

SEDIMENT TYPES AND SEDIMENTARY ENVIRONMENTS  
 AT THE GULF OF HAGION OROS (SIGITIKOS),  
 NORTHERN AEGEAN SEA.

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ABSTRACT : Two sedimentary environments, a shallow marine and a hemipelagic are distinguished in the gulf of Hagion Oros, Chalkidiki, Northern Aegean Sea. The shallow marine sedimentary environment extends to a depth between 150 to 200m., and is characterized by coarse grained sediments well sorted to very poorly sorted. The hemipelagic environment is characterized by gray fine grained sediments, very poorly sorted. The transition between the two environments is abrupt.

The recent sediments of the gulf of Hagion Oros have recently been studied, (Perissoratis 1980). This gulf is the eastern of two gulfs formed by the three peninsulas of Chalkidiki. The gulf is bounded to the south by the north Aegean Trough, while the greater area belongs to the northern Aegean physiographic province. The area surrounding the gulf is covered mainly by metamorphic and volcanic rocks which belong to the Serbomacedonian zone; neogene and quaternary sedimentary formations of minor extent outcrop mostly around the mouth of the gulf. The bottom morphology of the gulf is very complicated, and it is characterized by its great depth (up to 900m.).

Grain size analyses of surface samples taken from the area has shown that the sediment types covering the bottom of the gulf consist of sands, silty sands, sandy silts, clayey silts, silty clays, and sand-silt-clay. The sands occur in all nearshore areas of the gulf and have variable extent. They are more extended off the western peninsula of Sithonia, while at the eastern nearshore part of the gulf the sand covers a narrow zone. The central part of the gulf is covered by silty clay. The other lithological sediment types are discontinuous their presence depending on the morphology of the bottom, the existence of sedimentary formations in the adjacent land, the drainage pattern e.t.c. In many parts of the gulf due to the steep bottom gradient the transition from sands to silty clays is abrupt and sudden.

Further detailed study of the data showed that two sedimentary environments are present in the area: A shallow marine and a hemipelagic environment. The shallow marine environment extends up to a depth of about 160 to 200m. The sediments are sands, silty sands and sandy silts.

Their mean size ranges from  $-0,38 \text{ } \emptyset$  to  $5,98 \text{ } \emptyset$  and the sediments are well sorted to very poorly sorted, depending on the energy of the environment of deposition. The coarse fraction of the shallow marine sediments (fraction  $0,063\text{mm}$ ) consists mainly of metamorphic and igneous rock fragments, light minerals, heavy minerals, micas, shells, benthonic and planktonic foraminifera and glauconite aggregates. The carbonate content of the sediments is usually around 10% while the organic carbon content ranges from 0,2% to 0,4%.

The gulf below the 200m. isobath is covered by fine grained sediments of gray colour and the environment of deposition is a hemipelagic sedimentary environment. The sediment types are clayey silts, silty clays, and sand-silt-clay. The mean size of the sediments is from  $6,2 \text{ } \emptyset$  to  $9,2 \text{ } \emptyset$  and they are poorly to very poorly sorted. The coarse fraction is usually less than 10% and consist mainly of light minerals, heavy minerals, rock fragments, foraminiferal tests, skeletal remains of sponges and echinoids and pyrite aggregates. The carbonate content ranges from 10% to 40% exceeding 40% at the center of the mouth of the gulf. The organic carbon content is usually low (0,2% to 0,5%) except in the central part of the mouth of the gulf where it is as much as 2,0%.

Due to Sudden deepening of the gulf the transition from the shallow marine to the gray hemipelagic environment is abrupt. The absence of large rivers in the area and the scarcity of sedimentary formations in the surrounding land restricts sediment input into the gulf. The sediments are distributed mainly along the shallow parts of the area and only minor amounts of them reach the deep gulf.

#### REFERENCES.

- Perissoratis, C., 1980 : Study of the recent Sediments of the gulf of Hagion Oros, (Sigitikos), Chalkidiki, Northern Aegean Sea. Doctorate thesis, University of Patras, 127p.