Pollution-eating bacteria produce electricity

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Microbiologists seeking ways to eliminate pollution from waterways with microbes instead discovered that some pollution-eating bacteria commonly found in freshwater ponds can generate electricity. They present their findings today at the 105th General Meeting of the American Society for Microbiology.

"The bacteria are capable of continuously generating electricity at levels that could be used to operate small electronic devices. As long as the bacteria are fed fuel they are able to produce electricity 24 hours a day," says Charles Milliken of the Medical University of South Carolina, who conducted the research with colleague Harold May.

The use of bacteria to create electricity is not necessarily a new idea. Other researchers have developed microbial fuel cells using simple sugars or organic waste products. What makes Milliken's and May's discovery so unique is the bacterium itself. It is the member of a genus known as Desulfitobacterium, which up until now was not known to have the capacity to generate electricity. These bacteria are most commonly known for their ability to breakdown and detoxify some of the most problematic environmental pollutants, including PCBs and some chemical solvents.

"These bacteria are very diverse in their metabolic capabilities, including the food that they can consume. That means that these bacteria can convert a large number of different food sources into electricity," says Milliken. "The technology could be used to assist in the reclamation of wastewaters, thereby resulting in the removal of waste and generation of

electricity."

Another unique characteristic of these bacteria is that they are the first known spore-forming bacteria shown to continuously generate electricity. A bacterial spore is a dormant stage of growth for the organism and is highly resistant to heat, radiation and drying. Such characteristics could prove useful in future microbial fuel cell designs where the device need not always be operational but must survive long periods of hazardous conditions before being used.

"The generation of electricity is one of those things that we tend not to think about during our daily routines. When we do, thoughts on bacteria usually do not enter our minds. Bacteria make you sick, they are important in the processing of food, but making electricity? Surely that is not part of the story. But it is," says Milliken.

Source: American Society for Microbiology