MORPHOLOGY AND SEDIMENTARY EVOLUTION OF THE DEEP FORE-REEF SLOPES OF THE COMORO ISLANDS IN COMPARISON WITH THE RED SEA AND THE CARIBBEAN

W. Dullo (GEOMAR, Kiel, Germany)

Grande Comore is the youngest island of the archipelago and in its submarine morphology it is strongly controlled by recent volcanism. The slopes, observed onshore, continue below the present-day sea level in the same inclination. Apart from its morphology that is still dominated volcanically, the shallow regions to 30 m are covered with scleractinies even on the youngest extrusions (15 years). Moheli already shows, especially on the western side, an independent morphology due to carbonate production and reef growth. This is particularly demonstrated by a most distinct terrace, currently at 120 m water depth. Its structure is probably related with the last glacial lowstand of sea level or shortly after its maximum, respectively. On the southern side, this terrace step can be followed across the east side to the north side. Characteristic rock walls are below this step, which can be found in the Red Sea, as well as in the Caribbean. The bathymetric range of these walls always begins below 100 m of present water depth and reaches to approximately 180 m. The ledge structures known from the Red Sea are found here on the rock walls, as well as on the steeply inclined (75° - 80°) deeper parts (down 250 m). Slopes with 30° to 45° tilt follow below showing thin sediment covers over cemented carbonates. Cipit boulders are found in some places.

The Island of Anjouan has an intermediate type of morphology because it possesses very thin fringing reefs and deeper carbonate fore-slopes; however, it is mainly dominated by volcanics below 130 m of present water depth.

Mayotte, as the oldest island of the ones investigated, has very well-developed fringing reefs and a circular barrier reef. On the SW side between the outer barrier and the coast there even exists an internal reef barrier. An independent fore-reef morphology has developed currently above 250 m of present water depth, owing to its age and a longer subsidence connected with that. Therefore, as on Moheli, there are very steep reef slopes on which the well-known ledge structures are located. First investigations indicate that the ledges are mainly built by *Halimeda* sand, whereas red algae and bryozoan occur as primary biogenic framework. According to our investigations in the Red Sea the primary framework here is also intensively corroded.

The volcanic basement was reached at a depth of 360 m on the west side below the rock walls. Here, the slopes that are covered by reef talus are differently inclined (20° - 45°). The top of the fans shows only a very thin sediment cover over cemented reef rud stones. This result perfectly matches the observations from the Caribbean and the Red Sea. According to these observations the steep walls and the cemented slope fans were formed during the last glacial, while formation of the ledges took place during rapid sea level rise. The last stage of present-day conditions is characterized by the accumulation of non-lithified talus at the base of the steep walls, as well as fine sediment trapping on top of the ledges.