Phosphorus (P) and natural organic matter (NOM) excesses in dam waters from anthropogenic activities : Diagnosis and treatments

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Human have extensively altered the global environment, changing global biogeochemical cycles, transforming land and enhancing the mobility of biota. Diversity at all organizational levels, ranging from genetic diversity within populations to the diversity of ecosystems in landscapes, contributes to global biodiversity. Human alterations change the global distribution of organisms. These changes in biodiversity alter ecosystems processes and change the resilience of ecosystems to environmental change.
The originality of our work is based on a systematic approach engaged in the place of Cholet (Maine-et-Loire, France) for a dam waters of the lake denoted Ribou in order to obtain dramatic decrease of P and NOM excesses which origin is mainly antropogenic. These nutrients brought by the agricultural activities as well as the wastewater involve a degradation of our aquatic ecosystem (eutrophication periods and high level of DOC > 10 mg/L and P > 1 mg/L).

We started this work by a diagnosis on the catchment area. The following work was the inventory of the autochtonous macrophytes. One phytosociological group of species appeared forming a *phalaridae*, a typical sociological group only resident in water containing high levels of pollutants. The results show that the hydrophytes density, represented mainly by the common duckweed (*Lemna minor)*, still being small compared with the amphibious species density on which yellow cress (*Rorippa amphibia*) and the willow (*Salix sp.*) dominate.

To complete this macroscopic approach, we focalized our attention on the epiphytic biofilms of the inventory macrophytes by scanning electronic microscopy (SEM) and the presence of few micro-organisms species (bacteria, cyanobacteria, alguae) forming epiphytic biofilms were described for the first time, specially on the *phalaris arundinacae* species.

Furthermore, the Principal component analysis (PCA) tool was conducted in order to identify the different trophic status of our dam water during seven years (2000 to 2007) from water physico-chemical parameters (T, O_2, pH, conductivity, Chlorophyll. a, DOC, total P, etc).
Actually, treatment wetlands are envisaged by combining the results of floristic inventory, biofilms characterizations and PCA results, in order to restore water quality (De Nardi, 2006, 2008).

References : De Nardi F. *et al*., (2006), Communication JIE06, 17ème Ed.26.27 et 28 sept 06, P03-1 ; Nardi F. De *et al.* (2008), CRAS Biologie (submitted) ; Eriksson P. G., 2001*Biogeochemistry* 55; 29-44; Picard C. *et al*., (2005) *Bioresource Technology* 96 1039-1047; Parinet B *et al.*, *Ecological modeling* 178 (2004) 295-311.