Geophysical Research Abstracts
Vol. 16, EGU2014-6517, 2014
EGU General Assembly 2014


# Seep carbonates and chemosynthetic coral communities in the Early Paleocene alpine accretionary wedge: evidences from the Bocco Shale (Internal Liguride ophiolitic sequence, Northern Apennine, Italy)

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In Northern Apennines, the Internal Liguride units are characterized by an ophiolite sequence that represents the stratigraphic base of a Late Jurassic-Early Paleocene sedimentary cover. The Bocco Shale represents the youngest deposit recognized in the sedimentary cover of the ophiolite sequence, sedimented just before the inception of subduction-related deformation history.
The Bocco Shale has been interpreted as a fossil example of deposits related to the frontal tectonic erosion of the alpine accretionary wedge slope. The frontal tectonic erosion resulted in a large removal of material from the accretionary wedge front reworked as debris flows and slide deposits sedimented on the lower plate above the trench deposits. These trench-slope deposits may have been successively deformed and metamorphosed during the following accretion processes.
The frontal tectonic erosion can be envisaged as a common process during the convergence-related evolution of the Ligure-Piemontese oceanic basin in the Late Cretaceous-Early Tertiary time span.
In the uppermost Internal Liguride tectonic unit (Portello Unit of Pandolfi and Marroni. 1997), that crops-out in Trebbia Valley, several isolated blocks of authigenic carbonates, unidentificated corals and intrabasinal carbonatic arenites have been recognized inside the fine-grained sediments that dominate the Early Paleocene Lavagnola Fm. (cfr. Bocco Shale Auctt.).
The preliminary data on stable isotopes from blocks of authigenic carbonates (up to 1 m thick and 3 m across) and associated corals archive a methane signatures in their depleted carbon isotope pattern (up to $\delta$13C –30‰ PDB) and suggest the presence of chemosynthetic paleocommunities.
The seep-carbonates recognized at the top of Internal Liguride succession (cfr. Bocco Shale Auctt.) occur predominantly as blocks in very thick mudstone-dominated deposits and probably developed in an environment dominated by the expulsion of large volume of cold methane-bearing fluids focused in the frontal part of the Early Paleocene alpine accretionary wedge.