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Rotalia skourensis -

Dissocladella undulata -

Dicarinella concavata Zone

Dicarinella

asymetrica

Stratigraphy of Sadi Formation (Santonian) and its Relationship to Kometan Formation from North and Mid Part of Iraq

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ABSTRACT

The litho-facies of Sa'di Formation is characterized by chalky and marly limestone with thick-wall rotaliids and algal facies of shallow marine environments of Santonian age. These facies are distributed in the mid -sector of Iraq, which is parallel to the Tigris river. While in Late Santonian the upper facies of Sa'di Formation was replaced by extensive Globotruncanal facies of pelagic environment of Kometan Formation, due to sea level change, which is accordant with in changing of paleo-topography of basin configuration.

Two biozones are defined for the complete section of Sadi formation as:

- 1- *Rotalia skourensis* Zone (Late Santonian).
- 2- *Dissocladella undulata* Zone (Early Santonian).

The second one is changing laterally to the *Dicarinella concavata* Zone for the same formation. Overplayed by *Dicarinella asymetrica* Zone from Late Santonian of Kometan Formation. While the Sadi Formation was disappear in the eastern part of the Iraq and replaced by kometan formation.

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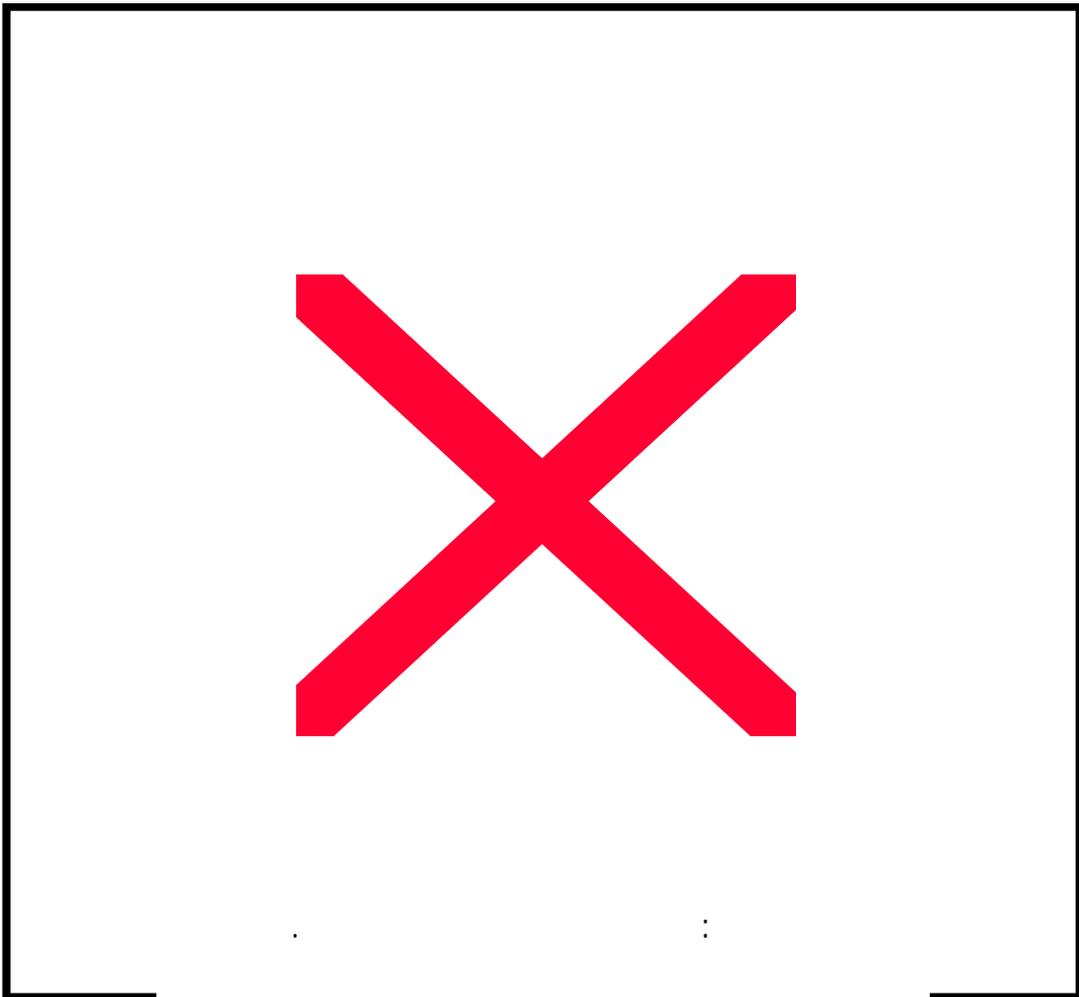
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(J -) (F -) (D -) (E -)

(L -) (K -) (O -) (H -) (G -)

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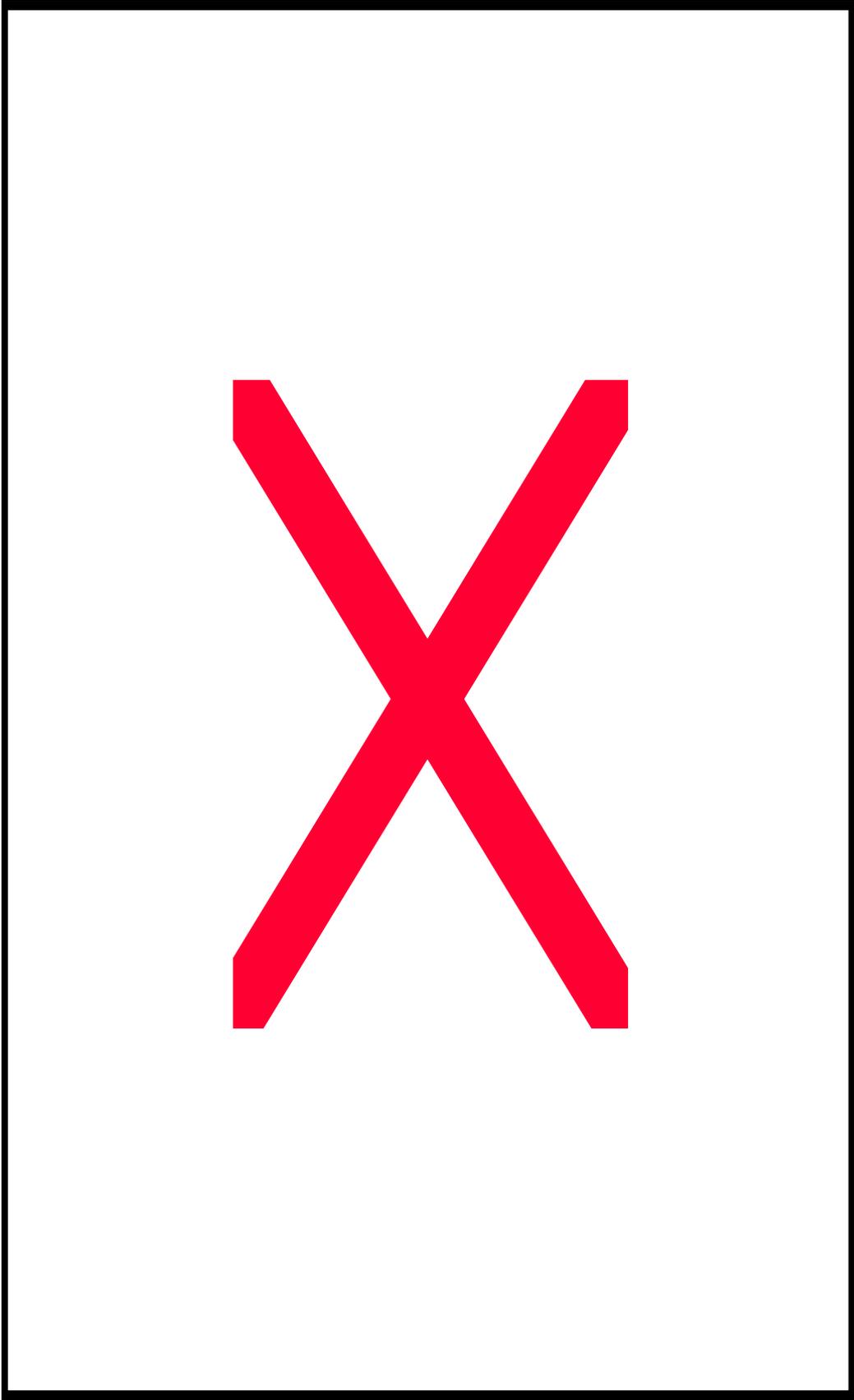


(-) (Owen and Nasir,1958)

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(*Nodosaria sp.*, *Palmulina sp.*, *Marginulina cristellaria*, *Globotruncana sp.*, *Heterohelix (Gumbelina) sp.*, etc...).



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(Upper Senonian)

Ogivalia sp. (Elliott, 1958)

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(*Archaeolithothaminiium digitatum*, *Dissocladella undulata* and *Trinocladus tripolitanus*)

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(Bellen et al.,1959)

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(*Pseudedomia complanata*, *Cuneolina cylindrica*, *Archoecycle mid-orientalis* and *Rotalia skourensis*)

(*P. complanata* Lst.)

(Chatton and Hart,1961)

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.(Chatton and Hart,1961)

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Geologic Events	Shelf Area	Intermediate Area	Basin Area	
Intra-Campanian epeiorogenic movement	Sa`di / Hartha probable unconformatiy	Kometan / Bekhma or Shiranish erosion of Kometan from Mosul high	Basinal Limestone Balambo	Continuous sedimentation
Late Lower Campanian terminal regression	Pseudedomia limestone of top of Sa`di	Mushorah over Kometan		
Santonian and Lower Campanian re-establishment of transgressive phase	Sub-basinal sedimentation Sa`di	Basinal sediment upper Limestone of Kometan		

Pseudedomia Lst.

Pseudedomia

(Loeblich and Tappan, 1964)

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(Sartorio and Venturini,1988)

Pseudedomia Lst.

(Bellen et al., 1959)

(Naqib,1967)

(Darmoian,1975)

(Darmoian,1975)

Sa`di Group	Mhejran Formation		Campanian	
	Carmat Ali Fm.	Carmah Marl Member	Late	Santonian
Carmah Lst. Member		Early		
Shat Al-Arab Fm.	Tanuma Fm.	Conician		
	Khasib Fm.	L. Touronian		

(Darmonin,1975)

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(Darmonian,1975)

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(Al-Mutwalli and Al-Hamdani,1997)

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(-)

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(O-)

Dissocladella undulata

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.(L -) (K -)

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-) (L -)

.(O -)

(K

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(H -)

(*Halobia*)

(O -) (L -) (K -)

Rotalia

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(K -) (L -)

(O -)

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(K -) (L -)

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Moldic

(Vuge) (porosity)

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(M -)

(O -

Fresh water pheratic Zone

(Vadose Zone)

(Flugel, 1982,)

(Power and Word,)

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. (Haq et al., 1987)

.(K -)

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(H -)

.(Saller et al.,1994)

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(Chatton and Hart,1961)

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Rotalia

Discorbis Cibicides

.*Rotalia skourensis*

Bryozoa

Dissocladella aundulata

(*Halobia, Inoceramus*)

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Calcispheres

(*Marginotruncana coronata, M. sigali, Globotruncana angusticarinata, Glt. lapparanti, Glt. fornicata ,Dicarinella asymerica*).

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. *Rotalia skourensis* -

. *Dissocladella undulates* -

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(A -)

(Elliott, 1958)

.(-) (K -)

(Elliott, 1968)

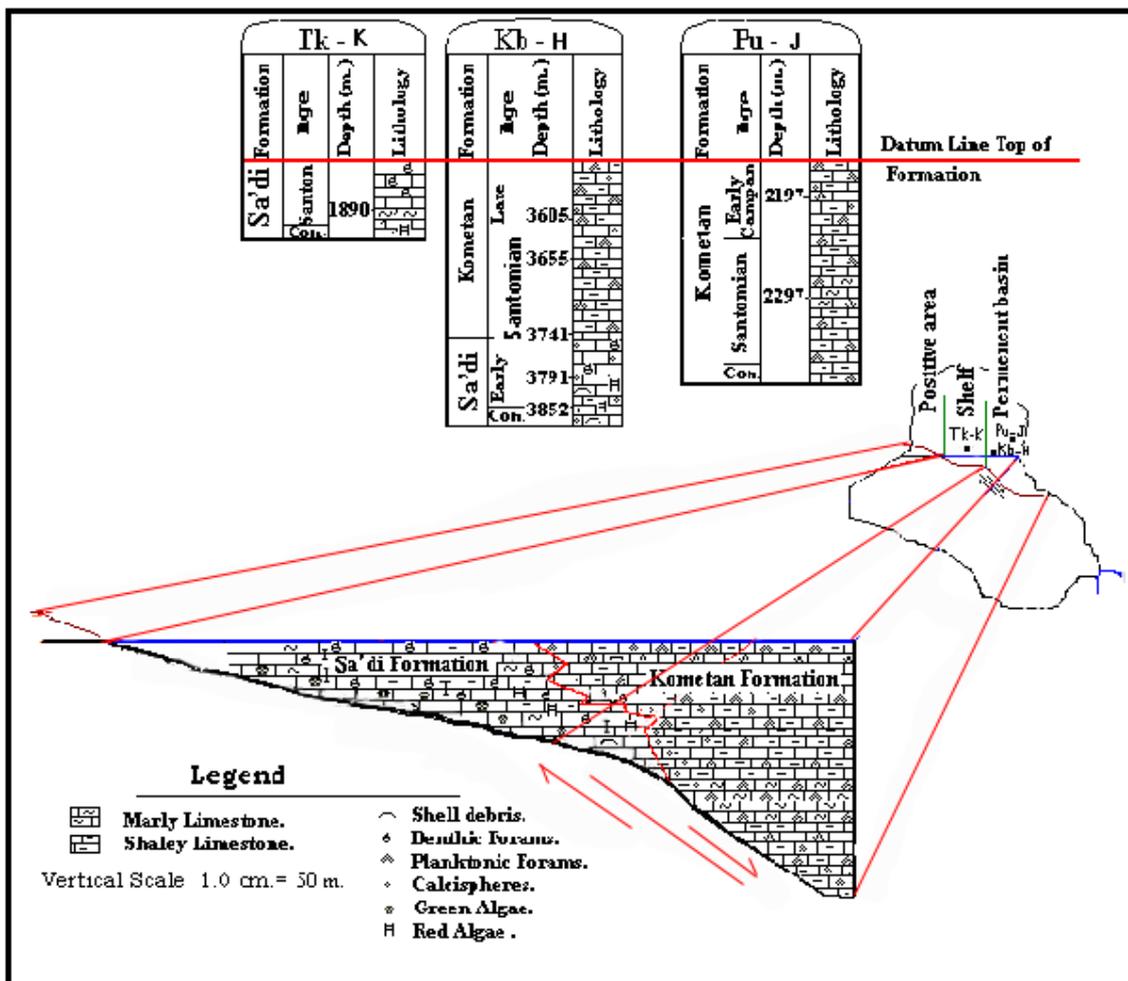
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A				B			C				
Formations	AGE	Bio - Zones	Environment	Formations	Bio - Zones	Environment	Formations	AGE	Bio - Zones	Environment	
Mushurah	Early Campanian	<i>Hartella inflatotriangularis</i>	Basin Margin	Mushurah	<i>Hartella inflatotriangularis</i>	Basin Margin	Kometan	Santonian - Early Campanian	<i>Globotruncana subspinoso</i>	Basin	
Sa'di				Santonian	<i>Rotalia skourensis</i>	Shelf					Kometan
	Early	<i>Dissociadella undulata</i>	Outer Shelf - Basin	Sa'di							<i>Dicarinella concavata</i>
Coniacian						Coniacian					

A - Complete section of Sa'di formation from Santonian age, from shelf environment, from Mid - zone of Iraq.
 B - Sadi formation of early Santonian age, from the eastern part of Mid - zone of Iraq.
 C - Complete section of Kometan formation from Santonian - Early Campanian, from the Eastern part of Iraq (Perment Basin).



. Tk-K, Kb-H, Pu-J

(B-)

(-) (H -) (-)

Dicarinella asymetrica

.(Robaszynski et al.,1984 ; Caron,1985) /

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Shelf

.(4 -) (A -) ()

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(Masin,1975)

Shelf

(Tucker,1985)

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Drowned

Shelf

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.(-) Shelf

(Owen and Nasr,1958)

.(Bellen et al.,1959)

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(*Halobia, Inoceramus*)

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Shelf

Rotalia skourensis

Dissocladella undulata

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.(*Inoceramus*)

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- Al-Mutwalli, M. and Al-Hamdani, M., 1997. Planktonic Foraminiferal biostratigraphy of Sa`di Formation (Upper Cretaceous) - central and southeast Iraq. Iraqi Geol. Jour., Vol 28, N
- Al-Naqib, K. M., 1967. Geology of the Arabian Peninsula, Southwestern Iraq: U. S. Geol. Survey Prof. Paper 560-G, 54 p.
- Bellen, R. C. Van-; Dunnington, H. V. ; Wetzel, R. and Morton, D. M., 1959. Lexique stratigraphique International, Asie, V. 3, Fasc. 10a, Iraq, Paris, 333 p.
- Chatton, M. and Hart, E., 1961. Reveiw of the Cenomanian to Maestrichtion stratigraphy in Iraq. Unpublished Report, Iraq Petro.Co., Baghdad.
- Caron, M., 1985. Cretaceous planktic Foraminifera. In : Bolli, M., Saunders JR., and Perch-Nielaem K., (eds.). Plankton stratigraphy, Cambridge University Press, pp.17-86.
- Darmoian, S. A., 1975. Stratigraphy and micropaleontology of the Upper Cretaceous Aruma Super Group, Southeastern Iraq. Jour.Geo. Soc. Iraq, Special Issue, pp.89-116.
- Elliott, G. F., 1958. Cretaceous Bryozoa and Algae from the Sadi formation in Musaiyib-1, Rep. No. IR/ GFE/ 252 , NOC Library, Unpub.
- Elliott,G.F.,1968.Permian to Paleocene calcareous algae (Dasycladaceae) of the Middle East. British Mus. Nat. Hist. Bull., Geol. Suppl. 4, pp.1-111.
- Flugel,E., 1982. Microfacies Analysis of Limestone .Translated by Christn Son,K.Springer-Verlag, Berline, 633p.
- Haq, B. U.; Hardenbol and Vail P. R., 1987. Chronology of Fluctunting Sea Level Since The Trasssic : Science Vol. 235, pp.1156-1167.
- Loeblich, A. R. Jr. and Tappan, H., 1964. Foraminiferida. In: Moore, R. C., Treatise on invertebrate paleontology, C. Protista, Vol. 1 and 2, pp. 1-868, Geol. Soc. Am. and the University of Kansas Press.
- Masin,J., 1980. On the plate tectonic in Iraq. Jour. Geo. Soc.Iraq, V. 13, No.1.

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- Owen, R. M. S. and Nasr, S. N., 1958. Stratigraphy of the Kuwait-Basrah area, In : Lewis, L. G., (ed.), Habitat of oil, AAPG Symposium, pp. 1252-1278.
- Pomar, L., Ward, W.C., 1999. Reservoir Scale Heterogeneity In Depositional Packages and Diagenetic Patterns on Reef – Rimmed Platform Upper Miocene, Mallorca, Spain: AAPG Bulletin, Vol. 83, No. 11, pp. 191-198.
- Robaszynski, F; Caron, M.; Gonzalez Donoso, J. M. and Wonders, A., 1984. Atlas of Late Cretaceous Globotruncanids. Revue de Micropaleontologie, V. 26, No. 3-4, pp. 145-305.
- Sartorio, D. and Venturini S., 1988. Southern Tethys Biofacies, Agip S.P.A., S. Donato Milanese, 232 p.
- Saller, A.H.; Budd, D. A. and Harris, P.M., 1994; Geohorizons: Unconformities and porosity Development in Carbonate Strata: Ideas from a Hedberg Conference. AAPG, Bulletin, Vol.78, No.6, pp. 857-872.
- Tucker, M. E., 1985. Shallow-marine carbonate facies and facies models. In : Brenchley, P. J. and Williams, B. P. (eds.), Sedimentology: Recent development and applied aspects, Geol. Soc. London, Special Publication, Blackwell Pub., Oxford.