# INTRODUCTION OF MIOCENE DEPOSITS TURBIDITES IN THE SAVEH-TAKAB AREA (NW OF CENTRAL IRAN BASIN)

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## Abstract

*Oligomiocene deposits in the Qom area was introduced as a Qom formation. This formation divided to nine members. Classification of these rock units in the Qom formation is local, so that toward west of Qom(study area) these members are undividable and the main facies of sediments are clastic in this region.*

*Study area have been devided to three sub basins by variations facies , ages, distribution of faults and outcrops of deposits which are older than Oligomiocene in NW-SE direction.*

*These local basins as a consideration of entrance of clastic deposits from paleo high could be suitable area for forming of turbidite deposits. Detail field investigations and laboratory studies, shows Miocene deposits in local basins have characteristic of deep basin area and the deposits are related to turbidites.*

*The most important characteristic of turbidites deposits in outcrops can be pointed as a Buma sequence, chanels flute cast, trace fossils such as Nerites and Paleodictyon that associated with current ripple marks in clastic deposits. Microscopic evidence that shows turbidites characteristic are mixing of benthic and planktonic foraminifera, existence of micro erosional surface and existence of plagic foraminifera in clastic deposits(grey wacky).*

*In this study sequences of Miocene deposits was determined and based on sequence boundaries (SB) and maximum flooding surface (mfs) nine palegeographic maps were drawn. With regarding of paleogeographic maps distribution and variation of turbidites were determined.*

## Introduction

The Qom basin is very dynamic and covering a vast area in the central part of Iran (Stocklin, 1952; Huber1952; Aghanabati,2003).Study area is located in north west of central Iran(Fig 1).

The Qom Formation in central part (around Qom town) could be divided into nine lithostratigraphic members (Gansser, 1955; Furrer, 1955; bozorgnia, 1966 and Baghbani 1995). Some of these lithostratigraphic units laterally are wedged out and their sedimentary features and thickness strongly changed from the central part to the west (Saveh-Takab region) that makes litho/chrono-stratigraphic correlation somewhat impossible.

Towards west of study area clastic deposits become more dominated and the members are hardly definable. The fact that these clastic sediments are deposited in deep marine environment thus study of these sediments in relating with turbidites and construction of paleogeographic maps in choronostratigraphic framework could be one of the main goals of this study which helps understanding of petroleum systems in this area.

## Field and laboratory observations

In total 33 surface sections were measured and more than1300 samples studied.

The sequence stratigraphy study is carried out based on five NE-SW regional transects which led to recognition of four sedimentary sequences in this time interval that two sequences are related to the Aquitanian and two other ones related to the Burdiqalian(fig 2 ).

The Aquitanian sequences were deposited in deepest part of the sub-basins and laterally wedge out. In contrary the Burdigalian sequences were deposited in the entire area and show major sea level rising. A SE-NW trending regional cross section represents three sub-basins which are separated by highs(Fig3), suggesting probably a series of Graben and horst or inherited palaeohighs and depressions. Turbiditic facies are deposited in the depressions while carbonate facies laterally move to the east and specially lies on the palaeohighs. This implies that the architecture of the basin strongly controlled by faults. According to the results of this study the palaeotopography of the Oligo-Miocene time are very coinciding to the recent topography.

In some of stratigraphic columns such as Estibolagh,Qarah Darreh،Charlanqush، Oshtanian and Gomish tappeh some evidence were found such as Bouma sequence(Fig4a)، Flute cast(Fig4b,4c)، Nerites and Paleodictyon trace fossil(Fig5a,5b) and current Ripple mark (Fig6)in clastic sediments that presents turbidites flows. To investigation of thin section relation to these deposits were found planktonic foraminifera that presents these sediments are deep marine.

With integrated of field observations and laboratory many of clastic deposits in Qom formation are turbidites deposits.

## Conclusions

**1-** A SE-NW trending regional cross section represents three sub-basins which are separated by highs, suggesting probably a series of Graben and Horst or inherited palaeohighs and depressions.

2- Detail field investigations and laboratory studies, shows Miocene deposits in local basins have characteristic of deep basin area and the deposits are related to turbidites.

3- Turbiditic facies are deposited in the depressions while carbonate facies laterally move to the east and specially lies on the palaeohighs. This implies that the architecture of the basin strongly controlled by faults.

## References

- Aghanabati,(2003) A., Geology of Iran, Geological Survey of Iran

- Beberian, M., and King, G.C.P., (1981). Towards a Paleogeography and tectonic evolution of Iran, Nat. Res. Coun. Canada, pp. 210-263.

- Baghbani ,D.,et al., (1995) . Investigation of Qom basin and Evaluation of its Hydrocarbon potential , N.I.O.C. Gr 1838

- Bozorgnia, F., (1966). Qom Formation stratigraphy of the central basin and its intercontinental position. Iran petrol. INST. Bull. No. 23, pp. 69-75

- Huber, H., (1952). Geological report on the upper Qara – Chai area between Saveh & Hamadan, N.I.O.C. GR.99.

- Furrer, M.A. and Soder, P.A., (1955). The olige-miocene marine formation in the Qom region (Central Iran). Proc. 3th world Petrol.Cengr. Rom. Sect. I/A/5, pp. 267-277.

-Gansser, A., (1955). New aspects of the geology in Central Iran. P Roc. 3th World Petrol congress.

- Nayebi, Z., (2008).Biostratigraphy And Micropaleontological study on the surface samples of the Amjak Dagh stratigraphic section and its correlation eith other sections in Saveh – Takab Project (central Iran ).N.I.O.C. Paleont. Note # 727

- Stocklin, J., (1952). Stratigraphical investigation in Arak – Gulpaigan – Delidjan area , N.I.O.C. GR95.

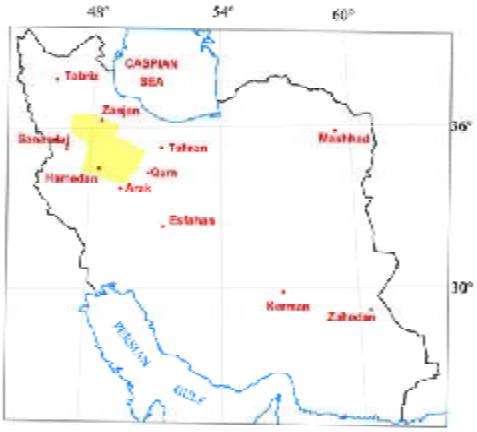


**Fig 1: Location map of study area in Central Iran zone.**

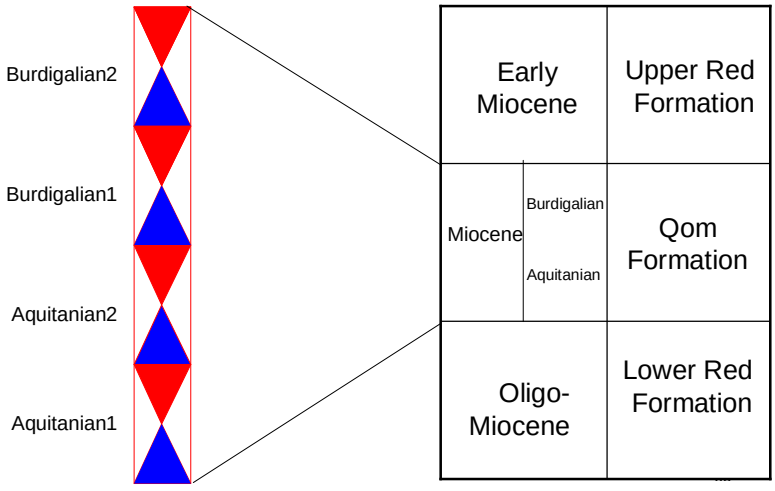


**Fig 2: Stratigraphy and sequences of Qom formation**

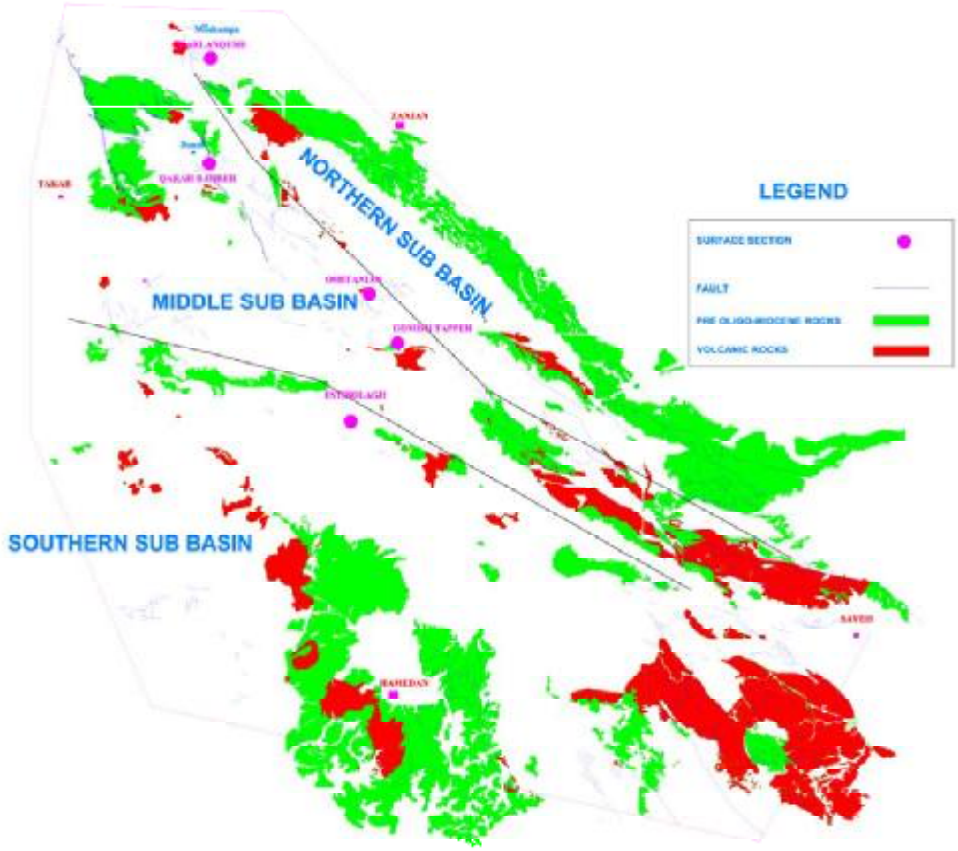


**Fig 3: Based on paleogeographic maps studied area divided to three sub basin. There are good correlation between faults, paleohighs and sub basins**

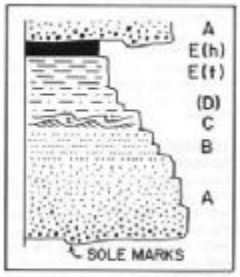


Figure 3 Bouma (1962) sequence; division A is structureless, B is parallel-laminated sand, C is rippled and/or convoluted, (D) is hard to see in weathered or tectonized outcrops, and consists of parallel-laminated silt and mud. The pelitic interval E is partly of turbidite origin (t) and partly hemipelagic (h).

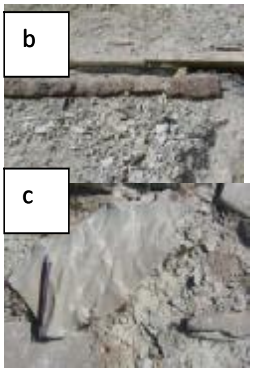



**Fig4:Buma sequence (a)-Flute cast(b,c) in Estibolagh section**

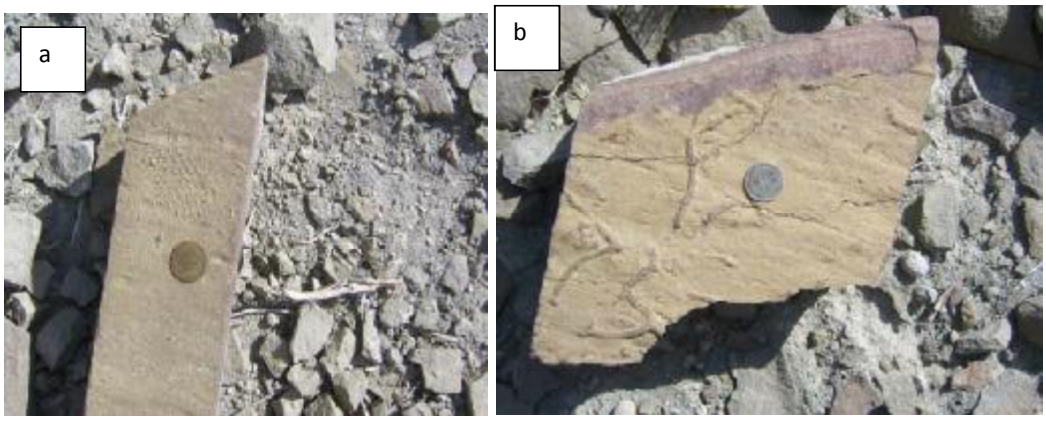


**Fig5:Nerites trace fossil(a) in Charlanqush section and Paleodictyon(b) in Qarah Darreh section.**

**Fig6:Ripple Mark in deep sandstone in Oshtanian section**