

**Mineralogic and geochemical researches on the cores IN 68-21 and  
IN 68-5 (Central and Southern Adriatic Sea)**

F. LUCCHINI (\*), A. URBINATI, B. VICI and P. GIORDANI(\*\*)

(\*) Dipartimento di Scienze Mineralogiche - Università di BOLOGNA (Italy)  
(\*\*) Istituto per la Geologia Marina del CNR - BOLOGNA (Italy)

Eighty samples collected from the cores IN 68-21 and IN 68-5 have been analyzed in order to obtain mineralogic and geochemical characterization of the Adriatic sediments deposited in the Meso-Adriatic Depression and in the South Adriatic deepwater basin respectively during the last 18 KA. This study is included in a research-project concerning both the geochemical records of the paleoenvironmental changes and the determination of the heavy metals levels preceding the human impact on the Adriatic Sea.

The analyses were carried out by XRD, XRF, TG-DTG, SEM-EDS and gasvolumetry.

Calcite (15-30%), dolomite (2-12%), quartz (8-20%), clay minerals (chlorite, muscovite-illite and smectite) and feldspars are the main minerals phases. Their ratios are slightly variable, but calcite/dolomite ratios decrease downward in both cores, beginning from 380-390 cm (~ 12 KA) in IN 68-21 and from 180-190 cm (- 10 KA) in IN 68-5. Volcanogenic layers were found at 135-145 cm and at 258-262 cm (core IN68-5; 9 and 11 KA respectively) and at 99-102 cm and 389-392 cm (core IN 68-21 ; lower layer age: 12 KA).

The sediments bulk chemistry is rather uniform, with SiO<sub>2</sub> (33-43%), Al<sub>2</sub>O<sub>3</sub> (9-14%), Fe<sub>2</sub>O<sub>3</sub> tot. (3.5-5.7%) and K<sub>2</sub>O (1.5-3.3%) lower than average shales, CaO (11-18%) and MgO (2.8-7.8%) higher, in accordance with carbonate contents. Trace elements averages generally agree-well with those of the shales, but Ni and Nb are enriched (1.5 times).

In both cores early diagenetic mobilization of interstitial solutions was active as indicated by Sr and Sr/Ca profiles and by the Mn enrichment (0.61% MnO) in the upper parts of the sapropelitic layer S1 in the core IN 68-5. Diagenetic origin of dolomite and of most calcite is also suggested by their grain size and thermal and chemical behaviors.

The main geochemical features distinguishing the cores are the elemental distributions. In the core IN 68-21 trace elements Ni, Co, Cr, V, Sc, Cu and Zn decrease, and Rb and Ba increase downward in accordance with the behavior of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, MgO and K<sub>2</sub>O, while the profiles of the core IN 68-5 are characterized by irregular peaks without any definite trends. The organic matter contents change regularly upward from 0.7 to 1.5% in the core IN 68-21, but increase sharply (from 0.78 to 2.20%) in the core IN 68-5 starting from the sapropelitic layer S1. This reflects differences both in the hydrodynamic regimes and in the sediments supply between the central and southern basins. The Meso-Adriatic Depression seems more sensitive to the postglacial changes in the river loads in comparison with the South Adriatic basin, which is more affected by the circulation and exchanges of the Mediterranean sea waters.

Major and trace elements of volcanic glass are consistent with trachytic, trachyandesitic and phonolitic products, but only the last (135-145 cm of IN 68-5 core) display geochemical features similar to Campanian tephra.