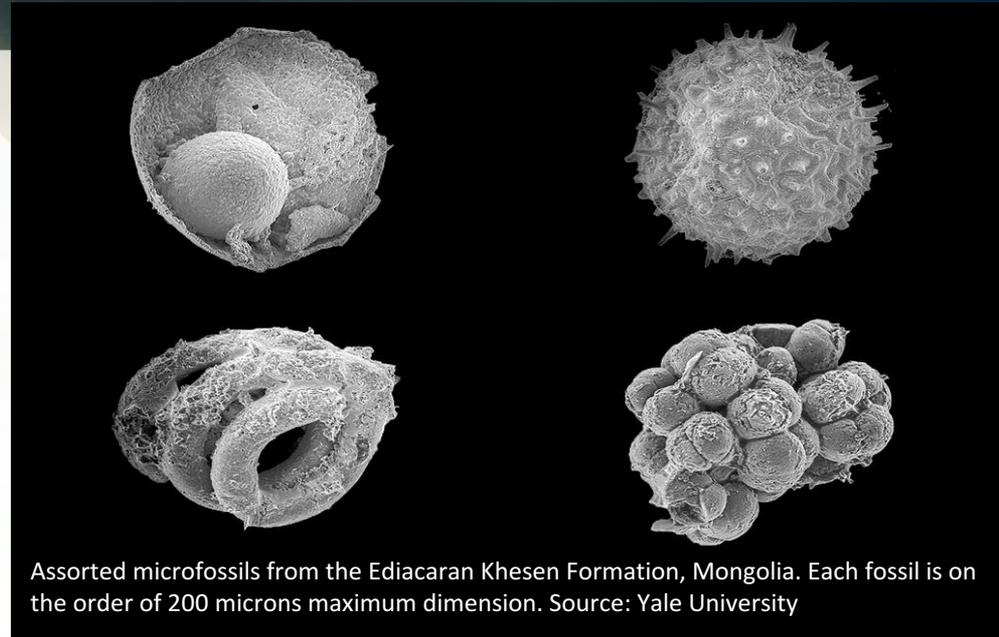


Mongolian Microfossils Point to the Rise of Animals on Earth

BACKGROUND: Understanding when, how, and why animals evolved is a fundamental question about life on Earth and is vital to understanding the conditions that might allow complex life to evolve on other planets. Chemical traces of animals are preserved in rocks as old as ~640 million-years and differences between the genetic material of various modern animals suggest they evolved almost ~800 million-years-ago. In spite of this evidence for ancient animal life, however, definitive animal fossils are unknown from rocks of this age.

THE RESEARCH: 600 million-year-old microscopic fossils from South China were interpreted as embryos of animals almost 20 years ago. If their animal nature were confirmed, these would be the oldest animal fossils. However, alternative possibilities include algae or bacteria and the nature of these fossils is still debated. Recent fieldwork in northern Mongolia recovered an assemblage of microscopic fossils similar to those found in South China (at least 8 different types). Among them are spiny microfossils known as Doushantuo Pertatataka-type acritarchs, now extinct, and most notably additional embryo-like forms.

TAKE-HOME: The new Mongolian fossils are slightly younger (~545 million-years-old) than those from South China and show that many of the spiny microfossils known from China and elsewhere survived much longer than we thought. Some of the new fossils from Mongolia preserve features of animal embryos and may add enough information to allow us to determine whether these really are the oldest animal fossils. Future field work on these Mongolian rocks should result in significant discoveries in years to come.



Assorted microfossils from the Ediacaran Khesen Formation, Mongolia. Each fossil is on the order of 200 microns maximum dimension. Source: Yale University