

A standard local chronology of late Quaternary based on the TOC profiles of the sediment cores from the Japan Sea

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The TOC content was measured for the late Quaternary sediments of the Japan Sea with high time resolution (ca. 100 yrs interval), and show the good similarity to the delta ¹⁸O curve of NGRIP not only in the orbital scale but also the D-O cycle scale (Urabe et al., 2013). In this study, we use TOC profile of the MD179-3312 core from the Japan Sea, and we align the TOC profile to the delta ¹⁸O in NGRIP using signal matching, the Match protocol (Lisiecki and Lisiecki, 2002). Before this matching process, there were ca. 4000 years gaps in maxima between both signals, and the gaps are variable. Based on the matched TOC profile, we calculated the ages of TOC peaks, and we proposed a new age of TL layers recognized in MD179-3312 (Kakuwa et al., 2013) on the basis of the matched chronology.

Recently, detailed TOC profiles of the sediment cores were reported from several sites in the Japan Sea, and they show very similar profiles. Therefore, we tried to compile the TOC profiles, using the same match protocol. The matched MD179-3312 profile mentioned above is used as a tentative standard, and TOC profiles of three sediment cores, namely MD179-3304 off Joetsu, MD01-2407 at Oki bank and MD01-2408 off Akita were matched to the tentative standard. This compiled TOC curve (TOC_{JSCOM}; Japan Sea TOC compile) has a reliability due to averaging the four cores data. This TOC_{JSCOM} have a good similarity with the TOC profiles from lake sediments in Japan. When we compared the TOC_{JSCOM} with the delta ¹⁸O of stalagmites from the Hulu/Sanbao caves in the south of China (Wang et al., 2001, 2008), we found the improved chronological correspondence between both proxies in MIS 1/2 boundary, lower MIS 3, 4, 5.1, and 5.2. The difference of the trends is recognized in MIS 5.5, and a part of this discordance is due to the local environmental condition of the Japan Sea.

Keywords: Late Quaternary, Japan Sea, TOC, Chronology