
Beyond microplastics: Water soluble synthetic polymers exert sublethal adverse effects in the freshwater cladoceran *Daphnia magna*

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Abstract

Plastic pollution is considered one of the causes of global change. However, water soluble synthetic polymers (WSSPs) have been neglected so far, although they are used in several industrial, dietary, domestic and biomedical products. Moreover, they are applied in wastewater treatment plants (WWTPs) as flocculants and coagulant agents. Hence, their presence in the aquatic environment as well as their uptake by aquatic organisms is probable, whereas no data are available regarding their potential adverse effects. Here we show in the freshwater key species *D. magna* exposed to five different WSSPs life history changes along with an altered level of reactive oxygen species, although acute mortality was not observed. Since daphnids act as keystone species in lake ecosystems by controlling phytoplankton biomass, even sublethal effects such as WSSPs induced changes in life history may result in cascading effects, from lower to higher trophic levels, which in turn could affect the whole food web.

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