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Insights into the ecotoxic impact of diclofenac using *Daphnia magna* as a model organism

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Abstract

Residues of pharmaceutical compounds (PCs) are among the groups of contaminants of emerging concerns that have been reportedly detected in the aquatic environment. These compounds are widely distributed in diverse water bodies, thus, necessitating ecotoxicological assessment of PCs. However, data concerning the risk they pose to unintended non-target species in different ecosystems are still very scanty and scarce. This study investigated the ecotoxic effect of diclofenac, an analgesic, on freshwater aquatic ecosystem using the sensitive *Daphnia magna* (water flea) bioassay. The daphnid bioassay was carried out at concentrations 10 µg/L and 100 µg/L, which are the least and upper-end detection (LED & UED) values of the range of concentrations of diclofenac detected in the tested aquatic water columns, as well as reported levels in some international surveys. The 24 to 48-hr *Daphnia magna* test revealed a mortality rate of > 75 % and 90 % for 100 µg/L diclofenac, respectively, in freshwater-spiked samples. These results suggest that the presence of PCs in aqueous ecosystems may pose a lethal impact on aquatic fauna at the detected levels in the environment.