

## STRUCTURE AND PLIO-PLEISTOCENE EVOLUTION OF THE ADRIATIC REGION

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### Abstract

The Po-Adriatic-Apulia region represents the common foreland of the Apennines, Southern Alps and Dinarides; the latter constitute three distinct segments of the Neogene Africa-verging orogenic system having different kinematic histories. The vergence of the orogenic transport had opposite directions in the Northern Apennines and Southern Alps, as well as in the Central-Southern Apennines and Dinarides. The compression fronts of the facing foldbelts, therefore, approached more and more during Neogene times, progressively reducing the width of the foreland. In the subsurface of the Po Valley, moreover, folds and thrusts having northwards vergence developed during the late Pliocene-early Quaternary beyond the buried, inactive front of the south-verging Southern Alps.

The Apenninic range and its foreland are separated by a trough (the Po-Adriatic-Bradano foretrough) marked by highly negative values of the Bouguer gravity anomalies and filled up with Pliocene-Quaternary clastic deposits. In the Southern Apennines from Molise to the Taranto Gulf most of the trough has been invaded and filled up by gravity nappes and slides. Along the opposite side of the Po-Adriatic-Apulia foreland, the compression front appears to be generally sutured by uppermost Miocene-lowermost Pliocene undeformed sediments. Only in the subsurface of the Venetian Plain there are evidences of young compressive features along the external front of the Southern Alps (Friuli).

Extensive research carried out by Agip Mineraria on the subsurface of the Po Valley, thousands of kilometres of available seismic

lines in off-shore and a lot of information coming out from drilling in the Adriatic Sea and on land provided, together with field geology studies, a good picture of the structure of the Apennine foretrench-foreland system and allowed us to obtain a quite reliable reconstruction of the Plio-Pleistocene tectonic evolution of the region. The foretrench does not consist of a unique subsiding basin, since the depression centre of the trench underwent a time-space migration due to a progression of the compression fronts from the Apennines towards the foreland. In the Adriatic area, the major tectonic events younger than the Messinian salinity crisis have been recorded in the latest Miocene (after the deposition of the so-called "Tetto" formation and before the "Columbacci" formation), during the early Pliocene (*G. punctulata* zone) and in the middle Pliocene (*G. aemiliana* and *G. crassaformis* zones). This tectonic activity is evidenced by thrust structures and folds which migrated in the time from the SW towards the NE and from the W towards the E. Younger compressive features only consist of gentle folds involving the upper part (*G. inflata* zone) of the Pliocene sequence. The Pleistocene is represented by undeformed deposits prograding from the coastal area towards the present Adriatic Sea. In the Po Valley, on the contrary, a compressive regime persisted, which produced folds and upthrusts (buried Ferrara High) and induced a northwards migration of the Apennine foredeep.

In conclusion, the Po-Adriatic-Bradano trough actually consists of several basins each of one played the rôle of foredeep of the Apenninic foldbelt during successive evolutionary stages. An upper Pliocene-Quaternary foredeep is presently developed NW of Ancona, due to the persistence of a compressive regime in this area. The Po-Northern Adriatic region and the Central Adriatic one are linked by an "en échelon" arrangement of the structures with a widespread occurrence of N-S trending dextral strike-slip faults within the Apennine foldbelt and the foredeep system. The foreland area, on the contrary, does not appear dissected by significant Pliocene-Quaternary faults from the Po region to the Central Adriatic one.

References

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