Scaling percentages and distributional patterns of benthic foraminifera with flux rates of organic carbon

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Résumé en anglais	Seafloor organic matter flux from marine primary productivity is quantified, and the range of annual flux rates is calculated and compared to the counts of benthic foraminifera at 382 surface sediment stations from the equatorial Guinea Basin to the Arctic Ocean. Benthic foraminifera show high variability in flux range dependent distributional patterns, with maximum deviations at lowest percentages. The occurrence of a single species covers flux ranges within one to three orders of magnitude. Only a small number of species shows a correlation of this broad range of organic fluxes versus percentages in a count. For C. wuellerstorfi a functional relationship for the recalculation of flux rates from percentages in a count can be given within a standard deviation below 2 g organic carbon [m 2 yr 1]. However, such functions have to be restricted to a specific size range counted. The patterns of dominance more closely scale the environmental optimum of the species in general. For interspecific combinations, these patterns identify the ranges of overlap, where it is impossible to distinguish between higher or lower fluxes on the basis of faunal composition. This is quantified for the co-occurrence of C. wuellerstorfi and U. peregrina near 20% for one species. On an ocean wide scale, a number of taxa can be used to define threshold values for the nutritive needs of the assemblages, most pronounced within annual flux ranges at 2-3 g org. C [m-2]. Different trophic needs of species can be attributed to their infaunal, epibenthic, or opportunistic behavior respectively, and examples for the flux dependent takeover in dominance are given. These quantifications may offer approximations for flux rate dependent faunal patterns in surface sediments and for the detection of flux rate dependent faunal fluctuations in the Quaternary record.
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