



Seismotectonics of the Adriatic region between the Northern Apennines and Dinarides

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The Adriatic Region is the foreland for both Northern Apennines and Dinarides fold-and-thrust belts formed in response of convergence between the Euroasian and African Plate in Cenozoic time. The collision tectonics was driven by the underthrusts of the Adria microplate, with development of inversion and reactivation of oldest structures involving the basement in the internal zone. The orogenic activity within these thrust belts was accompanied by the development of two superposed foredeep basin systems of opposite polarity and different ages. The SW vergent Dinarides chain overthrust along the northeastern Adriatic margin by in Eocene-Oligocene time, while the NE vergent Apennines chain overthrust along the southwestern margin by in Miocene-Pliocene time.

The Adriatic region is characterized by the presence of extensive and diffuse crustal seismicity, concentrate mainly in the coastal area. The deriving stress field is complex and characterized by contemporaneity of extension and compression in the Apenninic chains and compression and strike-slip in the Dinaric area, also well recorded in the recent geologic time from Neogene to Quaternary.

The western part of the Dinarides are elongated thrust belts with large folded and embriacated structures, involving a multilayer consisting of about 1000 m of Permian-Triassic clastics and evaporites, overlain by at least 4000 m of the Middle Triassic through early Eocene platform carbonates. The compression phase in the Dinarides is dated Middle Eocene by the earliest syntectonic flysch deposits and by the latest carbonate platform sedimentation.

The structure of the Umbro-Marchean Apennines in Central Italy is characterized by a dextral set of en-echelon rootless anticlines, deforming a multilayer of more than 1.000 m thick Triassic evaporites, overlies by about 2500 m of a Lower Jurassic

carbonate bank and Middle Jurassic to Paleogene carbonate pelagites. The system nappes-troughs migrated discontinuously from West to East since Upper Oligocene in the Tuscan area and reached to Pliocene in the Adriatic area, originated and differentiated several deepest major foreland basins. These basins were progressively filled by turbiditic sequences supplied mainly from NW with a maximum subsidence of more than 6000 m in the Pliocene time.

The progradation of the contractional deformations evolved with shallow thrust sheets involving the siliciclastic sediments of foredeeps, located at the top of carbonate multilayer with a shortening of about 45% in the Apennines and 35% in the Dinarides sides. Subsequently the activation of décollements rooted in the evaporites layers (Triassic, Late Jurassic-Early Cretaceous) or deeper levels in the basement (Permian shales), producing the widest contractional structures with larger shortening in the Apenninic chain that reached 35 %. Strike-slip faults are superimposed in the contractional structures in both sides, especially in the Dinaric. Here the main fault zone consist of transpressional flower structures and transtensional pull-apart basins-karst valley.