Early Cretaceous Index Benthic Foraminifera from Northeast of Torbat-e-Heydarieh Area (Esfiyukh Section)

Nahid Khodashenas, Ali Asghar Aryaei, Ali Reza Ashouri
Department of Geology, Mashhad Branch, Islamic Azad University, Mashhad, Iran
Email: wpu.gama@gmail.com

Received 2 February 2014; revised 2 March 2014; accepted 10 March 2014

Copyright © 2014 by authors and Scientific Research Publishing Inc.
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/

Abstract
The first study of early cretaceous succession in Northeast of Torbat-e-Heydarieh, led to recognition of 30 genera and 25 species of benthic foraminifera such as *Rectodictyorbitolina* sp., *Dictyconus arabicus*, *Orbitolina discoidea*, *Palorbitolina lenticularis*, *Mesorbitolina parva*, *Orbitolina kurdica*, *Praeorbitolina* sp., *Valvulammina picardi*, *Pseudocyclamina litus*, *Charentia cuvillieri*, *Lenticulina* sp., *Nezzazata picardi*, *Quinqueloculina robusta*, *Nautiloculina oolitica*, *Subaudia minuta*, *Praechrysalidina infracteracea*, *Rumanoloculina* sp., *Choffahella decipiens*, *Vercorsella arenata*. Regard to Stratigraphy range of above mentioned, the Barremian–Aptian age suggested for this succession.

Keywords
Torbat-e-Heydarieh, Cretaceous, Benthic Foraminifera

1. Introduction
Stratigraphic cuts located in Razavi Khorasan, 5 km from NE Torbat Heydarieh, in the Esfiyukh section region have been studied; and the geographical characteristics of this cut with the longitude 59 15 and the latitude of 35 20; 60 thin sections are studied [1].

2. Discussion
Sediments thickness in this cut is about 175 m, and consists of Alternatives lime including medium thick layer to
very thick layer. This section with a few meters of conglomerates is held on the Jurassic or older sediments and contains red dark red sand stone to brown sand stone with angular conformity; this section is also covered in the same format with the cretaceous sediments or younger ones.

Target sequence from bottom to top are:

1) Massive gray limestone containing microfossil orbitolina (5/21 m).
2) Brown) gray fossiliferous limestone containing abundant rudist (5/1 meter).
3) Massive gray limestone containing microfossil orbitolina (71 meters).
4) Dolomite (5/0 mm).
5) Thick limestone layer containing a light gray and brown algae and calcareous microfossil orbitolina (80 meters).

Microscopic study of thin sections led to the identification of 30 genera and 25 species of fossil benthic foraminifera as below:

Choffatella decipiens, Vercorsella arenata, Cuneolina camposaurii, Pseudocyclamina hedbergi, Cuneolina pavonia, Maynina sp., Debarina hahounerensis, Pseudocyclamina lituus, Charentia cuvillieri, Lenticulina sp., Nezzazata picardi, Quinquiloculina robusta, Nautiloculina oolitica, Subaudia minuta, Praechrysalidina infracteracea, Rumanoloculina sp. Valvulammina picardi, Orbitolina conoidea, Rectodictyorbitolina sp., Dictyococcus arabicus, Orbitolina discoidea, Palorbitolina lenticularis, Mesorbitolina lotzei, Orbitolina kurdica, Praeorbitolina sp., Chrysalidina gradata, Everticyclamina hedbergi, Mesorbitolina parva, Praeorbitolina cormeyi, Dictyococcus pachymarginalis [2]-[6].

The age of foraminifera Barremian-Aptian is proposed for the sequence which is shown in the Figure 1 and Figure 2. Some of benthic foraminifera section Esfiyukh Mountain are listed and shown in the Figure 1. The names of these sections are also referred in the below based on A, B, … X.
Figure 2. Geographical map of Esfiyuk.

Figure 3. Some of benthic foraminifera Esfiyuk section [2]-[6]. Plate 1 A. Praeorbitolina sp. cf. P. cormeyi (×100); B. Mesorbitolina lotzei (×100); C. Palorbitolina lenticularis (×100); D. Dictyoconus pachymarginalis (×100); E. Dictyoconus arabicus (×100); F. Mesorbitolina parva (×100); G. Dictyoconus ichnusae (×100); H. Rectodictyoorbitolina sp. (×100); I. Everticyclammina hedbergi (×120); J. Debarina sp. (×120); L. Chrysalidina gradate; M. Cuneolina camposaurii (×120); N. Choffahella decipiens (×120); O. Nautilolina oolitica; P. Charentia curvillieri (×120); Q. Cuneolina pavonia (×120); R. Pseudocyyclamina lituas (×120); S. Subaudia minuta (×120); T. Valvulammina picardi (×120); U. Maynsina sp. (×120); V. Lenticulina sp. (×120); W. Praechrysalidina infraferacea (×120); X. Vercorsella arenata (×120).
3. Conclusion

In this research, for the first time biostratigraphic characteristics of Esfiyukh Mountain located 5 km north of East Torbat Heydarieh have been studied. The sediment thickness is 175 m and involves sections Medium to very thick layer alternatively limestone. This section with a few meters of conglomerates is held on the Jurassic or older sediments and contains red dark to brown sand stone with angular conformity; this section is also covered in the same format with the cretaceous sediments or younger ones. Study of microfossils in this section led to 30 genera and 25 species of fossil of benthic foraminifera as mentioned in passage. The age of the sequence is proposed Barremian-Aptian.

References

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science with its publication.

Other selected journals from SCIRP are listed as below. Submit your manuscript to us via either submit@scirp.org or Online Submission Portal.