From the Earth's Formation to the Appearance of Cyanobacteria

When the Earth was formed, approximately 4.6 billion years ago, its surface is thought to have been covered by molten magma with no traces of water, whether as liquid, solid, or gas.

The formation of water

Scientific research suggests that following the Earth's formation, gas that had been dissolved in the ocean-like magma was released into the atmosphere. The Earth began to cool, and the magma ocean solidified, forming a hard crust atop which water accumulated in liquid form, giving rise to a primordial sea.

The primordial ocean

Large amounts of metals in the form of ions, including iron and manganese, were dissolved into the primordial ocean, but there was still no trace of oxygen at this point. Protocells, the precursors of living organisms, were born in this ocean, leading to the evolution of anaerobic microorganisms, which did not need oxygen to grow.

Shaping the course of evolution

The earliest cyanobacteria appeared on Earth about 3.5 billion years ago. The photosynthetic activity of these ancient cyanobacteria provided the primordial ocean with oxygen. This caused the oxidation of metal ions, forming minerals that precipitated to the bottom of the ocean.