

中央インド洋海嶺かいいい熱水フィールド周辺における深部岩石の露出 Occurrence of deep-seated rocks around the Kairei hydrothermal field in the Central Indian Ridge Segment 1

中村 謙太郎^{1*}, 森下 知晃², 渋谷 岳造¹, 辻 健³, 高井 研¹

Kentaro Nakamura^{1*}, Tomoaki Morishita², Takazo Shibuya¹, Takeshi Tsuji³, Ken Takai¹

¹JAMSTEC, プレカン, ²金沢大学, FSO, ³京都大学

¹PEL, JAMSTEC, ²FSO, Kanazawa Univ., ³Kyoto Univ.

Since the first discovery of hydrothermal vent site at the Galapagos Spreading Center in 1977 (Corliss et al., 1979), it has been revealed that seafloor hydrothermal systems host a variety of vent-endemic biological communities (e.g., Van Dover, 2000; Wilcock et al., 2004). The principal source of primary productivity in the vent ecosystems is chemolithoautotrophic microorganisms that obtain energy from inorganic substances, such as H₂S, CO₂, H₂, and CH₄ derived from hydrothermal vent fluids (e.g., Jannasch and Mottl, 1985). Recently, particular attention has been paid to H₂-enriched hydrothermal fluids supporting archaeal methanogens, because this type of hydrothermalism and microbial ecosystem is considered to be an important modern analogue to the early life on Earth (e.g., Takai et al., 2006).

The Kairei hydrothermal field, located in the first segment of the Central Indian Ridge (CIR), is known to be characterized by unusually H₂-rich hydrothermal vent fluids (Van Dover et al., 2001; Gallant and Von Damm, 2006). Similar H₂-enriched hydrothermal vent fluids have also been reported from several hydrothermal vent fields along the Mid-Atlantic Ridge (MAR) (e.g., Charlou et al., 2002, 2007; Melchert et al., 2008). Based on geological and petrological observations at the MAR hydrothermal vent sites, H₂ in the hydrothermal fluids is considered to be derived from serpentinization of ultramafic rocks that have been tectonically uplifted and emplaced near the hydrothermal vent fields (Charlou et al., 2002; Douville et al., 2002). However, ultramafic rocks have not previously been recognized around the Kairei hydrothermal field and thus, several researchers have considered that H₂ in the Kairei fluids are not derived from serpentinization of ultramafic rocks.

In January 2006, we discovered serpentinized troctolitic rocks from the Uraniwa-Hills near the Kairei hydrothermal field (Kumagai et al., 2008), and demonstrated that serpentinization of the Uraniwa troctolites can produce enough H₂ into the Kairei hydrothermal fluids (Nakamura et al., 2009). There is, however, still another possible source region of H₂ in the Kairei hydrothermal fluids, which have not been investigated yet. On bathymetric image, an approximately 10 x 10 km size gentle hill is observable in an inside corner of the CIR Segment 1, northern part of the Hakho-knoll. In November 2009, we conducted a Yokosuka/Shinkai6500 YK09-13 Leg2 cruise to clarify the occurrence and distribution of deep-seated (lower crustal and upper mantle) rocks around the Kairei hydrothermal field. In this presentation, we report the first result of the YK09-13 Leg2

cruise.