NE Atlantic deep water corals: determination of ventilation ages

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Thermal ionization mass spectrometry and accelerator mass spectrometry were applied for determining the uranium, thorium, protactinium isotope concentrations and ^{14}C-ages in ten solitary corals (*scleractinia*) from Northern East Atlantic dredged at the Hyeres, Plato, Atlantis and Tyro Seamounts.

Due to significant coating of these corals with Mn-oxides authigenic thorium and uranium are adsorbed on the surface of the samples. For example, the amount of ^{232}Th in the coating ranged between 5 and 28 μg/g. Therefore the samples were pretreated with a newly developed cleaning procedure based on leaching steps with a solution, composed of Na_2EDTA and ascorbic acid.

This procedure reduces contamination down to 10% compared with other procedures utilising nitric acid or mechanical cleaning (Fig. 1).

Hence additional correction for residual authigenic ^{230}Th contamination was necessary using the specific $^{230}Th/^{232}Th$-ratio of the coating of each coral.The slope of the straight line represents the '^{232}Th-free'-age of the solitary coral (Ludwig & Titterington, 1994).

The ^{14}C-ages of these corals group into two time intervals between 10,500–13,500 years and between 29,000–30,500 years. Six samples of the most recent time interval, where ^{14}C ages are more reliable because they are less affected by contamination with recent carbonate, suggest that growth of deep sea corals may have been enhanced following Heinrich event 1 in the North Atlantic (Fig. 2, from Zahn *et al.*, 1997). On these samples we derived deep water ventilation ages of ~1,000 years in agreement with our earlier result on one deep sea coral from the equatorial Atlantic (Mangini *et al.*, 1998).

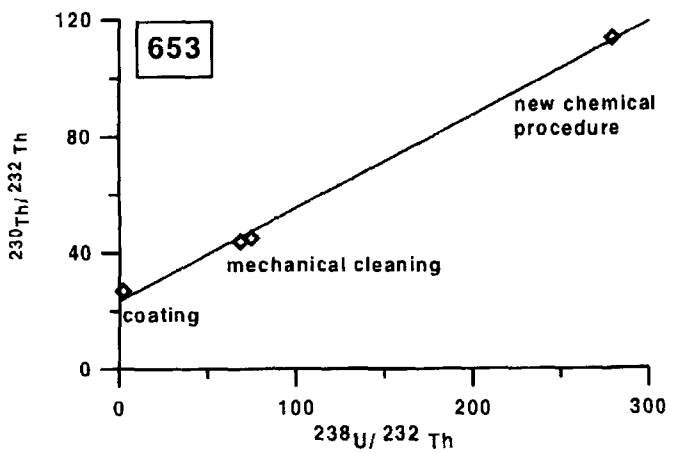

FIG. 1. Isochron-diagram obtained with different cleaning steps.

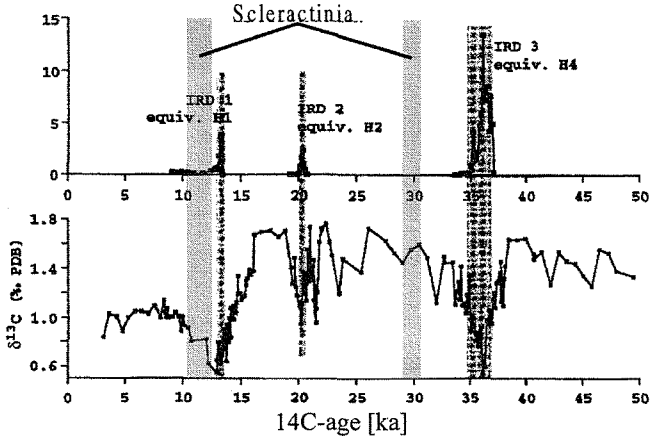

FIG. 2. ^{14}C ages of the scleratinia samples compared to the timing of IRD events in the North Atlantic (from Zahn *et al.*, 1997).

References

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