
Tectono-sedimentary evolution of the Vera Basin: Interaction between gravitational events and structuration

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Résumé

Eastern Betics are affected by active strike-slip tectonics along NE-SW/NNE-SSW faults recognized since the Upper Late Tortonian. Nevado-Filabrides HP nappes were exhumed in the ductile domain under top to the west extensional regime during the first half of the Neogene. In between these two tectonic settings, the dynamics of the Tortonian basins remain debated.

Dextral EW strike-slip cluster along the southeastern edge of the Sorbas basin is sealed by Messinian reefs while the trike-slip activity lasted during the Messinian along the NNE-SSW Palomares fault on the eastern border of the Vera Basin. Alpujarriid nappes are lacking along the western border (Sierra Bédar) where the structural contact between Bédar-Macael units and the basin remains poorly characterized.

A study combining brittle/ductile structural mapping and sedimentology in the southern Vera Basin allowed to reconstruct the relationships between deformation, sedimentation and depocenter migration. During early stages of Serravalian-Tortonian sedimentation, terrigenous material was mainly provided by the Alpujarriides series from the southeastern margin even if a contribution of the northwestern margin is not excluded. The Sierra Bédar revealed the existence of later major palaeolandslides that abruptly exposed deeper parts of the Bédar-Macael tectonometamorphic pile. Their fossilization by an onlap of Messinian sediments, then by the last effusive lavas of the Cabezo María zone, underlines their synsedimentary character.

During a generalized deepening, drastic changes in the sources of clastics inputs reveal the uplift of the Sierra Bédar. Mega-landslides from the northwest then fed an olistostrome filling submarine incisions during the emplacement of syntectonic growth structures on the southeastern edge (Sierra Cabrera).

The deep structures bordering the uplifted Sierra Bédar are masked by landslides and unconformities. Towards its eastern edge, stretching locally indicates top to the SE kinematics that could prefigure the deep subsidence initiation of the Vera-Cabrera basin. Although largely fossilized, the continuation of the tectonic activity of this supposed deep NNE-SSW structure was expressed through Pb-Cu mineralizations, hosted by unconformable sediments and the latest Cabezo María effusive volcanics.

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Mots-Clés: Spain, Betics, Vera Basin, Neogene, tectonics, sedimentation