



Biostratigraphy, facies analysis of Upper Cretaceous–Lower Paleocene strata in south Zagros basin (southwestern Iran)



Massih Afghah

Department of Geology, Islamic-Azad University, Shiraz Branch, Iran

ARTICLE INFO

Article history:

Received 19 October 2015

Received in revised form

31 March 2016

Accepted 1 April 2016

Available online 6 April 2016

Keywords:

Upper Cretaceous

Lower Paleocene

Biostratigraphy

Facies

Zagros

Iran

ABSTRACT

In this study, two stratigraphic sections of the Tarbur Formation named Kuh-e Gadvan and Kuh-e Tir were selected. The thicknesses of the whole sediments of the sections studied are about 1100 m of which 400 thin sections were studied. Two biozones are determined in Kuh-e Gadvan and three biozones are described in Kuh-e Tir section. According to established biozones, the age of Tarbur Formation of Kuh-e Gadvan section is assigned to Campanian-Maastrichtian and Tarbur Formation age determination shows relation to Maastrichtian-Lower Paleocene in Kuh-e Tir section.

Seven major lithofacies are distinguished along two studied stratigraphic columns which are foraminifer-bioclust wackestone, algal-foraminifer- intraclast wackestone, rudist bioclust wackestone, bioclust packstone, bioclust-intraclast grainstone, coral and rudist boundstone. According to the recognized lithofacies, paleoenvironment of the Tarbur formation consists of lagoon, open margin of the reef landward, margin of the reef, flat reef, and seaward margin of the reef. Comparison of studied sections allows that geologic setting had been controlled biostratigraphy and facies change.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Upper Cretaceous sequence in some parts of the Zagros Mountain Ranges which was studied by James and Wynd (1965) is named Tarbur Formation. Lithologic aspect of the Tarbur Formation is characterized by medium-bedded to massive rudist limestone in type section. Based on the study, the age of the Tarbur Formation was determined as Campanian-Maastrichtian. Comprehensive biostratigraphic study on several outcrops of the Tarbur Formation confirmed Campanian-Lower Paleocene age (Afghah and Farhoudi, 2012; Khosrow Tehrani and Afghah, 2004) which supported interformational boundary between Upper Cretaceous–Lower Paleocene. Additionally, ascending stratigraphic order of Upper Cretaceous–Lower Paleocene sequence indicated three major rock units in the studied area which are Gurpi, Tarbur and Sachun formations. Tarbur Formation is sandwiched between Gurpi (at the base) and Sachun formations (on the top) as sharp contacts. Actually, Tarbur Formation is a thick well exposed carbonate unit in Interior Fars area (Chavidel Syooki et al., 2003). However, many authors have emphasized that, Tarbur Formation consists of organodetrital limestone (Khosrow Tehrani and Afghah, 2004;

Kalantari, 1976). To acquire a high resolution biostratigraphy and facies analysis studies of Upper Cretaceous–Lower Paleocene strata, two stratigraphic sections of the Tarbur Formation such as Kuh-e Gadvan and Kuh-e Tir stratigraphic sections were selected. The importance of Biostratigraphy and facies analysis study of Upper Cretaceous–Lower Paleocene boundary supports tectonic effect on carbonate deposits during the mentioned age interval. The previous investigations showed the basement fault zones affected sedimentation during deposition in Zagros area (Afghah and Shaabanpour Haghighi, 2014; Afghah and Fadaei, 2015). Since the Kuh-e Tir section is located in Sarvestan basement fault zone, biostratigraphy and facies analysis studies can allow the fault effect on vertical distribution of foraminifer taxa and stratigraphic facies change during deposition of the Tarbur Formation in the mentioned section. Moreover interpretation of epeirogenic movement of Upper Cretaceous/Paleocene boundary and local tectonic activity as effective factors on biozonation and facies change are the significant elements of the Tarbur Formation biostratigraphic and facies characteristics.

2. Geographical and geological setting

Both studied sections are located in eastern Shiraz city (in the SW of Iran). Geographical coordination of study area is described as

E-mail address: massihafg2002@yahoo.com.

E 52° 30' to 53° 30' and N 29° to 30° (Fig. 1). The studied sections are placed in folded-zone of the Zagros (Alavi, 2004). As mentioned before, Tarbur Formation is encompassed by Gurpi shale and marls of Sachun formations. Gray-brown limestone of lower lithostratigraphic limit of Tarbur Formation covers green shale of Gurpi formation in both studied sections.

Mid Jurassic sequence through Paleocene marl of Sachun formation are distinguishable in Kuh-e Gadvan whereas just Gurpi, Tarbur and Sachun formations are exposed in Kuh-e Tir section. Structurally Kuh-e Gadvan is an anticline with northwest to southeast trend similar to Zagros. Geographical setting of Kuh-e Tir indicates that the mentioned section is located in Kherameh area (east of Shiraz city). Generally, many Tarbur Formation exposures can be found in this region. Geologically Kuh-e Tir corresponds to Sarvestan basement fault as the major tectonic setting of this area. The basement faults of the Zagros basin had been recorded by many workers previously (e.g. Burberry, 2015; Dehbozorgi et al., 2010; Berberian, 1995). According to Dehbozorgi et al. (2010), the basement fault of the Sarvestan reflects NS trend. Structurally, Kuh-e Tir section is determined as homocline with NW to SE strike trend corresponding to Zagros.

3. Methods and materials

As mentioned before, two stratigraphic sections were selected such as: Kuh-e Gadvan and Kuh-e Tir sections. Lower and Upper lithostratigraphic limits were determined by detailed field work. Over 1100 m of the Tarbur Formation were sampled and coded. The sampling was provided by vertical change in lithofacies. In addition, 345 samples were collected from both studied sections. Thin sections were prepared and microscopic figures deposited. According to Afghah and Farhoudi (2012); Omaña (2006); Dieni (2010); Abdelghany (2003); Akyazi and Özgen-Erdem (2003); Mitchell (2005); Permoli Silva et al. (1995), foraminifers were identified. Investigation of facies and paleoenvironment interpretation were provided by Al-Ghreri et al. (2015); Núñez-Useche and Barragán (2012); Al-Shareefi et al. (2010); Daod (2009); Flügel (2004) van

Waasbergen (1995); Scott (1995), Wilson (1975) and Dunham (1962).

4. Stratigraphy

The lower and upper lithostratigraphic limits of the studied Tarbur Formation sections are marked by sharp contacts with surrounded strata (Gurpi Formation at the base and Sachun Formation on the top). According to the field work, Tarbur Formation is divided into two distinct lithostratigraphic units in both studied sections including lower well-bedded limestone and upper massive limestone. Field measurement reflected obvious different thickness of lower and upper units between Kuh-e Gadvan and Kuh-e Tir sections. This is related to the organic builds up habitat (reef setting) of the Tarbur Formation and its evolution during carbonate sedimentation. Based on field work, the lower unit of Kuh-e Gadvan is generally composed of 232 m gray to cream well-bedded limestone with rudist fragments which covers pelagic shale of Gurpi formation and the upper parts include 295 m gray-brown massive limestone. However, total measured thickness of the Tarbur limestone is approximately 525 m. Eventually marls of Sachun formation cover the Tarbur Formation conformably.

Kuh-e Tir section is comprised of Upper Cretaceous to Lower Paleocene succession which is Gurpi shale, carbonates of Tarbur and marls of Sachun formations. The lithostratigraphic contact of the Tarbur and Gurpi formations are marked by iron nodules as disconformity. Similar to Kuh-e Gadvan, the Tarbur Formation is divided into two separated lithostratigraphic units. Both lower and upper lithostratigraphic limits are distinctly well-exposed. Additionally, the lower part consists of well-bedded limestone which is covered by upper unit massive limestone. Reddish organodetrital limestone with iron nodules are recognized in the lowermost lithostratigraphic boundary of the Tarbur Formation, and some parts of the lower portion are covered; eventually upper portion of the lower unit terminates to cream rudist well-bedded limestone. Thickness of the lower part is measured approximately 323 m. The upper part is composed of light to dark gray rudist limestone which



Fig. 1. Location of studied sections of Kuh-e Gadvan and Kuh-e Tir.

Download English Version:

<https://daneshyari.com/en/article/4728353>

Download Persian Version:

<https://daneshyari.com/article/4728353>

[Daneshyari.com](https://daneshyari.com)