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**Hydrography, Hydrothermalism, Paleoceanography
in the Red Sea**

FINAL REPORT
Sonne 121 - Red Sea
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1. Abstract

The Red Sea is a very young ocean, and is one of the most interesting areas on Earth (ocean in statu nascendi). It is the only ocean where hydrothermal activity associated with ore formation occurs in a sterile environment (anoxic, hot, saline brines). In addition, its geographical position means that it is predestined to record the monsoonal history of the region in detailed sedimentary sequences.

The major aim of the present project was to investigate the dynamics of hydrothermal systems in selected Deeps (Atlantis-II-, Discovery-, Kebrit-, Chain-Deep) in the central and northern part of the Red Sea. Geochemical (hydrocarbons, gas and trace element cycles) and microbiological questions have been addressed. Furthermore, paleontological studies have been made and will be reported in a forthcoming report.

Specific aims were:

1. To study hydrographic changes in individual Deeps (hydrothermal region Atlantis-II, Discovery Deep) during the last few years (compared to Meteor-cruise 31/2 in 1995) and to investigate the brine compositions and brine-seawater interfaces.
2. Investigating hydrothermal mineral deposits to get more information about the hydrothermal history in the Red Sea rift area.
3. Claryfing the influence of hydrothermalism on the sedimentary organic matter in the Deeps and the hydrocarbon gases in the brines. In particular, the production and degradation processes of hydrocarbons have been studied.
4. Documentating microbiological activity associated with hydrothermal activity in an extreme (hypersaline and hot) environment. In detail, to separate microorganisms from the brines and to characterise them in terms of their metabolic physiology and ecology, and to describe their taxonomy.
5. To clarify the palaeoceanographic conditions, sea-level changes and the climatic history (relationship of the circulation system and nutrient supply to the monsoon) of the southern Red Sea (forthcoming report).

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