



The fold-and-thrust tectonic setting of the Mesozoic carbonate units of Eastern Sardinia: insights from 3D (2D + t) modelling

Simone Arragoni, Paola Cianfarra, Matteo Maggi, and Francesco Salvini

Dipartimento di Scienze, Sezione Geologia – Università degli Studi Roma Tre, Rome, Italy (simone.arragoni@uniroma3.it)

Present-day Eastern Sardinia structural setting was mainly determined by Cenozoic strike-slip-to-oblique faulting in the Tacchi and Golfo di Orosei regions, where Mesozoic shallow water carbonates crop out (Costamagna and Barca, 2004 and references therein). These structures are interpreted as the effects of the rotation of the Sardinia-Corsica block during Oligocene and the successive opening of the Tyrrhenian sea starting from lower Miocene (Oggiano et al., 2009 and references therein).

New structural data indicate the presence of dip-slip compressive tectonics and thrusting affecting the Mesozoic carbonates and involving the underlying Paleozoic basement. This event shows a westward vergence (top-to-the-W) and is cut by later strike-slip faults.

The age of this tectonics is constrained between Eocene (Lutetian rocks involved) and Oligo-Miocene (post-dated by the strike-slip tectonic event).

The integration between these new structural observations and the available geological and geophysical datasets allowed to construct a balanced and admissible geological cross section in order to study the tectonic evolution of eastern Sardinia before the opening of the Tyrrhenian basin. The orientation of the section is parallel to the direction of the tectonic transport, that is WSW-ENE.

The balanced cross-section has been modelled with the “Forctre” software in order to get a 3D (2D + t) evolutionary model and check its admissibility through time. The final section shows a thin-skin geometry (flats sectors prevailing over ramps) and is composed of two main tectonic slices deeply involving the Paleozoic basement and secondary thrusting affecting the Mesozoic carbonate units. These are characterized by “younger-on-older” flat-over-flat tectonics evidenced by Cretaceous-over-Jurassic thrusting.

Similar geometries have been described also in the Latium-Abruzzi sector of the Southern Apennines.

Costamagna L.G. & Barca S. 2004. Stratigrafia, analisi di facies, paleogeografia ed inquadramento regionale della successione giurassica dell’area dei Tacchi (Sardegna Orientale). *Boll. Soc. Geol. It.*, 123, 477-495, 8 ff.

Oggiano G., Funedda A., Carmignani L. & Pasci S. 2009. The Sardinia-Corsica microplate and its role in the Northern Apennine Geodynamics: new insights from the Tertiary intraplate strike-slip tectonics of Sardinia. *Boll. Soc. Geol. It.*, 128 (2), 527-539.