

The basal part Modino Unit Succession under the belt-foredeep system of the Northern Apennines (Italy)

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The Modino Unit turbidite system of the Northern Apennines foreland basin provides an excellent opportunity to study the sedimentary and structural variations within the context of spatial and temporal distribution of source rocks during the evolution of foreland basins. The substrate of this Unit was interpreted as a stratigraphic-structural *mélange* (Plesi et al., 2000), the expression of polyphase tectonic phases of Cretaceous-Eocene accretion that have affected the external part of Ligurian and Subligurian domain.

In this article we present the preliminary data of different stratigraphic sections outcropping in Tuscan and Emilian regions, with particular attention to the lower part of Modino Unit Succession, of pre-Ligurian stage, unconformably deposited at the top of the Ligurian and Subligurian substrate, composed by Fiumalbo Shale Fm. and Marmoreto Marl Fm.

The tectonic setting of this Unit is complex and necessitated the use of stratigraphical, biostratigraphical and petrographical studies to achieve this goals.

The Modino Unit succession is composed by three different formations:

The Fiumalbo Shale Fm. followed in some sections of coarse breccia deposits that cover the substrate (Riccovolto Breccia) are made up of mostly red and green shales with intercalations of limestone and turbidite-like sandstones beds more or less extensive (Rio Acquicciola Sandstones Auctt. or M. Sassolera Sandstones Auctt.). The Marmoreto Marl Fm. are characterized by fine emipelagic sediments, have a massive structure (with rare thin layers of fine sandstones).

The Monte Modino Sandstone Fm. are constituted by one or more sequences of turbidite facies with quite variable vertically and laterally. Their deposition occurs preferentially in the middle and front al part of the prism and is quickly interrupted, on its southwestern margin, by the thrust belt materials. From this reason the axis of sedimentation moving outwards.

A petrographical study on turbidite-like sandstone beds in Fiumalbo Shale Fm., show a petrofacies character-

ized by a modal composition of Q48F27L+CE25, according with the composition of Monte Modino Sandstone of this study, while shows different composition in the Fine-Grained Rock Fragments Compositional Mode (Lm-Lv-Ls plot).

The sandstones in Fiumalbo Shale Fm., are composed by different tipology of fine grained lithic fragments, and its composition changes strata-strata in the same stratigraphic sections. The fine grained lithic fragments are composed by dominating metamorphic origin clasts and ophiolitic rock fragment associated with unmetamorphic radiolaritic fragments.

The biostratigraphical analysis indicate that the age of these formations is comprised between Lutetian and Chattian ages.

These formations reflect a slope environment, with quite deep and with a strong affinity to Epiligurian sections, which resemble the coeval succession Monte Piano-Ranzano and their sedimentation environment reflects a time and an area of major physiographic expression of the prism.

The composition of this arenites is interpreted as being controlled mainly by synsedimentary tectonics connected with the evolution of an accretionary prism east vergent.

This composition reflects the different stages of the process of accretion and is the expression of the different sedimentary environments that were gradually generating. The lower part of Modino Unit succession seems to be supplied by two different source areas, the classic Alpine source area and a more proximal "Liguride derived" source, maybe located in the proto-apenninic wedge.

REFERENCES

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