

Billion-year-old fossil reveals missing link in the evolution of animals

April 29 2021, by Emma Griffiths



Credit: CC0 Public Domain

A billion year old fossil, which provides a new link in the evolution of animals, has been discovered in the Scottish Highlands.



A team of scientists, led by the University of Sheffield in the UK and Boston College in the U.S., has found a microfossil which contains two distinct cell types and could be the earliest multicellular animal ever recorded.

The fossil reveals new insight into the transition of single-celled organisms to complex multicellular animals. Modern single-celled holozoa include the most basal living animals, the fossil discovered shows an organism which lies somewhere between <u>single cell</u> and multicellular animals.

The fossil has been described and formally named Bicellum Brasieri in a new research paper published in *Current Biology*.

Professor Charles Wellman, one of the lead investigators of the research, from the University of Sheffield's Department of Animal and Plant Sciences, said: "The origins of complex multicellularity and the origin of animals are considered two of the most important events in the history of life on Earth, our discovery sheds new light on both of these.





This enhanced image of Bicellum brasieri shows an outer wall of sausage-shaped cells enclosing an inner cell mass. The fossil reveals multicellular structure in an early animal form 400 million years earlier than previously established. Credit: P.K. Strother

"We have found a primitive spherical organism made up of an



arrangement of two distinct cell types, the first step towards a complex multicellular structure, something which has never been described before in the fossil record.

"The discovery of this new fossil suggests to us that the <u>evolution</u> of multicellular animals had occurred at least one billion years ago and that early events prior to the evolution of animals may have occurred in freshwater like lakes rather than the ocean."

Professor Paul Strother, lead investigator of the research from Boston College, said: "Biologists have speculated that the origin of <u>animals</u> included the incorporation and repurposing of prior genes that had evolved earlier in unicellular organisms.

"What we see in Bicellum is an example of such a genetic system, involving cell-cell adhesion and cell differentiation that may have been incorporated into the animal genome half a billion years later."

The fossil was found at Loch Torridon in the Northwest Scottish Highlands. Scientists were able to study the fossil due to its exceptional preservation, allowing them to analyze it at a cellular and subcellular level.

The team hope to now examine the Torridonian deposits for more interesting fossils which could provide more insight into the evolution of multicellular <u>organisms</u>.

More information: Paul K. Strother et al. A possible billion-year-old holozoan with differentiated multicellularity, *Current Biology* (2021). DOI: 10.1016/j.cub.2021.03.051



Provided by University of Sheffield

Citation: Billion-year-old fossil reveals missing link in the evolution of animals (2021, April 29) retrieved 27 April 2024 from https://phys.org/news/2021-04-billion-year-old-fossil-reveals-link-evolution.html

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