Identification of turbidites in the Yatsushiro Sea surface sediment core samples from non-destructive measurements: Hakuho-maru KH-18-3 Cruise, Yatsushiro Sea, Western Kyushu, Japan

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Submarine active faults in Yatsusiro Sea, western Kyushu, Japan, constitute the Yatsushiro section of Hinagu fault zone in its southwest end (AIST et al., 2011). The 2016 Kumamoto Earthquake was sourced from a part of active faults of the Futagawa-Hinagu fault zones (JMA, 2018), and survey has hardly conducted in the sea area after the earthquake occurrence. Earthquake shaking occasionally triggers turbidity currents by submarine landslides and resuspension of unconsolidated sediments on the seafloor (Ikehara et al., 2018). In recent years, the study of earthquake occurrence history using earthquake turbidites formed by turbidity currents is being conducted throughout the world. As earthquake-origin turbidity currents can take place in very gentle slope (e.g. the Mississippi-Delta 0.01°: D. B. Prior et al., 1978), its occurrence is sufficiently thought even in Yatsushiro Sea. However, any record of earthquake turbidites in this area has not been reported. In this study, identification of turbidites in the Yatsushiro Sea surface sediment core samples from non-destructive measurements.

Here we conducted four-days research cruise Hakuho-maru KH-18-3 in July, 2018. We conducted sub-bottom profiling on eight lines, piston coring at 11 sites in Yatsushiro Sea, western Kyushu, Japan. Recovered cores are analyzed by X-ray CT scanner, multi-sensor core logger, core imaging apparatus, visual core description, color spectroscope and X-ray fluorescence core scanner (Itrax) in the Center for Advanced Marine Core Research, Kochi University. With reference to the previous studies (Iwai et al., 2014, JGS abstract; Isabel Rodríguez-Germade et al, 2015; Okutsu et al., 2017, JGS abstract), the behavior of Ca/Ti and Fe/Ti where the peak was observed at the base of turbidites, and the behavior of Fe/Ti and Zr/Ti where the peak was observed at the base of volcaniclastics turbidites.

Our results revealed turbidites and volcaniclastics turbidites in six piston coring sites (PC01 to PC06). As all of sites are located in the Taura-Tsunagioki fault group or Minamataoki fault group, turbidites were considered to be present in all of sites. However, turbidites were identified from PC01 to PC06, but not identified from PC07 to PC11. According to Rifardi et al. (1998), PC01 to PC06 are located in the sea area where the deposition rate is high, and PC07 to PC11 are located in the sea area where the deposition rate is slow.

As turbidite is formed by various factors besides earthquakes, it is necessary to consider whether the turbidites identified in this study are earthquake turbidites. In addition, to investigate the history of earthquakes, it is also a future task to conduct individual sample measurements (such as grain size distribution analysis) and dating.

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