DRINKING WATER TREATMENT

Antibiotics in water

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Antibiotics are commonly used pharmaceuticals, and they have been detected in surface and groundwater. Water treatment plants use several processes to purify water for drinking. Coagulation and flocculation clump together particulates and other contaminants, which can then undergo precipitation to settle them out or flotation so they can be skimmed from the water surface. Next, filtration removes suspended particles, and then chlorine and ultraviolet light are used for disinfection. Treatment plants use various combinations of these basic processes; however, traditional water treatment units were not designed to treat antibiotics.

Zi Song and colleagues from Tianjin Chengjian University in China and the University of Technology Sydney in Australia evaluated the effectiveness of two drinking water treatment plants in removing antibiotics from water in Tianjin, China. Of the ten antibiotics tested, removal efficiency varied by type. The plant (B) that showed the more effective antibiotic removal did so predominantly using ultraviolet light with chlorine for disinfection, although ozone pretreatment combined with coagulation precipitation also contributed significantly. The other plant (A) was generally less effective, but, of the processes used, its coagulation flotation step removed the most antibiotics. Both treatment plants also used filtration, which was found to be less effective in antibiotic removal. Even without complete antibiotic removal, the authors' health risk assessment found them at acceptable levels.

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