

# Key moment in the evolution of life on Earth captured in fossils

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The Welsh countryside near the Coed Cochion Quarry, where the fossils were found. Credit: Curtin University

Curtin-led research has for the first time precisely dated some of the oldest fossils of complex multicellular life in the world, helping to track a pivotal moment in the history of Earth when the seas began teeming with new lifeforms—after 4 billion years of containing only single-celled microbes.

The [research paper](#), "U–Pb zircon-rutile dating of the Llangynog Inlier, Wales: Constraints on an Ediacaran shallow 1 marine [fossil](#) assemblage from East Avalonia," appears in the [\*Journal of the Geological Society\*](#).

Lead author Ph.D. student Anthony Clarke, from the Timescales of Mineral Systems Group within Curtin's School of Earth and Planetary Sciences, said to determine the age of the fossils, researchers used volcanic ash layers like bookmarks in the geological sequence.

"Located in the Coed Cochion Quarry in Wales, which contains the richest occurrence of shallow marine life in Britain, we used outfall from an ancient volcano that blanketed the animals as a time marker to accurately date the fossils to 565 million years, accurate down to 0.1%," Clarke said.

"With similar Ediacaran fossils found at sites around the world including in Australia, dating the fossils identifies them as being part of an ancient living community that developed as Earth thawed out from a global ice age.

"These creatures would in some ways resemble modern-day [marine species](#) such as jellyfish, yet in other ways be bizarre and unfamiliar. Some appear fern-like, others like cabbages, whereas others resembled sea pens."

Study co-author Professor Chris Kirkland, also from the Timescales of Mineral Systems Group at Curtin, said the fossils are named after the

Ediacara Hills in South Australia's Flinders Ranges, where they were first discovered, leading to the first [new geological period](#) established in over a century.

"These Welsh fossils appear directly comparable to the famous fossils of Ediacara in South Australia," Professor Kirkland said.

"The fossils, including creatures like the disk-shaped *Aspidella terranovica*, showcase some of the earliest evidence of large-scale [multicellular organisms](#), marking a transformative moment in Earth's biological history.

"Ediacaran fossils record the response of life to the thaw out from a global glaciation, which shows the deep connection between geological processes and biology.

"Our study underscores the importance of understanding these ancient ecosystems in order to unravel the mysteries of Earth's past and shape our comprehension of life's evolution."

**More information:** U–Pb zircon-rutile dating of the Llangynog Inlier, Wales: Constraints on an Ediacaran shallow 1 marine fossil assemblage from East Avalonia', *Journal of the Geological Society* (2024). [DOI: 10.1144/jgs2023-081](#). [www.lyellcollection.org/doi/10.1144/jgs2023-081](http://www.lyellcollection.org/doi/10.1144/jgs2023-081)

Provided by Curtin University

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