CLAYS DIAPIRS IN NEOGENE-QUATERNY SEDIMENTS OF CENTRAL SICILY : EVIDENCE FOR ACCRETIONARY PROCESSES

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Neogene-Quaternary sedimentary sequences of the central Sicily exhibit characteristic horizons of chaotic clay, known as Argille brecciate, occurring at different stratigraphic levels. Five main horizons of Argille brecciate have been distinguished in the Tortonian-Lower Pleistocene sequences. These horizons have a thickness ranging between a few meters to a hundreds meters and are mainly made up of darkly brecciated clays containing exotic blocks. These horizons have been interpreted as large olistostromes linked to gravitational processes occurring on the slopes of the basin.

To better define the significance of these levels sedimentological and structural observations have been carried out on the horizons which occur within the Plio-Pleistocene sequences cropping out at the frontal part of the thrust belt. These levels are made up of dark-grey to brown clays showing a distinctive brecciated to cataclastic texture. These sediments, that usually contain re-worked Miocene microfaunas, include several blocks represented by volcanics and sediments belonging to the meso-cenozoic sequences involved in the Sicilian thrust belt. Volcanics are represented by alkaline basalts similar to those that characterize the mesozoic sequences of the Sicani domain, and by transitional basalts. Sedimentary blocks are made up of quartzarenites of the Numidian Flysch, glauconitic sandstones, varicoloured clays of the Sicilide units, reef limestones of the Panormide domain, Cretaceous marly-limestones and Miocene calcarenites belonging to the frontal units of the chain. Blocks of the Messinian sequence (Tripoli, evaporitic limestone and gypsum) and of the Lower Pliocene marly-limestones (Trubi) are also to be found.

These chaotic horizons occur as kilometric-long lens at the base of the major thrust sheets or as large intrusions showing typical flow-structures. These observations suggest that brecciated clays within the Plio-Pleistocene sequences may represent the results of mud diapirism occurring at the frontal part of an accretionary wedge. Their geometry, as well documented in several seismic profiles carried out along active accretionary complexes, reflects mud diapirs and mud ridges related to the frontal thrusts that during their emplacement have sampled different terranes of the accretionary complex and of the overlying slope sediments.