

Salt Tectonics of the Atlas Mountains in Morocco

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ABSTRACT

The fabulously cropping out Central High Atlas in Morocco is defined as a major diapiric province during Jurassic times. An intricate polygonal network of salt walls separating minibasins with different orientations characterized the Atlas Rift Basin. Field data on both structural geology and sedimentology of halokinetic sequences, significant remote sensing mapping using good quality satellite images, thermal modelling and subsidence analysis, balanced and restored cross-sections and analogue modelling allowed us to construct an integrated tectono-sedimentary interpretation of Central High Atlas salt-related rift basin. The analysis of three areas (Tazoult, Jbel Azourki and Imilchil) reveals a consistent evolution of this diapiric domain. Analysed diapiric ridges (salt walls) show a similar evolution with the main distinctions related to both regional main geodynamic changes in the Jurassic Rift Basin and local different ratios of diapir rise and sediment accumulation. The Tazoult and Jbel Azourki salt wall developed by post-Hettangian extension triggering reactive-active diapirism after 199 Ma followed by a long period of passive diapiric growth roughly from 199 Ma to before 170 Ma. Its partial fossilization at about 168 Ma took place during Middle Jurassic although some close localities show halokinetic sequences of this age. The diapiric activity in Imilchil is recorded at least since the Toarcian (Early Jurassic at around 183 Ma) up to the Callovian (Middle Jurassic at around 164 Ma). At the larger scale, the diachronic evolution between extension and diapirism along the Atlas suggests that diapirism and salt withdrawal play an important role not only in the Central High Atlas in Morocco but also along the Saharan Atlas in Algeria and Tunisian Atlas.