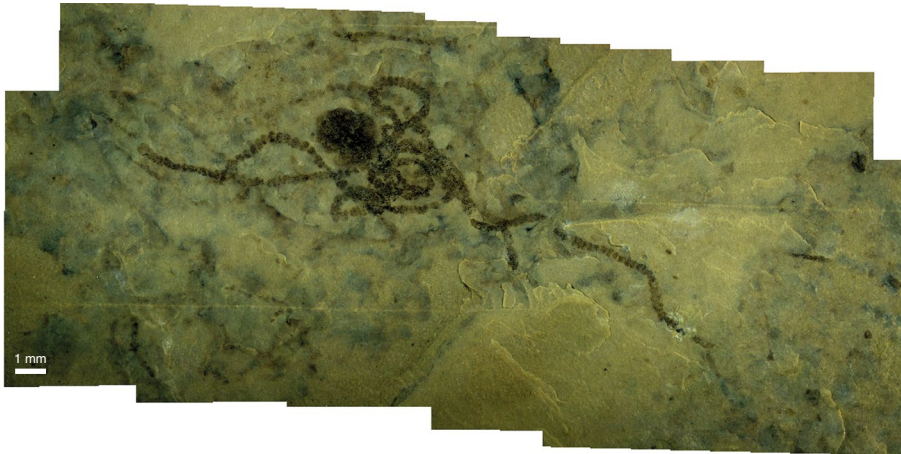


CYANOBACTERIA

Ancient nitrogen fixers

Curr. Biol. **28**, 616–622 (2018)



Credit: Ke Pang, Nanjing Institute of Geology and Palaeontology (NIGPAS)

Cyanobacteria are an ancestral and diverse clade of oxygenic photosynthetic bacteria. The emergence of cyanobacteria is believed have driven the oxygenation of the atmosphere and changed the composition of life forms on our planet. In addition to CO₂ fixation and O₂ release, many cyanobacteria play key roles in the N₂ cycle, and some have developed a special type of thick-walled cell called a heterocyst, which contains the nitrogenase enzyme complex for N₂ fixation. Recently, Ke Pang and his colleagues from the Nanjing Institute of Geology and Palaeontology at the Chinese Academy of Sciences and the Department of Geosciences, Virginia Tech, reported a new collection of heterocystous cyanobacterial fossils from the Tonian period (~1,000–720 million years ago), making the finds some of the earliest nitrogen-fixing cyanobacteria known.

The fossils were collected in the Anhui province of China. Some showed remarkable filamentous and specialized structures, leading to the conclusion that these filaments

represent a new genus of multicellular cyanobacteria. Pang et al. named it *Anhuiithrix magna*. In detailed analyses of the *A. magna* specimens, they identified cell pairs that are probably produced by transverse binary fission, short fragments that are possibly asexual reproductive structures and large globose akinetes, which are stress-tolerant cells formed by heterocystous cyanobacteria. Moreover, they found that *A. magna* is entangled with multiple filamentous taxa, indicating a palaeoecological role of *A. magna*, possibly as a benthic microbial-mat builder.

Fossils establish and frequently change our understanding of biological evolution, and *A. magna* may now help scientists to determine when nitrogen-fixing cyanobacteria first evolved.

Lei Lei

Published online: 1 March 2018
<https://doi.org/10.1038/s41477-018-0120-2>