Development of Filter Embedded with Silver Nanoparticles for Water Sanitation

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In the 21st century, 780 million people are without clean water, and 2.5 billion people do not have access to water with improved sanitation. Dirty drinking water can cause dysentery, infertility, and waterborne illness. Developing filters embedded with silver nanoparticles aims to create an inexpensive, convenient solution to cleaning contaminated water. First, water will be collected from different regions along Mississippi and Alabama, and these water samples will be put through a bacteria testing kit. After the kit confirms that the water samples have bacteria, those samples will be disposed of, and new water samples from the same sources will be put through the silver nanoparticle filter. The silver nanoparticles will be created from a plant extract, Ocimum basilicum. The plant extract will be used as a reducing and capping agent; it will be suspended over the silver nanoparticle mixture and added until the silver nanoparticle mixture turns yellow. Lower possible environmental bacteria result due to the bioactive properties of Ocimum basilicum and the antimicrobial properties of silver nanoparticles. The null hypothesis is rejected. The filter embedded with silver nanoparticles did decrease possible environmental bacteria in water sourced from all three water sources. Not only do the filters aim to sanitize water, the silver nanoparticles could also have health implications in water gels or bandages to disinfect wounds. The application of this project has the ability to lower people's chances of contracting a waterborne illness and allows for reduced gender inequalities through lessening the time women clean water.

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