

## International Ridge-Crest Research: 4D Architecture...

## Geological and Geophysical Exploration along Carlsberg Ridge

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The Carlsberg Ridge is a slow-spreading ridge, similar to the Mid Atlantic Ridge, which forms the northern part of the Indian Ridge system. In June-July 1996 it was surveyed for the first time with a state-of-the-art multibeam bathymetric system and the topographic features of this slow-spreading ridge segment were obtained. We used the oceanographic ship *ORV Sagar Kanya* fitted with Hydrosweep, a multibeam bathymetric system (MBS) along with other geophysical equipment such as a magnetometer and a gravimeter.

We surveyed a small area of about 15,000 km<sup>2</sup> out to the 2A magnetic anomaly with closely gridded survey lines to get one hundred percent coverage by the multibeam system. A total of seventeen survey lines with a spacing of 5.5 km were made during the survey. The multibeam data shows a ridge axial discontinuity (RAD) or a non-transform discontinuity (NTD). The general observation of the data shows a broad axial valley with depth varying from 4500 to 2200 m. The sections across ridge axis shows a uniform spreading along this section of the Carlsberg ridge. Figure 1 shows the location and generalized depth contour map of the survey area. The back scatter amplitude data from MBS was processed to generate pseudo side-scan images, from which it was determined that the rift valley is sedimented.

Rock sampling brought up altered ultramafic rocks such as serpentinites, lherzolites and gabbros. The lherzolites have large phenocrysts (4-5 mm) of clinopyroxenes and bastite, indicating the rocks have undergone hydration alteration. The bastites display a typical bronze-like luster, even macroscopically. Short spade cores for sediments were also collected from the axial valley and from the flanks of the ridge from a depth of about 4500 m.

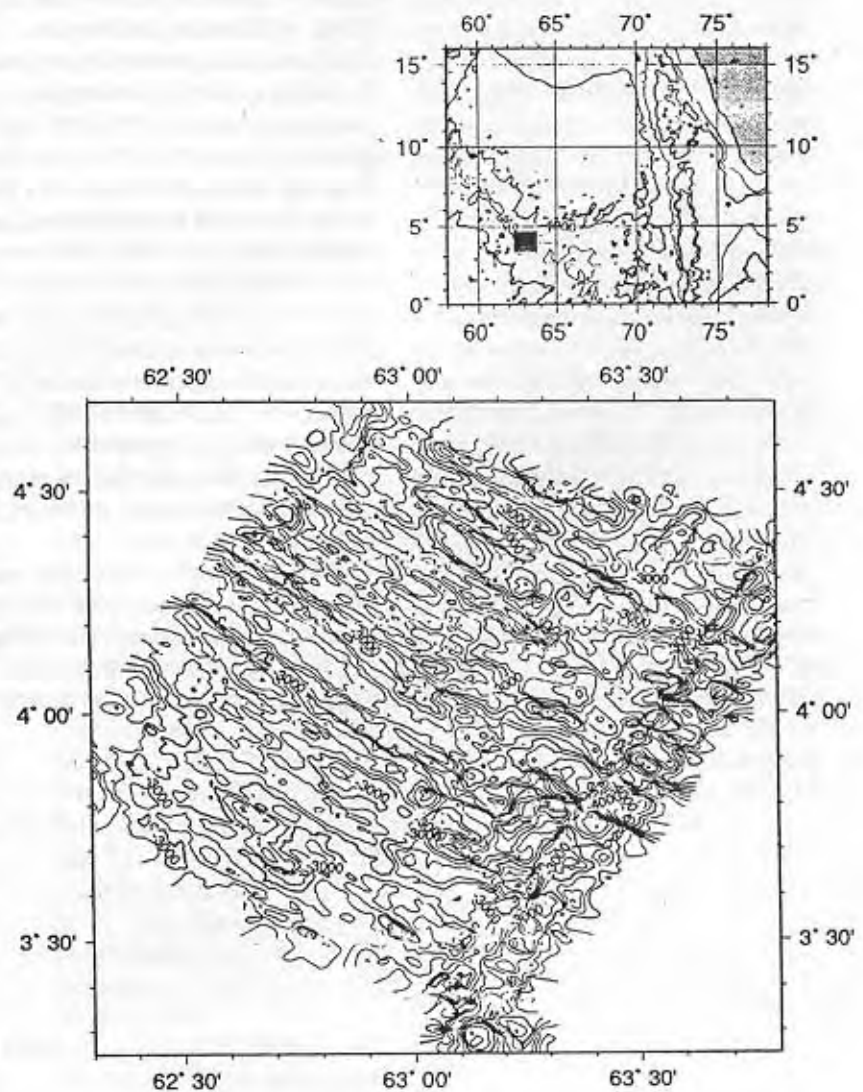


Figure 1. (top) The general location of the survey area, indicated by the black box, and (bottom) a generalized depth contour map (contour interval is 200 m) of the region surveyed by the *ORV Sagar Kanya*.