

Central Atlasic and Western Atlasic/Atlantic Permian to Early Liassic Rifts and their Tertiary Inversion

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Field and subsurface data were used to compare Permianearly Liassic extensional systems and their Tertiary inversion in the Central High Atlas and the Essaouira-Agadir segment of Atlantic margin where the Atlas fold belt intersects the passive margin.

Structural and lithostratigraphic analysis show that Upper Permian to Infra-Liassic red bed formations that extensively crop out along the Telouet traverse in the Central High Atlas can be subdivided into five unconformity-bounded tectonostratigraphic sequences each of which is characterized by its own lithologic and biostratigraphic signature. The aerial distribution of these stratigraphic units suggests an upper Permian to Sinemurian S-SE migration of subsiding areas and, thus, of the High Atlas rift axis. They resulted from an essentially distensive tectonic regime under which the Central High Atlas trough opened as a dissymmetric complex basin bounded by EW to ENE-WSW oriented major faults.

In the Western High Atlas and its adjacent Atlantic margin segment seismic data indicates that the Triassic-early Liassic time is characterized by NE to SW half-grabens linked by EW striking transfer faults and overlain by a wide considerably less faulted, salt-rich sag basin with extensive basalt flows. Here also the red bed formations that filled these structures consist of at least four tectonostratigraphic sequences that can be correlated with similar stratigraphic units defined by previous work in the Argana outcrops. Seismic data also suggests that the distension has migration from East to West and that the sag basin which forms the transition from the rifting to the drifting phase is sealed by a seismically conspicuous unconformity of pre-Carixian/Domerian age, commonly considered as the Break-up unconformity. The sag sequences pinchout eastward and northeastward against the pre-Jurassic. This pinchout coincides with the west flank of the West Moroccan Arch ("dorsale du massif Hercynien central" of Du Dresnay) that separates the Tethys domain from the Atlantic domain. The Proterozoic-Paleozoic block of the High Atlas (Massif Ancien) lies at the southern end of this West Moroccan Arch. Our Stratigraphic and structural data from the Triassic sedimentary basins of the High Atlas of Marrakech, in particular of the Eççour basin, indicates that this ancient block formed a paleogeographic high during this period, with the basement block acting as an east-west trending horst, separating two large half-grabens to the north and to the south. The marginal half-grabens, which were filled by red beds essentially of continental origin, were most likely linked via transverse pathways.

We have for the first time in Morocco, palynologically characterized the Middle Triassic (Middle Anisian) in the High Atlas of Marrakech. The stratigraphic, tectonic and paleogeographic implications of this discovery are analysed in this presentation and possible correlations with the Atlantic basins are also discussed. Finally the control of the Tertiary Atlasic compression by pre-existing rifting structures is discussed.