Geophysical Research Abstracts
Vol. 20, EGU2018-13281, 2018
EGU General Assembly 2018

Micropaleontological and taphonomic characteristics of mass-transport deposits in the northern Gulf of Eilat/Aqaba.

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Submarine mass transport deposits (MTDs) are a well-known phenomenon in tectonically active regions. Evidence for such deposits is commonly found in the continental slope sedimentary records, as distinct units with coarser grain size compared to the usual and continuous pelagic sedimentation. The Gulf of Eilat/Aqaba is located between the southernmost end of the Dead Sea transform and the spreading center of the Red Sea, and is considered as an active tectonic region.

In this study, an innovative approach using symbiont-bearing Larger Benthic Foraminifera (LBF) to identify MTDs in the Gulf of Eilat/Aqaba (GEA) sedimentary record is presented. The abundance, size and preservation state of LBF shells were analyzed in two radiocarbon dated sediment cores collected at different deposition environments, at water depth of 532 m and 316 m.

The microfaunal and taphonomic results show that the coarse units are characterized by a generally higher numerical abundance of LBF, dominated by Operculina ammonoides, Amphistegina papillosa and Amphistegina bicirculata. These benthic assemblages are found in deeper depths than their original habitat, ranging between 50 and 120 m, in accordance with their symbionts light requirements. In the coarse units, LBF >1 mm appear in high frequency, up to 161 specimens per g sediment, and poorly preserved shells are also abundant, containing up to 247 specimens per g sediment. In addition, these units also contain high numbers of yellowish and blackish colored LBF shells, as opposed to null in the non-disturbed units, and unlike their natural white color.

The large shell size indicates that high energy is involved in the displacement of the sediments. The poor state of preservation also suggests a turbulent flow during transportation, which also requires a high-energy triggering mechanism. The color alteration is probably associated with a diagenetic process related to increasing burial time/depth, also supported by the stratigraphic older ages of the MTDs, suggesting a long burial before the sediments were displaced. In addition, according to the dating of the record, some units correlate with historical and pre-historical earthquakes, reinforcing LBF species as a reliable proxy for mass transport events.