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Origin and burial depth of Médée-Hakuho Mud Volcano in the Eastern Mediterranean Sea

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Present-day geodynamic framework in the Eastern Mediterranean Sea and the surroundings is characterized by a complex pattern of active thick-skin crustal tectonics resulting from various plate and microplate interactions. Moreover, thick impermeable barrier of the Messinian evaporates exists below the entire Eastern Mediterranean foredeeps exceeding 3 km in thickness. These geological frameworks result in the Mediterranean Ridge differing from other accretionary complexes around the world, coupled with formation of mud diapir or mud volcano and brine lake.

Ten-day PENELOPE Cruise in January/February 2007 (KH-06-4 Leg06 survey of the *R/V Hakuho-Maru*) made significant results in detailed mapping and piston/multicores sampling of newly-discovered Médée brine lake and its westward neighboring Médée-Hakuho Mud Volcano (MHMV) in the western branch of the Mediterranean Ridge. The MHMV has an almost circular dome structure in diameter of $\sim$7km and reaching $\sim$130m high, standing on the backstop boundary thrust in water depths of 2260 m. It was initially roughly-recognized during Médée Cruise conducted in 1995 on the basis of its distinct backscattering characteristics. The MHMV is interpreted to be active because of existence of many pebbles in the obtained core samples and the high backscatter intensity.

Little has been clarified the relationship between undergoing collisional tectonics and mud volcanism, although these processes are strongly associated. Mud volcanism in the Eastern Mediterranean Sea is known to be present on contiguous belt along the Mediterranean Ridge, which is referred to as the Mediterranean Ridge mud diapiric belt, but mud fields in the western branch of the Mediterranean Ridge remain poorly solved. In this study, we measure vitrinite reflectance of the clasts from the obtained MHMV cores in order to evaluate the temperature history and thus burial depth of MHMV. Calculation of vitrinite reflectance is followed by using the ambient temperature at the summit of the MHMV of $\sim$14°C and an average geothermal gradient of 20-24°C/km from previous study. Estimating the sediment source and burial depth of MHMV will contribute to understand its geological properties and thus presumably to reveal characterization of the mud volcano coupled with brine lake at the prism-backstop contact.