



Long-term faulting history along the Missyaf - Ghab segment (Syria) of the Dead Sea Fault from paleoseismology

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We have conducted field investigations in tectonic geomorphology and trenching on the Missyaf – Ghab segment of the Dead Sea Fault. Recent studies in archeo-paleoseismology made along several sites of the fault in Syria indicate evidence of earthquake-related faulting and damage were identified. Coseismic offsets and damage of archeological sites have been identified primarily at the faulted Roman aqueduct at Al Harif located at mid-distance of the Missyaf segment. Paleoseismic investigations with trenching across the northern end of the segment and in the Ghab pull-apart basin reveal a mega-flower structure with several fault branches affecting late Pleistocene and Holocene lacustrine and alluvial deposits. Two fault branches display late Holocene slip with successive colluvial wedges and apparent vertical offset of paleosols. Radiocarbon dating and archeological artefacts (pottery, flint, object) constrain the succession of seven faulting events; the youngest being from the pre-Ottoman period may correspond to the AD 1156 or AD 1170 large earthquakes ($M > 7$). Our results indicate a predominant earthquake clustering during the Bronze Age and after the Roman time along this segment of the Dead Sea Fault. Taking into account the geologic and geodetic slip rate (2.5 – 6 mm/yr.), a 2.5 to 5.5 m slip deficit is inferred on this segment that exhibits a seismic gap since nearly 1000 years.

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