

Aussie scientists discover oldest proof of live birth

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Australian scientists have discovered the oldest evidence of live birth on the planet, thanks to a fossil fish from Western Australia with a well-preserved embryo inside the body cavity.

The fish comes from Gogo, a world-famous fossil deposit in the Kimberley about 375 million years old, making it the oldest example of live birth known amongst the vertebrates (animals with backbones).

Researchers from Museum Victoria, the University of Western Australia and The Australian National University have collaborated in documenting this remarkable fossil – a new genus and species named *Materpiscis attenboroughi* after Sir David Attenborough – in *Nature* today.

The *Materpiscis* ('mother-fish' in Latin) was collected during a research trip to Western Australia in 2005 under an Australian Research Council Discovery Project based at ANU. Dr John Long, Head of Science at Museum Victoria (and Adjunct Professor, ANU), discovered the partly developed small skeleton inside the mother's body cavity when he extracted the specimen from limestone using acetic acid.

The specimen was X-rayed by Dr Tim Senden from the Department of Applied Mathematics at ANU using a special 3D CT scanner built and housed at the University. The fossil has revealed details of the umbilical cord and recrystallised yolk sac, soft tissue structures very rarely preserved as fossils.

“We never know, even in well-studied specimens, what additional information may be revealed by new techniques like XCT scanning - the embryo is a terrific start, but what other secrets these uniquely preserved specimens hold is even more exciting,” Dr Senden said.

Materpiscis belongs to the extinct armoured fish group called the Placodermi. Dr Kate Trinajstic from the University of Western Australia re-examined specimens in the museum collection in Perth and found three small embryos inside an adult female of a closely related form, Austroptyctodus. Previous descriptions of male Austroptyctodus by Dr Gavin Young (Research School of Earth Sciences, ANU) had already indicated an advanced reproductive biology involving copulation and internal fertilisation, as in modern sharks.

The preserved Materpiscis embryos now demonstrate that these placoderms did not lay eggs, but produced live young, a remarkably advanced reproductive strategy to have evolved in such an ancient fish.

“We hold a very significant Gogo fossil collection at ANU - perfect skeletons of ancient skulls and braincases. Recent research has revealed the oldest preserved vertebrate muscle tissue and nerve fibres, and now we have the oldest evidence of the umbilical cord and yolk sac” Dr Young said.

Source: Australian National University

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