

What Came Before the Cambrian?

Advanced Reading

The Cambrian Explosion was an era of significant evolution of animal life. What came before the Cambrian era that, in a sense, opened the door for the new body forms to evolve? The geologic era before the Cambrian was called the Ediacran, lasting from about 635 to 542 million years ago. Scientists often characterize this era as an “experimental” phase in the evolution of animals.

By this time unicellular life had been around for millions of years and a mat of microbes covered parts of the seafloor. The first multicellular animals that evolved could have grazed on those microbes. The fossils from the Ediacran mostly show soft-bodied organisms. Some of these fossils look like fronds, discs and blobs, and aren't easy to identify. Others seem to be related to Cnidarians or to be soft-bodied relatives of arthropods or perhaps Echinoderms. In addition, there are trace fossils, probably made by worm-like creatures. Many of the fossil animals remain mysterious and may represent lines of animals that no longer exist.

But fossils are not the only evidence of animal life in the Ediacran. In fact the first evidence of sponges is not a body fossil but rather a biochemical fossil. When an animal dies, some of its molecules break down into a stable form that can last in rocks for millions of years just like body fossils. These are biochemical fossils. Scientists have found an Ediacran biochemical fossil of a fat molecule found today only in sponges.

The name Ediacran comes from the Ediacra Hills of South Australia, the most famous location of these fossils. It's not the only location of these fossils: they have been found in over 30 different sites worldwide. From Newfoundland, to the Ukraine, to Namibia and the Mohave Desert in California, these fossils continue to puzzle scientists.

Photos:

https://commons.wikimedia.org/wiki/File:Cyclomedusa_cropped.jpg

<https://commons.wikimedia.org/wiki/File:DickinsoniaCostata.jpg>

https://commons.wikimedia.org/wiki/Category:Ediacaran_fossils#/media/File:Kimberella_quad_rata_4.jpg

Resources

- The Geological History of Canada, as part of [The Nature of Things](#) series, CBC-SRC; 2011; Eastern Canada.
- The first episode of a BBC documentary titled [Life on Earth](#), with [David Attenborough](#) as narrator.
- Another documentary narrated by [David Attenborough](#) titled [First Life](#) featuring *Charnia*, *Dickinsonia*, *Spriggina*, *Funisia*, and *Kimberella* animated in CGI.
- BBC podcast - In our time - Edicara Biota - 9 July 2009 - <http://www.bbc.co.uk/programmes/b00lh2s3>