Live and dead benthic foraminiferal faunas from Whittard Canyon (NE Atlantic): Focus on taphonomic processes and paleo-environmental applications

Submitted by Emmanuel Lemoine on Tue, 09/16/2014 - 11:47

Titre	Live and dead benthic foraminiferal faunas from Whittard Canyon (NE Atlantic): Focus on taphonomic processes and paleo-environmental applications
Type de publication	Article de revue
Auteur	Duros, Pauline [1], Fontanier, Christophe [2], De Stigter, Henko C. [3], Cesbron, Florian [4], Metzger, Édouard [5], Jorissen, Frans [6]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2012
Langue	Anglais
Date	2012
Pagination	25 - 44
Volume	94-95
Titre de la revue	Marine Micropaleontology

Résumé en anglais	Dead benthic foraminiferal assemblages were studied in the > 150 µm fraction of 4–5 cm deep sediment levels at 18 stations in the Whittard Canyon area in June 2007. This sediment layer is composed of fairly recent sediment (< 312 years). The stations were located along 4 bathymetric transects ranging from 300 to 3000 m depth: two along the main canyon axes (Eastern and Western branches) and two along adjacent open slopes (Eastern and Western slopes). The comparison between the live (Rose-Bengal-stained) communities and the dead assemblages reveals more or less important differences in representation of species which can be attributed to various biological and taphonomic processes. Differences in species composition between live and dead faunas are much larger along both canyon branches than in the open slope environments.In both canyon branches, the population dynamics, such as seasonal response to phytodetritus deposition, certainly contribute to differences between live and dead faunas. For instance, Bulimina marginata, which is usually considered as an opportunistic species is over-represented in the dead assemblage. The fragility of the tests of some species can explain their total absence in the thanatocoenoses. This concerns many organic cemented arenaceous tests, miliolid tests sensitive to dissolution and perforate taxa with thin tests. Furthermore, transport (e.g. sediment gravity flows), active in both canyon branches, leads to an increasing relative contribution of allochthonous individuals, originating from outer shelf and upper canyon sites, towards the deeper canyon stations. Consequently the dead faunas do no reflect local environmental conditions. The high abundance of transported dead foraminifera in both canyon branches leads to important biases in the foraminiferal assemblage composition, but may also significantly bias the interpretation of δ13C, δ18O, trace-elements and 14C concentration in foraminiferal shells. It may therefore strongly complicate the reconstruction of environmental parameters such as bottom water temperature or exported paleoproductivity, and radiocarbon dating of the foraminiferal assemblages. Therefore, in both canyon axes, the use of dead foraminiferal faunas to reconstruct paleoenvironmental in situ conditions is precluded. However, the study of dead assemblages in the canyon branches, in particular the quantity of allochthonous foraminifera, can give important clues about the downslope sedimentary dynamics. On both open slopes, despite taphonomic (test destruction) and biological processes (population dynamics), the distribution and the composition of the live fauna resemble those of the dead assemblage. In these areas, dead foraminiferal faunas include much less material derived from downslope transport. Consequently, on the open slope, dead assemblages appear to better reflect local conditions. Therefore, the ecological information obtained from fossil open slope samples can be more reliably used to reconstruct paleoenvironmental conditions.
URL de la notice	http://okina.univ-angers.fr/publications/ua3839 [7]
DOI	10.1016/j.marmicro.2012.05.004 [8]
Lien vers le document	http://dx.doi.org/10.1016/j.marmicro.2012.05.004 [8]

Liens

[1] http://okina.univ-angers.fr/publications?f[author]=6827
[2] http://okina.univ-angers.fr/christophe.fontanier/publications
[3] http://okina.univ-angers.fr/publications?f[author]=6539
[4] http://okina.univ-angers.fr/fcesbron/publications
[5] http://okina.univ-angers.fr/edouard.metzger/publications
[6] http://okina.univ-angers.fr/f.jorissen/publications
[7] http://okina.univ-angers.fr/publications/ua3839
[8] http://dx.doi.org/10.1016/j.marmicro.2012.05.004