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Effects of non steroid anti inflammatory drugs on the composition of natural algal assemblages

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Effects of five non steroid anti inflammatory drugs (NSAIDs; diclofenac, diflunisal, mefenamic acid, ibuprofen and piroxicam) on composition of natural algal assemblages were studied in microcosm experiments. Ibuprofen and piroxicam had no effect on algal growth on the basis of individual number, while only ibuprofen seemed to be harmless on the basis of chlorophyll content. Diversity and taxa number decreased in all treated assemblages, these decreases were the most pronounced during diflunisal and mefenamic acid treatments.

The assemblages were dominated by the euglenid *Trachelomonas volvocina* and centric diatoms (their initial relative abundance were 32% and 26%, respectively), beside them the green alga *Chlorella* and the dinoflagellate *Peridinium* genera were present in notable number. These dominant taxa were not sensitive to the treatments, especially the *Cyclotella* species, which relative abundance increased in treated assemblages, reaching 80% in some cases, causing the mentioned decrease of diversity. It should be noted that the green alga *Gonium pectorale* (which initial abundance was under 1%) became one of the most abundant species (reaching almost 50% in certain cases) in diclofenac and mefenamic acid treated assemblages. It is also noteworthy, that relative abundance of cyanobacteria was low, but it did not changed during treatments, which suggest that cyanobacteria may be not sensitive to NSAIDs.

In contrast, cryptomonads and most of chrysophyte species seemed to be sensitive to the treatments, they almost completely disappeared from the treated assemblages. Beside them, some pennate diatom taxa showed notable sensitivity to the presence of NSAIDs. Our results showed for the first time in natural algal assemblages that the tested, mostly hardly degradable NSAIDs have notable effects on aquatic ecosystem already at the level of producer organisms, so these contaminants require special attention during wastewater treatment and monitoring of surface waters.