

Ecotoxicological Impact of Antibiotics on Aquatic Ecosystems

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Abstract:

Anthropogenic pressures on the environment pose significant threats to biodiversity, thereby undermining ecological sustainability. Antibiotics have a significant impact on the environment, and these effects can have long-term consequences on ecosystems. Current research is increasingly directed toward developing advanced screening methodologies to assess the toxic impacts of contaminants on aquatic ecosystems utilizing specific biological models known as bioindicators. Tetracycline, a widely used antibiotic, has raised significant environmental concerns due to its persistence and potential ecotoxicological effects in aquatic environments. Tetracycline can inhibit the growth of algae and phytoplankton, which are crucial for aquatic food webs. This can disrupt primary production and nutrient cycling in aquatic ecosystems. Tetracycline exposure can lead physiological changes in aquatic invertebrates like *Daphnia magna*. These effects can have cascading impacts on higher trophic levels. The ecotoxicological impact of tetracycline on aquatic environments is multifaceted, affecting not only individual species but also ecosystem functions and services. The persistence of tetracycline, its potential to promote antibiotic resistance, and its effects on aquatic organisms underline the need for more stringent environmental regulations and advanced treatment technologies to protect aquatic ecosystems from this pervasive contaminant.

Keywords:

Antibiotics, ecotoxicological impact, bioindicators, tetracycline.