

THE NIVIONE STRUCTURE (NORTHERN APENNINES, OLIGOCENE): CONTEMPORANEOUS TECTONICS AND SEDIMENTATION BETWEEN ALPINE AND APENNINE OROGENY

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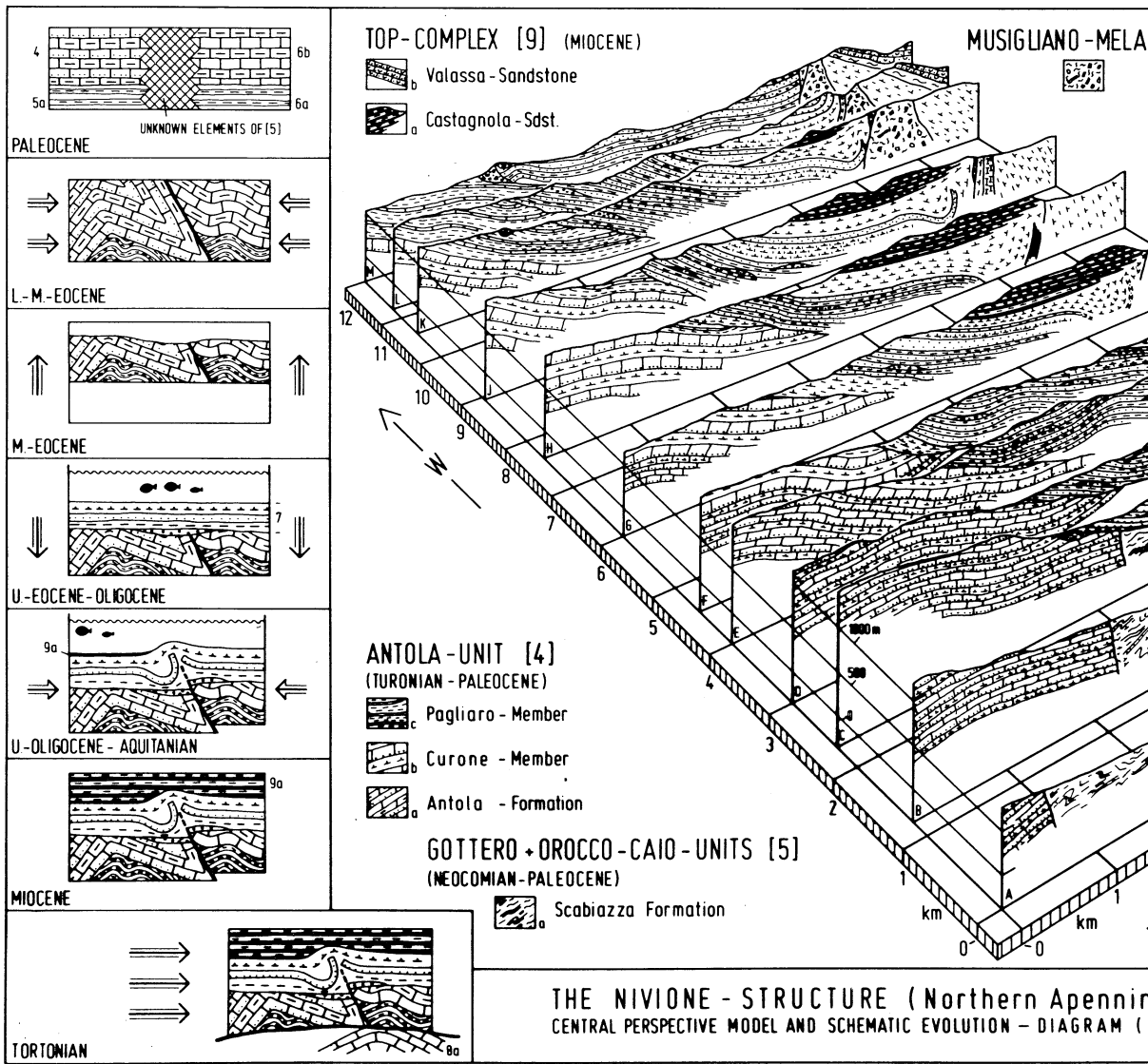
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Abstract: The Ligurian sub-units Antola and Cassio, joined to the paleoeuropean plate during the Ligurian phase, were shortened further in the Upper Oligocene. The superposed Ranzano-Formation was folded and developed a submarine relief syndimentarily (24.3. m.y.). Turbidite sedimentation filled up the relief. In the Tuscan phase the entire complex was incorporated into the main apennine overthrustings.

In the course of the Ligurian phase (Alpine orogeny, L.-M. Eocene) the Ligurides were to a large extent joined on to the paleoeuropean plate (Corsica, Schistes lustrés, Voltri Group, Antola Group). In the Tuscan phase (Apennine orogeny, Tortonian) subduction took place beneath this extended plate margin. In the meantime (U.-Eocene - Oligocene) both intensive sedimentation (Ranzano-Formation) and shorting tectonics (U.-Oligocene) occurred. During these processes it seems that especially the tectonic contacts between the Ligurian sub-units were reactivated and the Ranzano-Formation was syndimentarily folded.

In the area of the Nivione structure (next p.) the Ligurian sub-units Antola and Cassio were shortened by at least 1.5 km. The superimposed approx. 800 m thick Ranzano Formation was folded during the sedimentation of the Nivione marls, forming a 11km long syncline. The anticline element adjoining in the north was sheared off. Thus a 7 km long, about 60 m high elevation was formed on the sea floor of the Nivione marls, with a slope gradient of approx. 10° . The tectonic shaping of this submarine relief was finished by the beginning of the Nannoplankton Zone NP25 (24.3 m.y.). During the Nannoplankton Zone NP25 the relief was filled up by the turbidity currents of the Castagnola Formation. The turbidites wedge out at angles between 2 and 3° to the slope. Sandstone beds and marly interstrates were sedimentated in the same phase. At the end of the Nannoplankton Zone NP25 (22.5 m.y.) the submarine slope was filled up and the sedimentation continued on into the Miocene.

Post-Ligurian and pre-Tuscan movements can only be recognised by the deformation of eocene and oligo-miocene rocks. If the occurrence of such sediments were not so incomplete on the Ligurides, movements like the ones shown here could probably be proved more often. Thus this probably represents only a minimum activity. A closer continuity of tectonic movements within the orogenic interval cannot be ruled out.



References

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