

Mazarron escarpment : an inestable slope composed by Pliouaternaries Sedimentary Units (Murcia, Spain)

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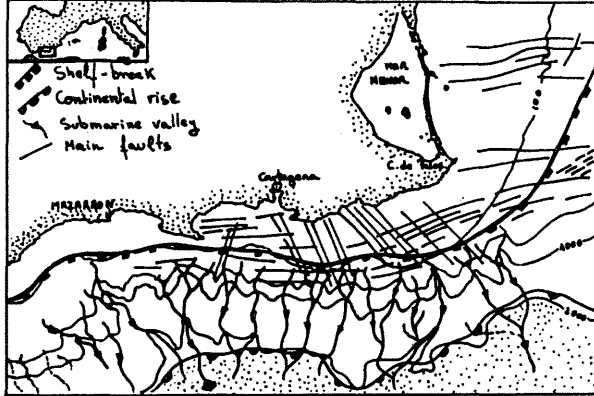
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The Mazarron escarpment itself, constitutes the geological border between continental shelf-slope and the abyssal plain in the eastern Alboran basin, being part of the Iberian margin in the province of Murcia. From a broader perspective it is considered as the extension to the SW of the Emile Baudot Escarpment.

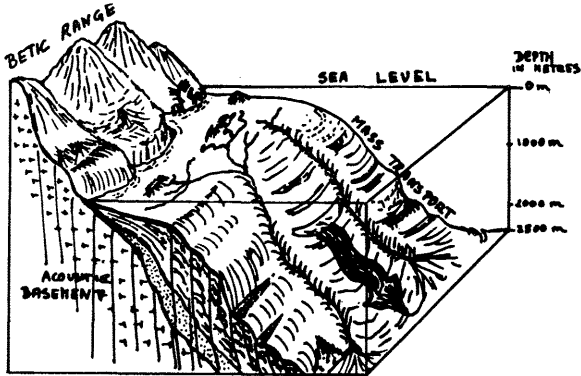
It still corresponds to the limit southward of the threshold linking the Betic Range and the Balearic Promontory.

The surveyed area in the continental margin of Spain, is located around Mazarron place, in a depth between 0 and 2500 metres.

This margin belongs to a passive type and is extremely steep along the Mazarron and Emile Baudot escarpment. The sedimentary cover, mainly Pliouaternary in age, is fully variable in thickness. It's covering a high tectonized substratum (Betic Range) that outcrops close to "Cabo de Palos".



From the sedimentary point of view, can be included in a abrupt-type, characterized by a narrow shelf with some irregularities produced by the proximity of the basement to the bottom, where the sedimentary factor has not exceeded the tectonic one. The morphology of the slope is dominated by elongated reliefs (convex downslope) as a "tongue-shaped" sedimentary bodies. Those units are independent one to the other, and are separated by submarine valleys -eventually deep-, which occasionally are coincident with faults in a NV-SE direction (or close to it).



The sediments forming the margin are mainly argillaceous with calcareous beds, deposited in prograding series, getting thicker with the slope. Those sediments are extremely unestables and soft, and its plasticity help the slumping.

On base of seismic-reflection profiles (Sparker 7500 joules and 1000 joules), has been possible to establish a structural-tectonic outline of the area. The margin is affected by numerous faults in a E-V to NEE-SSW and NV-SE directions.

Successive evolution stages of the continental margin along the Neogene period, have produced the replayment of the ancient faults, due to alternation in the distensive regime and the compressive one. In consequence, the mass transport is triggered by the neotectonic activity.

According to some tectonic evolution theorys about passive margins, it's easy to explain the present morphology of the margin in the area, where the deposition is produced under a distensive regime followed of a compressive one.



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Red Algae sediments in the Balearic Shelf

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The Balearic Shelf is an open marine shelf that ranges in width from 9 km in the north of Menorca to 55 km around Cabrera Is. Water temperatures at 5 m depth fluctuate from 12°C in winter to 27°C in summer. The absence of great terrigenous influx and the nutrient depleted waters make this shelf very clear to the light.

Sedimentation is mainly of biogenic origin (93%) and the lithoclasts (7%) are locally concentrated in littoral areas near the mouths of the rushing streams. Biogenic composition is formed by red algae (50%), molluscs (15%), foraminifers (6%) and bryozoan (5%) fragments.

Productive communities like *Posidonia oceanica* and maërl are the main responsible for the biogenic composition. Second order productive communities are platform coralligenous, coralligenous on hard rock, photophilic algae, *Vidalia volubilis*, *Cymodocea nodosa*, *Caulerpa prolifera*. Productive communities and biogenic facies are closely related and so is their spacial distribution.

One of the most characteristic facies of the Balearic Shelf is originated by maërl communities. Principal components of the algal gravel facies are red algae fragments (60%) but bivalves, gastropods, bryozoan, foraminifera and crustacea fragments are also present. Textural parameters qualify this sediments as grainstones although locally rudstones are present.

Algal gravel facies are usually present at depths greater than 40 m and even reach 90 m deep. This range agrees with maërl community depths. Some carbonate productive species from maërl have been recognized in the sediment and some others have not.

Species that form the basal stage of maërl are among others: *Phymatolithon calcareum*, *Lithothamnium corallioides*, *Lithothamnium valens*, *Peyssonnelia ros-marina*, *Lithothamnium crispatum*, *Lithothamnium fruticosum*, *Mesophyllum lichenoides*, *Lithophyllum expansum*.

From those we have recognized in the sediment fragments of: *Phymatolithon calcareum*, *Lithothamnium corallioides*, *Lithothamnium valens*, *Peyssonnelia rosa-marina*, *Lithothamnium fruticosum*, *Lithophyllum expansum*, *Mesophyllum lichenoides*.

An explanation for this disagreement can be found in the biological structure of some carbonate crystall arrangements which are not present in the unrecognized species.

Species distribution in sediments seem to be fortuituous though a depth influence is suitable. Algal gravel facies form growth patches over the sea bed where small mounds with bafflestone textures are found. These mounds are built up by the branching growth of red algae.

From the several areas that have been studied in the Balearic Shelf (Pollença Bay, Campos-Cabrera zone, and South Menorca shelf) the first two are dominated by coralline species while the South Menorca Shelf is characterized by a great presence of peyssonneliaceae, especially in the deepest zones.

Apart from this distribution pattern mainly related with depth we have found other red algae sediments related with other processes.

Posidonia oceanica meadows are also rich in algal gravel sediments as well as some places from the infralittoral environment. These localities are placed on irregular coastlines, rather exposed to the wave action and with very shallow water. The red algae that have been found in these areas are characterized by branching rodolites (more than 16 cm in diameter) that are usually attached to a hard substratum or placed in mobil sands that fill morphological traps.

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