

CRUISE SUMMARY

In this cruise, we have successfully conducted 8 *Shinkai 6500* dives; 3 dives at Kairei hydrothermal field, 1 dive at the Edmond hydrothermal field, and 4 dives at the area among the URANIWA-Hills, Hakuho-knoll, and inside corner high of the CIR Segment 1 (this area here after designates the Hakuho-garden). We also performed SCS survey at the Hakuho-garden as well as 25°S OCC (Ocean Core Complex). The main results of these observations are as follows;

1. Dives#1170 and #1176 confirm that mantle peridotite is extensively exposed at the inside corner high of the CIR Segment 1, northern part of the Hakuho-knoll. This clearly indicates that this area is one of the possible source regions for hydrogen in the Kairei hydrothermal fluids, in addition to the URANIWA-Hills that was discovered in a previous cruise.

2. Dive#1171 shows that the eastern slope of the Hakuho-knoll is composed of pillowed basalt, as in the western slope, and no exposure of gabbroic and/or peridotitic rocks is observable. This confirms that the Hakuho-knoll, hosting the Kairei hydrothermal field, is completely composed of basaltic rocks.

3. We also discovered hydrothermally altered gabbroic and doleritic rocks in a small ridge located between the URANIWA-Hills and Hakuho-knoll at Dive#1173. This suggests that exposure of deep-seated rocks, constituting the URANIWA-Hills, continues toward western part, near the Hakuho-knoll.

4. We obtained single-channel seismic reflection data for 7 survey lines. We classified lithological units using several seismic attributes along the seafloor (e.g., reflection strength, smoothness, and frequency components). The lithology variation estimated by seafloor seismic response is well consistent with Shinkai observations. We further estimated subsurface structures; fault distribution and magmatic intrusions.

5. We successfully collected various hydrothermal vent animals, and performed a variety of onboard experiments.