

Spatial distribution of radionuclides in marine sediments from Djibouti seamounts (Alboran Sea, Western Mediterranean)

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In the present study, sediment samples from two seamounts of the Djibouti Banks area – Avempace and Herradura - located at the Motril Marginal Plateau (northern Alboran Sea) were investigated to determine the radioactivity of natural (²²⁶Ra, ²³²Th, ²¹⁰Pb, ⁴⁰K) and artificial (¹³⁷Cs) radionuclides. Changes in the elemental composition of sediment from seamounts may be related to sources and oceanographic conditions in the water column, but also biogeochemical and geochemical processes can be involved during the vertical deposition of particles and in the sediment surface once particles are settled. The particular interest of this area is that the influence of fluvial supplies is scarce and therefore the contribution of aeolian dust inputs to sediments is expected to be high and largely responsible for the sediment's composition. In this setting, the Sahara and northernmost part of North Africa or Sahel regions are the most likely areas providing dust particles to the Mediterranean Sea.

The tops of the Avempace and Herradura seamounts are relatively flat and shallow, with minimum depths of 260–275 m, respectively. In general, both seamounts presented similar average radiological load and the results showed that the spatial distribution of radionuclides was relatively uniform in surface sediments from these two banks. For the anthropogenic ¹³⁷Cs, the radioactivity ranges from 1.8-6.9 Bq/Kg and can be mainly attributed to the significant supply of aeolian dust from North Africa to the Alboran Sea.