Neogene Tectono-Sedimentary Evolution of the Guercif Basin

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The Neogene-Quaternary Guercif Basin, developed as a foreland basin in front of the eastern termination of the Rifian Arc and located above the major Middle Atlas Shear Zone, which affects the foreland, represents a hybrid basin with a complex tectono-sedimentary evolution. An integrated approach was applied to study the basin: basin stratigraphy reconstruction was based on the recognition of widespread unconformities and on detailed facies analysis. A detailed structural analysis was carried out through the entire basin and a grid of seismic profiles was interpreted. Fieldwork, structural and stratigraphical analyses led to recognize two different areas, where both characters of the stratigraphic succession and geometry and kinematics of the structures differ. The area located in the northwesternmost side of the Guercif Basin, where the Rifian front overlies the Middle Atlas foreland, shows a maximum thickness of the sediments of 600m and is predominantly affected by E-W-oriented normal faults tied to the extension which took place contemporaneously with basin development. The major part of the basin, where thicknesses reach at least 1500 m in the depocentre, is characterised by NE-trending structures aligned along and in direct prosecution with the Middle Atlas structures. Interpretation of seismic profiles confirms 1) the presence of three main unconformities within the succession: main basal unconformity, base of the Messinian lagoonal-lacustrine deposits, base of the continental sediments, and 2) the presence of normal faults related to the early phases of basin formation.

In conclusion, the Guercif Basin evolution reflects a twophase history. During Tortonian it was part of the South Rifian Corridor, conditioned by the advancing Rifian front, then, after the closure of the Corridor, the sinistral transpressive tectonics related to the Middle Atlas Shear Zone prevailed.