

# Leymeriellidae (Cretaceous ammonites) from the lower Albian of Esfahan and Khur (Central Iran)



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## ABSTRACT

Leymeriellid ammonite faunas are described from northeast of Esfahan and the Khur area (Central Iran). The faunas comprise *Leymeriella* (*L.*) *tardefurcata*, *L.* (*L.*) *germanica* and *L.* (*L.*) *acuticostata*? as well as *L.* (*Neoleymeriella*) *regularis*, *L.* (*N.*) *diabola* and *L.* (*Neoleymeriella*) *pseudoregularis*?. The leymeriellids of Iran are closely related to faunas from northwest Europe, the Vocontian Basin and Transcaspia (Mangyshlak) and thus allow for biostratigraphic correlations, indicating the earliest Albian *Leymeriella tardefurcata* Zone with its superimposed *L. acuticostata* and *L. regularis* subzones. We suggest that the sudden appearance of common representatives of the genus *Leymeriella* in the northern and Central Iranian basins (*Leymeriella acme*) can be used as a useful proxy marker to define the base of the Albian Stage in Iran.

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## 1. Introduction

Ammonites from the Cretaceous System of Iran are well known (Seyed-Emami, 1988) and mid-Cretaceous (Aptian–Turonian) faunas have been recorded from several sites in northern and Central Iran (e.g., Seyed-Emami et al., 1971; Seyed-Emami, 1977, 1980a, 1980b, 1982, 1995; Kennedy et al., 1979; Immel and Seyed-Emami, 1985; Seyed-Emami et al., 1993; Seyed-Emami and Immel, 1995, 1996; Wilmsen et al., 2005, 2013a) and the Koppah Dagh (northeastern Iran: Seyed-Emami and Aryai, 1981; Seyed-Emami et al., 1984; Immel et al., 1997; Rajsosadat, 2002, 2004, 2006; Mosavinia et al., 2007, 2014; Mosavinia, 2008; Mosavinia and Wilmsen, 2011; Wilmsen and Mosavinia, 2011). The ammonite faunas of northern, northeastern and Central Iran are of Boreal (northwest European and Transcaspian) affinity and thus enable precise biostratigraphic

correlations to mid-Cretaceous standard successions in Europe, Crimea and Mangyshlak (e.g., Mosavinia et al., 2014; Niebuhr et al., 2016).

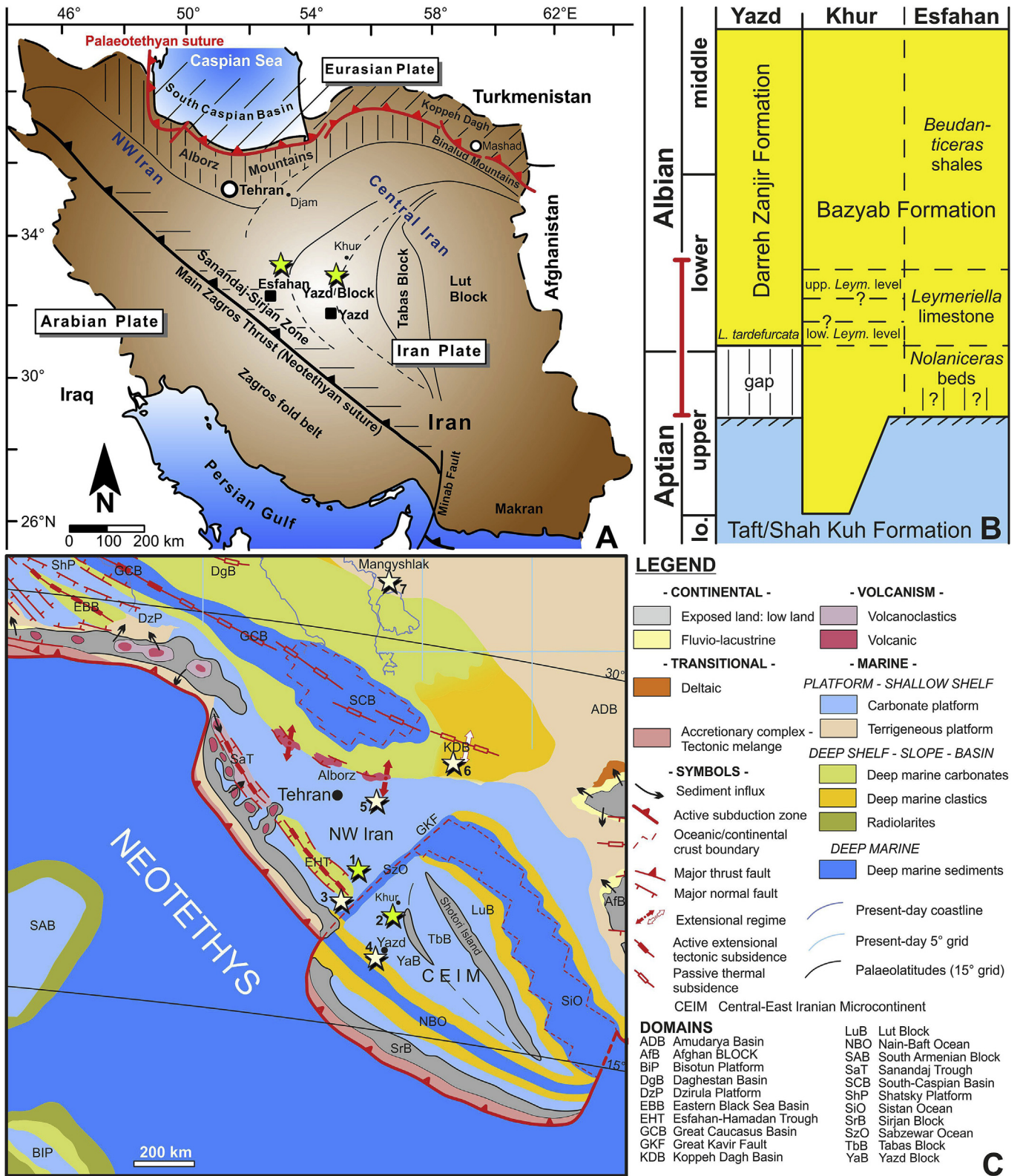
Here, we document well-preserved early Albian faunas from Bagherabad, ca. 55 km northeast of Esfahan, and the Khur area (Central Iran). These faunas provide temporal constraints to the widespread dispersal of Leymeriellidae during the Aptian–Albian boundary interval. We suggest the sudden appearance of common representatives of the genus *Leymeriella* Jacob, 1907 in northern and Central Iranian basins (*Leymeriella acme*) as a useful proxy marker for the base of the Albian Stage in Iran. Furthermore, they allow dating the end of carbonate platform demise during an inter-regional late Aptian–earliest Albian platform crisis.

## 2. Geological setting

The study areas belong palaeogeographically to Central Iran. Northwest Iran forms a structural unit along with the Alborz and Binalud mountains (Fig. 1A, C). The Khur area is part of the Central-East Iranian Microcontinent (CEIM; Takin, 1972), an independent structural unit in the plate tectonic mosaic of the

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**Fig. 1.** Regional structural, palaeogeographic and stratigraphic framework. A, structural map showing the main tectonic domains and sutures/faults of present-day Iran. The green asterisks show the position of the studied ammonite faunas. B, lithostratigraphic subdivision of the upper Aptian–middle Albian in the study areas (following Aistov et al., 1984 and Wilmsen et al., 2015). The red range bar indicates the studied interval. C, plate tectonic and palaeogeographic setting of the Albian–Cenomanian in the Middle East (modified after Barrier and Vrielynck, 2008). The green asterisks indicate the studied sites at Bagherabad (1) and the area south of Khur (2, Bazyab and Bayazeh), whereas yellow ones are sites with leymeriellids discussed in the text (3, southeast of Esfahan; 4, Yazd area; 5, Djam; 6, Koppeh Dagh; 7, Mangyshlak). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

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