Investigation of Micro Facies and Renovation of Old Formation Environment in Central Iran

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Abstract: The formation of Central Iran includes sequences of Dolomite, Dolomite ironstone and ironstone to upper Sanpaleosen-Ethosen in Zagros Mountains. For identification of micro facies of this formation from 216 m of its thickness in Dodaj Cutting (West of Shiraz) 120 thin sections was investigated. Performed desert and laboratory studies resulted to recognition of 7 micro facies and since this deposition is formed of benthic foraminifers, therefore by using of these suitable indices as a valuable tool, we can determine old environments of these deposits. Lack of turbidity, damming and reify and other studies show that Jahrom is formed in an ideal carbonate ramp. Because of high variety and plentifulness of benthic foraminifers, also this carbonate ramp is known as "Carbonate ramp system with plentifulness of benthic foraminifers".
[Mostafa Yousefirad, Hamideh Noroozpour. Investigation of Micro Facies and Renovation of Old Formation Environment in Central Iran. Journal of American Science 2011;7(8):766-768] (ISSN: 1545-1003). http://www.americanscience.org.

Keywords: Micro Facies, Central Iran, Old Formation Environment, Renovation.

1. Introduction

Jahrom deposition is considered a section of Tertiary Zagross basin to upper San Paleosen? – upper Eosen. Cutting of model of this formation is placed on shallow water in north wing of Jahrom mountain in south of Jahrom (Fars Province) in thickness of 268m and for the first time has introduced by James and Wind (1965). Old biological and ecological zoning of back Paleosen benthic foraminifers to former Myossen in north and south east of Shiraz by Khosrow Tehrani , et al (2007) is from the latest works has performed in relation with this deposition. Stratigraphy cutting under study is located in 30km of west of Shiraz and near Ahmadi village and through main road of Shiraz-Kharameh is in convenience and geographical coordinates E: 53°, 03', 40" and N: 30°, 30', 37". In this stratigraphy cutting, Jahrom deposition gradually is located on colored marens of Sachon Depost and gradually is covered by red color marens of hope (razak) deposition. For identification of micro facies of this formation in under study area, desert sampling was performed regularly and also with regard to change of facies. Finally, from samples 120 thin microscopic section provided which examined in laboratory. Nomination of carbonate stones in Dunham method (Dunham, 1962) was performed and classification of micro facies on the basis of Lassemi method (Lassemi, 1979) and Carozzi (Carozzi, 1989) was made. Finally micro facies with provided modes by Wilson (Wilson, 1986) and Flugel (Flugel, 2004) and other researchers was compared and 7 micro facies was recognized and finally also a model for old environment of this formation in case study area was suggested.

2. Discussion

In respect of fossilology, benthic foraminifers specially, large foraminifers such as Nummulites, Orbitolites, Somalina, etc. are found in this formation plentifully. Skelton parts of non-foraminifers such as soft bodies, Brachiopod, Beriosother, green algae, echinodermatous, coral and Estraked also there are together with foraminifers. Because of dulumiticity. More lower sections of Jahrom formation in under study area, plentifulness of foraminifers in this section relative to upper sections which is formed of limestone and dulumitic limestone is less. In the following it is referred to some of benthic foraminifers in under study area.

Alveolina pastisilata, Coskinolina sp., Lituonell sp., Miliolids, Nummunlties cf. subatacicus, Nummulites guettardi, Nummulites striatus, Ollssonina cribrosa, Orbitolites complanatus, Peneroplis sp. Lockhartia sp., Rapydionina urensis, Somalina stefaninii.

Generally, in respect to these foraminifers we can consider age of Eosen for Jahram formation in this cutting.

With regard to performed studies upon 120 thin cross, 7 types of micro facies with different ecologic combinations was identified. In bellow these micro

facies in sequence from open sea to the shore have described and finally also a model for old environment of this formation in under study area in respect to these micro facies has been renovated.

MF7: Bioclastic nummulites wackstone

Main element in this micro facies, are nummulit benthic foraminifers about 2025 and bioclasts including briosother chips, green algae, bivalve shell and Estraked which are located as scattered in micrinic field. In some sections bioclasts are more than main element i.e. nummulit and name of micro facies is changed to Nummulites bloclast wackstone. Size and form of Nummulites specifically is in relation with type of sedimentary environment (Beavington-Penney et al., 2006) in a manner that stretched and large Nummulites are related to sedimentary sections (Beavington-Penney et al., 2006). So that stretched and large Nummulites are related to sections far from shore and deeper waters and is showing increasing the rate of space enable to sedimentation (Beavington-Penney & Racey, 2004). Existence of high percent of Hepaline foraminifers is indicating deeper sedimentary basin. But in samples which lack of foraminifers is index of Lagon environment in a general field explaining sedimentation bellow the rule of effect of wave (Rasser, 2005). On this basis we can result that this micro facies may has been formed under line of wave trace and in sections at the end of internal ramps and probably first sections of middle ramp. With regard to form of nummulites which are in lentil form and their small to medium size of them and also their thick walls we can conclude that they don't belong to very deep areas of the basin.

MF6: Rotaliid Wackstone

This facies mainly is including Rotalid foraminifers (Rotaliids and Lukartia) which forms about 15-20 percent of main volume of Allukems. Rotaliids are living in shallow waters (Geeel, 2000). Rotaliid species and Milluliids can re-product where the circulation of water doesn't replace them. With regard to mentioned cases, i.e. plentifullness of these hepaline foraminifers and decreasing of large benthic foraminifers with persulanoze crust and sedimentary mode represented by Beavington- Penny and Racey (figure 3), can indicates sedimentation of this micro facies in less shallow areas in relative to MF7.

MF5: Alveolina bioclast Nummulites wack/packstone

Main elements in this micro facies are including Nummulite about 15-20 percent and Alveolina with the percent about 10-12 and skeleton chips of non-foraminifers are about 12-15%. Alveolinas more are living in shallow basin (Beavington-Penny and Racey, 2004). In deed existent of Alveolina benthic foraminifers introduces internal section of ramp in carbonate platform (Papazzzoni et al., 2006). High percent of Nummulite together with Alveolina indicates that there has not been a barrier which prevents mixing of these large benthic foraminifers with Hepaline crust and persulanoze, but the rate of large foraminifers hepaline is more than persulanoze.

MF4: Bioclast Alveolina Nummulites Orbitolites wack/packstone

Main element in this Orbitolites micro facies is about 15-20% AND Nummulites And Alveolina is about 12-15% and skeleton chips of non-foraminifers is about 10-12%. In some samples sometimes name of facies is changed to Orbitolites Nummulites Alveolina wack/packstone which instead of Orbitolities, Alveolina is prevailing element. It is Wackstone texture that sometimes reaches to packstone. Accompanying Alveolina with Orbitolites is indicating a fairly disturbed and shallow environment (Reiss & Hottinger, 1984). Orbitolites also in back rife environments where in lagonic environments and near shore have the most expansion (Luterbacher, 1984) then existence of Orbitolites and Alveolina is indicating shallow of basin and as micro facies No. 3 accompanying them with Nummulites is indicating lack of a barrier which prevents of their mixing, but in these micro facies percent of foraminifers with porcelanoze crust is more which is indicating shallow of basin relative to micor facies No. 3.

MF3: Larger agglutinate forams Somalina wackstone

Main elements in this micro facies is including somalina foraminifer about 15% and large foraminifers with agglutinate crust (such as litveolena and gaskinovelina) is about 10-12%. Existence of Somalina which is part of large benthic foraminifers with persolanoze crust together with large foraminifers with agglutinate crust is indicating shallow of basin relative to previous micro facies.

MF2: Millolid bioclast wack stone

Main elements of this micro facies is including Millolids about 10% together with estraked, coral, green algae, Brakiopood and bivalve chips is about 10-12%. Milliolids mostly live in shallow waters and semi-sore to supra-sore with little disturbance, but in respect to bioclastic chips such as coral and green algae it is indicating shall and photic environments with special sore and temperature. Meanwhile considerable thickness of Estrakods crust in this micro facies can be a reason for more energy of basin. It means that probably this micor facies has been near the shore.

MF1: Dolostone

In this micro facies dullumite crystals in middle and fairly tiny sizes are seen as compressed and semi-compressed, deformed and dark to clear. Clearly we

can see effect of initiate sedimentary texture and also we can see the effects of benthic foraminifers such as Millolids and chips of echinodermatous and anidritic evaporative cement in this micro facies which is indicating duplication of these dullumits. It sees that dullumits have been formed in tidy area.

3. Conclusion

After studying thin cross and identification of micro facieses and their comparison with Wilson and Fluggel standard facieses model and standard sedimentary models in case of Tertiary ramps it is considered that Jahrom formation in case study area is deposited in a carbonated ramp. Existence of benthic foraminifers with personaloze and hepalline crust with each other in these micro facieses indicates that during Jahrom formation deposition in case study area there has not been a barrier that can cause separation of these two environments. Therefore lack of this dam facieses and non-presence of turbidite facieses which is indicating slop ramps and indicates tininess of grains of most particles, specifies existent of a carbonate platform in type of ramp with mild slope (hemoclinal ramp) and ideal in this study. Also non-presence of facies related to deep areas which clear specification of that is existent of Plagic foraminifers and specifications of microfossils existent in that, shows that deepest part of this ram is related to shallow parts of open sea in internal ramp and probably is at the first of middle ramp. Therefore since Jahrom formation is full of benthic foraminifers, as a result by using of this valuable fossil content and other existent fossil part, in a limit we can renovate this formation. Of course in this case suggested models of carbonate ramps of researches such as Baxton & Pedley (1989) , Racey (1994) et al that by studying on foraminifers is performed, are used.

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8/7/2011