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## PRELIMINARY RESULTS OF POTENTIAL CORRELATIONS BETWEEN GEOCHEMICAL PARAMETERS, METALS CONTAMINATION AND MICROBIAL DIVERSITY IN NORTH SEA SEDIMENTS

Willy BAEYENS<sup>1</sup>, Rafeh BECHARA<sup>2</sup>, Gabriel BILLON<sup>3</sup>, Philippe DUBOIS<sup>4</sup>,  
Jean-Claude FISCHER<sup>3</sup>, Yue GAO<sup>1</sup>, David GILLAN<sup>4</sup>, Martine LEERMAKERS<sup>1</sup>,  
Ludovic LESVEN<sup>3</sup>, Annelies PEDE<sup>5</sup>, Koen SABBE<sup>5</sup>

<sup>1</sup>Analytical Chemistry, VUB, Pleinlaan 2, 1050 Brussels, Belgium ; <sup>2</sup>University of Science and Technology of Lille, Unité de Catalyse et Chimie du Solide, (UMR-CNRS 8181), 59655 Villeneuve d'Ascq, France ; <sup>3</sup>University of Science and Technology of Lille, Geosystems Laboratory (UMR-CNRS 8159), 59655 Villeneuve d'Ascq, France; <sup>4</sup>Marine Biology Laboratory, ULB, 50 av Roosevelt, 1050 Brussels, Belgium; <sup>5</sup>Protistology & Aquatic Ecology, Ugent, 281 Krijgslaan, 9000 Ghent, Belgium

Many coastal areas worldwide are contaminated by metals such as Cd, Cu, Pb, Zn, Hg and Ni, and these contaminants usually accumulate in sediments. On the Belgian Continental Plate, (BCP), metal concentrations in sediments are above, or just at the level of the Ecological Assessment Criteria (EAC), which are defined by the OSPAR Commission as concentration levels above which concern is needed.

As the most abundant organisms in the sediments, microorganisms play a key role in the biogeochemistry of benthic ecosystems, including a variety of processes which may affect metal mobility and bioavailability. This may lead to both the alteration of microbial biodiversity and to metal bioaccumulation in higher trophic levels through increased leaching of metals from the sediments (metal upward fluxes).

Two sampling cruises have been carried out in February and July 2007 at 7 stations near and far from the Belgian coasts. Geochemical parameters such as oxygen at the water-sediment interface, pH, Eh, dissolved and particulate sulphides, granulometry specific surface area (SSA) have been measured in the sediments at various depths. Metals concentrations have also been evaluated in the sediment particles (after a strong mineralization using concentrated acids) and in porewaters by using DET and DGT probes. A soft leaching of sediment with a 1 M HCl solution has also permitted to calculate a toxicity index towards metals easily associated to Acid Volatile Sulphides (AVS) [1].

Finally, Microbial community (archaeobacteria, eubacteria and microeukaryotes) has been determined in surface sediments (0-2 cm) and in deeper ones (8-10 cm).

Intermediary results clearly indicate that eubacterial taxon richness and diversity indexes are both reduced in heavy metal contaminated stations, when compared to the other stations analysed. This result is not an artefact due to differences in the surface areas considered because this factor was taken into account. Additionally, a surprising high biodiversity of microeukaryotes was revealed in some BCP stations.

### References:

[1] Di Toro, D.M., J.D., Hansen, D.J., Scott, K.J., Hicks, M.B., Mayr, S.M., and Redmond, M.S., Environ. Tox. Chem. 9, 1487-1502 (1990).