

TECTONO-SEDIMENTARY EVOLUTION OF THE LIGURIAN UNITS IN SOUTHERN TUSCANY

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ABSTRACT

To attempt the reconstruction of the stratigraphic – tectonic framework of the oceanic units pertaining to the Ligure – Piemontese Ocean (Ligurian Units Auctt.: Helminthoid Flysch Units, Vara Units, Lanciaia Fm.) cropping out in Southern Tuscany, sedimentological, biostratigraphical, petrographical and structural studies were performed. These analyses were carried out in some key outcrops (Gambassi-Montaione; S. Donato in Poggio; Northern Monti della Gherardesca; Micciano-Libbiano and Serrazzano; Lanciaia-Montecastelli Pisano.). Data coming from the geothermal wells were also utilized for regional correlation.

The Cretaceous helminthoid flyschs of these areas have been grouped in a single formation, the Monteverdi Marittimo Fm., subdivided in three members: i) Larderello Member deposited in the middle part of the basin., ii) Montaione Member, deposited in the inner (western?) part and close to an ophiolitic ridge because of the occurrence of ophiolitic olistoliths and breccias iii) San Donato Member, that represents the distal eastern part of the turbiditic system.

Despite a complex polyphasic evolution, the piling up of four main Ligurian tectonic units can be recognized (from bottom to top of the pile): Castelnuovo Val di Cecina Unit (CVU), Vara Unit (VU) and Lanciaia Fm., Castelluccio Unit (CU), Montignoso Unit (MU). The Lupicaia Creek Unit (LU) is also present locally at the top of the pile (Montecatini Val di Cecina and south of the Montaione-Gambassi).

Between the Early and the Late Paleocene, the thrust of the VU onto the Monteverdi M.mo Fm. happened and was sealed by the sedimentation of the Lanciaia Fm.. Since Late Eocene also the Lanciaia Fm. was deformed by the out-of-sequence thrust of the CU and, finally, of the MU.

In particular, the structural data point out, at least for the Ligurian Units of this sector of the Northern Apennines, to a structural evolution likely linked, until the Middle – Upper Eocene, to a transpressive tectonic context. This regime probably was focused along the transform fault of the Ligure-Piemontese Ocean.

