

HCG036-P04

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Sediment wave developments observed in the Aoshima Formation, Miyazaki Group: based on the interpretation of cyclic step

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Sediment waves, which are a form of depositional topography observed in deep-sea environments, are characterized by orderly reliefs of very long wavelengths with low amplitudes (Migeon et al., 2004). Coarse-grained deposits (sediment-gravity flow deposits with grain sizes > 0.25 mm) and rip-up mud clasts found in sediment wave deposits in deep-sea environments are generally observed on the upslope of the waves; however, they are also deposited on the downslope of the waves through hydraulic jumps (Migeon et al., 2001; Nakajima and Satoh, 2001). Cyclic steps, which have been suggested as one of the causes for the formation of sediment waves, experience such hydraulic jumps (Fildani et al., 2006). Evidence found in outcrops, the fact whether sediment wave deposits are formed in cyclic steps, detailed mapping of grain sizes, and distribution of rip-up mud clasts, essential elements for the determination of hydraulic jumps, are required, in addition to descriptions of sedimentary structures and bed thickness. In this study, we obtained a detailed map of grain sizes and rip-up mud clasts in sediment wave deposits in turbidite successions of the Aoshima Formation, Miyazaki Group, suggested by Takii et al.(2010). We discuss the formation of a sediment wave as the cyclic steps experienced hydraulic jumps during the forming processes.

The Aoshima Formation is the uppermost part of the Miyazaki Group filling the Neogene forearc basins (Shuto, 1952). We studied suggested sediment waves in the outcrops of the Shirahama coast, Miyazaki City. The results revealed that coarse-grained deposits and rip-up mud clasts are distributed at irregular intervals in the sediment-gravity flow deposits, suggesting a migration of the deposits and clasts in the upstream direction. The sediment-gravity flow deposits including coarse-grained deposits and rip-up mud clasts, which are thought to be deposits that experienced hydraulic jumps, are mainly composed of graded beds. The sediment-gravity flow deposits with such graded beds occur alternately with massive beds in the paleocurrent direction. These alternate occurrences in the sediment-gravity flow deposits suggest that cyclic step formation with some intervals of hydraulic jumps.

Keywords: sediment waves, cyclic steps, sediment-gravity flow deposits, hydraulic jumps