Organic carbon isotope stratigraphy across the Cenomanian/Turonian boundary at northern Atlantic

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Carbon cycle is one of the important drivers/regulators of Earth's climate system. In the modern world, increasing atmospheric carbon dioxide concentration produces global warming which we should deal with. It is suspected that climate-carbon cycle feedback in near future would become positive feedback. As a result, obviously, global warming would be accelerated. On the other hand, in geological history, climate-carbon cycle feedback may act as negative feedback. One of those examples is Oceanic Anoxic Event (OAE) in the mid-Cretaceous. OAE is defined as stratigraphically restricted deposition of carbon-rich sediment in the world ocean. The deposition of massive amount of carbon on the global seafloor decreases atmospheric carbon dioxide, resulting in global cooling.

Since OAE is the global event, a carbon cycle perturbation at OAE can be found in global sediments. On the other hand, precise age, i.e. stratigraphic position, of carbon-rich black shale is significantly different from site to site. For example, black shale occurs throughout the Cenomanian/Turonian transition in the Equatorial Atlantic, while it is restricted to the upper Cenomanian in British coast. In this study, we present new records of organic carbon isotope stratigraphy at Newfoundland margin, mid-latitude western Atlantic. Samples were recovered by Integrated Ocean Drilling Program Expedition 342. Although upper half of the Cenomanian/Turonian transition were within a core gap and not recovered, the first buildup, trough, second buildup intervals of carbon isotope stratigraphy are clearly identified. Interestingly, black shale only occurs the trough and second buildup intervals, which can be correlated to the upper half of the Plenus Marls Member in British coast. This observation implies that productivity and ocean circulation in mid-latitude western Atlantic (Newfoundland) were different from those of mid-latitude eastern Atlantic (British coast).

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