

## Bromine (Br) counts measured by XRF core scanner (ITRAX) as a proxy of marine organic carbon content in the hemipelagic sediments of the Japan Sea

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The marine organic carbon content in sediments is a useful tool for reconstructing past productivity in the ocean. Bromine (Br) has been proposed as a useful proxy for marine organic carbon (Ziegler et al., 2008), since bromine is more concentrated in marine organic matter compared to terrestrial organic matter (Berg and Solomon, 2016).

In this study, we estimate the marine organic carbon content from the Br counts measured by the XRF core scanner. The hemipelagic sediments of the Japan Sea obtained during Integrated Ocean Drilling Program (IODP) Expedition 346 were used because they have distinct alternation of dark colored (organic rich) and light colored (organic poor) layer (Tada et al., 2015).

We measured the bromine content in the sediments using an XRF core scanner (ITRAX) in the Kochi University, Japan. The total organic carbon (TOC) content, total nitrogen (TN) content, and stable carbon isotope ( $\delta^{13}\text{C}$ ) values were also measured for discrete samples from the same sediments. The stable carbon isotope ratio of the total organic carbon is used to estimate the marine organic carbon content within the total organic carbon.

The Br counts and marine organic carbon content show a high correlation, which we used to construct a calibration equation of the marine organic carbon content from the Br counts. Using the calibration equation, we reconstructed high-resolution record of marine organic carbon content in the hemipelagic sediments of the Japan Sea during the Quaternary with a time resolution of  $\sim 50$  years.

The method to estimate the marine organic carbon content from the Br counts measured by the XRF core scanner proposed in this study will be a useful tool to reconstruct the organic carbon content with high resolution and high speed.

Keywords: XRF core scanner, ITRAX, Marine organic carbon, Japan Sea, IODP