

First record of late Campanian ammonites from the Abderaz Formation of the Koppeh Dagh, northeastern Iran



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ABSTRACT

An ammonite fauna from the upper Abderaz Formation of Kuh-e-Bul in the northwestern part of the Koppeh Dagh (Iran) is described and illustrated. The collection of 30 specimens is assigned to seven species, all of which are recorded from Iran for the first time: *Pseudophyllites indra* (Forbes, 1846), *Pachydiscus* (*Pach.*) *haldemisis* (Schlüter, 1867), *Patagiosites stobaei* (Nilsson, 1827), *Menuites wittekindi* (Schlüter, 1876), *Glyptoxoceras retrorsum* (Schlüter, 1872), *Lewyites elegans* (Moberg, 1885) and *Trachyscaphites spiniger* (Schlüter, 1872). This fauna is of a typical Boreal character, with all taxa having been described from northwest Europe originally. The stratigraphic range indicated by the ammonites is lower upper Campanian, below the first occurrence of *Nostoceras* (*Bostrychoceras*) *polyplacum* (Roemer, 1841) and probably above the last occurrence of *Hoplitoplacenticeras* (*H.*) *vari* (Schlüter, 1872). A nannofossil sample from the ammonite-bearing interval corresponds to the upper Campanian nannofossil zone UC15/CC22. Thus, on the basis of both ammonites and calcareous nannofossils, the upper Abderaz Formation is shown to be younger than assumed previously.

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1. Introduction

Ammonites from the Cretaceous System of Iran are well known (for a summary, see Seyed-Emami, 1988) and mid-Cretaceous (Aptian–Turonian) faunas in particular have been recorded from several sites in central Iran (see Wilmsen et al., 2005, 2013) and in the Koppeh Dagh in the northeastern part of the country (Seyed-Emami and Aryai, 1981; Seyed-Emami et al., 1984; Immel et al., 1997; Raisossadat, 2002, 2004, 2006; Mosavinia et al., 2007, 2014; Mosavinia, 2008; Mosavinia and Wilmsen, 2011; Wilmsen and Mosavinia, 2011). However, ammonites of late Late Cretaceous age have not been recorded so far, or only on rare occasions. Here we document for the first time a well-preserved late Campanian fauna from the Kuh-e-Bul section near Qaleh-Zoo in the Koppeh Dagh Mountains, c. 230 km northwest of Mashhad.

2. Geological setting and stratigraphy

2.1. Geodynamic framework

The area of present-day Iran comprises a complex mosaic of tectonic plates and subordinate blocks that assembled during the Mesozoic and Cenozoic (e.g., Davoudzadeh, 1997). The main structural elements are the Neotethyan suture (Main Zagros Thrust) in the southwest and the Palaeotethyan suture in the north (Fig. 1A). These major sutures demarcate the Arabian and Eurasian plates, the Iran Plate being sandwiched in between. The Palaeotethyan suture, which resulted from the Late Triassic collision of the Iran Plate with the southern margin of Eurasia (Turan Plate), runs south of the Caspian Sea from the northwest to the northeast of Iran. In this area, it separates the Koppeh Dagh (Kopet-Dagh) from the Binalud Mountains, the southeastern extension of the Alborz Mountains of northern Iran (Fig. 1A; Nabavi, 1976; Alavi, 1991; Wilmsen et al., 2009a, b). The WNW–ESE-trending sedimentary–structural zone of the Koppeh Dagh (inclusive of the Hezar Masjed Mountains) extends from east of the Caspian Sea into

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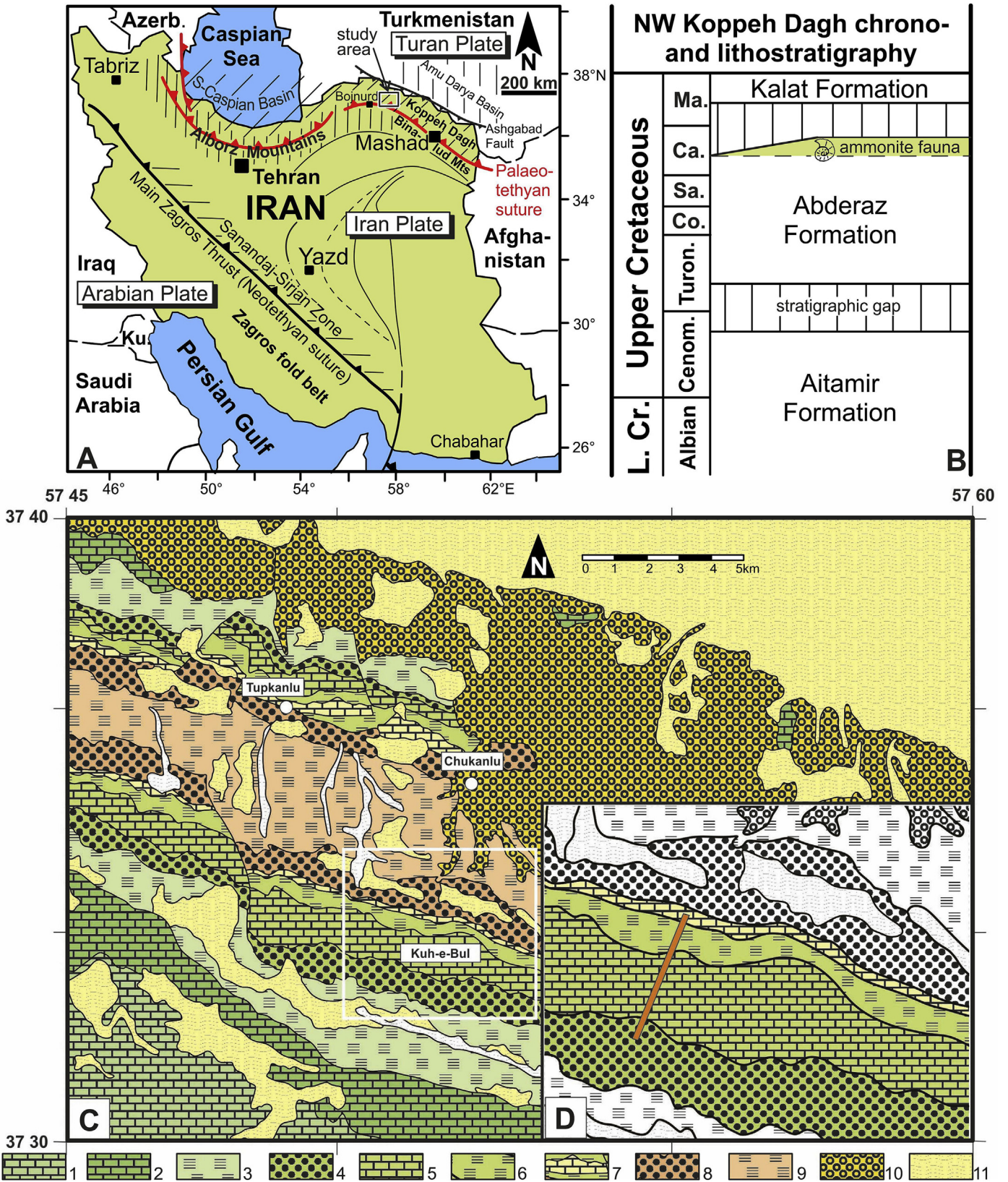


Fig. 1. A. Map of Iran with main sutures, tectonic plates, regional domains and indication of the study area in the Koppeh Dagh (see Fig. 1C). B. Albian–Maastrichtian chrono- and lithostratigraphy of the northwestern Koppeh Dagh. C. Geological map northwest of Bojnurd with indication of studied section. D. The section studied, Kuh-e-Bul. Legend: 1 – Tigran Fm (upper Barremian–lower Aptian), 2 – Sarcheshmeh Fm (Aptian), 3 – Sanganeh Fm (upper Aptian–lower Albian), 4 – Aitamir Fm (Albian–Cenomanian), 5 – lower Abderaz Fm (ab1, ?Turonian–?Santonian), 6 – upper Abderaz Fm (ab2, Campanian), 7 – Kalat Fm (Maastrichtian), 8 – Pestehligh Fm (Paleogene), 9 – Khangiran Fm (Paleogene), 10 – Neogene, 11 – Quaternary.

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