

## **The Ordovician of Tafilalt-Taouz (Eastern Anti- Atlas Oriental, Morocco): Depositional Systems and Control**

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Sedimentological study of thirteen representatives Ordovician (Arenigian-Ashgillian) successions in Tafilalt-Taouz (eastern Anti Atlas), allow to identify for the first time the depositional systems and their controls. It also highlighted a complex history of this part of the Moroccan north Gondwanan platform.

During the Lower and Middle Ordovician, the Tafilalt-Taouz domain acted as a siliciclastic epeiric shelf with ENE-WSW trending isopachs, that was alimented by siliciclastic sediments from the Panafrican shield and it's old cover and intrabasinal sources (oolitic ironstones and shell fragments). The sedimentation took place in storm dominated offshore and transition zone, macrotidal estuary and tide dominated subtidal zone under the control of subsidence and eustatism.

During the Upper Ordovician, an extensional tectonic event resulted in the individualization of two sub basins the « Khabt-El-Hejar sub basin » and the « Western Tafilalt sub basin », where the sedimentation developed under the interplay between tectonics and glaciation. The « Khabt-El-Hejar sub basin » created at the Eastern edge of the Tafilalt domain, correspond to a ramp type basin where took place Bryozoan mounds and a mixed siliciclastic carbonate high energy peritidal littoral that was alimented by biogenic gravels and sand derived from subtidal areas and glacial siliciclastic sediments originated from the Saharan ice sheet. The « Western Tafilalt sub basin » corresponding to the previous siliciclastic epeiric shelf recorded a change in the direction of isopachs that became NW-SE and was structured in half graben. The sedimentation occurred in storm dominated offshore, estuary, deltas and fan deltas and the sediments are mostly siliciclastic supplies from the Saharan ice sheet and carbonates originated from the « Khabt-El-Hejar sub basin ».

Keywords: Ordovician, Tafilalt-Taouz, Paleogeography, Extensional tectonics, Glaciation.