

Modern Microbial Ecosystems Provide Window to Early Life on Earth

A new study on the growth and structure of microbial reefs known as stromatolites, gave a new perspective on these modern features that have a fossil record dating back 3 billion years.

- Stromatolites are rare in modern environments, but can be found in high salinity environments, where grazing and competition from modern animals is scarce. Similar to coral reefs, they are comprised of limestone, but are constructed by microbes rather than tiny multicellular animals (coral polyps).
- Three years of data collection were used to map communities in Shark Bay, Australia, and revealed features of modern communities that are shared with Precambrian stromatolites, including eight distinct morphological 'provinces' many of which were previously unknown.



Elongate nested stromatolites, one of the eight structures, and previously unknown in Hamelin Pool



Probing a massive segmented stromatolite in Hamelin Pool, Shark Bay, Western Australia.

- In addition to new large-scale structural features, the study revealed that the microbial communities forming the mats were different than previously understood, and that rather than trapping and binding particles, minerals like carbonate were actively precipitating in the stromatolites.
- Fossilized stromatolites hold a record of early life and early stromatolite-forming microbes produced the atmospheric oxygen that allowed for more complex life to evolve. Modern-day stromatolites are a living laboratory for studying these examples of ancient life.