



Conference Abstract

Comparative acute toxicity of the pharmaceutical compound Diclofenac on groundwater and surface water crustaceans

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Abstract

Pharmaceutical compounds have been extensively used in medicine and currently detected in trace concentrations (ranging from ng/L to mg/L) in both surface and groundwater bodies worldwide in the last decades. Despite being mostly found in low concentrations, these are persistent compounds that are continuously discharged into aquatic ecosystems. Pharmaceutical compounds are also present in complex mixtures and the actual absence of appropriate wastewater treatment specifically targeting their elimination, renders them emerging contaminants with high risk for surface and groundwater ecosystems. None of these compounds is included in the European Water Framework Directive as a priority substance and comprehensive data are still being built regarding pharmaceuticals toxicity on standard surface aquatic taxa and almost none concerning groundwater-dweller species. However, the current Directive 2008/105/EC has included some antibiotics, steroids, phenolic-antioxidants and the anti-inflammatory diclofenac in the established watch list for monitoring substances regarding water quality policy.

Assessing the toxicity of pharmaceutical compounds in a large spectrum of aquatic environments is needed to assist a realistic environmental risk assessment. Hence, including subterranean species is a priority for establishing conservation measures in

groundwater ecosystems. Copepod crustaceans are widely represented in freshwater bodies and dominant in groundwater ecosystems. We have selected the cosmopolitan (freshwater and groundwater) crustacean species *Diacyclops crassicaudis crassicaudis* Sars, 1863 and the freshwater model species *Daphnia magna* Müller, 1785 to estimate their response to acute exposures to the pharmaceutical compound diclofenac. Our preliminary results indicate that diclofenac was more toxic to the copepodites C1-C2 than to the neonates of *D. magna* (half maximal effective concentration: 63 mg/L and 111.3 mg/L at 48 h respectively) (See Suppl. material 1). However, further long-term toxicity testing at more environmentally relevant concentrations and the use of species with similar ecological features and more closely related are required for a better understanding of the potential of pharmaceutical compounds to harm the groundwater biota.

Presenting author

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Supplementary material

Suppl. material 1: Comparative acute toxicity of the pharmaceutical compound Diclofenac on groundwater and surface water crustaceans [doi](#)

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