
Press Releases



April 10, 2013
JAMSTEC

Round-the-World Voyage of the Shinkai 6500 Manned Research Submersible (Progress Report) — Central Indian Ocean Ridge, Rodrigues Triple Point Area Research —

As a part of its scientific research into diverse communities of marine organisms inhabiting and developing in extreme environments of the oceans, the Japan Agency for Marine-Earth Science and Technology (JAMSTEC: Asahiko Taira, President) is carrying out a global voyage for scientific research into ecosystems established in areas with extreme marine environments as has already been reported on December 13, 2012. The expedition name is "QUELLE 2013," and these areas include high-temperature hydrothermal environments in the Indian Ocean and Atlantic Ocean and hadal zones in the Pacific Ocean; the Shinkai 6500 manned research submersible and its support ship the Yokosuka embarked on this expedition in January 2013.

Investigations in the Indian Ocean, which is the first area being investigated during this expedition, were completed in March 2013, so an overview of the research carried out is being reported at this time. Moreover, investigations are to continue in the coming months with a move to the waters of the Atlantic Ocean.

1. Research Objectives in the Indian Ocean

At JAMSTEC, comprehensive research is being carried out on chemosynthetic communities and the deep-sea hydrothermal system that they inhabit. As a part of this research, the objectives are to carry out exploratory investigations to elucidate systems of interaction for hydrothermal activity, the structure of hydrothermal circulation and in communities of organisms such as scaly-foot gastropods that inhabit these environments.

2. Overview ([See Appended Map](#))

(1) Rodrigues Triple Junction Area (depth: 1400 to 5200 m)

Period of operations: January 27 to January 29

Details of operations: Geophysical investigations of hydrothermal areas

- Deployment of ocean bottom electro-magnetometer (OBEM) and ocean bottom seismometer (OBS)
- Single channel seismic survey of crustal structure beneath ocean floor by using air gun, OBS and a single channel streamer
- Observations of ocean bottom topography, gravity and geomagnetism at the sea surface

(2) Rodrigues Segment of the Central Indian Ridge (*) (depth: 2400 to 6000 m)

* Segment: continuous topological feature without break in ocean ridge

Period of operations: February 8 to 23

Details of operations:

- 1) Geophysical investigation of the two hydrothermal areas
 - Observations of ocean bottom topography, gravity and geomagnetism at the sea surface
- 2) Investigation of chemosynthetic communities inhabiting hydrothermal area
 - Comprehensive investigation of hydrothermal ecosystems and chemical environments in the Solitaire hydrothermal field
 - Collection of white scaly foot gastropods for shipboard culture experiments with the objective of elucidating mechanism for synthesis of iron sulfide scales

(3) Rodrigues Triple Junction Area (depth: 1400 to 5200 m)

Period of operations: February 28 to March 28

Details of operations:

- 1) Geophysical investigations of hydrothermal area Single channel seismic survey of crustal structure beneath ocean floor by using air gun, OBS and a single channel streamer

Recovery of OBEM and OBS deployed in the cruise (1)

- Investigation of the newly found hydrothermal activity in the Yokoniwa Rise north of the Kairei hydrothermal field
- Survey of rock distribution in the Yokoniwa Rise
- Observations of ocean bottom topography, gravity and geomagnetism at the sea surface

- 2) Investigation of chemosynthetic communities inhabiting hydrothermal area

- Collection of black scaly-foot gastropods for shipboard breeding experiments with the objective of elucidating mechanism for synthesis of iron sulfide scales

In the investigations in the Indian Ocean, researchers from the Mauritius Oceanography Institute (MOI, Republic of Mauritius) were on board, and collaborative research was carried out in geophysics and other fields.

* Moreover, when papers on the results of research involving this voyage are completed, they will be published.

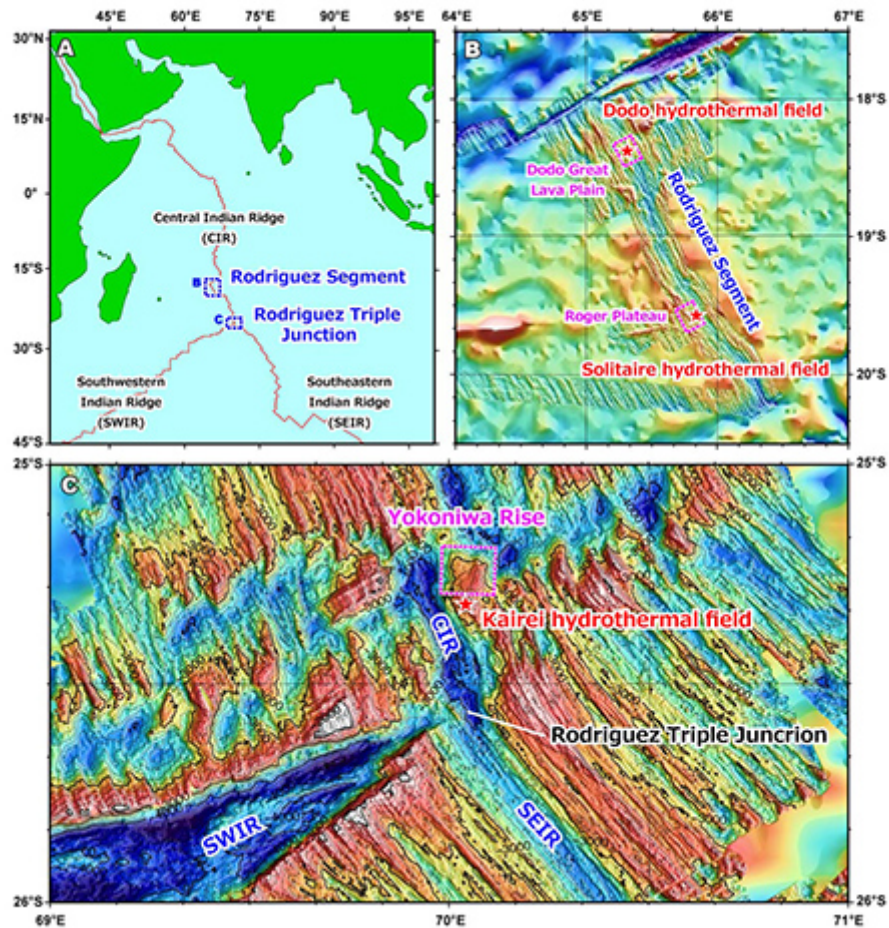
3. Future Plans

April 10 to 12	Special exhibition of Yokosuka and Shinkai 6500 in Cape Town (South Africa)
April 20 to May 3	Investigations offshore of Brazil (Rio Grande Rise)
May 6 to 8	Special exhibition of Yokosuka and Shinkai 6500 in Rio de Janeiro (Brazil)
May 11 to 22	Investigations offshore of Brazil (Santos Basin)
May 25 to 27	Special exhibition of Yokosuka and Shinkai 6500 in Santos (Brazil) Symposium and other events in Sao Paulo (Brazil)

Mid-June to early July Investigation around island chain in British Cayman Islands in the Caribbean

* There may be changes due to sea conditions and work situation.

[References]



Scaly foot gastropods collected in ocean bottom hydrothermal areas at ocean ridges in the Indian Ocean



White scaly foot gastropod



Black scaly foot gastropod

Scaly foot gastropod: Sea snail discovered in the Indian Ocean and attracting attention for having scales clad in iron sulfide (black scaly foot gastropod), but in an investigation in 2009, individuals (white scaly foot gastropod) having white scales, not clad in iron sulfide were discovered also in the Indian Ocean.

Contacts:

Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

(For structural investigation)

Kentaro Nakamura,

Laboratory for Earth Systems Science, Precambrian Ecosystem Laboratory Unit

(For investigation of chemosynthetic communities)

Manabu Nishizawa,

Laboratory for Earth Systems Science, Precambrian Ecosystem Laboratory Unit

(For publication)

Kazushige Kikuchi, Director

Planning Department Press Office