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Bio-chronostratigraphical constraints in geohistory analysis: data from ENI wells of the Venetian-Friuli area (Late Paleocene-Early Pleistocene)

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The thrust belt-foreland systems are complex geodynamic settings where sedimentary, tectonic, geomorphological and climatic processes interact at different time and spatial scales. In particular, the foreland basins represent the place where the products of the dismantling of the forming mountain belts mostly accumulate, also recording the events which affected the adjacent belts.

Since the continuous interaction between the processes occurring on the mountain belt (i.e. exhumation, uplift and erosion) and the related phases affecting the adjacent foreland basin (e.g. crustal flexure, subsidence, inherited paleo-topography and sedimentation), its architecture can be considered as an important multidisciplinary research topic for micropaleontological, sedimentological, structural, geodynamic studies.

According to the literature, the interaction among the stated processes should lead the thrust belt-foreland systems to a steady configuration in a dynamic equilibrium over a long time interval. Up to present, however, the correct chronological relationship existing between the tectonic evolution of the mountain belt and the record of the same events in the adjacent foreland basin, quantified as flexural subsidence, creation of accommodation space and sedimentary infill, remains partly unknown.

In this respect, the Cenozoic successions accumulated in the Veneto-Friuli Basin, from Late Paleocene up to Early Pleistocene, provides a good opportunity to investigate this matter. It is, in fact, the consequence of the interaction of the three surrounding mountain belts (Dinarides, Southern Alps and Northern Apennines) with different age of structuring phases, orientation , vergence and topography.

The primary aim of this work is to collect micropaleontological data for biochronostratigraphical purposes. This step of the research, in turn, provides the fundamental constraints for modelling the flexural response of the basin to tectonic in act in the neighbouring mountain belts (geohistory analysis) furnishing the timing of both the vertical motions (subsidence/uplift) and the subsequent sedimentary infill.

In this view, a high resolution biostratigraphy, based on the integrated study of both planktonic foraminifera and calcareous nannofossils, has been carried out for the Cenozoic Veneto-Friuli Basin succession from thirteen ENI wells drilled in the Venetian-Friuli Plain and in the adjacent off-shore area.

Biostratigraphical data have been primary used to improve the chronological constraints necessary to reconstruct the depositional evolution of the basin, during Late Paleocene to Pleistocene time interval. In detail, the proposed high resolution biostratigraphy is necessary to quantified the sedimentary and erosional hiatuses, to evaluate changes in the sedimentation rates and eventually, also to quantify and correlate the subsidence/uplift rates in the studied area.