

# Living fossil still calls Australia home

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They are separated by a vast ocean and by millions of years, but tiny prehistoric bones found on an Australian farm have been directly linked to a strange and secretive little animal that lives today in the southern rainforests of South America.

The fossilised ankle and ear bones are those of Australia's earliest known marsupial, *Djarthia*, a primitive mouse-like creature that lived 55 million years ago. It is a kind of Australian Eve, possibly the mother of all the continent's unusual pouched mammals, such as kangaroos, koalas, possums and wombats.

But a new study in the journal PLoS ONE has confirmed that *Djarthia* is also a primitive relative of the small marsupial known as the Monito del Monte – or "little mountain monkey" – from the dense humid forests of Chile and Argentina.

Although scientists now generally agree that marsupials found their way to Australia from South America, the new finding suggests that the Monito del Monte may subsequently have made the return journey and is indeed a living fossil, the last of a lineage that can be traced back to *Djarthia*.

The bones were collected from the Tingamarra fossil site near Murgon, in Queensland, and have been studied by a research team led by Mr Robin Beck, a doctoral student in palaeontology at the University of New South Wales, in Sydney.

"It's now accepted that Australia's marsupials are the result of dispersal from South America via Antarctica, when the three continents were joined as part of the super-continent Gondwana," Mr Beck says.

"We know from other fossils that marsupials were present in South America at least five million years before Djarthia, which is by far Australia's oldest and most primitive marsupial fossil.

"Scientists already suspected that the Monito del Monte is more closely related to Australia's marsupials than to South America's, but its exact origins have been controversial. Until now, we only knew Djarthia from isolated teeth, which weren't enough to tell us whether it was related to the Monito del Monte or not."

"The fossil ankle and ear bones of Djarthia make it clear that the Monito del Monte descends from a Djarthia-like ancestor, and so probably returned to South America from Australia before Gondwana broke up. The continents have been separated by deep ocean since about 40 million years ago."

Like the Monito del Monte, Djarthia was a little larger than a mouse and, likewise, its ankle bones show adaptations for climbing trees. It probably had a similar diet as well: the Monito del Monte eats insects and other small invertebrates and some fruits.

The Monito del Monte is nocturnal and its agility and prehensile tail make it an excellent climber. Females carry up to five young in a well-developed pouch.

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