The blooming coccolithophore identified in the western Pacific during the Mid-Brunhes dissolution interval

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Calypso core MD06-3050 (15°57.0943'N, 124°46.7747'E; water depth, 2967 m) and Calypso Square core MD06-3047 (17°00.44'N, 124°47.93'E; water depth, 2510 m), recovered from western Pacific, were used to construct paleoceanographic scenarios for the Mid-Brunhes in a region with an important role in global ocean/atmosphere transfer. Coccolithophore (calcareous nannofossil) and planktonic foraminiferal assemblages were collected. The record of coccolithophore assemblages show similar trend in MD06-3047 and MD06-3050. The coccolithophore assemblage has relatively high proportions of Florisphaera profunda and Gephyrocapsa spp. in both cores. These species are abundant or present in high proportions in tropical waters. The interval from marine isotope st ages 8 to 14 displays an assemblage dominated by small Gephyrocapsa, especially G. caribbeanica, the highest values being seen in the Mid-Brunhes event, accompanied by a clear reduction in other tropical species. Although the ecological interpretation of G. caribbeanica is controversial due to a clear evolutionary overprint, the high abundance of this species in the Western Pacific could play an important role in deep ocean carbonate dissolution that could be inferred from the record of planktonic foraminifera assemblage. By analyzing the variations in the dominant and common species, it can be found that dissolution play an important role in the preservation of planktonic foraminifera assemblages. The relative abundance of soluble species, such as G. ruber and G. sacculifer, shows similar trend with the variations in the planktonic foraminifera fragment ratios in the past 1 Ma. On the contrary, the relative abundance of resistant dissolution species, such as *P. obliquiloculata* displays the low values during glacial intervals but high values in the interglacials. Moreover, the planktonic assemblage in MD06-3050 was influenced by the obvious dissolution during MBDI, since it is characterized by a remarkable decrease in planktonic foraminifera mixed-layer species, such as G. ruber, G. sacculifer. Due to long term low values during the MBDI, the planktonic for aminifera accumulate rate of the total planktonic and some common species could be taken as effective dissolution proxies in the core MD06-3050 at the water depth of 2967 m. However, the deep water carbonate concentration show high values except for the extremely low values during MIS 11 in the MD06-3047 at a water depth of 2510 m. Based on the different response of the deep sea water carbonate preservation conditions to the coccolith blooming event between the two nearby cores MD06-3050 and MD06-3047, we proposed that the deep sea carbonate chemistry in western Pacific could not be influenced directly

by regionally enhance surface productivity and pore-water undersaturation but by the basin-wide carbonate compensation.