CAMPANIAN CALCAREOUS NANNOFossil BIOSTRATIGRAPHY OF EASTERN KOPPEH-DAGH BASIN (NORTH EAST OF IRAN), TETHYAN REALM

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Abstract. Tethyan calcareous nannofossil assemblages have been recorded from three sections of the Abtalkh Formation including the type section at Abtalkh village and two others (Padeha and Jalilabad) in the east Koppeh-Dagh Basin, north east of Iran. The formation studied is expanded with a thickness of up to 1770 m at the type locality in the middle of eastern Koppeh-Dagh spanning biozones UC15bTP to UC16 while in the Padeha (973.5 m thick) in east and Jalilabad (1316 m thick) section in the west the formation spans biozones UC14dTP–UC15aTP to UC16. The zonation erected indicates an age of early–latest Campanian for the Abtalkh Formation. The recorded assemblages are of low-latitude to intermediate forms suggesting placement of the Koppeh-Dagh Basin in low to intermediate latitudes during Campanian.

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INTRODUCTION

The Koppeh–Dagh Basin stretches NW–SE east of the Caspian Sea north east of Iran, Turkmenistan, and Afghanistan. Sedimentation was continuous from Jurassic through the Neogene (Berberian & King 1981; Afshar-Harb 1994) depositing ca. 6500 m of shale, marl and limestone (Afshar-Harb 1994). The Iranian part of the basin is located between longitudes 36° 00‘ - 38° 16‘ E and latitudes 54°00‘ - 61°41‘N (Fig. 1A).

As the Koppeh-Dagh Basin is an important hydrocarbon oil field, it has been considered as a target for a number of multidisciplinary studies (paleontological, sedimentological and structural-geological) by the National Iranian Oil Company. Biostratigraphic and sedimentologic studies have been made on the basin's Cretaceous strata (Kalantari 1969; Afshar-Harb 1969, 1979, 1994; Seyed-Emami & Aryai 1981; Raisossadat & Moussavi-Harami 2000; Hadavi 2004; Hadavi & Notghi Moghadam 2010; Vahidinia & Sadeghi 2011; Mahanipour et al. 2011 and Notghi Moghadam et al. 2013).

The Abtalkh Formation is one of the thickest upper Cretaceous rock units in the Koppeh-Dagh Basin (Stocklin & Setudehnia 1991) and consists of green to gray marls, green siltstones and gray silty marls. This formation conformably overlies the upper most chalky limestone beds of the Abderaz Formation which contains mainly yellow, green to gray marls and three to four white to yellow thick chalky limestone beds and is overlain by the Nayzar Formation, which consists of green to gray siltstone and sandstone, and yellow limestone (Afshar-Harb 1994).

Calcareous nannofossils and foraminifera have provided different ages, ranging from Santonian to Maastrichtian for the formation. For example Kalantari (1969), Afshar-Harb (1994) and Ahmadi (2011) provided an age of Santonian to Maastrichtian while, Niyazi (2011) reported Campanian for the formation based on foraminifera. On the other hand, based on calcareous nannofossils, Hadavi (2004), suggested Santonian–early Maastrichtian age for the formation, while Hadavi & Notghi Moghadam (2010) reported Santonian–Campanian for the upper part of Abderez and lower part of Abtalkh Formation eastern Koppeh-Dagh. Few studies have been carried out on the nannofossil biostratigraphy of Upper Cretaceous sediments...