

Fossil fish shows oldest live birth

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Illustration of how this ancient fish, a placoderm, gave birth to live young ©
Museum Victoria

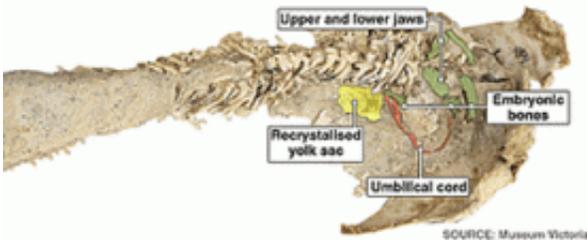
(PhysOrg.com) -- A 380-million-year-old fossil fish that shows an unborn embryo and umbilical cord has been discovered, scientists report in the journal *Nature*.

The extremely rare specimen shows incredible detail. The umbilical cord is attached to an area of small bones, corresponding to the embryo. This means the fish would have given birth to live young, known as viviparity and is the oldest record of this kind known.

'The find is important because it provides concrete evidence for viviparity,' says Zerina Johanson, fossil fish curator (expert) at the Natural History Museum.

'It is extremely rare to find preservation like this in the fossil record.'

This new discovery extends the record of viviparity further back almost 200 million years'.



Fossil specimen found in Australia showing the umbilical cord and embryo parts.
© Museum Victoria

Advanced reproduction

Viviparity, where a mother gives birth to live young, is an advanced form of reproduction and it is most often found in mammals.

This specimen belongs to an ancient species of fish that was previously thought to have had a more primitive form of reproduction where fertilisation happens externally.

However, the specimen shows evidence of viviparity and a reproductive biology that is comparable to that of some modern sharks and rays.

Careful unearthing

The well-preserved specimen is from the Gogo Formation in western Australia where many other fossil fishes have been discovered.

These fossils are unearthed using an acid solution to break down the

limestone around the fossil. John Long (Museum Victoria, Melbourne, Australia) and colleagues were able to reveal even finer details because they used a lower concentration of acid.

'Long and his colleagues observed small placoderm bones within the body cavity of an adult placoderm,' says Johanson.

'One could say that this indicates that the adult simply ate the smaller specimen, but the concrete evidence comes in the form of a fine, curled cord in association with the small bones. Long and his colleagues suggest this is an umbilical cord, indicating a placental connection between adult and embryo.'

New species

The fossil fish belonged to an extinct diverse group of fish called placoderms. The fish is a new species, named *Materpiscis attenboroughi* after David Attenborough, who first drew attention to the Gogo fish sites in the Life on Earth TV series in 1979.

'Placoderms as a group represent the most primitive group of jawed vertebrates, so the work of Long and colleagues shows that viviparity evolved very early during vertebrate history,' Johanson concludes.

Provided by Natural History Museum

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