

THE RECORD OF SOUTH-ALPINE STRUCTURAL EVENTS IN THE VENETIAN FORELAND AND FOREDEEP

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During the Cenozoic, the Friuli and Venetian plain represented the foreland of the three chains: the Dinaric, the South-Alpine and the Apennine. The tectono-sedimentary evolution of that foreland is analysed along a seismic transect orthogonal to South-Alpine structures and located between the southern end of the Transalp profile and the Adriatic coastline (fig. 1).

During the Lower Cretaceous, according to seismic data, Friuli Platform underwent a strong aggradation which led to an estimated elevation about 1200–1500 m with respect to the surrounding basins.

Such a space was inherited by the first Alpine tectonic phases (Upper Cretaceous-Eocene) and added to the accommodation due to the load of the South Alpine-Dinaric orogenic system.

In the Conegliano region, the slope dips NNW, and the Transalp profile, calibrated with Nervesa 1 and Volpago 1 wells, provides a good image of the original geometry and modes of space fill by the Paleocene-Oligocene siliciclastic wedge which outcrops in the north (Belluno syncline).

Particularly, the Eocene succession onlaps the pre-existing slope and the starvation of terrigenous input is recorded around the Bartonian-Priabonian boundary (Volpago 1 well), whereas the definitive basin infill occurred only at the end of the Oligocene, when the clastic wedge began to accumulate even above the platform margin (Nervesa 1 well). In the meantime, the western and southern margins of the Friuli platform were poorly fed by turbidites flowing from south and/or east and mostly mudstone accumulated in

a prograding shelf environment (Jesolo well area, fig.1); also in these areas accommodation space was definitively filled only at the end of Oligocene.

Despite of the Eoalpine-dinaric compressive tectonic phases which occurred during the same time span, the creation of new accommodation space is recorded only in the eastern margin of the Friuli platform due to an eastward flexure toward the Dinaric belt.

The latest Oligocene basin filling led to the development of a wide terrigenous-carbonate platform, extended from the Belluno area, to the Southern Alps margin, to the Friuli-Venetian foreland (Cavanella Group), to the present-day margin of the Dinaric belt (Carnazzo well).

At a regional scale, integrated outcrop and subsurface data point out the thinning of the Chattian-Aquitania sediments toward the Friuli Platform, while Burdigalian-Langhian units record the extension of a terrigenous shelf environment to the whole Friuli high, and still seem to record a feeble thinning toward the south (fig. 1). As a whole, this cause the Chattian-Aquitania succession to thin from some hundreds to few tens of meters from the Piedmont area to the coast region. In addition, sandstone composition pointed out that in that time span, only the axial region of the belt delivered significant volume of clastic sediments, whereas the outer part, even though deformed, was not eroded so much. Furthermore, the foreland dipped only slightly northward, reflecting a still far Alpine load, while toward the east no flexure due to the Dinaric belt is recorded.

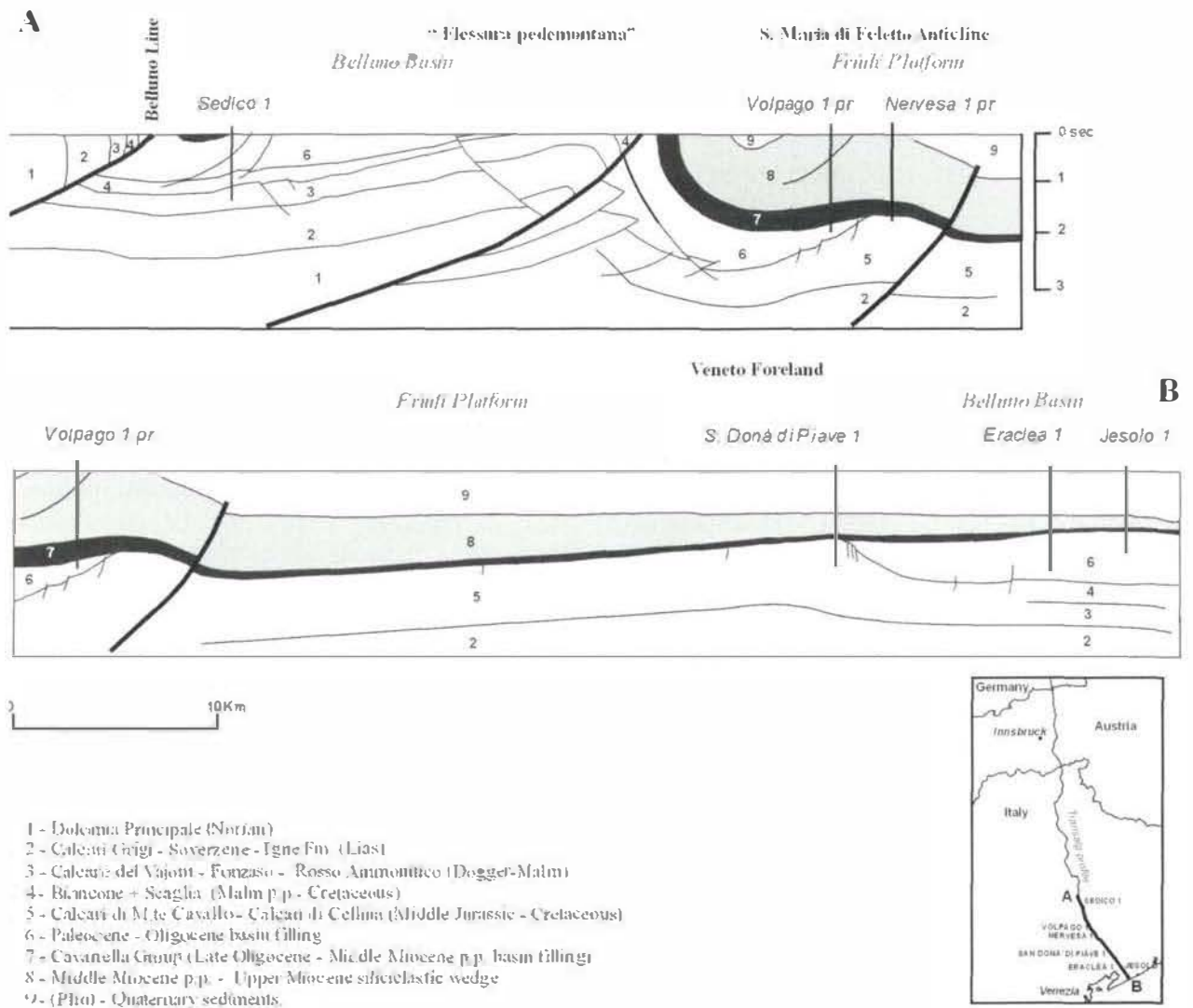


Fig. 1: Simplified seismic profile from South Alpine belt to Adriatic foreland south of TransAlp transect (thick line in the inset map)

From the Serravallian to the early Messinian, the southern margin of the South-Alpine chain experienced a strong subsidence, and a well recognisable foredeep developed, with outcrop successions exceeding 3000 m in thickness in the north, reaching 1500 m in the South Alpine margin subsurface (Arcade well) and rapidly thinning in the subsurface of the outer foreland region (S. Donà di Piave well; fig. 1). Contrasting with the older one, the petrography of sediments filling this foredeep indicates a South-Alpine mostly carbonate source, which records the fast uplift of the belt that began to deliver a huge

amount of clastics whose accumulation exceeded even the fast accommodation rate in the area, causing a general shallowing trend of the succession. A Tortonian age of the deformation and uplift of the belt in the Valsugana-Giudicarie region would be consistent with fission track data, which record a 3–4 km uplift between 10 and 6 Ma. This tectonic phase and the related variation of tectonic load fit well the marked flexure contemporaneously recorded in the foreland.

From the late Messinian to the Pleistocene, the sedimentation rate became more regular at the regional scale, without significant thickness vari-

ations. The accommodation space was relatively small during Pliocene, but increased during Pleistocene.

During this period, it is not recognisable a significant northward or eastward tilting of the foreland, due to increased Alpine or Dinaric loading, notwithstanding the severe tectonic phases that affected Southern Alps. Only the southernmost part of the examined area shows the effects of the north-eastward shifting of the Apenninic foredeep, as the north-Adriatic turbidite system reached the present-day Venetian coastal area

during middle Pleistocene, and the turbidite wedge onlaps the southern foreland slope and thickens south-westward.

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