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Litostratigraphy and Biostratigraphy of Carbonate Deposits in the Southwestern Khorramabad (Southwestern of Iran)

Mehri Dalvand[1], KobraMirbeik- Sabzevari[2]

[1, 2] Department of Geology, Khorramabad Branch, Islamic Azad University, Khorramabad, Iran

Abstract: ***In current research, Talehzangformation of carbonaceous deposits has been studied in theNeqarehsection. In this section, the studied sediments with a thickness of 101.7 meter mainly consist of carbonate rocks and are divided into six sections based on field observations and lithology changes. These deposits could be found continuously and isoclines on the Amiran and lower of Kashkan formations. It should be noted that, in the 1:100000 map of Khorramabad, these deposits have been mentioned as Tarbur sediments. Fifty four samples have been used from the mentioned section (fifty samples from the Talehzang formation and four samples from the Amiran formation) that, after preparing a thin section of them and microscopic studies, in total, 12 species, 12genus and 1 group of Benthic foraminifers and 1 group of red algae And some macrofossil fragments of echinoderms, Brachiopod and bivalve were identified. By studying benthic foraminifers, in result, 1assemblage zone was identified as a Miscelaneaminuta - Kathinahunti Assemblage zone which is comparable with Assemblagezonenumber 43 of Wyand (1965) with an late Paleocene age (Thanetian).***

Keywords: Talehzang formation - Neqareh section - Litostratigraphy – Biostratigraphy- carbonaceous deposits

1. Introduction

The Lorestan basin is situated in the south west of Iran and forms the part of folded belt of Zagros. Sedimentary rocks of this region go back to Palaeocene and Eocene period which are related to three formations of Amiran, Talehzang and Kashkan (James and Wynd, 1965; Lees, 1993; Thomas, 1948;Stoneley, 1975;Wells, 1967) Since, studies about formation of Talehzang are so far and the most findings are related to 40 years ago from (2013), no studies have been done in Neqareh region. Therefore, this paper is to study the features of Biostratigraphic, Lithostratigraphic, formation of Tallehzang and Stratigraphy of Neqareh section in the southwesternKhorramabad.

2. Research Method

This research, intending to study the lithostratigraphy and biostratigraphy of the Tallehzang Formation in the Neqareh sections which was conducted in some phases. First, the section was studied on the field and based on thickness of the calcareous member of the Tallehzang Formation and facies variations were collected 50 samples in Tallehzang section systematically (with a distance of about two meter). Moreover, some samples were collected from the lower Amiran Formation. The thin sections were carefully studied in the laboratory and microfauna were identified. Then, onebiozone was introduced according to foraminifer's dispersion.

3. Geographical Situation and Regional Access Routes

The Neqareh section is situated in the 25 km southwestern of Khorramabadand in the Khorramabad road to the Pole-Dokhtar in the region by the name ofNeqareh, (Fig-1). It is situated at latitude 33 °28'30 " north and longitude 48˚8'32" east, being 1260 meters above sea level.

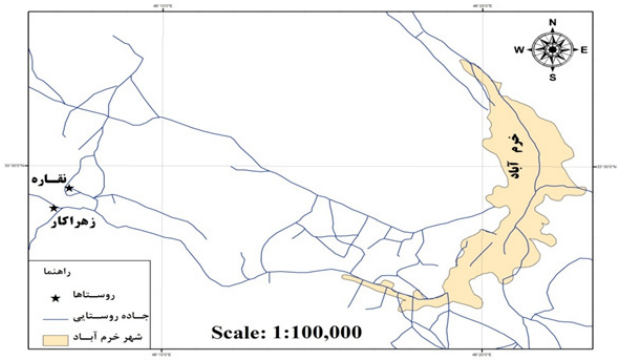

Figure 1: Map showing the location of the study areas in in the southwestern Khorramabad (southwestern of Iran)

Formation Lithostratigraphy of Tallehzang in the stratigraphy cut of Neqareh with an actual thickness of 101.5 meter comprises the medium-bedded to thick-bedded limestone. In this section, deposits of Tallehzang formation is situated in the same slope and continues on the Amiran formation which are alternation of sandstone and green to gray siltstone and the Kashkan formation that got red conglomerate also covers the Tallehzang formation in the same slope and continues way. (fig.2)

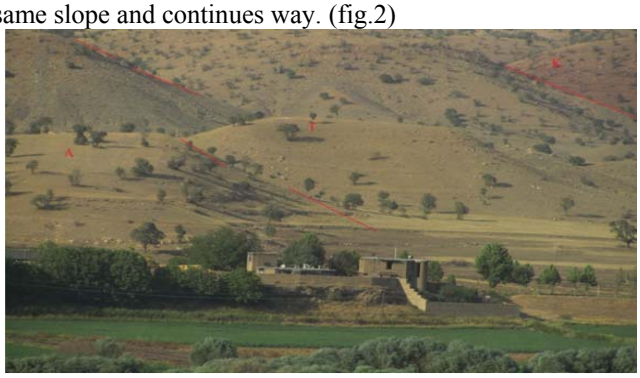

Figure 2: a view from Amiran formation, Tallehzang and Kashkan in the stratigraphy cut ofNeqareh
A: Asmari formation **T:** TallehZang formation **K:** Kashkan formation

In this section, in order to determine the lower boundary of Tallehzang from sand stones and upper siltstones of Amiran formation, several thin sections were prepared and studied, which indicated the late Paleocene age for upper section of Amiran formation. Motiey (1993) had reported the of Amiran's upper deposits age to the Paleocene. No sampling has been done due to the lack of sufficient density in Kashkan formation's floor; therefore, to determine the boundary between the Tallehzang formation and Kashkan, the lithological characteristics were used. According to the previous studies, the Kashkan formation age was reported the Eocene. (Motiey, 1993)

According to the field and geology observations, the Tallehzang formation in Neqarehsection includes carbonate section that it comprises six small units with following specifications (fig.3):

1) 18.6 m. Light gray mediumto thick- bedded limestone that many microfossils can be seen in this section which are:

Forminifera:*Flusculinapesticillata, Katina hunti, Miscellanea iranica, Miscellanea minuta, Miscellanea primitive, Nummulitesconvexa, Nummulites globules, Ooerculinacomplanata, Pseudolitounellareicheli, Ranikothaliasoldadensis,Alveolina* sp., *Assilinasp., Cuvillieriana* sp., *Lockartia* sp., *Nummulites* sp., *Olssoninasp., Operculina* sp., *Quinqueloculina* sp., *Ranikothella* sp., *Valvulina* sp., Miliolid
Non Foraminifera: Echinoderm, Pelecypoda, **Algae:***Lithophyllum* sp.

2) 10.8 m.Gray thick -bedded limestone that the following microfossils could be seen in the thin sections.

Foraminifera:*Flusculinapesticillata, Katina hunti, Lockartiadiversa, Miscellanea iranica, Miscellanea minuta, Miscellanea primitive, Nummulitesconvexa, Nummulites* sp., *Pseudolitounellareicheli, Ranikothaliasoldadensis, Ranikothaliasp.,* Assilinasp., Cuvillieriana sp., Lockartia sp., *Olssoninasp., Quinqueloculina* sp., *Valvulina* sp., Miliolid
Non Foraminifera: Algae:*Lithophyllum* sp.

3) 25.8 m.Light gay thick-bedded to massive limestone that the following microfossils could be seen in the thin sections.

Foraminifera:*Flusculinapesticillata, Katina hunti, Miscellanea iranica, Miscellanea minuta, Miscellanea primitive, Nummulitesconvexa,Nummulites* sp., Pseudolitounellareicheli, Ranikothaliasoldadensis, Assilinasp., Cuvillieriana sp., Lockartia sp., Olssoninasp., Quinqueloculina sp., Valvulina sp., Miliolid
Non Foraminifera: Bryozoa, Pelecypoda,Algae:Lithophyllum sp.

4) 14.7 m.Dark gray thin to medium-bedded limestone that the following microfossils could be seen in the thin sections.

Foraminifera:*Distichoplaxbiserialis, Flusculinapesticillata, Katina hunti, Katina sp., Miscellanea minuta, Nummulitesconvexa, Pseudolitounellareicheli, Ranikothaliasoldadensis, Assilinasp., Cuvillieriana sp., Lockartia sp., Olssoninasp., Quinqueloculina sp., Valvulina sp.,* Miliolid
Non Foraminifera: Bryozoa,**Algae:** Lithophyllum sp.

In this section apart from Ranikothellasoldadensis microfossil all the microfossils are as the same as third section

5) 23.2 m.Light gray thick-bedded to massive limestone that the following microfossils could be seen in the thin sections.

Foraminifera:*Distichoplaxbiserialis, Flusculinapesticillata, Katina hunti, Miscellanea minuta, Nummulitesconvexa, Pseudolitounellareicheli, Assilinasp., Cuvillieriana* sp., *Lockartia* sp., *Olssoninasp., Valvulina* sp., *Miliolid*
Non Foraminifera: Pelecypoda,**Algae:***Lithophyllum* sp.

6) 8.6 m.Light graymedium-bedded limestone that in this section unlike the previous sections the fossil abundance and diversity is very low and the seen microfossils in thin bedded are as follow:

Foraminifera:*Flusculinapesticillata, Pseudolitounellareicheli, Spirolina sp., Valvulina sp.*
Non Foraminifera: Pelecypoda
Considering the mentioned collection of fossils for per section, the late Paleocene (Thanetian) age is suggested for the all the sections.

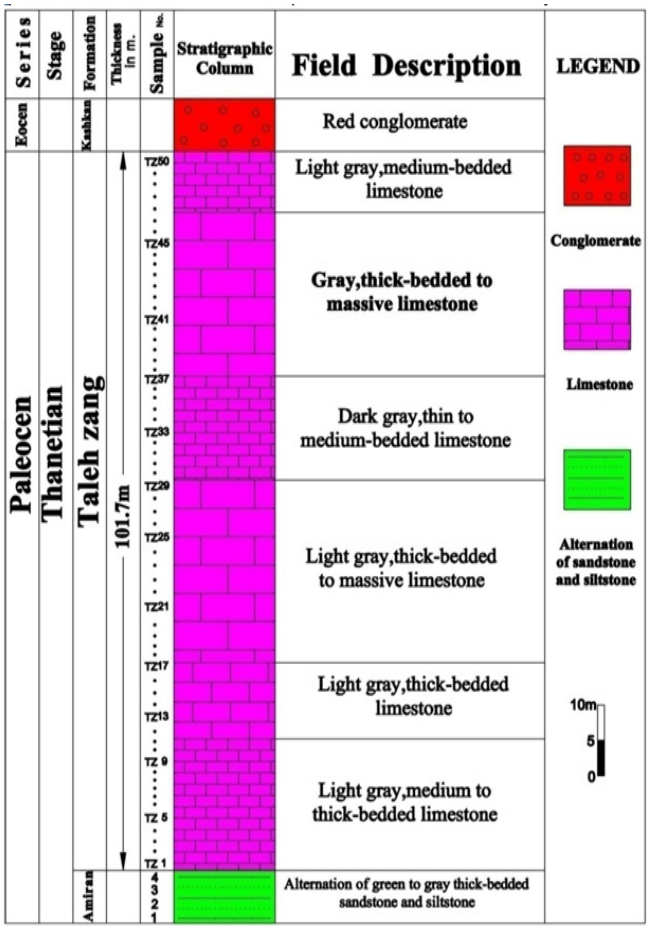

Figure 3: Stratigraphic column of the Talehzangformation in the Neqareh section.

After identifying the present fossils in the deposits of Tallehzang formation, their biostratigraphic chart has been drawn and the biozonatione has been done considering the distribution and biological limits of these fossils. The biozonatione was done based on Benthic Foraminifera and eventually in a studied section aassemblage zone was identified (fig.4) and it was compared with reported biozonationeof (Wynd, 1965). Identified assemblage zone in the studied section's deposits is as follow:

1. *Miscelaneaminuta - KathinahuntiAssemblage* Zone
This biozone has a thickness of 90 m. and includes the TZ1-TZ44 stones which are the sequence of the studied section stones. This assemblage zone has been started from the initial sections on the Tallehzang formation deposits and with the appearance of Miscellanea and Kathinahunti Species and continues to the 90 m. of mentioned formation which indicated the extinction of this Species and the other microfossils that are with this biozone are as follow:

Forminifera: *Distichoplaxbiserialis, Flusculinapesticillata, Lockartiadiversa, Miscellanea iranica, Miscellanea minuta, Miscellanea primitive, Nummulitesconvexa, Nummulites globules, Operculinacomplanata, Pseudolitounellareicheli, Ranikothaliasoldadensis,Alveolina* sp., *Assilinasp*., *Cuvillieriana* sp., *Kathinasp.,Lockartia* sp., *Nummulites* sp., *Olssonina*sp., *Operculina* sp., *Periluculina* sp., *Quinqueloculina* sp., *Ranikothella* sp., *Valvulina* sp., Miliolid

Non Foraminifera: Algae: Lithophyllum sp.

According to the mentioned fossils, the assemblage zone equivalent with assemblage zone 43 Wynd (Wynd, 1965) is known as ***Miscelanea - Kathina Assemblage Zone***, the late Paleocene (Thanetian) is considered for assemblage zone. Existence the species *of Miscellaneaminuta & Kathinahunti* with *Distichoplaxbiseriali* in the Lorestan region (apart from type section) is the confirmation to the late Paleocene (Thanetian) for the most sections of this formation especially the Neqareh section.

In this section no fossils like *Glomalveolina sp.and Sakesaria*sp. that are reported as a concomitant fossil in the sample section by Wynd (Wynd, 1965), were seen. Also no existing index fossils like Ranikothaliasoldadensis, *Distichoplax, biserialis, Flusculinapesticillata,* were seen in the sample section. In the type section of this formation, there are species like *Discocyclina, Saudia, Operculina, Somalina,and Opertorbitolites* which are related to the Eocene period and has led to the creation of younger biological zone in the upper part of this formation and also has increased its age to the mid Eocene period. But there is no such a biozone in the Neqareh section.and the age of deposits has been considered to the late Paleocene (Thanetian).

4. Conclusion

According to the Neqarehsurface section study (south of BakhtarKhorramabad), the following results have been obtained:

1. As a lithology view the Tallehzang formation in studied section, comprises one carbonate section that includes six small unit that is formed from light dark gray limestone and from lithology view no diversity was seen there.
2. In the studied section, the Tallehzang formation is situated in the same slope and continues on the deposits of sandstone and green to grey Siltstone of Amiran formation.
3. The Tallehzang formation in a studied section is situated in the same slope and continues under the Kashkan's red Conglomerate floors.
4. By studying deposits of Tallehzang formation in a studied section, twelve species, twelve kinds and one group of Benthic foraminifers and one group of red algae And some macrofossil fragments of echinoderms, Brachiopod and bivalve were identified.
5. According to the identified Benthic Foraminiferal and the way they are distributed and their biological limits, one Assemblage zone has been determined by the title of Miscelaneaminuta - KathinahuntiAssemblage zone. According to the done studies of identified Assemblage zone in a studied section had a correspondence witha Assemblage zone no 43 (Wynd,1965) with the title of Miscelaneaminuta - KathinahuntiAssemblage zone and the late Paleocene (Thanetian). Age is observed for studied deposits section.
6. By paleontology studies in this region, it was identified that the deposits that was mentioned in the Khorramabad 1:100000 map as Tarbur is related to the Tallehzang formation.

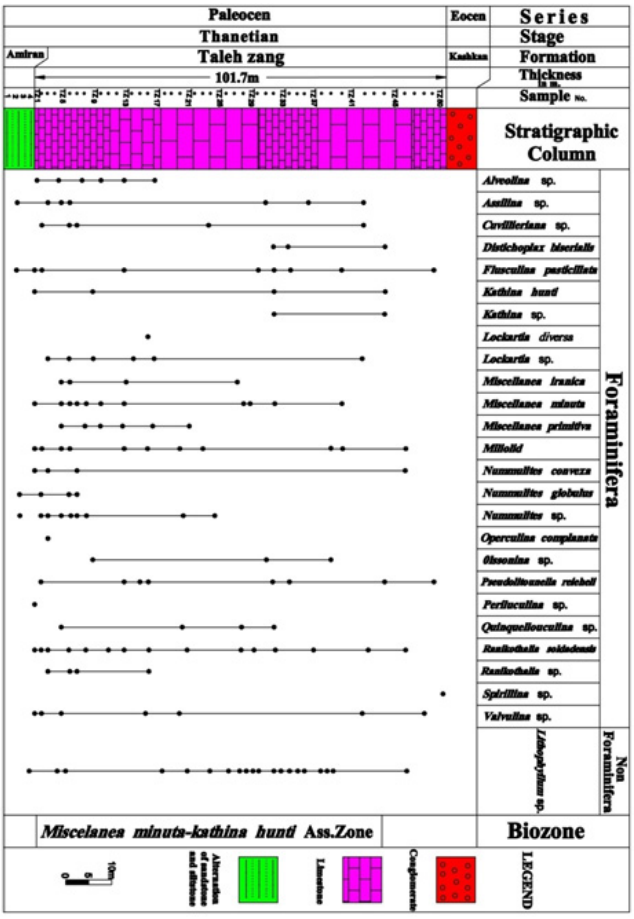

Figure 4: Distribution and the time spread of the identified fossil`s of the Talehzang Formation in the Neqareh section

1-Kathina huntiSmout, 1954, (X40)

2- MiscellaneaminutaPfender, 1935, (X40)

3-Lockharita sp., (X40)

4-MiscellaneaminutaPfender, 1935, (X40)

5-Cuvillieriana sp., (X40)

6-Ranikothalia soldadensis , (X40)

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