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Turbidites, benthic foraminifera, and earthquakes – a paleoseismic record from the northern Gulf of Aqaba

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Submarine mass transport deposits (MTDs) and turbidites 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 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, symbiont-bearing Larger Benthic Foraminifera (LBF) were used to identify MTDs in the Gulf of Eilat/Aqaba (GEA) sedimentary record. The abundance, size and preservation state of LBF shells were analyzed in two radiocarbon dated sediment cores collected at different deposition environments at the deep GEA slope.

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 at the continental shelf. In the coarse units, LBF> 1 mm appear in higher frequency and poorly preserved shells are also abundant. In addition, these units contain high numbers of yellowish and blackish colored LBF shells, as opposed to null in the non-disturbed units, and unlike their natural pristine 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 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. Radiocarbon dating reveled most of the MTDs correlate with historical and pre-historical earthquakes, reinforcing LBF species as a reliable proxy for mass transport events.