



## **The accretionary complex of Makran in SE-Iran**

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We reassess the stratigraphy and tectono-sedimentary history of the Makran accretionary complex that results from the convergence between the Arabian and Eurasian plates since at least the late Cretaceous. The Makran accretionary complex was a turbidite basin on an active margin between the late Paleocene – early Eocene and the Serravallian. The oldest well-dated sediments are Lower Eocene turbidites with typically rhythmic alternation of brown sandstone and lighter-coloured shales; this upward-coarsening unit represents relatively distal slope deposits conformably covering a series of pillow basalts, basaltic flows and pelagic limestones and shales of early Palaeogene age. New fossil data reveal that many turbidite units that were previously considered to be Eocene are in fact late Oligocene in age. The facies changes from distal deep-water to proximal shallow-water indicate a prograding clastic wedge and decreasing accommodation space. Syn-tectonic growth strata and a marked increase in the re-working of microfossils indicate that this change is not only linked to outward migration of a sub-marine fan system but to the onset of deformation. The accretionary complex of Makran includes a giant catastrophic mud-and-debris flow inserted between Lower Miocene and Upper Miocene sediments. We provide evidence for sedimentary gravitational emplacement of the resulting olistostrome between 11.8 and 5.8 Ma or shortly thereafter. The olistostrome includes blocks of ophiolites and oceanic sediments derived from the ophiolite-bearing, imbricate thrust zone to the north and reworked chunks of the turbidites on which it rests with an erosional unconformity. The chaotic scattering of blocks of any size and lithology and the soft-sediment deformation of the matrix argue against a tectonic emplacement of the olistostrome. Its size

and internal structure make it a fossil equivalent of the large debris flows found along continental margins and unstable volcanic edifices.