

Palynofacies and Sedimentary Environment of Sarcheshmeh Formation on Dodanloo Village Section

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Abstract

Sarcheshmeh Formation is one of lower Cretaceous formations of Kopet-Dagh sedimentary region located at northeastern direction of Iran. A profile of the formation was studied through Dodanloo Village section, palynologically. The formation has 312 m diameter over Dodanloo Village and its lithology is consisted of grey marls, dark grey shale with calcareous slim intra-strata. Organic shreds including Macerals, Playnomorphs and unstructured organic matters which have been prepared in the framework of 135 slides out of 27 samples of the section were studied in order to identify and determine sedimentary environment. Subsequently, two types of Palynofacies were determined. A shallow and proximal environment was suggested for Sarcheshmeh Formation at the mentioned section after determination and perception of palynofacies.

Introduction

Sarcheshmeh Formation is consisted of two informal parts and a key strata at the pattern section with 310 m diameter (Aghanabati, 2005), underneath part of the formation is consisted of 178 m grey bluish harmonized marl. Upper part is consisted of 132 m dark grey calcareous shale with slim limestone intra-strata. It's underneath common border with Tiregan Formation and its upper border with Sarcheshmeh Formation are in the same inclination (Afsahr Harb, 1994).

Sarcheshmeh Formation is on latitude 58°:52':50"N and longitude 21°:2': 37° E.

Dodanloo section is located at 77-km of Mashhad-Ghochan Road through Aliabad road. It is accessible after passing 2 km of the road and its location is near the Dodanloo Village. Sarcheshmeh Formation in this section is consisted of grey marls and calcareous shale.

Organic shreds including phytoclasts, marine palynomorphs and SOM were analyzed for determining palynofacies during playnologic studies. Eventually, playnofacies and sedimentary environment of the formation were determined subsequent to counting, making percentage, taking pictures and matching them with Tyson Diagram (Tyson 1993).

Discussion

Based on classification of organic matters, organic particles presented at palynologic slides are divided into two Allocthonous and Autocthonous (Van der Zwan, 1978), Allocthonous particles including Palynomacerals and terrain palynomorphs such as spores and pollens and Authocthonous includes dinofellagelate cysts, acritarchs, SOM and inner cover of foraminiferans. SOMs are some unstructured organic particles which are created through dissection of organic materials by bacteria (Wavern & Visscher, 1994).

After preparing palynologic slides, a number of 300 particles out of organic particles including dinofellagelate cysts, Palynomacerals and SOM were counted randomly through selecting various sight fields. After making percentage and distinguishing palynomorphs at Tyson's ternary diagram, its palynofacies were determined.

The results of separation of two types of palynofacies are as follows:

Palynofacies I: Palynomacerals of this kind of palynofacies are more than 90 percent, SOM percent is very low and is about 5 percent and marine palynomorphs are between 2-5 percent. Most samples are categorized in this palynofacies and it covers 1, 2, 4, 6, 8, 9, 10, 13, 14, 16, 18, 19, 22, 23, 25, 26 and 27 samples.

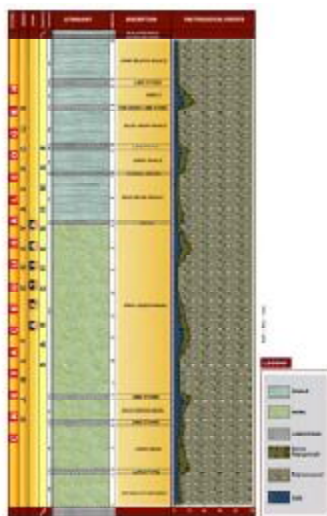
This palynofacies is concomitant to palynofacies type I of Tyson classification and it can be considered as a part of basin's initial environment.

(highly proximal shelf or basin) this palynofacies shows sedimentation at oxygenated condition.

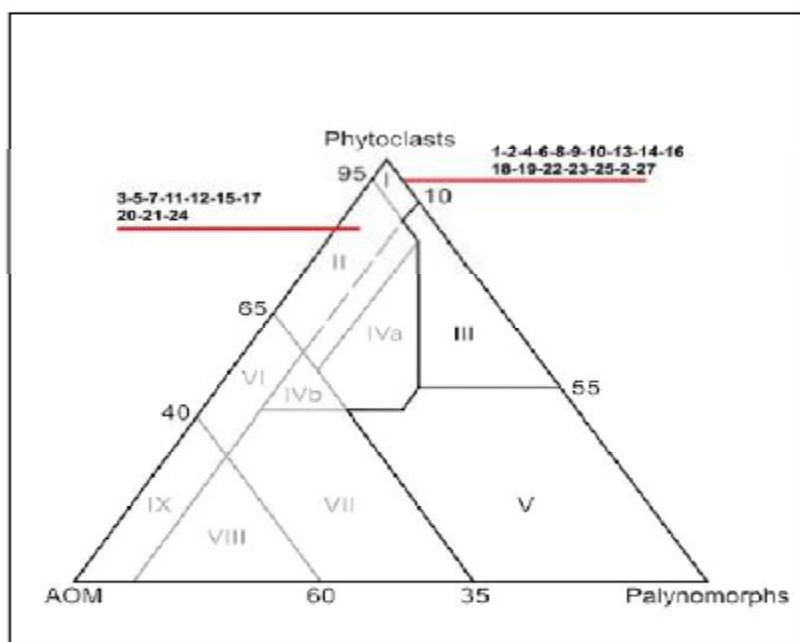
Palynofacies II: In this type, percentage of palynomacerals is over 80 percent and they consist dominant particles here, SOM amount is between 5 to 13 percent and palynomorphs are about 6-12 percent, palynomacerals are of same-dimension type. Spore and pollen are found in this Palynofacies. Again it is concomitant with Tyson's Palynofacies II classification. It shows dysoxic-anoxic marginal basin. This kind of Palynofacies is seen at 3, 5, 7, 11, 12, 15, 20, 17, 21, and 24 samples. High percent of palynomacerals which are of same-dimension shows a marginal and shallow proximal environment and introduces SOM deficiency along with low oxygen amount, however presence of inner cover of Foraminiferans in some samples shows that the condition had some oxygen (Van der zwan, 1990).

Conclusion

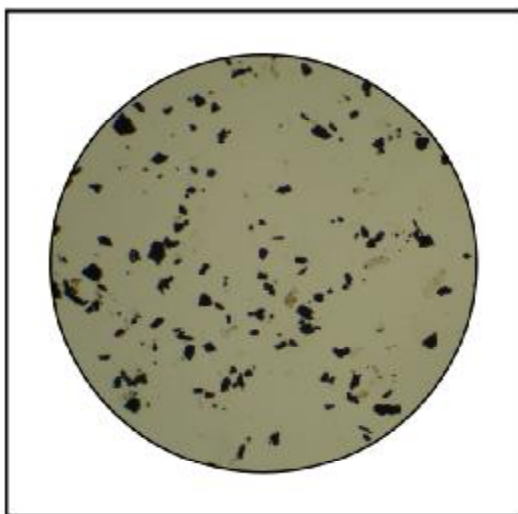
1. Analyzing palynologic slides in this section implies two palynologic profiles I and II.
2. Sedimentary environment of Sarcheshmeh Formation of the section is a coastal and shallow environment.
3. Spore and pollens in most samples focuses on shallow environment across the coast.



Stratigraphic Column of the Region



Tyson's Ternary Diagram and Samples Positions in it



Palynofacies1



palynofacies2

Reference

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