

Discovery of Carbonate Mounds in the Alboran Sea: The Melilla Mound Field

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A cluster of Holocene mounds was discovered during the recent MARSIBAL I-06 cruise (R/V BIO HESPÉRIDES, December 2006) east of Melilla in the southeastern margin of the Alboran Sea (Morocco margin). The area was investigated with swath bathymetry, high-resolution sub-bottom profiling and seismic reflection. Based on seismic and swath-bathymetry data, mounds are thought to be largely biogenic carbonate accumulations. Nevertheless, as it is known from comparable settings, mud mounds or even mud volcanoes may well coexist there. The Melilla Carbonate Mound Field (MCMF) covers an area of circa 15km² and probably extends off the actual surveyed area.

Seabed and buried mounds are elongated and domed families of ridge-like buildups occurring in water depths from 200 to 400m. Mounds roiled on high reflective sedimentary layers, and are surrounded by dark reflective moats caused by bottom currents. Some mounds have no linear but branched shapes. Seabed mounds begin beneath the gentle upper slope (water depth from 200-230m) producing bulges in the seafloor, and give way with depth to larger buildups 100–250m wide, 2-6km long, and 20-60m high. At 400m depths a mound ridge attains 100m high above seafloor. Three generations of successive mound-growth are observed, and some ridged mounds nucleated upon older domes so that buried constructions grow up to 150m.

Planned sampling will inform mound nature and origin (coldwater bioherms, diagenetic knolls?), or if microbial mediation accounted for its nucleation and stabilization.

Seismic profiles across the MCMF show that faults exist beneath the mound ridges, so that mounds nucleation may have some influence from fluid venting via fractures that may leak thermogenic gas or cold hydrocarbon seepages, in addition to any likely oceanographic control.