



## Benthic foraminifera as bio-indicators of eutrophicated environments

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Résumé en anglais

Foraminifera are among the most abundant protists in marine benthic environments (Murray, 1991). Because of their short life cycles, high biodiversity and specific ecological requirements of individual species, foraminifera react quickly to environmental disturbance, and can be successfully employed as bio-indicators of environmental change, such as those brought about by anthropogenic pollution (as defined by Kramer and Botterweg, 1991). Foraminiferal assemblages are easy to collect; foraminifera are commonly abundant, providing a highly reliable database for statistical analysis, even when only small sample volumes are available. Furthermore, many foraminiferal taxa secrete a carbonate shell, and leave an excellent fossil record, that may be used to characterise baseline conditions, and to reconstruct the state of the ecosystem prior to sampling. Studies of the effects of pollution on benthic foraminiferal assemblages, and their possible use as pollution indicators were initiated in the early 1960's by Resig (1960) and Watkins (1961). In the last decennia, foraminifera have been increasingly used to monitor pollution in a wide range of marine environments, such as intertidal mudflats impacted by oil spillages (Morvan et al., 2004), harbours affected by heavy metal pollution (Armynot Du Châtelet et al., 2004), or eutrophicated continental shelves (Sharifi et al., 1991; Yanko and Flexer, 1991). The goal of our study is to compare different types of eutrophicated environments, under anthropogenic or natural conditions: we used benthic foraminifera as bio-indicators of anthropogenic eutrophication caused by drill cutting discharges (Congo and Gabon), by sewage sludge (Firth of Clyde; Scotland) and by fish farms (Loch Etive; Scotland) and compared the faunal patterns with those observed in the Rhone prodelta, an environment characterised by strong natural eutrophication due to important continental nutrient input.

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### Liens

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