

## RECENT STUDIES ON GENOTOXICITY IN THE NORTH SEA (I) - DNA DAMAGE IN SEDIMENT EXPOSED ORGANISMS

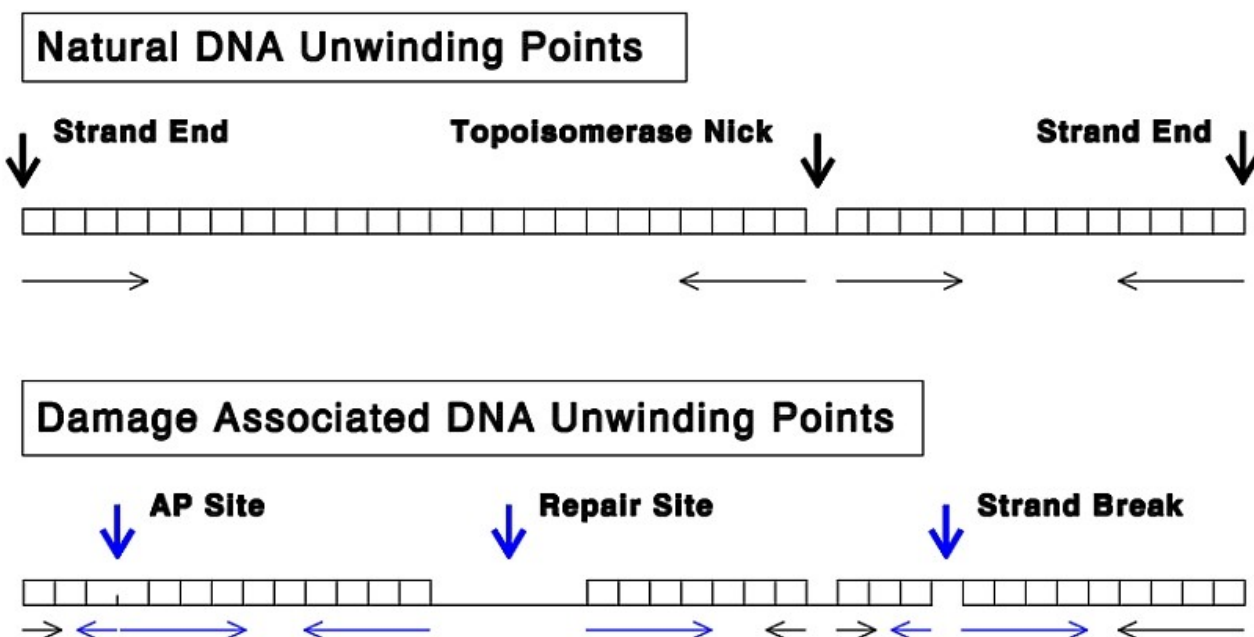
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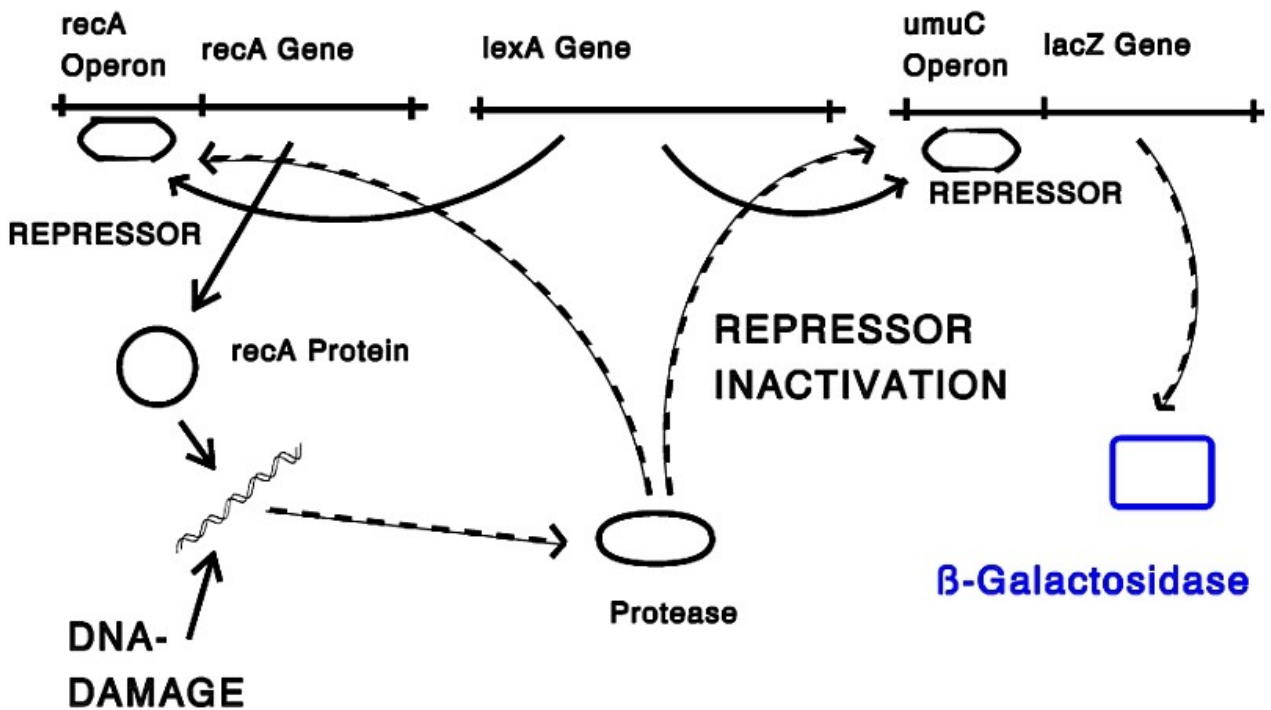
### Abstract

Sediments from 5 estuarine sites of the German coast of the North Sea were collected, of which 4 were assumed to be polluted and 1 to be unpolluted (reference site). In addition, one freshwater sediment was sampled from the river Elbe, which was assumed to be highly polluted. Pore water and aqueous extracts were tested in a bacterial genotoxicity assay with a potential to indicate DNA damage (*umu* assay). Besides this, invertebrate (*Mytilus edulis*, *Dreissena polymorpha*) and vertebrate species (*Platichthys flesus*, *Cyprinus carpio*) were exposed to the sediments and later examined for DNA damage by a DNA unwinding assay. In the bacterial assay only the river sediment proved to be genotoxic, slightly higher with prior S9 activation. In mussels, genotoxic effects were found in those animals exposed to the river sediment as well as in one marine sediment. In fish, however, genotoxicity was found in all fish exposed to sampled sediments. Fish from the reference site had significantly increased DNA fragmentation, when compared to non-exposed fish (controls), however still below fish exposed to the other sediments. Results indicate different sensitivities among biological taxa towards genotoxic impact with fish being the most sensitive organisms.

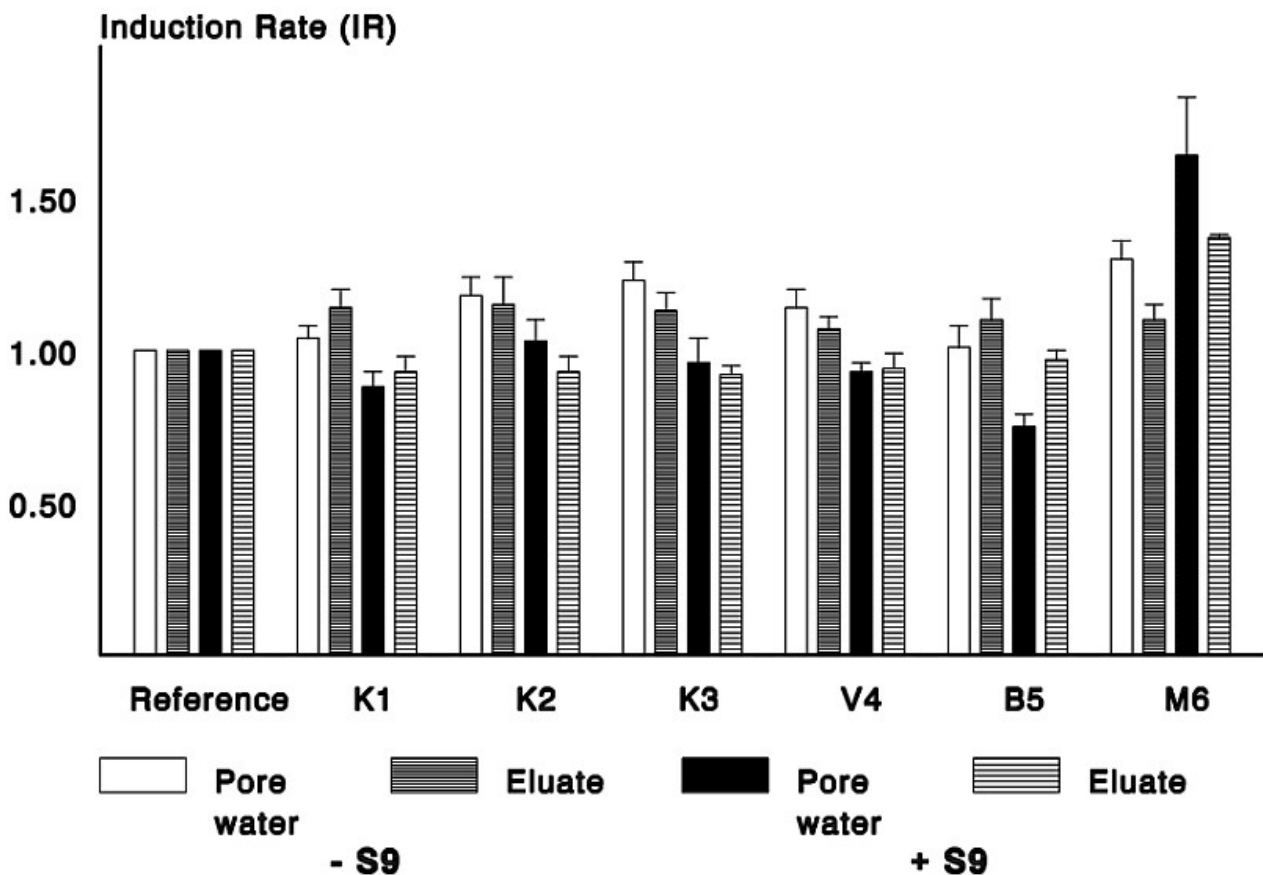
## Theoretical Basis of the Alkaline DNA Unwinding Assay



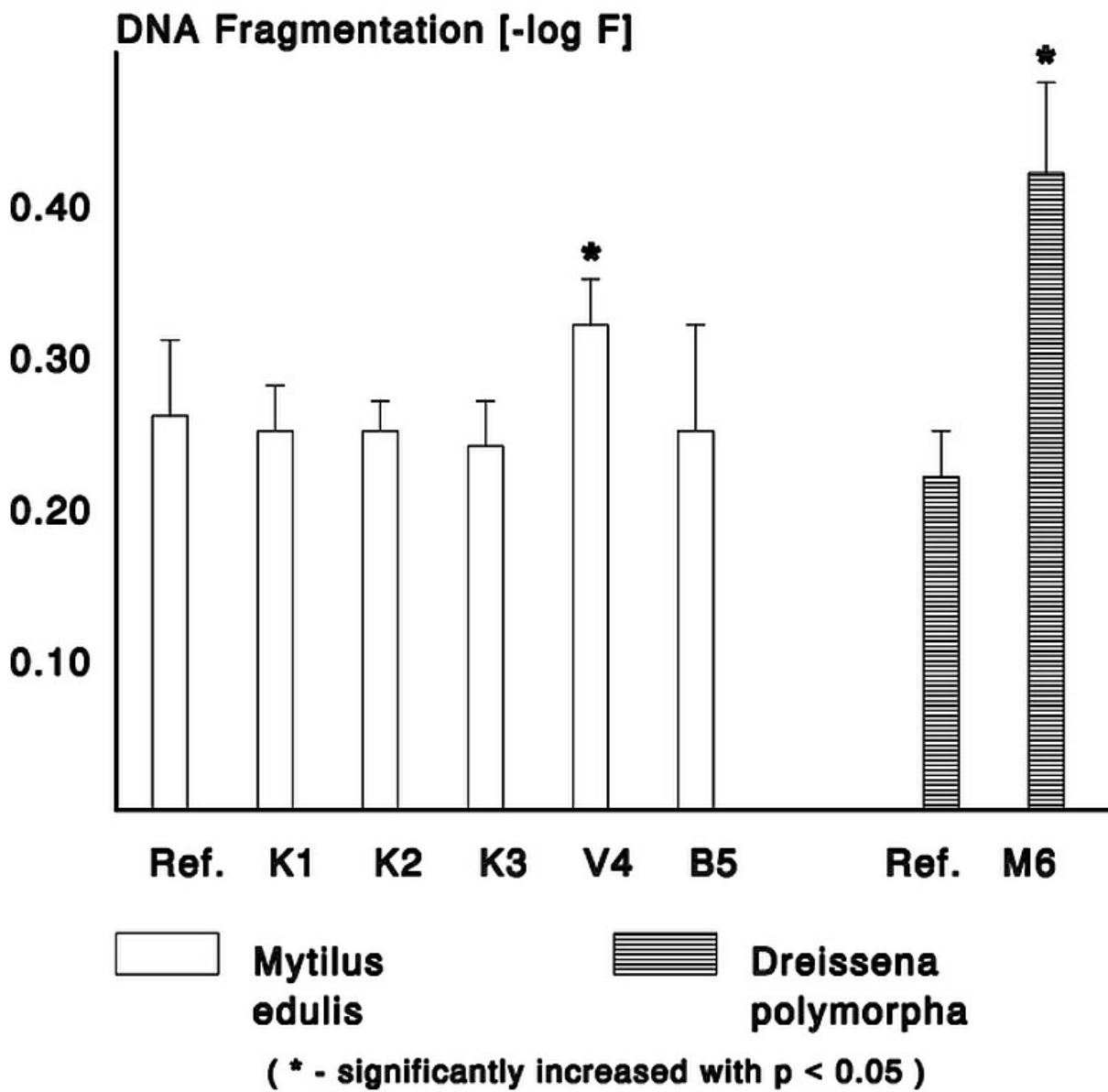
# Theoretical Basis of the umu Assay



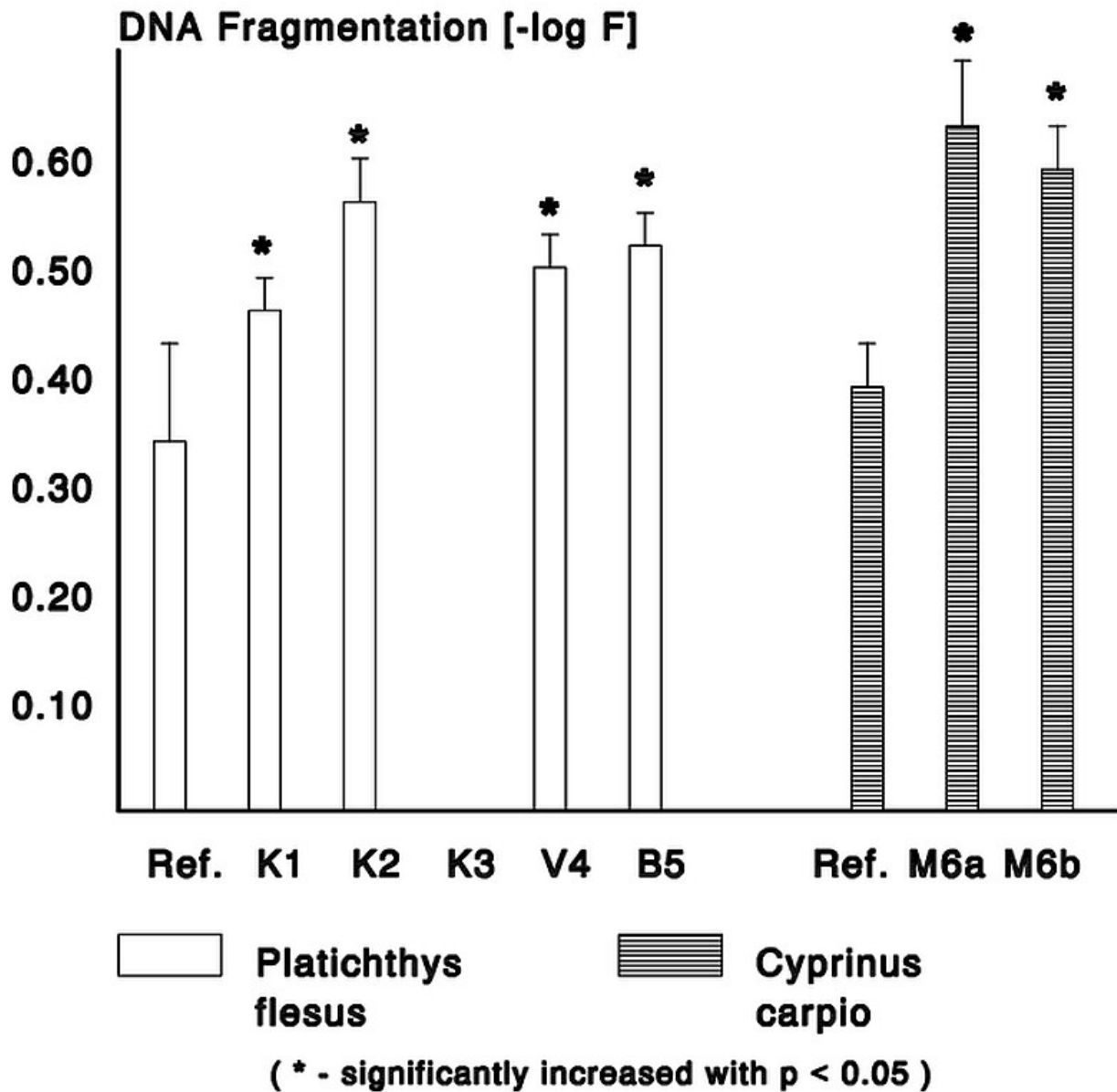
## umu Assay with Sediments from the North Sea and the River Elbe



# DNA Damage in Mussels Exposed to North Sea and Elbe Sediments



# DNA Damage in Fish Exposed to North Sea and Elbe Sediments



# MFO Activities in Fish Exposed to North Sea and Elbe Sediments

