

Responses of diatom taxa to the presence of non steroid anti inflammatory drugs in natural algal assemblages

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Responses of diatom taxa to the presence of five non steroid anti inflammatory drugs (NSAID: diclofenac, diflunisal, mefenamic acid, ibuprofen and piroxicam) were studied in natural algal assemblages in microcosm experiments. Altogether 23 diatom taxa were identified by light microscopy from undigested samples. Diversity and taxa number of diatoms decreased in all treated assemblages in the first four to six days, this decrease was the most remarkable in diclofenac and diflunisal treatments. The number of diatom taxa and diversity of diatoms increased from the 8th day in all treated assemblages, this increase was the most considerable in ibuprofen treated assemblage, so ibuprofen seemed to be the less toxic, while the fluorine containing, hardly degradable diflunisal seemed to be the most toxic on the basis of these regeneration processes.

Centric diatoms (*Cyclotella* species) were one of the dominant taxa both within the whole algal assemblages and within diatoms; their initial relative abundance was 26%. Beside them *Cymbella* sp. and *Fragilaria capucina* were the most abundant diatom taxa. According to their responses to the presence of contaminants, diatom taxa can be classified into several groups. The dominant *Cyclotella* species was not sensitive to NSAID, its relative abundance increased in treated assemblages reaching 80% in some cases, causing the mentioned decrease of diversity. Other taxa (*Cymbella* sp., *Nitzschia closterium*, *Achnanthes* sp. etc) were less sensitive to the treatments, their abundance did not changed during the experiment. The most sensitive taxa can be characterized by decreasing relative abundance in almost all treated assemblages (members of *Achnantheidium minutissimum* species-complex, *Fragilaria ulna acus*, *Ulnaria ulna*).

These results show, according to our knowledge for the first time, that the tested, mostly hardly degradable NSAID have notable effects on algal assemblages, and on diatoms among them. Interestingly, diatoms responded differently to NSAID in comparison with other algal groups, in terms of the most toxic compound and the regeneration capability of the assemblage. The results suggest that the presence of these contaminants could lead to diversity loss, depending on the initial composition of the algal assemblage. Further studies are required for revealing the background processes of the insensitivity of resistant diatom taxa, which may be involved of future remediation studies.