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Biostratigraphy Beneath the CCD: Using Agglutinated Foraminifera to correlate abyssal sediments

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The sub-CCD areas of the ocean constitute the world's largest biotope, populated by diverse faunas of agglutinated foraminifera. A reasonable estimate for the diversity of modern agglutinated foraminifera in the deep ocean is a thousand species. Therefore the potential must exist to use their fossils for the purposes of stratigraphic correlation. In spite of over a hundred years of study on this fossil group, the Mesozoic to Cenozoic foraminiferal biostratigraphy of the sub-CCD areas are still only sparsely studied.

One of the main focuses of Felix Gradstein's micropalaeontological reseach has been to improve our understanding of agglutinated foraminifera and their applications for biostratigraphy, especially in the northern hemisphere petroleum-producing basins. Over the past 20 years, quantitative biostratigraphical schemes based on agglutinated foraminifera have now been constructed for the Upper Cretaceous to Cenozoic sequences of the Labrador Margin, North Sea, Norwegian Sea, and Barents Sea. These zonal schemes have been correlated to the standard chronostratigraphy by means of planktonic microfossils, and can be compared to the benthic foraminiferal records obtained from North Atlantic DSDP/ODP sites to establish better correlations to the Geological Timescale, and to assess the utility of agglutinated foraminifera ranges and acmes for stratigraphic correlation. In addition to coining the term "flysch-type" agglutinated foraminifera, Felix Gradstein has pioneered the efforts to establish both local and supra-regional zonations using probabilitic methods to and incorporate these microfossils into standard zonal schemes.

Although the stratigraphic ranges of agglutinated foraminifera are long in comparison to planktonic foraminifera and in many cases their total ranges are unknown, their high diversity in the North Atlantic offshore basins and the presence of distinctive acmes improves their value for local (basin-wide) biostratigraphical schemes. Both geographical and palaeobathymetrical differences in the ranges of taxa are observed, for example the ranges of some taxa extend to younger levels in the northern part of the Norwegian Sea. Nevertheless, by examining elements in common between the local zonation schemes, we are now much closer to the ultimate goal of defining a "standard" zonal scheme for sub-CCD biostratigraphy using agglutinated foraminifera.