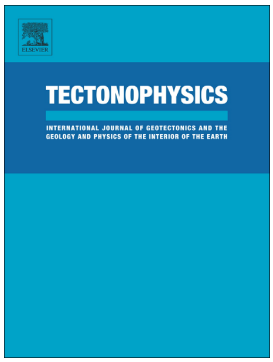

Structural evolution and tectonic style of the Tunisian central Atlas; role of inherited faults in compressive tectonics (Ghoualguia anticline)

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Structural evolution and tectonic style of the Tunisian central Atlas; role of inherited faults in compressive tectonics (Ghoualguia anticline)

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Abstract

Geological mapping, field cross sections, structural analyses and new subsurface data were used to characterize the geometry and tectonic setting of the Ghoualguia structure, which is an E-W-trending anticline located between the Kalaa Khasba and Rouhia troughs of the central Tunisian Atlas.

The results show an important NE-SW extensional phase during the Mesozoic, as demonstrated by synsedimentary normal faults (NW-SE and E-W) and thickness variations. In the Aouled Mdoua area, the absence of Paleocene-Eocene rocks indicates that the eastern and western parts of the Ghoualguia structure were separated by high topography. In addition, the angular unconformity observed between the Upper Cretaceous unit (Abiod Fm.) and the upper Eocene series (Souar Fm.) provide evidence of a tilted-block structure delineated by North-South faults. A major compressional phase during the middle to late Miocene created various detachment levels that originated mainly in the Triassic and Cretaceous deposits. Faults were reactivated as thrust and strike-slip faults, creating fault-related fold structures. In the core of the Ghoualguia fold, an original S-dipping normal fault underwent reverse movement as a back thrust. Fault-slip data indicate that the area records a major NE-SW extensional phase that took place during the late Miocene and Pliocene. A balanced cross section provides insight into the existence of two main detachment levels rooted in the Triassic (depth +/- 6km) and the lower Cretaceous (depth +/- 2.5km). The balanced cross section highlights a shortening of about 2.5 km along cross section and 1.5 km in the central part of the Ghoualguia anticline. This work underlines the predominant role of the inherited Mesozoic structures during the evolution of the Atlassic range and their influence on the geometry of the central Tunisian atlas.

Keywords: