

FÖRAMINS 2010

Keynote Presentations

Friday, September 10, 2010

Room XXXXX

08:30 Frans Jorissen: *Foraminifera and pollution monitoring - Room for improvement*

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The use of foraminifera for pollution monitoring has experienced a spectacular increase over the past decades. This unexpected success is due to several particularities of foraminifera: their elevated densities in small sediment volumes, their high diversity, their tolerance to strongly adverse conditions, and especially the preservation of their tests in the sediment, which makes it possible to obtain an idea about the natural faunas, in the many cases in which no baseline study has been performed.

Unlike the situation for other bio-indicator groups, no formalised working protocols exist for foraminifera. The various research groups use a wide range of methods with various degrees of scientific rigour. Whereas ecotoxicology tests have been developed for many other bio-indicator groups, only some preliminary results are available for foraminifera. It appears therefore urgent to develop a more solid scientific basis for pollution monitoring with foraminifera.

I will address several points which need particular consideration. Some of the methods which are presently used for foraminiferal bio-monitoring will be discussed, as well as the biotic indices routinely used for macrofauna. In practice, it appears difficult to adapt these indices for foraminifera, because they occupy a more limited number of ecological niches, and especially, because the vast majority of foraminiferal species are surprisingly tolerant to pollution. This leads directly to the question how to select marker species. Since pollution-sensitive taxa appear to be rare, it appears judicious to select opportunistic indicator species, which are favoured by pollution phenomena. However, such a monitoring strategy can probably only be successful if chemical pollution is accompanied by organic enrichment. Furthermore, since the natural level of organic supplies determines which opportunistic taxa are present in the natural fauna, it appears impossible to select a universal set of indicator species, as has been done for macrofauna. A final problem, which also concerns pollution monitoring with macrofauna, is that marine areas present various degrees of natural enrichment. Hence, the quality of a marine environment should be quantitatively described with respect to the natural state of the same environment. Existing monitoring methods do not foresee such a possibility.

Finally, I will treat the very scarce ecotoxicological studies available today. The main result of these studies is the surprisingly high tolerance of many foraminiferal taxa to many types of pollutants. It is clear that much more research is needed in this particular field.