

The international debate on Occurrence and Persistence of antibiotic in drinking water treatment plants

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Globally, antibiotics have been efficiently used for human treatment as well as veterinary therapy. The extensive use of antibiotics in agriculture, animal farming, aquacultures, and the release of un-absorbed antibiotics from human and animal leads to persistence of minute amount of antibiotics in different drinking water sources. The majority of pharmaceutical residues are come from healthcare facilities, industries, plants, soils and sludge, which in turn increase the selective pressure of microbial community and water contamination. Most notably that, some unused pharmaceuticals are usually thrown to the sewage system to be removed; nevertheless, if these antibiotics are not eliminated or degraded properly, they will directly move to the surface water, ground water, and drinking water. There are different ways to eliminate the antibiotics from waste water such as oxidation, biodegradation, sorption and photo-degradation, however, not all antibiotics were completely treated, it may release into the natural waters. This is mostly due to the versatile nature of these pharmaceuticals and to their weak degradability and

high water solubility, which make it easily pass across the membrane through filtration steps and reach to the drinking water. Different types of antibiotics can be detected in different environments between and within countries, based on the patterns of antibiotic consumption, environmental behavior of antibiotics and environmental parameters. Amongst antibiotics, tetracycline, fluoroquinolone and ciprofloxacin, sulfanamide, were the most detectable antibiotics in different drinking water sources worldwide at ng L⁻¹ to low level of µg L⁻¹. Because of they are ubiquitous in nature, antibiotics and their derivatives represent a broad spectrum of physico-chemical and biological properties based on environmental physical parameters such as pH, which can be a good indicator for antibiotics behavior in different pH values. In this review, we will stand with the main sources of antibiotic distribution in different drinking water sources in several countries, as well as, water pollution, and the potential effect of antibiotics on natural microbial communities.