

Ancestor of all modern crocodilians discovered in outback Queensland

June 14 2006



Isisfordia duncani

Fossils of the world's most primitive modern crocodilian have been discovered near the outback town of Isisford, in central-western Queensland, Australia.

The new animal, named *Isisfordia duncani*, is described today in the prestigious *Proceedings of the Royal Society* journal by an international team of palaeontologists, headed by Dr Steve Salisbury from The

University of Queensland's (UQ) School of Integrative Biology.

“These are the most complete crocodylian fossils yet discovered in Australia, and provide us with valuable new insights into the early evolution of today's crocodylians and their lifestyle as semi-aquatic ambush predators,” Dr Salisbury said.

“What's more, their discovery in Queensland suggests that the ancestor of all living crocodylians was Australian.”

Dr Salisbury said it had been a long-standing mystery as to where and when the immediate ancestors of modern-day crocodylians – crocodiles, alligators and gharials – originated.

“The appearance of *Isisfordia* signalled the dawn of crocodylians as we know them today,” he said.

“Living 98-95 million years ago, *Isisfordia* predates the first recorded appearance of alligators and gharials by almost 20 million years, and the first true crocodiles by over 30 million.

“The discovery of *Isisfordia* in Australia indicates that the precursors to all three groups of modern crocodylians may have originated in Gondwana, rather than Europe or North America, as was previously thought.”

Dr Salisbury said *Isisfordia* was small compared with the majority of its modern descendants and looked like a dwarf version of the American alligator, but with a much flatter and longer snout.

“Adults appear to have been just over a metre in length, and probably weighed no more than about three kilograms,” he said.

“It may only have been small by today's standards, but it represents a very important phase in the evolutionary history of crocodylians.”

Discovered by former Deputy Mayor of Isisford, Ian Duncan, after whom the new species has been named, the first fossils of Isisfordia were found in the mid-1990s in a dried-up creek bed on the outskirts of town.

Initial preparation of the fossils was undertaken at the Queensland Museum, with the remainder of the work being completed in Dr Salisbury's Vertebrate Palaeontology Laboratory at UQ.

Kerry Geddes, Dr Salisbury's Research Assistant, carried out most of the delicate preparation work on the more complete skeleton, which took two-and-half years and an estimated 3000 hours to complete.

“Unfortunately, the front portion of the skull was missing,” Dr Salisbury said.

“It was the only part of the skeleton that had been exposed to weathering.”

In April 2005, after four years of systematic exploration in the Isisford district, Dr Salisbury's team finally found a complete fossilised skull that would put a face on the new crocodylian.

“Apart from a slight difference in size, the rear of this new skull is identical to the portion that is preserved on the first skeleton, so we are sure that they belong to the same species,” he said.

Dr Salisbury said Isisfordia had features that are characteristic of modern crocodylians, such as vertebrae that fit together via loose ball-and-socket joints, and a fully formed bony secondary palate – a kind of

second roof to the mouth, that allows air to pass to the lungs without entering the oral cavity.

The research team comprised Dr Steve Salisbury (UQ), Dr Ralph Molnar (Museum of Northern Arizona), Dr Eberhard 'Dino' Frey (State Museum of Natural History, Karlsruhe, Germany) and Dr Paul Willis (University of New South Wales and 'Catalyst', ABC TV).

Source: University of Queensland

Citation: Ancestor of all modern crocodilians discovered in outback Queensland (2006, June 14) retrieved 20 April 2024 from

<https://phys.org/news/2006-06-ancestor-modern-crocodilians-outback-queensland.html>

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