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Reducing the economic impact of an invasive bivalve, *Mytilopsis leucophaeata*, in the harbour of Antwerp

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Introduction

Any surface exposed to untreated water provides an opportunity for the settlement and subsequent growth of organisms. The cooling water conduits of a power station provides an ideal habitat for such species. Given these perfect conditions, settlement occurs readily and growth can be rapid until it begins to interfere with the operational systems and finally leads to their failure. This phenomenon is known as bio-fouling. World-wide, mussels cause serious problems in cooling water conduits. Because of the great economical damage, caused by these fouling-organisms, biocides are being used to control them. To use these chemicals properly, knowledge of the life cycle of these organisms is indispensable and monitoring is necessary.

Using the Scheldt water as cooling water, a lot of companies in the harbour of Antwerp have problems with fouling organisms. In this research, *Mytilopsis leucophaeata*, the brackish water mussel, will be used as model species for the study of bio-fouling control. The problems and possible solutions will be examined at the site of BASF, Antwerp.

Project objectives

The objective of the project is to achieve an efficient and rational use of biocides to control bio-fouling caused by *M. leucophaeata* and as such minimize their harm in the environment and in the cooling water conduits.

The objective is divided in four aspects:

- 1) Population dynamics of *M. leucophaeata*
Weekly sampling of the incoming cooling water gives us a reliable view on the population dynamics of *M. leucophaeata*.
- 2) Development of an "early warning system"
Knowledge about the population dynamics of *M. leucophaeata* will be used to develop an "early warning system" to use biocides at the right time (= the fouling organisms most vulnerable stage) and in the right dosage.
- 3) Influencing environmental factors on the lifecycle of *M. leucophaeata*
Experimental research will test the influences of the environmental parameters on the lifecycle, possibly simplifying the prediction of or reducing the recruitment success of *M. leucophaeata*.
- 4) Predict the recruitment success of *M. leucophaeata*
A model will allow to (1) considerably dose biocides, dependent on the expected recruitment success and (2) if possible, reduce the recruitment success of *M. leucophaeata* by manipulation of the relevant environmental factors of the incoming cooling water.

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