

Mud volcano in subduction zones - Its implication for material transportation and tectonics

Juichiro Ashi[1], Takuya Sawada[1], Nankai-SEIZ

[1] ORI, Univ. Tokyo

Mud diapirism is a phenomenon of upward intrusion of unconsolidated muddy material due to buoyancy from density reversal and abnormal high pore pressure. There are a large number of mud volcanoes in subduction zones and high sedimentation area. Mud diapirism is one of important processes on material transportation as well as plate subduction and sediment gravity flow. Mud volcano provides information of sediment, rock, pore fluid and gas at undrillable deep parts.

Around Japan, mud volcanoes have been reported from the Nankai Trough off Shikoku and the Ryukyu Trench off Tanegashima. Our presentation focuses on mud volcanoes in the Kumano Trough east of Kii peninsula. Seven mounds with a diameter of about 1km are recognized on side-scan sonar images and are regarded as mud volcanoes by submersible survey. These mud volcanoes are developed along active faults that extend toward west-southwest from Tokai region. Their distributions coincide with aftershock area of 1994 Tonankai Earthquake suggesting relationships with seismic activity and faulting. Development of BSRs suggests that gas expansion from dissociation of gas hydrate induces rapid methane/mud eruption. Variation of side-scan sonar reflectivity at the summit of mud volcanoes probably depends on thickness of cover sequence after formation of mud volcanoes. Thicknesses of cover sequences revealed by piston coring are consistent to reflectivity of sonar image. Moreover, activities of chemosynthetic biological communities also coincide with sonar image.

We will discuss about the role of mud diapirism on material transportation and tectonics in subduction zones including the Barbados Ridge and Mediterranean Sea.