

Multidisciplinary approach for outcropping and subsurface Permian-Cenozoic deep-water carbonates (Central Sicily): outcome for paleogeography of the Southern Tethyan continental margin

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An integrated stratigraphic study of the outcropping and buried Permian-Cenozoic deep-water carbonate successions have been performed. These successions form some of the tectonic units, mostly buried beneath the Late Neogene sedimentary cover, in the fold and thrust belt of Central Sicily.

Three main successions, pertaining to the well known Lercara, Imerese and Sicanian domains, have been reconstructed on the basis of a detailed facies analysis, seismostratigraphic interpretation, biostratigraphy (mostly based on palynological data) and comparison between outcropping and subsurface deep-water sediments.

The main results reveal a continuous sedimentation of the deep-water Southern Tethyan Sicilian succession since the Permian to Cenozoic. In detail:

- a) the Permian-Middle Triassic terrigenous and carbonate deep-water successions, outcropping or buried in the Cerda, Lercara-Roccapalumba and Sosio Valley regions, are well comparable to each other and represent the common substrate of the Mesozoic-Paleogene Imerese and Sicanian carbonate successions;
- b) the Mesozoic-Paleogene deep-water carbonates, when compared among them, reveal the occurrence of different sedimentary successions (Imerese and Sicanian);
- c) the Oligo-Miocene foreland basin terrigenous sediments (Numidian flysch) clearly differ from the coeval foreland hemipelagic to open-shelf carbonates.

The paleogeographic reconstruction envisages:

- a) during the Permian-Triassic, a wide subsident continental rifting area, bordered by a shallow-water domain periodically supplying the basin with calciturbiditic to gravity flows sedimentation (rift stage of the Southern Tethyan margin);
- b) during the Jurassic-Paleogene, two different deep-water basins developed in a context of a post-rift stage. The different sedimentation reflects the location of the Imerese and Sicanian basins, respectively, along adjacent rimmed shelf and stepped carbonate platform margins;
- c) the Oligo-Miocene sedimentation reflects the afore-mentioned different location of the two deep-water domains. Flysch deposits suggest that the Imerese was located near an accretionary prism, differently the Sicanian open-shelf carbonates and marls developed on a still undeformed foreland.