



Evidence of post-rift compressional tectonics in the North-Eastern Tyrrhenian Basin.

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The Tyrrhenian Sea is located in the center of the Mediterranean and it is a small back-arc basin developed behind the east-migrating Apennine chain. The Tyrrhenian rifting started about 10-12 Ma. A slab rollback mechanisms, which occurred at different rates between the northern and southern part of the basin, is commonly invoked to explain, respectively, the counterclockwise eastward migration of the Apennines and the SE migration of the Calabro-Peloritano arc. The Tyrrhenian extensional tectonics occurred in a compressional framework due to the convergence between Africa and Eurasia plates. Compressional structures have been recognized in many parts of the Tyrrhenian Sea and in the mainland. Earthquake focal mechanism analysis also suggests the presence of active compression mainly along the southern Tyrrhenian margins. We present here the results of interpretation of about 1600 miles of high-resolution, near vertical incidence, seismic profiles collected by ISMAR-BO during the 80's between Monte Argentario (Tuscan Archipelago) and Cape Circeo (Pontine Islands) in the North-Eastern Tyrrhenian basin, supplemented with about 150 miles of multichannel seismic lines, collected by AGIP in 1968 and available through the Italian VIDEPI ministerial project. We mapped the basement displacement and the deformation affecting the sedimentary cover in order to understand the syn-and post-rift tectonics, with particular attention to those deformation structures involving the post-rift sequences. In particular, we found evidences of "syn-rift" faults associated to tilted blocks and basin formation with prevailing direction NNW-SSE. Within the sedimentary cover, particularly in the southern part of the studied area, we found anticline and syncline systems trending approximately parallel to the basement extensional structures. The age of the sediments involved in the shortening, the correlation with similar structures present onshore and the regional convergence context in which the Tyrrhenian Sea was formed, suggest a partial reorganization of this sector of the basin under a compressional regime starting from the middle-late Pleistocene. One possible explanation of this could be the weakening (or cessation) of the opening mechanisms of the Tyrrhenian with compared to the convergence rate between Eurasia and Africa plates.