

Hauterivian-Barremian Bivalves from the Boulouha Formation of the Dahar Escarpment, Southern Tunisia: Stratigraphy and Regional Correlation

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Abstract

The Lower Cretaceous mixed siliciclastic-carbonate successions of the Boulouha Formation at the type locality in the Dahar escarpment of southern Tunisia have yielded a new discovered assemblage of bivalves which contains *Anomia laevigata* (Sowerby); *Modiolus* sp. cf. *M. dahuashuensis* (Yu et Li); *Astarte* sp.; and ?*Mytilus* sp.. The temporal distribution of the *Anomia laevigata* (Sowerby) and *Modiolus* sp. cf. *M. dahuashuensis* (Yu et Li) is limited to the Aptian formations of northeastern China, Japan and Korea, thus we suggest a Hauterivian-Barremian age for the Boulouha Formation. Henceforth, the new biostratigraphic data are used to improve a regional chronostratigraphic correlation between the lower Cretaceous strata of the Saharan Platform domain and those coeval from the Chotts domain.

Keywords

Bivalves, Hauterivian-Barremian, Boulouha Fm., Dahar Escarpment, Tunisia

1. Introduction

The Saharan Platform domain of southern Tunisia has recorded very thick Mesozoic successions that developed during the syn- and post-rifting stages in the Tataouine basin. These strata hosted a huge number of faunal and floral fossils that widely contribute to providing the necessary chronostratigraphic data for the establishment of the southern Tunisian stratigraphic chart. However, the lower Cretaceous deposits cropping out along the Dahar escarpment are worldwide known from the numerous biota sites discovered over the past twenty years which yield macro- and microfossil vertebrate remains [1] [2] as well as very well preserved fossil plants [2]. The present work provides new biostratigraphic data based on fossil bivalves and aims to: 1) refine the age of the Lower Cretaceous succession of the Tataouine basin and 2) correlate these lower Cretaceous strata with those of the Chotts basin.

2. Study Area

The Lower Cretaceous deposits are widely exposed in the Saharan Platform domain along the Dahar escarpment which runs for about 300 km in a roughly N-S direction along the northeastern margin of the Tataouine basin (**Figure 1(a)**). At the type locality, the Late Jurassic (Oxfordian-Kimmeridgian)-Early Cretaceous (Aptian) Merbah el Asfer Group, siliciclastic dominated succession, is divided into three formations which are from the base to top: Bir Miteur, Boulouha, and Douiret [2] (**Figure 1(b**)). The deposits of Bir Miteur and Douiret formations encompassed several fossiliferous beds which have yielded faunal and floral assemblages characterizing the Kimmeridgian and the Early Aptian respectively. However, the Boulouha Formation is attributed to different ages including the Barremian-Aptian [1] [2] and the Hauterivian (**Figure 1(b**)). Each Formation is bounded by erosional surfaces of regional extent called D1-D4 [2]. The Fossil bivalves assemblage recently discovered from the Boulouha Fm. allowed giving new insights on its age.

3. Results

The Boulouha Formation consists of approximately 80 meters of interbedded sandstones and greenish clays with frequent intercalation of dolomitic beds characterizing a siliciclastic/carbonate tidal flat setting [2] (Figure 1(b)). The greenish clay horizons have previously yielded fossil plants [2] and for the first time well preserved bivalve specimens were collected from a claystone bearing horizon situated at about 10 m above the Kimmeridgian carbonate marker bed (Figure 1(b)). This horizon contains the following bivalve species, *Anomia laevigata* (Sowerby); *Modiolus* sp. cf. *M. dahuashuensis* (Yu et Li); *Astarte* sp.; and ?*Mytilus* sp.. This bivalve association indicates a Hauterivian-Barremian age. The temporal distribution of the *Anomia laevigata* (Sowerby) and *Modiolus* sp. cf. *M. dahuashuensis* (Yu et Li) is limited to the Aptian formations of England, northeastern China, Japan and Korea [3].

Henceforth, the Hauterivian-Barremian Boulouha Formation of the Saharan domain constitutes coeval strata of the Hauterivian-Barremian Bouhedma Formation of the Chotts domain.

4. Conclusion

The Hauterivian-Barremian age is for the first time attributed to the Boulouha Formation of the Dahar escarpment, Saharan Platform domain, based on well



Figure 1. (a) Location of the study area; (b) Lithostratigraphy and key fossiliferous beds; (c) Stratigraphic ranges updates of the studied area at the prominent Jeffara Escarpment.

preserved bivalve assemblages. This new direct dating of the lowermost strata of the Boulouha Formation (=Bouhedma Formation of the Chotts basin), just few meters above the D2 which in turn is capping the widespread Kimmeridgian carbonate marker bed, corroborates the hypothesis [2] suggesting the presence of a major gap (20 Ma) between the Jurassic and the Early Cretaceous in the Sahara Platform domain.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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