# Temporal variations of the TOC content during the last 572 ka in the sediment cores off the Shimokita Peninsula, northwest Pacific

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We have revealed biological productivity fluctuations off the Shimokita Peninsula for the last 572 ka based on the study on IODP (Integrated Oceanic Drilling program) cores, namely, 901-C9002A, 901-C9002B and 902-C9001C. These cores were drilled by a deepsea drilling vessel CHIKYU in her shakedown cruises in 2005 and 2006.We have analyzed total organic carbon (TOC) and total nitrogen (TN) contents of the cored sediments from 0-301.66 in 1 to 8 cm intervals. An age model was constructed for the sediment cores, mainly based on the delta 18O profile of benthic foraminifers' tests, which was well correlated with a standard marine oxygen isotope curve, LR04. Based on this age model, depth of sediment analyzed can be translated to age of deposition. It demonstrates that the base of the studied core attains to 572 ka in age.

C/N ratio fluctuates within low values ranging between 5 and 11, suggesting most organic matters are marine planktonic in origin. Therefore, TOC of the cored sediments may reflect mainly biological productivities in the surface zone. TOC content varies from 0.5 to 2.0 %, and TN is from 0.05 to 0.5 % except for tephra and sand layers. TOC and TN curves fluctuate quasi-periodically with concordance.

In general, the fluctuation pattern of TOC content of the cored sediments correspond to the marine delta 18O curve such as LR04 expect for 250-320ka, suggesting pervasive effects of the global climate changes in glacial-interglacial cycle. This means that the biological productivity off the Shimokita Peninsula is affected by global climate changes. But, there is a slight difference in the TOC fluctuation patterns between the cold and warm periods. In the cold periods, TOC fluctuation curve well corresponds to the LR04 curve in detail. However, in the warm periods, TOC peaks of short frequency are not concordant with the delta 18O peaks in age, but they correspond to the summer insolation depression in the high latitude areas of the Northern hemisphere. TOC content is not so high even in the high insolation periods.

TOC content of the sediment can be regarded as a proxy of biological productivity of sea surface water. Therefore, TOC fluctuation clarified here might be reflected the change of ocean conditions such as surface currents and/or nutrient supply. One possibility is a cyclic shift of mixed water mass between the cold Oyashio and warm Kuroshio currents, in which high biologic productivity is common now. We shall propose one idea which can explain the phenomena shown in TOC variations.