



Planktonic Foraminifera fauna and carbonate preservation in the Caribbean Sea (Site ODP 999A): Insights into Indian-Atlantic exchanges during the last 450 Kyrs

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A recent micro-palaeontological study of a core from the South Atlantic (Peeters et al., Nature. 430, 661, 2004) stresses the importance of the Agulhas leakage intensity as a key control on North Atlantic Thermohaline operation. Planktonic foraminifera counts were conducted on the Colombian Basin core ODP 999A (12N, 74W, 2878 m); results are presented on a SPECMAP-based age model (Schmidt et al., in prep 2005). At present both climate and surface circulation are driven by the motion of the Intertropical Convergence Zone (ITCZ), which governs dry/wet seasons and upwelling intensity. Caribbean surface and thermocline water originate from both the south Atlantic, which re-circulates Indian Ocean water, and the salty north Atlantic subtropical gyre respectively. The intermediate and deep-waters AAIW and UCDW originate in the southern hemisphere. Both AAIW and UCDW have a lower [CO₃=] content and are more under-saturated than the high [CO₃=] GNAIW that originated in the north Atlantic during glacial times. We use a calcium carbonate preservation index, which is deduced from planktonic fragments and pteropod remains, is used to trace changes in the deep water. Our study confirms that the sediments are better preserved during glacial times. Furthermore, it shows that the sediments of MIS11 are intensely dissolved, suggesting a maximal contribution of AAIW UCDW during that interval. Over the last 450 kyr, we observe a decreasing contribution of the AAIW during both interglacial and glacial times with that respect the Holocene appears particularly unusual. The percentages of the surface Indo-Pacific species *G. menardii* seems to confirm this observation and identifying MIS11 as a time of maximal Indian-Atlantic. It also

confirms that during MIS2-4, Caribbean surface waters were unusually unfavourable for this species and/or suggest that the Agulhas connection was absent. The % of *G. Hexagona*, another Indo-Pacific species, which lives in deeper thermocline waters, peaks during MIS11, MIS9e, MIS7c and MIS5e but is absent during the Holocene and MIS7e. This observation suggests a slightly different scenario for the intermediate water flowing through the “valve” at various depths. On the basis of these species in the Caribbean Sea we cannot trace any enhanced and early exchange between the Indian and the Atlantic at the end of the past five glacial as found in the Agulhas area. This could suggest that in the Caribbean at thermocline depth there may be little influence of climatic fluctuation that originated in the southern ocean.