

Microbiostratigraphy of Upper Cretaceous deposits in SW Iran (NW Kermanshah , Javanroud)

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Abstract

Microbiostratigraphy of the Upper Cretaceous deposits (Sarvak Formation)in southwest of Iran in the road of Kermanshah to Javanroud were investigated with respect to their benthic foraminifera range in Dayar section .on base of lithological studies , the Sarvak Formation in this section consists exclusively of carbonates comprising 7 rock units and micropalaeontological determination thirty six taxa consist of 23 genera and 8 species of benthic foraminifera with a number of macrofossil as rudist ,coral ,ostracoda, gastropoda , echinodermata have been identified from it . Based on the associated index benthic foraminifera also one biozone as named of *Dicyclina schlumbergerina* – *Valvulamina picardi* -*Chrysalidina* Assemblage Zone have been selected that indicating a Cenomanian age for the Sarvak Formation in the studied section.

Key words: Microbiostratigraphy , Upper Cretaceous , Kermanshah, Javanroud ,Iran

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Introduction

In order to microbiostratigraphy of Upper Cretaceous deposits(Sarvak Formation) in southwest of Iran(northwest of Kermanshah in the road to Javanroud area) a suitable geological section as named of Daiar 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all materials and scientific achievements related to the subject under study such as books, articles, magazines, unpublished reports, theses and the internet as well.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.

C) Laboratory studies include the preparation of thin sections from all collected rock samples. The microfossils were studied and determined using a binocular microscope KYOWA-MEDILUX-12

Discussion

Based on studied done ,the Dayar section consist of 150.50 m width exposing Late Cretaceous (Cenomanian to Coniacian) deposits .the Cenomanian consists of the Sarvak Formation which is about 142.40m thickness and lithological consists of limestone and clayey limestone and the Turonian-Coniacian consists of the Surgah Formation which is 8.10m thickness and lithological consist medium to thick-bedded pelagic limestone .thus in this research only we study the Sarvak Formation in studied section.

Geographical setting of studied section

the Daiar section is located about 72 km NW of Kermanshah city and 4 km W of the village Dayar with the geographical coordinate of $46^{\circ}34'48''$ eastern longitude and $34^{\circ}33'20''$ of northern latitude. (FIGURE 1). the strike is $N60-70^{\circ}W$ and dip is $15-25^{\circ}NE$. on base of field geology ,the base of this section start by Sarvak Formation and in following the Sarvak Formation underlies conformably the Surgah Formation .the sampling in this section starts from calcareous layers in bottom of studied section and continues to cream to light gray calcareous layers of the Surgah Formation . This area belongs to the Zagros folded, a geological province which extends in eastern direction to Central Iran .

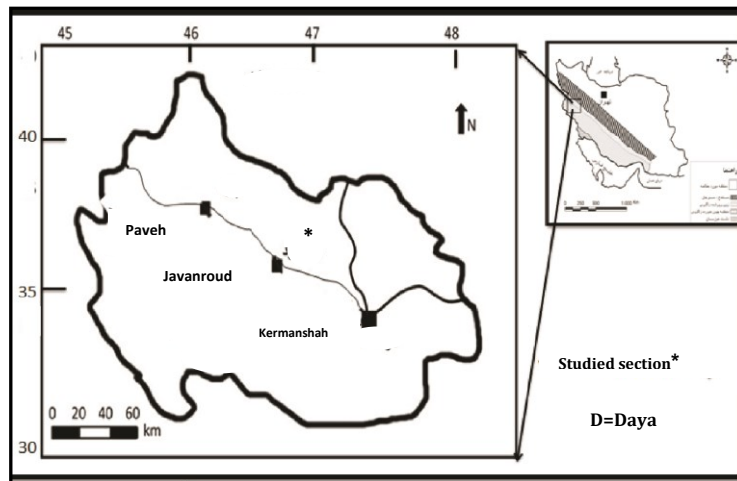


Figure 1: The Locality of Studied Section

Lithostratigraphy of the studied section

On base of studied done the thickness of Dayar section is 142.40 m and based on field geology studies especially attention to the facies differences of the strata, the Sarvak Formation in this section can be subdivided into 7 units as follows: (from bottom to top): (Table1)

(Unit 1):22.40 m. light gray medium bedded limestone with microfossils of *Hemicyclammina sigali*, *Pseudolituonella reicheli*, *Nautiloculina oolithica*, *Nezzazata simplex*, *Cuneolina* sp., *Chrysalidina* sp., *Nummoloculina* sp., *Ammobaculites* sp., *Valvulammina* sp., *Quinqueloculina* sp., *Nezzazata* sp., *Triloculina* sp., *Pyrgo* sp., *Biloculina* sp., *Textularia* sp., *Valvulina* sp., echinodermata

(Unit 2):15.10 m. light gray thick-bedded to massive limestone with some of macrofossil and microfossils of *Haplophragmium slingeri*, *Pseudolituonella reicheli*, *Valvulammina picardi*, *Cuneolina* sp., *Chrysalidina* sp., *Nummoloculina* sp., *Rhapydionina* sp., *Alveolina* sp., *Cibicides* sp., *Nezzazata* sp., *Triloculina* sp., *Quinqueloculina* sp., *Pyrgo* sp., *Biloculina* sp., *Textularia* sp., echinodermata

(Unit 3):30.20 m. dark gray medium to thick-bedded limestone with some of macrofossil and microfossils of *Dicyclina schlumbergerina*, *Nezzazata conica*, *Pseudolituonella reicheli*, *Valvulammina picardi*, *Nummoloculina* sp., *Rhapydionina* sp., *Ammobaculites* sp., *Quinqueloculina* sp., *Nezzazata* sp., *Triloculina* sp., *Pyrgo* sp., *Biloculina* sp., *Valvulina* sp., coral, ostracoda, gastropoda,

(Unit 4):25.30 m. light gray medium bedded limestone with thin bedded clayey limestone intrabeds with microfossils of *Hemicyclammina sigali*, *Dicyclina schlumbergerina*, *Nezzazata conica*, *Pseudolituonella reicheli*, *Valvulammina picardi*, *Nautiloculina oolithica*, *Nezzazata simplex*, *Cuneolina* sp., *Chrysalidina* sp., *Nummoloculina* sp., *Rhapydionina* sp., *Pseudochrysalidina* sp., *Ammobaculites* sp., *Pseudonummoloculina* sp., *Valvulammina* sp., *Dicyclina* sp., *Anomalina* sp., *Quinqueloculina* sp., *Pyrgo* sp., *Biloculina* sp., *Textularia* sp., *Valvulina* sp., ostracoda, gastropoda, echinodermata

(Unit 5):17.60 m. dark gray thick bedded to massive limestone with some of macrofossil and microfossils of *Pseudolituonella reicheli*, *Valvulammina picardi*, *Nezzazata simplex*, *Chrysalidina* sp., *Nummoloculina* sp., *Nezzazata* sp., *Dicyclina* sp., *Anomalina* sp., *Biloculina* sp., *Textularia* sp., echinodermata, rudist

(Unit 6):21.60 m. light gray medium to thick bedded limestone with some of macrofossil and microfossils of *Dicyclina schlumbergerina*, *Nezzazata conica*, *Nezzazata simplex*, *Cuneolina* sp., *Chrysalidina* sp., *Nummoloculina* sp., *Rhapydionina* sp., *Pseudochrysalidina* sp., *Valvulammina* sp., *Dicyclina* sp., *Alveolina* sp., *Cibicides* sp., *Nezzazata* sp., *Pyrgo* sp., *Biloculina* sp., rudist, coral, gastropoda, echinodermata

(Unit 7):10.20 m. light gray medium bedded limestone with microfossils of *Nezzazata* sp., *Textularia* sp., rudist, echinodermata

Identified microfossils of the studied section

from the Sarvak Formation in studied section a total number of 150 rock samples were collected and Various literature such as Harlan Johnson 1961, Kalantary 1992, 1972 Sampo 1969, Mehrnoosh & Partoazar 1977 Loeblich & Tappan 1988 were used to identify the

microfossils. In total, based on micropaleontological determinations 23 genera and 8 species of benthic foraminifera, with number of non-foraminifera were identified from the Sarvak Formation which altogether indicate Cenomanian age. The identified benthic foraminifera are as follows: *Haplophragmium slingeri*, *Hemicyclammina sigali*, *Dicyclina schlumbergerina*, *Nezzazata conica*, *Pseudolituonella reicheli*, *Valvulammina picardi*, *Nautiloculina oolithica*, *Nezzazata simplex*, *Cuneolina* sp., *Chrysalidina* sp., *Nummoloculina* sp., *Rhapydionina* sp., *Pseudochrysalidina* sp., *Ammobaculites* sp., *Pseudonummoloculina* sp., *Valvulammina* sp., *Dicyclina* sp., *Alveolina* sp., *Cibicides* sp., *Anomalina* sp., *Quinqueloculina* sp., *Nezzazata* sp., *Triloculina* sp., *Pyrgo* sp., *Biloculina* sp., *Textularia* sp., *Valvulina* sp., identified non-foraminifera include the following ones: rudist, coral, ostracoda, gastropoda, echinodermata

Foraminifer's biozonation

based on the first and last occurrences and the proposed stratigraphical range of the identified foraminifera, one assemblage zone were considered for the Sarvak Formation in studied section, as follow as:

Dicyclina schlumbergerina - *Valvulammina picardi* - *Chrysalidina* Assemblage

Zone

The thickness of this biozone is 142.40 m. and include the total thickness of studied section. The base of this biozone which is located at the beginning of the section under study, is concordant with the first appearance of Cenomanian index foraminifera (*Dicyclina schlumbergerina* and *Chrysalidina* sp.) and its end is concordant with the last appearance of important foraminifera *Valvulammina picardi* and *Dicyclina* sp. The most characteristic foraminifera associated with this biozone are as follows:

Haplophragmium slingeri, *Hemicyclammina sigali*, *Dicyclina schlumbergerina*, *Nezzazata conica*, *Pseudolituonella reicheli*, *Valvulammina picardi*, *Nautiloculina oolithica*, *Nezzazata simplex*, *Cuneolina* sp., *Chrysalidina* sp., *Nummoloculina* sp., *Rhapydionina* sp., *Alveolina* sp., *Nezzazata* sp.,

Considering the identified foraminifera associations, the age of this biozone is suggested to be Cenomanian. With regard to the age, this biozone is comparable with the *Prealveolina*-algae assemblage zone 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 total Upper Cretaceous deposits in the Dayar section belong to Cenomanian age related to Sarvak Formation and lithological consist mainly of limestone and clayey limestone and subdivided into 7 rock units. This Formation is fossiliferous and is marked by the presence of index foraminifera: *Hemicyclammina sigali*, *Dicyclina schlumbergerina*, *Nezzazata conica*, *Valvulammina picardi*, *Nezzazata simplex*, *Chrysalidina* sp., *Nummoloculina* sp., *Rhapydionina* sp., *Alveolina* sp., etc. and on base of stratigraphical range of the identified foraminifera can be defined one main faunal assemblage for studied section.

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System	Series	Stage	Formation	Thickness(meter)	Rock units No.	Description	Important benthic foraminifera
Cretaceous	Late Cretaceous	Cenomanian	Saryak Fm.	Surgah Fm.		Cream to light gray medium bedded limestone	Haplophragmium s.lingeri ,Hemicyclammina sigali, Dicyclina schlumbergerina ,Neozazata conica, Pseudolituonella reicheli, Valvulamina picardi, Nautiloculina oolithica, Neozazata simplex, Cuneolina sp., Chrysalidina sp., Nummuloculina sp., Rhaupylionina sp., Pseudochrysalidina sp., Ammobaculites sp., Pseudonummoloculina sp., Valvulamina sp., Dicyclina sp., Alveolina sp.,
				22.40 m	1	light gray medium bedded limestone	
				15.10m	2	light gray thick-bedded to masive limestone with some of macrofossil	
				30.20m	3	dark gray medium to thick- bedded limestone with some of macrofossil	
				25.30m	4	light gray medium bedded limestone with thin bedded clayey limestone intrabeds	
				17.60m	5	dark gray thick bedded to massive limestone with some of macrofossil	
				21.60m	6	light gray medium to thick bedded limestone with some of macrofossil	
				10.20m	7	light gray medium bedded limestone	

Table 1: Stratigraphic description of Saryak Formation in Dayar section in north-west of kermanshah