

The Albian tectonic “crisis” in Central Tunisia: Nature and chronology of the deformations



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ABSTRACT

The Mid-Cretaceous tectonic “crisis” is a classical feature of the tectono-sedimentary evolution of Tunisia. A reappraisal of synsedimentary deformation observed in the Tajerouine and Kasserine areas shows that deformation began in the earliest Albian, increased during the Early Albian, and culminated in the Middle Albian. Late Albian deposits overly, locally with a strong angular unconformity, Aptian to Early Albian sediments. In the southern part of the studied area, fault tectonics and tilted blocks dominate, whereas in the northern area, the occurrence of slumps and olistoliths suggests deformation related to incipient salt movements at depth. These new chronological constraints suggest that this tectonic event is most probably related to the final opening of the Atlantic Ocean at equatorial latitudes.

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1. Introduction

The Mid-Cretaceous tectonic phase is a classical feature of the geological evolution of Central Tunisia and Eastern Algeria, where it was often ascribed to the Aptian (“Aptian crisis” of *Soyer and Tricart, 1987; Rigane et al., 2010; Zouaghi et al., 2011*). It is usually interpreted as an extensional tectonic phase related, either to the rifting of the Equatorial Atlantic Ocean, or to the rifting of the Eastern Mediterranean (“Mesogean”) Ocean (*Burrollet, 1956; Soyer and Tricart, 1987; Martinez et al., 1991; Barrier et al., 1993; Piqué et al., 1998; Bouaziz et al., 2002; Guiraud et al., 2005; Ouali, 2007*). It provoked the end of the Aptian carbonate shelf sedimentation, the emergence of Central Tunisia, and the regional unconformity of Late Albian beds upon Jurassic to Early Albian deposits.

However, few studies document the nature, distribution and accurate chronology of this deformation phase, which are important for the regional interpretation of this tectonic event. The aim of this contribution is to present accurately dated and well documented examples of synsedimentary deformation, in order to make their regional or geodynamic interpretation more reliable. For this purpose, we shall discuss some synsedimentary deforma-

tion observed in well dated Late Aptian–Albian deposits, between 35° and 36° lat. N. in western Central Tunisia, in the light of new stratigraphic data obtained recently (*Chihaoui et al., 2010; Latil, 2011*).

2. Geological setting

Tunisia is part of the southern Tethyan margin, which is marked by Late Triassic to Middle Jurassic rifting, a middle Cretaceous extensional tectonic event, and by compressional tectonic events from the Late Cretaceous onwards, which culminated with Mid-Late Eocene and Plio-Pleistocene compressional phases, related to the Alpine orogeny (*Burrollet, 1956; Bishop, 1975; Masse et al., 1995; Souquet et al., 1997; Frizon de Lamotte et al., 2000, 2011*).

In the Cretaceous, the passive margin of Tunisia is classically divided into three main paleogeographic domains (*Fournié and Paucud, 1973; Zghal and Arnaud-Vanneau, 2005; Fig. 1*).

- To the South, the stable Saharan epicratonic platform is covered by thin, mainly clastic, continental to shallow marine deposits, which are virtually undeformed.
- The Central Tunisian platform is marked by shallow marine, first siliciclastic, then calcareous deposits. The Central Tunisian platform is bounded to the north by the present-day NE–SW

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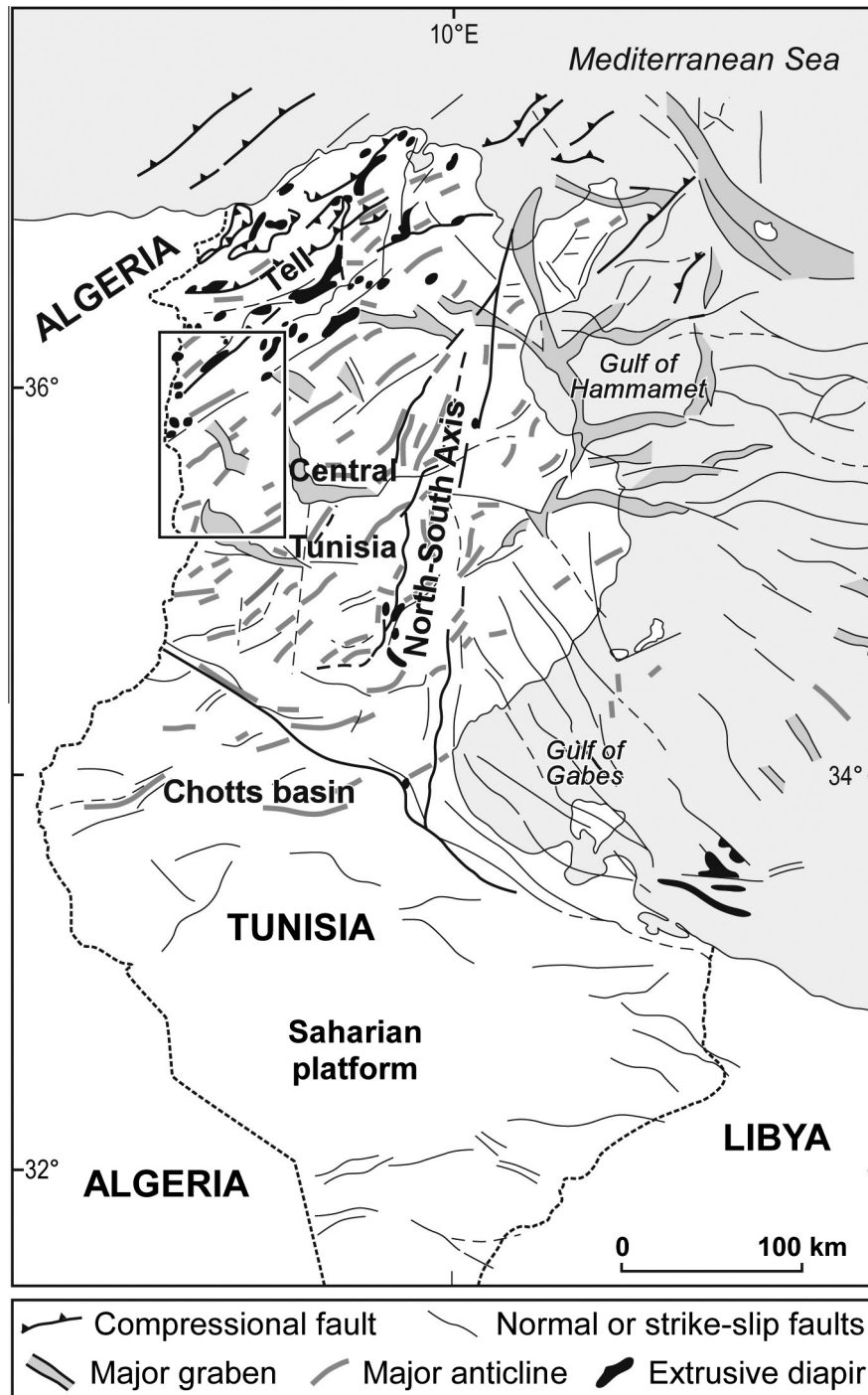


Fig. 1. Structural sketch of Tunisia (after Klett, 2001), and location of Fig. 2.

trending thrust and fold belt that corresponds to the Tell chain, and includes the southern Chott depression that separates the Saharan and Central Tunisian platforms. It is presently marked by NW-trending folds and by SW-trending grabens, both of Neogene age.

- The North Tunisian basin received thick marly deposits during most of the Cretaceous, and is presently folded to form the Tunisian Tell, marked by numerous thrusts and diapirs (Fig. 1).

The study area is comprised between Jebel Harraba to the Northwest, Jebel Jerissa and Bou el Haneche to the East, and Jebel El Hamra to the South. It comprises Jebel Harraba, Guern Halfaya,

Henchir el Goussa, and Jebel Hameima, Slat, Jerissa, Bou el Haneche, Ajeret and El Hamra (Fig. 2).

3. Stratigraphy

The Aptian–Albian stratigraphy of Central Tunisia has been first established by Burollet (1956) (see also Dubourdieu, 1956) and then refined by Bismuth (1973), Bismuth et al. (1981, 1982), M'rabet (1981) and M'rabet et al. (1995). According to more recent works (Zghal, 1994; Zghal et al., 1997; Jaillard et al., 2005; Robaszynski et al., 2008; Chihaoui et al., 2010; Latil, 2011), the following nomenclature will be adopted.

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