

Tectonic history of the Lyra Basin, west of Ontong Java Plateau

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We present the results of our research cruise conducted by R/V KAIREI in the Lyra Basin, west of the Ontong Java Plateau in the western equatorial Pacific Ocean.

The Ontong Java Plateau (OJP) is one of the most voluminous large igneous provinces (LIPs). The evidences from drilling samples indicate that most of the OJP formed rapidly around 120 Ma. The OJP consists of two major provinces: the high plateau and the eastern salient. Most of the high plateau are shallower than 3 km. Deep ocean basins about the OJP: the Lyra Basin to the west, the East Mariana and Pigafetta basins to the north, the Nauru Basin to the east, and the Stewart Basin to the south-east. Tectonic histories of the Nauru, East Mariana, and Pigafetta basins, were revealed using the Mesozoic magnetic lineations (Nakanishi et al., 1992).

Lyra Basin lies west of the Ontong Java Plateau. The Lyra Basin deepens westward from 4000 m to 5000 m. The Lyra Trough, crossing the Lyra Basin, is a broad and deep graben. The depth is about 6000 m. The eastern rim of the Lyra Trough is dotted seamounts.

We conducted the research cruise (KR06-16) around the Lyra Trough in the Lyra Basin using R/V KAIREI, JAMSTEC, in December 2006. Our bathymetric measurement revealed the topographic expression of the Lyra Trough. Linear ridges exist in the eastern rim of the trough near the equator. The height of the ridges is more than 500 m. The strike of some ridges is parallel to the trough. That of others is slightly oblique to the trough. We got basaltic rocks in the two slopes of the ridges by dredge. The single-channel seismic survey illustrates that the thickness of the sediment in the Lyra Trough is more than 500 m. Our seismic survey also exposes many faults that cut the sediment layers in the Lyra Basin.