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2010/06/06  
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% 55

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# **Stratigraphy, Petrology and Sedimentology of Cretaceous formations in Alhaffa area (Coastal chain - NW of Syria)**

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Received 06/06/2010

Accepted 27/09/2010

## **ABSTRACT**

Cretaceous formations present  $\approx 55$  % from sediments in Alhaffa area, and spread in its eastern & central parts. These formations were studied depending on field studies of (5) geological sections, and on deep microscopic studies. Stratigraphic study enable putting the boundaries between stages, scrutiny ages of studied formations, and showed the presence of two stratigraphic discontinuities. Petrological study showed that these formations are composed of carbonates, claystones, and siliceous components forming repeated alternation, which led by their correlation to record their facies differences, and deduce types of their distribution by time & space. Sedimentary studies showed that sediments were deposited in marine environment, by sedimentary sequences & cycles, in paleogeographic evolution, dominated by transgression and regression processes.

**Key words:** Alhaffa, Stratigraphy, Petrology, Sedimentary.

**-1**

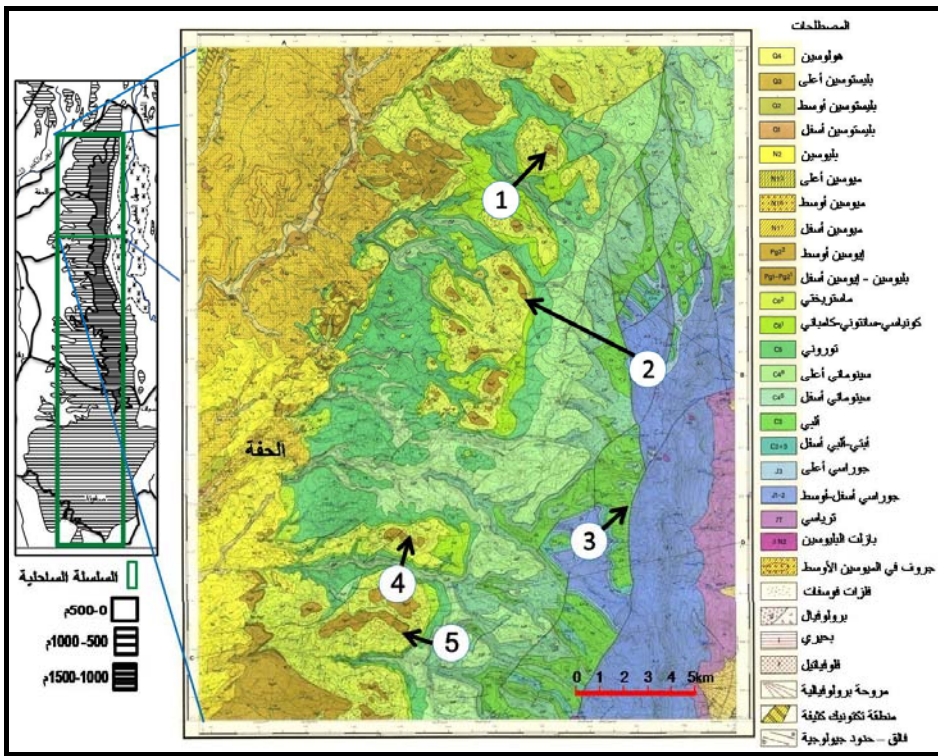
$2 \quad 6000$   
 $\cdot (30-20)$   
 $[28] [6]$   
 $[22]$   
 $\cdot [14] [1]$  ( )  
 $\cdot 1564$   
 $\cdot (10-5)$   
 Gomez

**-2**

$2 \quad 35^\circ 30' 00''$   
 $625 \quad 36^\circ 15' 00'' \quad 36^\circ 00' 00'' \quad 35^\circ 45' 00''$   
 $(1 \quad ) \quad 2 \quad 350 \approx \quad 40$   
 $\cdot 615$

**-3**

$\cdot [29] [12]$      $[5]$      $[22]$      $[21]$      $[20]$      $[19]$      $[17]$      $[8]$

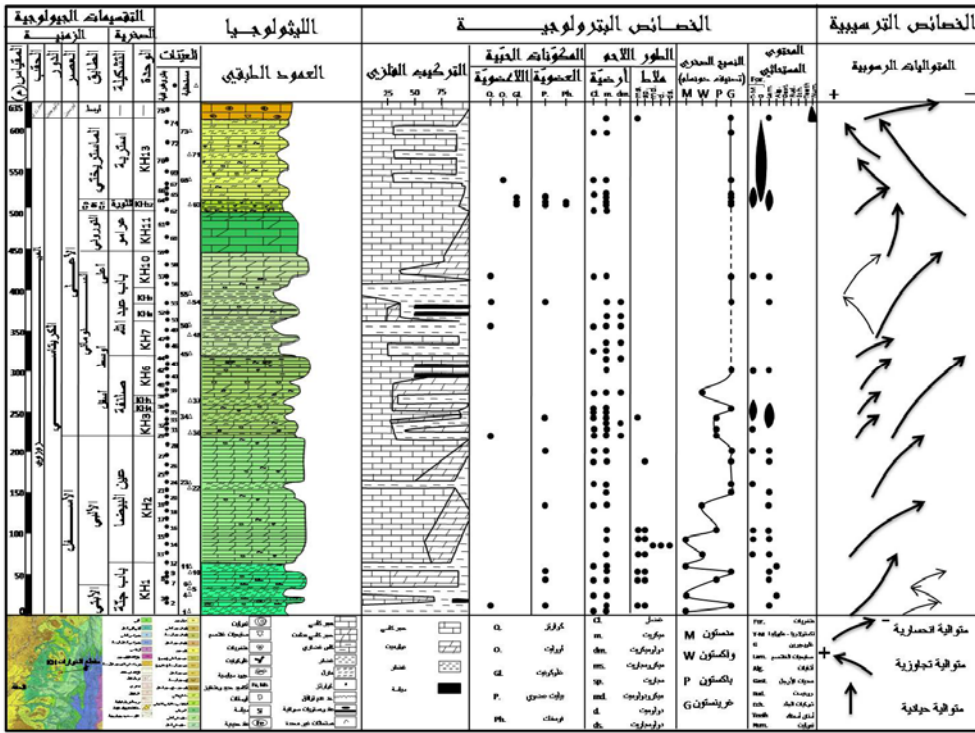


(1) -3 -4 -5 : -1 -2

-4

(SD) (KH) (T) (AM) (AL) ) :  
 20  
 .(1

.(2 ) 615



(KH)

(2)

229 : -2-4

Alezareen Red

(2 )

-5

: - -1-5

[3]

[4] (diagenesis)

13

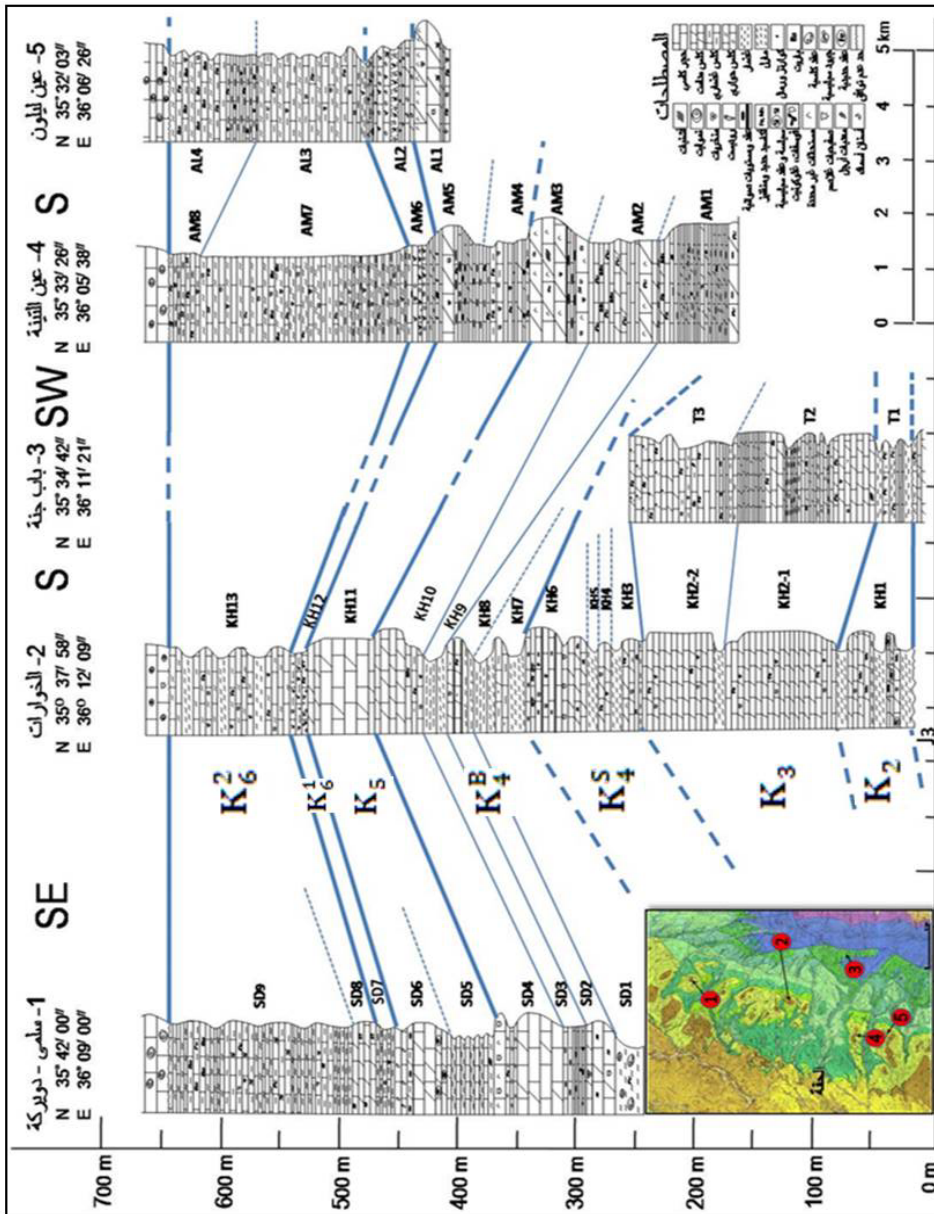
(2 )

)

(3 ) (1

(1)

|  | ( ) |     |     |     |     |
|--|-----|-----|-----|-----|-----|
|  | SD  | KH  | T   | AM  | AL  |
|  | 170 | 100 | -   | 191 | 155 |
|  | 15  | 15  | -   | 23  | 37  |
|  | 85  | 55  | -   | 76  | 28  |
|  | 130 | 125 | -   | 165 | -   |
|  | -   | 100 | -   | -   | -   |
|  | -   | 157 | 200 | -   | -   |
|  | -   | 63  | 30  | -   | -   |



(3)

(... - ) (markers)

:  
:K<sub>2</sub> -1-1-5

:(2 1 -I )

*Everticyclammina coronate* (REDMOND)

*Everticyclammina elegans* (REDMOND)

[26] [25] [21]

[18]

. [29]

:(4-I )

*Cuneolina laurentii* SARTON|et CRESCENTII.

*Hemicyclammina sigali* MAYNC.

[16]

. [29] [21] [18]

( )  
.[21]

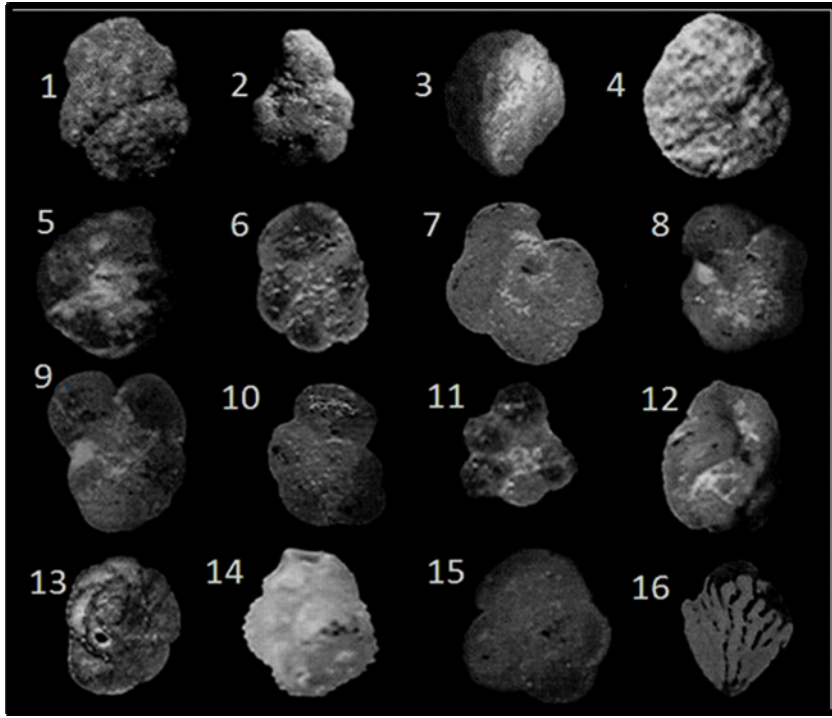
(KH1 )

63  
(1-II )

30  
. (2 - II )

(T1)





(I)

- 1: *Everticyclammina coronate* (REDMOND). 2: *Everticyclammina elegans* (REDMOND).  
 3: *Cuneolina pavonica* D'ORBIGNY. 4: *Hemicyclammina sigali* MAYNC.  
 5: *Haplophragmoides monionoides* (REUSS). 6: *Rotalipora cushmani* (MORROW).  
 7: *Dicarinella asymetrica* (SIGAL). 8: *Dicarinella concavata* (BRENOTZ).  
 9: *Marginotruncana sigali* REICHEL. 10: *Marginotruncana schneegansi* (SIGAL).  
 11: *Hedbergella simplex* (MORROW). 12: *Rosita fornicate* (PLUMMER).  
 13: *Globotruncanita stuartiformis* DALBEIZ. 14: *Abathomphalus mayaroensis* (BOLLI).  
 15: *Rugotruncana gansseri* (BOLLI). 16: *Bolivinooides draco draco* (MARSSON).

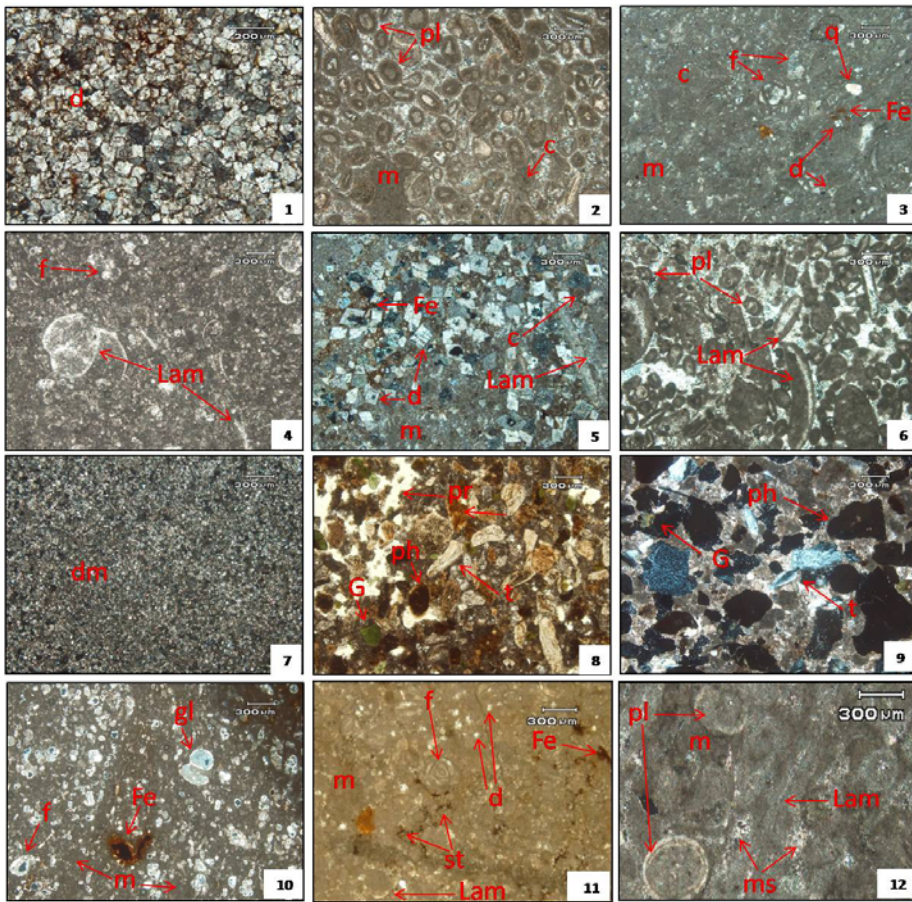
:K<sub>3</sub>

-2-1-5

[27] [26] [19] [16] [11]

:(4 3 - I )

*Cuneolina pavonica* D'ORBIGNY. *Hemicyclammina sigali* MAYNC.  
*Orbitolina minuta* DOUGLAS. *Spiroculina papyracea* BURROWS



(II)

- |    |     |     |     |      |     |     |
|----|-----|-----|-----|------|-----|-----|
|    |     |     | -3  |      | -2  | -1  |
|    | -6  |     |     | -5   | -4  |     |
|    |     |     | -9  | 8    | -7  | ( ) |
|    |     |     | -11 |      | -10 |     |
| :f | :c  | :m  | :Pl | :d   | :Fe | :q  |
|    | :St | :dm | :gl | :Lam |     | :Ph |
|    |     |     | :t  | :G   |     | :Pr |
|    |     |     |     |      |     | :ms |

157     **KH2**  
200            T3 T2  
            KH2            T2            .(3     )  
                                (3-II     )  
            KH2            T2            .(4-II     )  
                                T3

                                :**K<sub>4</sub><sup>S</sup>**            **-3-1-5**

100            .(KH6 KH5 KH4 KH3)

[9]                            (5-I     )                            :[23] [19]

*Haplophragmoides monionoides* (REUSS).  
*Textularia chapmani* LALICKER.

:  
*Hedbergella delrioensis* (CARSEY).  
*Praeglobotruncana delrionsis* (PLUMMER).  
*Schackoina cenomana* (SCHACKO).

                                :**K<sub>4</sub><sup>E</sup>**            **-4-1-5**

130

165    .(3     )

[20] [19] [13] [2] (6-I )

- Rotalipora cushmani* (MORROW).
- Heterohelix* sp. *Praeglobotruncana* sp.
- Heterohelix globulosa* (EHRENBERG).
- Praeglobotruncana gibba* KLAUS.

43 (K<sub>4</sub><sup>B</sup>) KH7 \*

(SD1)

25

(K<sub>4</sub><sup>B</sup>) KH8 \*

25

(AM1) (SD2)

(5 - II )

20 ( K<sub>4</sub><sup>B</sup> ) KH9 \*  
(AM2) 64 (SD3)

KH9

(SD3)

(AM2)

( 10)

( K<sub>4</sub><sup>B</sup> ) KH10 \*

15

(SD4)

(AM3)

(AM5 AM4) (SD6 SD5) (KH11) -5-1-5  
 :K<sub>5</sub>  
 .(AL1)

*Biconcava* sp  
*Gaudryina ruthenica* REUSS.  
*Merlingina cretacea* HAMOUI.

*Heterohelix moremani* (CUSHMAN).  
*Whiteinella inornata* (BOLLI).

[26] [13]

*Marginotruncana schneegansi* (SIGAL).  
*Whiteinella archaeocretacea* (PESSAGNO).  
*Whiteinella inornata* (BOLLI).

[25] [2]

.[9]

(SD5) .(SD6) (SD5) 55 (KH11)  
 (.7 - II )  
 ( 37)

48 (SD6)

38 (AM4)

(6-II )

(hard ground)

38 (AM5)

28 (AL1)

- :K<sub>6</sub><sup>1</sup> -6-1-5

- Gavelinella umblicatiformis* (HOFKER).
- Lenticulina spissocotata* (CUSHMAN).
- Verneuilina aff. muensteri* REUSS.
- Neoflabellina pararugosa* HILTERMANN.

:(11 10 9 8 7 - I )

- Dicarinella asymetrica* (SIGAL).
- Dicarinella concavata* (BRENOTZ).
- Marginotruncana sigali* REICHEL.
- Marginotruncana schneegansi* (SIGAL)
- Hedbergella simplex* (MORROW).
- Hedbergella planispira* (TAPPAN).

[27] [25] [2]

|       |        |              |
|-------|--------|--------------|
| (SD7) | (KH12) | 15           |
| 37    |        | (AM6)        |
|       | SD7    | (AL2)        |
|       |        | (AM6) (KH12) |

(9 8 - II )

:K<sub>4</sub><sup>B</sup>

-7-1-5

:(13 12-I )

*Rosita fornicate* (PLUMMER).*Globotruncanita stuartiformis* DALBEIZ*Globotruncanella havanensis* (VOORWIJK).*Globotruncana aegyptiaca* NAKKADY.

[26] [15]

:(15 14 -I )

*Abathomphalus mayaroensis* (BOLLI).*Rugotruncana gansseri* (BOLLI).

:(16-I )

*Bolivinooides draco draco* (MARSSON).

.[27]

100

191 (SD9 SD8)

170 (KH13)

. 155 (AL4 AL3)

(AM8 AM7)

( 20) SD8

(AM8 AM7)

.(10-II )

.(KH13)

:

-

-2-5

. [10] -1-2-5  
 :  
 :  
 : (3 ) -1-1-2-5  
 :  
 : -a  
 .KH3 KH1  
 .KH4 : -b  
 KH8 KH6 KH2 :( ) -c  
 .KH11 KH10

.b 2 ≈  
 b a  
 (7-II ) ( )

[7]  
 c (11-II )  
 .(1-II )

( )

(syndimentary)

. [24] -2 .(CaCO3) -1 :



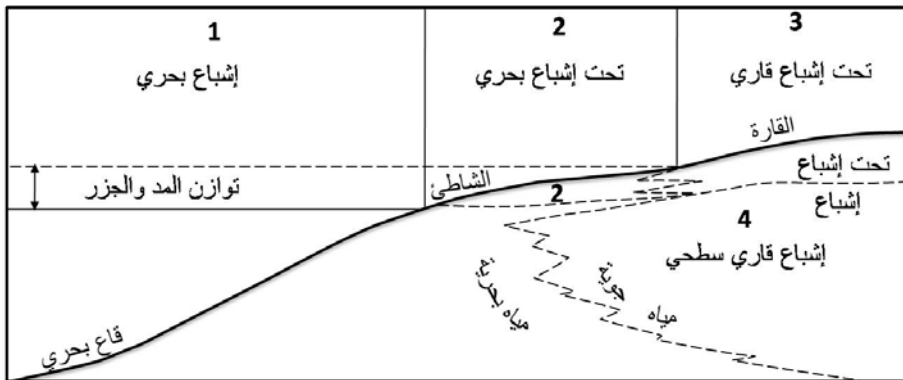
-4 .

-3 .

euهدral  
Mg<sup>2+</sup>

Mg/Ca  
(mixing zone)

.(4 ) (vadose - zone)



[24]

(4)

.(enter - supratidal)

% 30

:

-2-1-2-5

KH2

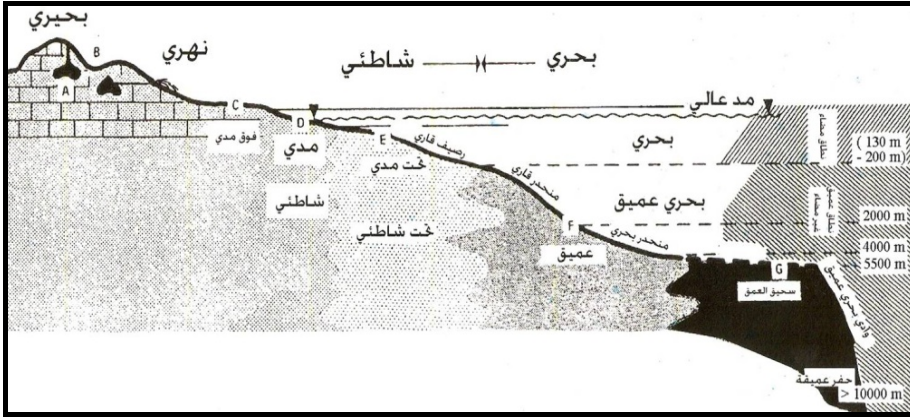
KH3

KH13 KH9 KH7 KH5

(oolithic)

(11-II)

(infratidal)  
(platform) [3] (5)



[24]

(5)

KH1 : -3-1-2-5

KH9 KH7

(12-II)

(subtidal)

-4-1-2-5

KH10 KH6

(5 2 - II )

-5-1-2-5

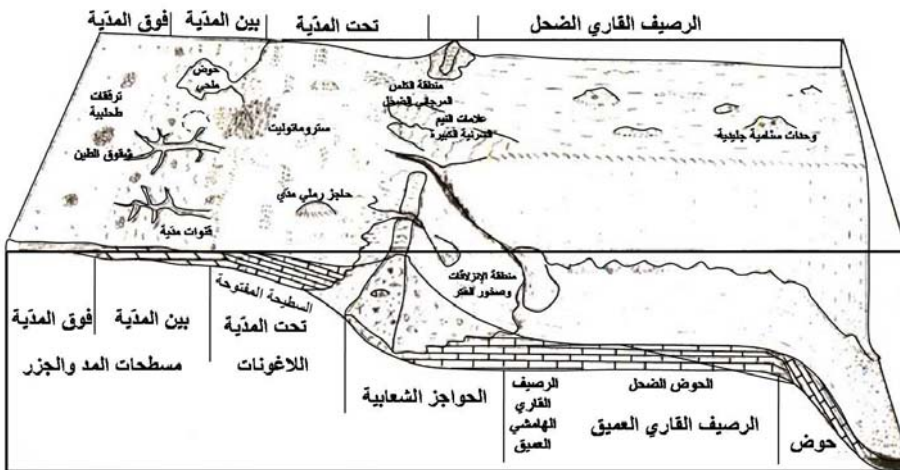
KH12

(9 8 - II )

(% 5)

-2-2-5

(6 )



[24]

(6)

: -1-2-2-5  
KH1

(T1) (supratidal)

: -2-2-2-5

.(intertidal) -

: -3-2-2-5

: -4-2-2-5

: -5-2-2-5

: -6-2-2-5

(7 >PH)

: -7-2-2-5

---

.(tidal flat)

: -8-2-2-5

: -9-2-2-5

.(tidal flat)

: -10-2-2-5

: -11-2-2-5

(shoal reef)

: -12-2-2-5

: -13-2-2-5

(infratidal)

: -3-2-5

( )

:

...

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: -1-3-2-5

: -2-3-2-5

: -3-3-2-5

- : -4-3-2-5

: -5-3-2-5

[20]

: - - -6-3-2-5

(lagoon) (bay)



(tidal flat)

: -7-3-2-5

(subduction)

(obduction)

[6]

-6

-1

)

.(

-2

-3

-4

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|            |              |   |              |   |    |
|------------|--------------|---|--------------|---|----|
| :          |              |   |              |   | -5 |
|            |              | - |              |   |    |
| (subtidal) | (supratidal) |   | (infratidal) | . |    |
|            | (supratidal) |   |              | . |    |
|            |              |   |              |   | -6 |
|            |              |   |              |   | -7 |

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