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Sessione III – Petrologia del sedimentario

sedimentary units outcropping onshore and partly controls the present thickness distribution of the AAVV. The thickness distribution of the Serravallian-Tortonian unit shows that this sedimentary succession has been truncated in the SW part of the study area, likely by the Messinian erosion; the same applies onshore where the outcrop of Tortonian-early Pliocene sediments terminates southward about in the same position. This pattern of truncation is related to the position of the lateral ramp anticline of the basement thrust. Some wedging of reflection within this unit indicates that deposition occurred during deformation. The isochrons of the base Plio-Quaternary succession represent the Messinian unconformity. The erosional character of this unconformity is clearly outlined by the truncated reflectors, belonging to different units, visible underneath the surface. The top of the basement ramp anticline is also outlined by the base Plio-Quaternary isochrons, suggesting that this surface has been shaped by recent movements along the basement thrust.

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PETROGRAPHIC CHARACTERIZATION OF COEVAL CARBONATE GRAINS IN RECENT FLUVIAL SANDS (SERRANÍA DE CUENCA, SPAIN)

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Different Mesozoic siliciclastic and carbonate rocks compose the Serrania de Cuenca in the Iberian Range (east of Spain). Carbonate formations (mainly Jurassic and Cretaceous) show evidences of an important degradation and dissolution processes with the development of actual karstification. At present several rivers flow from these formations to south-westwards and a great development in biogenic carbonates as tufa deposits can be observed (Pedley, 1990; Arribas *et al.*, 1998; Fernández *et al.*, 1998). An example is the Júcar River and its distributaries, which flow from the core of the Iberian Range in the Cuenca province to the tertiary Loranca basin through several sedimentary formations. Also this fluvial system cut different quaternary tufas

eroded and incorporated a high volume of carbonate sediment. The carbonate dissolution and degradation in the source area and the precipitation of bioinduced carbonate in the associated fluvial systems are significant processes in the origin of carbonate grains in the fluvial sands.

The recent fluvial sands in the Serranía de Cuenca present excellent conditions to analyse in detail the different typologies of carbonate grains. At the present the head stream of the Serranía de Cuenca receive carbonate sediments both intrabasinal and extrabasinal in origin. On the one hand the erosion of proximal carbonate source areas (Jurassic and Cretaceous rocks) contribute to generate extrabasinal carbonate grains, on the other hand the erosion of recent freshwater tufas, paleosols and others recent carbonates produce an important volume in intrabasinal carbonate grains. The good preservation of the composition and textures in the intrabasinal carbonate grains in the fluvial sands suggests a detailed petrographic analysis for their extrapolation in the fossil record.

The recent fluvial sands derived from erosion of the Serranía de Cuenca correspond to hybrid arenites (Zuffa, 1980). The intrabasinal grains are coeval carbonate grains composed of low-Magnesian calcite. The content in these grains was estimated in the coarse, medium and fine sand fraction. The content in coeval carbonate components is variable in the different sand fractions. Coeval carbonate grains increase in volume in the finer saud fraction, where these components tend to concentrate. Occasionally their content constitutes more than 90% of sediment volume in this fraction. Whereas siliciclastic (quartz, feldspar, rock fragments, mica) and carbonate grains (limestones and dolostones fragments) derived from parent rocks prevail in the coarse sand fraction. These grains show coatings of coeval carbouate with variable textures.

Textural and compositional criteria permit to describe four categories of these coeval carbonate grains: micritic, sparitic, coated grains and bioclasts.

i) Micritic grains are the most frequent coevals and are composed by micro-cryptocrystalline calcite. These grains can be partially replaced by microspar. They can show an internal structure (alveolar, filamentous or laminated) or not. Micritic grains with an alveolar microfabric correspond to paleosol fragments. The origin of micritic grains with filamentous or laminated structure has been associated with the erosion of recent bioinduced carbonates (tufa, microbial mats, and cyanoliths). Non-structureless micritic grains frequently are clotted (grumose texture) and spongy. In this case the origin is uncertain.

ii) Sparitic grains are also abundant and are composed by mesocrystalline calcite. Generally they are the result of the sparitization of microbial micrite. They are formed by single crystals or by an association of them with or without internal structure. Structureless grains can preserve a filamentous microfabric (as fan-like or simple filament) developed by bioinduced carbonate around cyanobacteria filaments (similar to those described in micritic grains). In some cases both longitudinal and transversal sections of single filament cau be recoguised. Also some sparitic grains show a prismatic and radial microstructure (rosette aspect) that characterised *Microcodium* structures. Again non-structureless sparitic grains appear as isolated and cluster sparitic crystals with an uncertain origin.

iii) Coated grains are very common and are constituted by a nucleus plus a coating of coeval carbonate (micritic or sparitic textures). They develop a concentric microfabric formed by a single or several *laminae*. Sometimes coated grains are formed by incomplete *laminae*. Coatings are formed by bioinduced carbonate by microbial activity over erratic grains (extrabasinal or intrabasinal). Due to the origin this grains can be considered as cyanoliths.

iv) Bioclasts are not common but have been recognised some gastropods and charophytes remains.

The coeval carbonate grains can be defined in basis on textural and compositional criteria but some problems exist when grains with different origin show similar microfabric. This convergence of microfabrics is emphasised in grains with laminated structure (microbial mats, cianoliths, rhizoliths and speleothems). On the other hand early sparitization and cementation are very frequent in these continental environments producing an increase of crystal size in the carbonate deposits. As consequence some coeval grains show very similar textures to those grains derived from carbonate source areas. This problem is emphasised in petrographic analysis carried out on sandstones, when diagenesis masks the primary textures. These studies underestimate the possible presence of coeval sparitic grains (formed as the result of early sparitization or cementation), considering them as false extrabasinal components.

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PRELIMINARY RESULTS ON THE INFLUENCE OF THE RIETVELD REFINEMENT STRATEGY ON STRUCTURAL RESULTS: $MgAl_2O_4$ SPINEL

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Several natural and synthetic materials are not suitable for single-crystal analysis (SCA) and therefore they may be only analysed through powder-diffraction analysis (PDA). It is sometimes difficult to directly compare the structural results obtained by means of the two methods because of the known limitations of PDA. However for a well calibrated sample preparation procedure it is quite common to obtain the reasonably random crystallite distribution necessary to perform a