Army-funded technology detects bacteria in water

November 10 2010

To keep soldiers in the battlefield healthy, the U.S. Army is exploring new ways to detect harmful bacteria in water.

Current techniques for analyzing water in the field can take as long as 24 hours to complete, according to Bart Lipkens of Western New England College in Springfield, Massachusetts and his colleagues at Physical Sciences in Andover, Ma.

They are working on an alternative technology that uses sound waves to accelerate the process.

"The goal of our project is to speed up the detection of bacteria in water supplies," said Lipkens. "We're developing a first order trigger, an alarm that maybe there's something in the water that warrants further investigation."

Lipkens has created a device that quickly gathers bacterial spores from running water using acoustical radiation force. It broadcasts waves of ultrasound into the liquid, exerting a pressure on the bacteria that pushes it into a collection pocket. In previous work, Lipkens used this technique to successfully separate polystyrene beads from water.

The device can draw in 15 percent of the bacterial cells from the water in a single pass. When the flow is shut off, the bacteria settle and can then be transferred to another apparatus for identification. Compared to existing methods, this procedure is quick.

Bacillus cereus, the species of bacteria used in this experiment, is about a micron in diameter and harmless. But its properties are very similar to many types of bacteria that would be harmful in drinking water.

"We think we would ultimately get the same results with harmful bacteria," said Lipkens, who will present his data at the 2nd Pan-American/Iberian Meeting on Acoustics in Cancun, Mexico.

More information: The talk "Separation of bacterial spores from flowing water in macroscale cavities by ultrasonic standing waves" by Bart Lipkens will be presented at 4:45 p.m. on Tuesday, November 16.

Provided by American Institute of Physics

Citation: Army-funded technology detects bacteria in water (2010, November 10) retrieved 25 April 2024 from https://phys.org/news/2010-11-army-funded-technology-bacteria.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.