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Interstitial Water of Tyrrhenian Sea, Western Mediterranean

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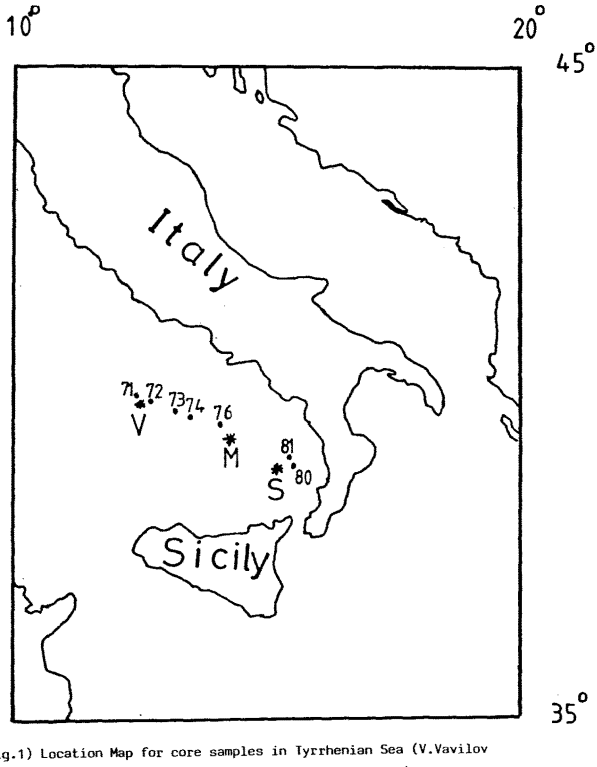
This study aimed to demonstrate the characteristics and type of interstitial water,as well as the paleoenvironment and digenetic processes governing the western Mediterranean region during the Holocene time. Seven core samples have been collected from Tyrrhenian Sea (Fig.1) using a stainless steel gravity core sampler of 4 meter length and 65mm diameter. Titanium hydraulic squeezers with pressure up to 200Kg/Cm2 have been used to extract the interstitial water from the sediments(Kriukov and Manheim,1982).The interstitial water was analysed for salinity, alkalinity, SO4,Ca,Mg,Na and K. Measurements of Redox potential



(Fig.1) Location Map for core samples in Tyrrhenian Sea (V.Vavilov volcano, M.Marsili volcano, S.Stromboli volcano).

for some samples revealed that the sediments under investigation have been exposed to diagenesis due to aerobic conditions. Such diagenesis generally leads to very limited changes- or almost none at all-in the interstitial water, where it retains the original composition as sea water. According to Valyashko(1955), the interstitial water of Tyrrhenian Sea could be classified as oceanic type (MgSO4). Similar conclusion has been reached by the authors in 1988 concerning Nile Cone sediments, Southern Mediterranean. Normal values of salinity were found in the investigated basin, except in the southern part where higher values were recorded (i.e. up to 44.33 %.). In addition, higher values of SO4, Na and K were observed in this part of Tyrrhenian. Stromboli volcano, which is active uptill now may play a dominant role in this respect. Infiltration of brines from the underlying Messinian evaporites have to be in considration too. Alkalinity showed a slight decrease with depth in sediment successions in the northern part of the basin (cores No. 71,72,73 and 74), on the other hand, increased in the southern part. Generally, the low values of alkalinity observed in the interstitial water of the Tyrrhenian Sea could be attributed to the following reasons: 1-The precipitation of HCO_3^- and CO_3^- from the interstital water as CaCC3 minerals,i.e. aragonite and calcite. 2- Absence of sulphate reduction which prevents the accumulation of HCO_3^- in interstitial water ($SO4+2C+2H2O \longrightarrow 2HCO3+H2S$). This phenomenon is due to the low content of organic matter which is the case in the investigated sediments. 3- Leaching of gypsum (CaSO4) from biogenic carbonate sediments. This gypsum decreases the solubility of CaCO3 and consequently, ceases the accumulation of HCO_3^- in the interstitial water (Shishkina,1972).

REFERENCES

Kriukov, P.A. and Manheim, F.T. (1982). Extraction and investigate technique for study of interstitial water of unconsolidated sediments : A review in " The Dynamic Environment of Ocean Floor". Eds. K.A. Fanning and F.T. Manheim, Lexington books :3-26.

Nasr, S.M. and Gorsky, Y.N. (1988). The study of interstitial water of a core sample from the Nile Cone Southern Mediterranean. Rapp. Comm. Int. Mer Medit., 31, 2.

Shishkina, O.V. (1972). Geochemistry of marine and oceanic interstitial waters. Moscow, Nauka, 228P (In Russian).

Valyshko, M.G. (1955). Main chemical types of natural waters and conditions of their formation. Dokl. Akad. Nauk, SSSR, V.102.N.2 :315-318. (In Russian).