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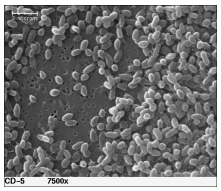

Fossil bacteria from Greenland ice probes

Frozen Fossils Have Been Brought Back to Life

Ancient bacteria trapped in the Antarctic ice

Do not expect the frozen mammoths found in Siberia to wake up and walk after being defrost. But a team led by Kay Bidle of Rutgers University has managed to bring back to life some fossil bacteria trapped in Antarctic ice at least 100,000 years old. The ancient bacteria started to develop metabolism and to grow when offered warmth and nutrients in a lab. The team investigated five samples of ice ranging from 100,000 years to 8 million years in age. "We didn't really know what to expect. We knew that microorganisms were really hardy," said Bidle, an assistant professor of marine and coastal sciences.The 8 million years probes were taken from the oldest known ice on Earth, but the researchers managed to bring back to life only bacteria from the younger samples."Microorganisms from the older ice didn't do as well, growing only very slowly. Some of the oldest microorganisms were watched for as long as a year, compared to the week or so it usually takes to culture bacteria." said Bidle. Naming the ice cores "gene popsicles" the team discovered the presence of some of the most common bacteria still inhabiting Earth, like firmicutes, proteobacteria and actinobacteria."These are microorganisms that have been around a long time, not something Earth hasn't seen before." said Bidle. The team revealed that the bacterial DNA in bacteria breaks down sharply after approximately 1.1 million years."After 1.1 million years the size of the DNA gets cut in half. In the oldest ice it consisted of just 210 units strung together. Normally the DNA of the average bacterium has about 3 million units." said Bidle. These fossil bacteria are useful in "understanding the geological and physiological limits of life on Earth under different conditions," he explained.This research is also important from another point of view: in our search for life on Mars and other planets, knowing more about how long microorganisms might have remained viable frozen in the ice can help. "Most of life on Earth consists of microbes. They live in every possible environment ... so learning about microbes and what they can withstand and what their limits are is important to understanding how the Earth works over long periods of time." said Bidle.