Is Turbidite Deposited as Textbook Explains? Deposition of Turbidite Beds Analyzed by Diatom Fossils and Mud Contents

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Diatom fossils and mud contents of a Neogene deep-water formation in Niigata, Japan were analyzed focusing on the formation of turbidite bed. This formation contains many turbidite beds, each consisting of a pair of sand and silt bed. Diatom fossils are abundant in the silt beds. There are difference in the abundance of mud contents and diatom fossils in the silt beds. From two turbidite beds (A and B), diatoms were most abundant and mud contents were highest in the uppermost layer of silt beds. However, in two turbidite beds (C and D), they both were most abundant in the middle part of silt bed. We conducted an experiment simulating deposition of turbidite. We firstly used a measuring cylinder to observe a small-scale turbidite-like deposition with various mud contents, and regardless of the mud contents, glass beads (20 μm in diameter) simulating diatoms were always accumulated at the uppermost layer. However by the experiment with a flume in high mud content (33%), glass powders were not accumulated at the uppermost layer, but deposited in the middle layer of mud. Therefore, diatoms can be accumulated in the middle layer of mud when the mud content is high. In conclusion, fine-grained mud and diatoms were not always accumulated at the uppermost part of a turbidite when the mud content is high, and such a difference should be caused by the difference in the distance of turbiditic flow from the origin to the depositional site.

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