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Stratigraphic correlation of the Late Cretaceous Simsima Formation United Arab Emirates and Akveren Formation, northwest Turkey

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ABSTRACT

Latest Cretaceous (Campanian-Maastrichtian) microfossils are used to correlate the carbonate rocks of the Simsima Formation in the northeastern part of the Arabian Peninsula (Northern Oman Mountains, United Arab Emirates and Oman) with the Akveren Formation in Kandira (northwest Turkey, near Black Sea region). Both formations have characteristically rich planktonic foraminiferal and calcareous nannofossil faunal assemblages that permit the recognition of the *Globotruncanella havanensis* Zone and *Quadrum sissinghii* Zone CC22. The palaeontological data is used to build an appropriate palaeoenvironmental model for the latest Cretaceous Aruma Group in the Oman Mountains foreland basin. The study reveals that the Late Cretaceous formations of UAE and Turkey can be divided into an open marine carbonate shelf facies (planktonic foraminifera/calcareous nannofossil biomicrite) and a shallow-marine carbonate facies (rudistids, coralline algal foraminiferal biomicrite).

1. Introduction

The Late Cretaceous is considered to be one of the most significant stages in the geologic history of Turkey and the Arabian Peninsula region, due to the major tectonic events of this age that affected the Anatolian and Arabian plates Glennie et al. (1974), Wilson (2000), Elmas and Gurer (2004), Alaygut et al. (2010) and Ramazanoglu et al. (2012). The Late Cretaceous tectonic movements in Anatolia led to reactivation of older structures, while in the UAE/Oman area NeoTethyan oceanic sediments and volcanics were thrust stacked and translated ahead of the Semail Ophiolite during its obduction. Latest Cretaceous post-obduction sediments, which lie unconformably upon the thrusted Semail Ophiolite, are widely exposed on the western periphery of the Oman Mountains. These strata crop out in the UAE and Oman as a discontinuous belt of low mounts ("jabals"), e.g. Jabal El Rawdah, the Malaqet-Mundassah-El Faiyah range and Jabal Qarn El Barr. The post-obduction sediments are commonly described as "neo-autochthonous" to distinguish them from older "autochthonous" NeoTethyan shelf sequences.

The stratigraphic units, sedimentary facies and faunal contents of the Upper Cretaceous (Simsima Formation) neoautochthonous sequence in UAE/Oman and (Akveren Formation) in the Kandira area in Turkey have been discussed in numerous papers. Glennie et al. (1974), Hamdan (1990a, b), Anan (1993), Noweir and Eloutefi (1997), Noweir et al. (1998), Sayed and Mersal (1998), Boukhary et al. (1999), Alsharhan et al. (2000), Abdelghany (2003, 2006), Baghdady et al. (2003), Abd El-Gawad et al. (2010) and Abd-Allah et al. (2013) have described the Simsima Formation. Yildiz and Ozdemir (1999), Gurbuz and Cakir (2005), Arman et al. (2007), Ozcan (2007) and Ramazanoglu et al. (2012) have described the Akveren Formation. Ramazanoglu et al. (2012) discovered a very rich microfaunal assemblage of the Akveren Formation with similarities to that of the Simsima Formation reported by Abdelghany (2003).

The present study aims to make a precise correlation of the Late Cretaceous (Campanian-Maastrichtian) successions, with standard biostratigraphic scales, between northwest Turkey and UAE/Oman, using identified microfossils (planktonic foraminifera and calcareous nannofossils) (Fig. 1a and b).

2. Materials and methods

One stratigraphic section measured and sampled from the Akveren Formation (Fig. 2) at Kandira area carbonate quarry, northwest Turkey. Ten rock samples collected for biostratigraphic analysis, concentrating on recovering and identifying foraminifera

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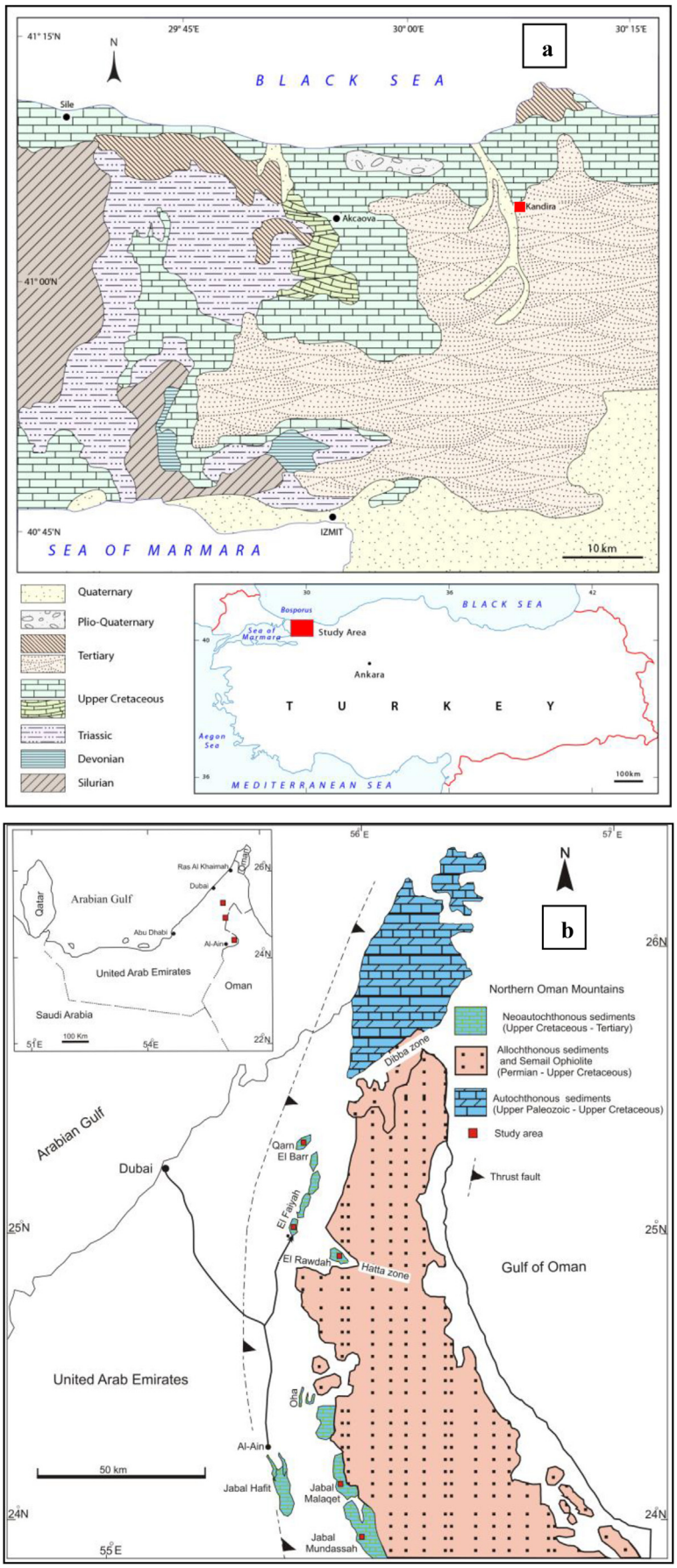

Fig. 1. Location maps of the studied sections in (a) Turkey (Ramazanoglu et al., 2012) and (b) UAE (Abdelghany, 2006).