

7-3 - MEDINA AND CYRENE SEAMOUNTS IN THE SOUTHWESTERN IONIAN SEA

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The Ionian seamounts occur mostly in its southwesterly quadrant (Lat. 33° to 36°N, Long. 16° to 20°E).

Only two, the largest, seamount groupings are discussed here. One is the Medina Rise, which juts out for 200 km. eastwards from the Sicilia Escarpment at the latitude of 35°N. The other is the Cyrene seamount, lying 170 km. due north of Benghazi, Libya.

The Medina Rise forms ridge crowned with a chain of three large and several smaller individual seamounts rising at an average spacing of 40 km. , above the sea floor. The lengths of the larger, oblong seamounts are 45,35,25 km. counting from West. Their length-to-breadth ratio is 3:1 the longer axis being aligned NE-SW. The flanks slope over 15°. The heights above floor decrease eastward from 3600 m. to 700 m.

The seismic reflection profiles show the seamounts to be flat-topped tectonic blocks covered with more than 300 m. of sediments distorted and displaced by numerous faults. An 8 m. long piston corer sample showed sequences of intercalated foram lutites, tephra and a few sapropelic layers.

The positive Bouguer gravity anomaly is broad and of 150 to 200 mgals order. It is larger than the usual oceanic anomaly and suggests a high mantle topography-not necessarily expressed in the surface feature.

The magnetic anomaly is an elongated E-W oriented feature, up to 300 gammas strong, associated with the whole rise rather, than with individual seamounts.

The Medina Rise and its seamounts are thus interpreted as a linear arrangement of tectonic blocks. They have sunk to a lesser depth than the adjacent sea-floor during the post-miocene foundering of the Ionian sea basin along the Sicilian Escarpment. The W-E alignment of the rise may be due to stresses caused by a major wrench -(transform) fault trend associated with relative lateral motion of the european & african plates suggested by other authors.

The Cyrene seamount is over 50 km long and 15 km wide. Its major axis show NNW-SSE alignment. The average flank slope exceeds 15°. The seamount rises over 2600 m above the adjacent Ionian abyssal plain.

The seismic reflection profiles show it to be covered with at least of 400 m. of little disturbed stratified sediments tilting 1° to NW, in the opposed sense to the tectonic tilt of the Sicilian Escarpment. The top sediments show effects of submarine erosion and slumping. The seamount conforms to the usual characteristics of a guyot.

The refraction profiles showed on the east flank presence of (Mesozoic ?) sedimentary rocks (velocity 4.7 km/sec) at a shallow depth.

The scarce magnetic data suggest that Cyrene seamount has a complex anomaly of the order of 200 gammas, stronger in the east and south flanks. The anomaly is interpreted as associated with the crystalline basement uplift rather than with intrusive volcanics.

Several much smaller seamounts form an E-W extensions of the Cyrene's southern flank. Their magnetic signature is unknown. Together they form an alignment paralleling that of Medina rise but displaced 200 km. southwards. We suggest that both seamount groups were formed by similar mechanism of differential foundering of tectonic blocks which occurred during the formation of the southwestern Ionian basin and possibly, of the bay of Sirte.