

Microbiostratigraphy of Paleocene- Eocene calcareous deposits in south-west of Iran (SW Kermanshah,Siahgel)

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Abstract

Microbiostratigraphy of Paleocene- Eocene calcareous deposits (Talezang Formation) in southwestern Kermanshah were investigated with respect to their benthic foraminifera range. The micropalaeontological analysis led to identification of thirty two taxa of benthic foraminifera and algae and macrofossil in the section studied. based on the associated index foraminifera two biozones have been selected : *Lockhartia - Sakesaria - Miscellanea* assemblage zone and *Cuvillerina eocenica- Opertorbitolies-Glomalveolina* assemblage zone that indicating a Thanetian-Ypresian age for the Talezang Formation in the studied area for the first time.

Key words: Microbiostratigraphy , Paleocene-Eocene , Kermanshah , Iran

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Introduction

In order to study the lithostratigraphy and biostratigraphy of Talezang Formation in southwestern Kermanshah a suitable geological section as named of Siahgel section was selected and sampled. The methodology in this research includes library, field and laboratory studies.

A) Library studies include all materials and scientific achievements related to the subject under study such as books, articles, magazines, unpublished reports, theses and the internet as well. Important information was also derived from personal communications with specialists.

B) In the field geology studies, various visits have been done for the overall geological analysis of the area under study for a better understanding of the geological formations and the relationships between various structures and the identification of the faults in the region. Following this procedure the sampled locations were selected by means of air photographs, topographical map, and geological map of 1:250000 Kermanshah and the field visits made. The Sampling of the geological section under study has been done in variable distances (10 cm to up to one meter) with respect to the facies differences of the strata, and all sampling locations have been spray-marked. Generally five main factors were considered in measuring the sections: 1- strike, 2- dip, 3- Azimuth, 4- inclination, 5- length. The real thickness of the layers were then determined through the triangular method. In total the number of the sample taken from the sections under study is 130.

C) Laboratory studies include the preparation of thin sections from all collected rock samples. The microfossils were studied and determined using a binocular microscope Olympus-BH-2 , Xsp-107BN.

Discussion

The Siahgel section is located about 90 km SW of Kermanshah city and 3.5 km west of the village Siahgel (latitude: N 34°06'65", longitude : E 46°56'10"). This area belongs to the Zagros folded , a geological province which extends in southeastern direction to Central Iran and the Persian gulf. The Siahgel section is a westward facing slope of 360.80m width exposing Late Cretaceous to Middle Eocene strata. on base of primary studies the Late Cretaceous consists of the Amiran Formation which is about 98.50m thickness and lithological consist dark olive green, sandstone and siltstone and barren zone. and the Eocene consist of the Talezang Formation (Late Paleocene- Early Eocene) which is about 144.60 m. thickness and lithological consist of thin bedded to massive limestone with some of nodules of chert. and the Kashkan Formation (Middle Eocene) which is about 117.70 m. thickness and lithological consist of red shale , sandstone and conglomerate and barren zone . Thus in this research we study only the Tale zang Formation .

The lithostratigraphy of Siahgel section

On base of studied done the Talezang Formation in Siahgel section. overlies the Amiran Formation and underlies the Kashkan Formation with a disconformity. The strike is 45-85°W and dip is 25-35°NE. and lithostratigraphically can be subdivided into 9 units as follows: (From bottom to top): (Figure 1)

(Unit 1): 19.40 m. Light gray , medium to thick- bedded limestone with some of macrofossil and nodules of chert

(Unit 2):10.360 m. Gray, medium bedded limestone

(Unit 3):12.80 m. Gray,thick-bedded to masive limestone with some of macrofossil and nodules of chert

(Unit 4):22.70 m. Dark gray, medium to thick bedded limestone with some of macrofossil

(Unit 5):13.60m. Light gray, medium bedded limestone with thin bedded limestone intrabeds.

(Unit 6):26.40m. Dark gray, medium to thick-bedded limestone with some of macrofossil and nodules of chert

(Unit 7): 15.30m. Light gray,medium bedded limestone

(Unit 8): 14.20m. Gray,thick-bedded to masive limestone with some of macrofossil and nodules of chert

(Unit 9):9.60m.Light gray, medium bedded limestone

Identified foraminifera and non- foraminifera

A total number of 130 rock samples were collected from Talezang Formation and Various literature such as Mehrnush & Partoazar 1977 Loeblich & Tappan1988 Kalantary 1972 ,1992 ,Sampo 1969 were used to identify the microfossils. In total, based on micropaleontological determinations 18genera and 2 species of benthic foraminifera, 5genera and 1species of calcareous algae with a number of macrofossils were identified from the Talezang Formation which altogether indicate Thanetian- Ypresian age.The identified benthic foraminifera are as follows: *Miscellanea miscellanea* ,*Cuvillerina eocenica* , *Kathina* sp., *Lockhartia* sp., *Sakesaria* sp., *Discorbis* sp. , *Rotalia* sp., *Opertorbitolites* sp. , *Glomalveolina* sp., *Cibicides* sp., *Orbitolites* sp., *Miscellanea* sp., *Pseudochrysalidina* sp., *Anomalina* sp.,*Valvulina* sp., *Pyrgo* sp., *Biloculina* sp., *Quinqueloculina* sp., *Textularia* sp. ,miliolids,The identified non-foraminifera include the following ones:

Calcareous algae: (*Distichoplax biserialis*, *Acicularia* sp.,*Boueina* sp., *Neomeris* sp., *Lithothamnium* sp.,Red algae,Green algae) coral ,ostracoda,gastropoda ,bryozoa ,echinodermata fragment.,

Foraminiferal biozonation

On base of the first and last occurrences and the proposed stratigraphical range of the identified foraminifera, two assemblage zone were considered for the Talezang Formation in studied section as follow as:(Table 1)

Zone I: *Lockhartia - Sakesaria - Miscellanea* Assemblage zone.

The thickness of this biozone is 67.90 m.the base of this biozone which is located at the beginning of the section under study, is concordant with the first appearance of Thanetian index foraminifera (*Kathina* sp.,)associated with *Miscellanea miscellanea* ,*Sakesaria* sp., *Lockhartia* sp. and its end is concordant with the first appearance of Ypresian index foraminifera(*Cuvillerina eocenica*).The most characteristic foraminifera associated with this biozone are as follows:*Miscellanea miscellanea* , *Lockhartia* sp., *Sakesaria* sp., *Kathina* sp., *Rotalia* sp., *Discorbis* sp. *Anomalina* sp., *Miscellanea* sp., *Pyrgo* sp., *Pseudochrysalidina* sp .Considering the identified foraminifera associations ,the age of this biozone is suggested to be Thanetian.With regard to the age, this biozone is comparable with the *Miscellanea-Kathina* Assemblage zone presented by Wynd (1965) from Iran's south-western regions (Zagros).

Zone II: *Cuvillerina eocenica- Opertorbitolites-Glomalveolina* Assemblage zone

The thickness of this biozone is 76.70 m.the base of this biozone which is located at 67.90 m. from the beginning of the section under study, is concordant with the first appearance of Ypresian index foraminifera (*Cuvillerina eocenica*) associated with *Glomalveolina* sp. *Opertorbitolites* sp. *Orbitolites* sp.and its end is concordant with the last appearance of Ypresian index foraminifera(*Cuvillerina eocenica* ,*Opertorbitolites* sp.)The most characteristic foraminifera associated with this biozone are as follows:*Cuvillerina eocenica* , *Miscellanea miscellanea* , *Opertorbitolites* sp., *Glomalveolina* sp.,*Orbitolites* sp., *Lockhartia* sp., *Sakesaria* sp., *Pyrgo* sp. *Anomalina* sp.,*Pseudochrysalidina* sp .Considering the identified foraminifera associations ,the age of this biozone is suggested to be Ypresian.With regard to the age, this biozone is comparable with the *Opertorbitolites* subzone presented by Wynd (1965) from Iran's south-western regions (Zagros)

Conclusion

In contrast to stratigraphic data of the geological map 1:250000 Kermanshah, the Talezang Formation in Siahgel section is proved to be of Thanetian. To Ypresian age. the Thanetian (Late Paleocene) succession is marked by the presence of *Miscellanea miscellanea* , *Sakesaria* sp.,*Kathina* sp.,*Lockhartia* sp., *Distichoplax biserialis* , etc. and the Ypresian (Early Eocene) succession is marked by the presence of *Cuvillerina eocenica*

,*Orbitolites* sp., *Opertorbitolites* sp., *Glomalveolina* sp., etc. and also two main general faunal assemblages can be defined, according to the relative abundance of benthic foraminifera in studied section.

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