

NOTES ON THE SEDIMENTATION  
IN THE WESTERN MARGIN OF THE IONIAN SEA

P. COLANTONI, C. BERTAGNONI & A.M. BORSETTI  
Istituto di Geologia Marina - C.N.R. - Bologna - Italy

Cores collected in the Ionian Sea bathyal plain are presented as representative of a depositional model by turbidity current in this part of the Mediterranean Sea.

The study area can be defined as limited by: 1) slope descending from the Calabrian and Sicilian coasts; 2) Malta escarpment and 3) Medina Rise.

- 1) The slope is incised by numerous canyons and valleys carrying turbidity currents induced by the sediment supply of the fiumare on the coast. The big Messina canyon brings the materials practically down to the center of the basin.
- 2) The escarpment ranges about 300 km south the coasts of Sicily and is very steep with some vertical cliff. It has been largely explored in detail by the ESCARMED Group using the CYANA submersible that observed generally little zones with recent fine sediments carpeting Pleistocene crusts and Mesozoic and Tertiary rocks largely outcropping on the steepest slopes. Tracks of rolling and sliding materials and true scours of detachment were also encountered.
- 3) The Medina Rise is formed by partially isolated reliefs trending NW-SE which interrupt the extension of the Malta escarpment but continue its morphology with linear vertical cliffs probably due to faults. On one of this mounts a CYANA dive observed a thick sedimentary sequence poorly or not covered by recent sediments with crusts and cemented material with Forams as major constituent.

Short cores recovered on the top of the Medina Seamounts display clayey sediments with undisturbed Holocene faunal assemblages and can be considered as representative of present day hemipelagic sedimentation.

The cores collected on the bathyal plain show on the contrary many differences.

One core (CS 76-10) collected in a water depth of 3225 mt. East of the Malta Escarpment, is entirely composed of turbiditic layers (mainly organogenous and only exceptionally volcanoclastic) of last glacial age (Wurm) probably also alternated with hiatus. Among the 35 levels sampled

only two seems not to be of turbidic deposit: the upper one contains a faunistical assemblage similar to that at present living in the Jonion Sea, while the other one shows a typical glacial assemblage of a probable wurmian age.

Another core (J 82-6) collected in a water depth of 4010 mt in front of the Medina Seamounts is, as well, made up of organogenous or clayey turbiditic layers with only some scattered volcanoclastic material. Among the 43 examined samples, only 5 seems to be of a normal pelagic sedimentation and present in age the turbidites are here finer and sometime composed only of elements of clay size.

Our main conclusion are as follows:

- The sedimentation in this part of the Jonion Sea is mainly turbiditic.
- In the northern part the large sediment supply from the coasts feeds the canyons and the terrigenous turbidity currents which reach the plain.
- In the Western and Southern part where the terrigenous input is very scarce, the tectonic activity and the associate earth quakes as well as the sediment accumulation can trigger episodic displacements of unstable materials on the steep escarpements and cause turbidity currents and the redeposition of the material by gravitative transport, according to a model suggested by STANLEY & MALDONADO 1981 for the Western Hellenic Trench.
- Normal pelagic sediments made up by mud and organogenous remains are found where no movements and reworking occur. Where there is a down slope displacement a progressive transformation results from the transport. Displaced amounts of Pteropods and locally of Foraminifera rest on the slopes, while on the plain a complete redeposition takes place: first a chaotic mass formed by slumping processes and debris flows deposits (as those described by CITA et al. 1981) are encountered near the base of the escarpements. A progressively less dense turbidity current carry successively toward the distal basin plain the material, redepositing the constituents according to their density and dimensions: first the remaining debris, then the organogenous remains (first Pteropods and later Forams) and latest the mud with coccolits (laminated or uniform). Deposits and erosions can also alternate in the proximal area as suggested by the age of the sediments sampled with the core CS 76-10.