an amnion. These animals may reproduce on land and may respire without the assistance of a body of water. Although some members of Lissamphibia (toads mostly) may travel great distances away from water, they still require great amounts of moisture in which to lay their eggs. Amniotes lay eggs with a water-preserving covering or give live birth. The amnion, a layer within the egg or womb, replaces the aquatic environment required for developing vertebrate embryos. Today amniotes exist in a variety of sizes and body forms. Hummingbirds, crocodiles, and whales are all amniotes (and you are too).

LIFE ON EARTH BEGAN IN SCOTLAND

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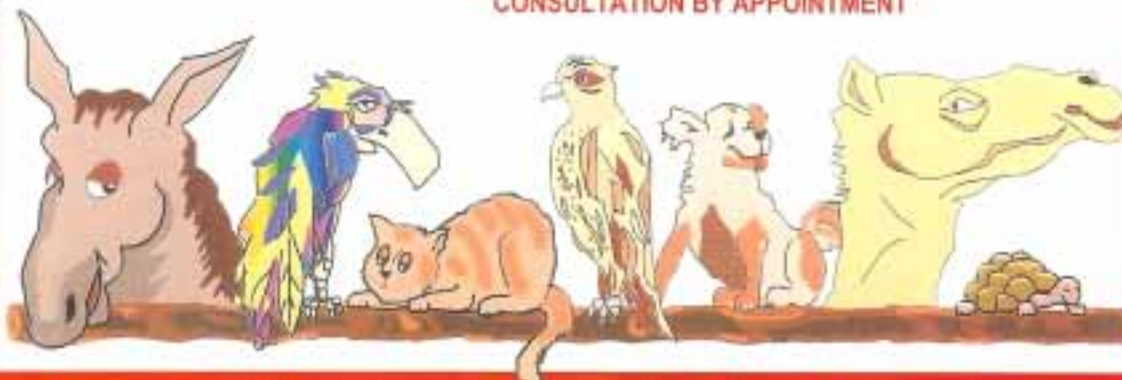
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