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REVIEW NOTES ON THE REVISION PROCESS OF THE STRATIGRAPHIC RECORD OF IRAQ

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Abstract

The importance of reviewing and revising the status of the formal stratigraphic classification of Iraq mandates detailed and careful processes that present a better and more practical tool for the understanding of the geology of Iraq. These processes are expected to include: introducing units, subdivision of existing units, removal of some units, merging and unification of others, and so on. However, a few important considerations should be taken into account to reach the best results out of this process. Among these: a). Unification and reduction are better than further subdivision and expansion. b). All Changes must follow the standard procedures set by the Code of Stratigraphic Nomenclatures of the International Stratigraphic Commission on Stratigraphy. c). Modification of the stratigraphic setting must consider the cyclic nature of the stratigraphic record and the eustatic effects and controls on sedimentation. d). Basin-wide facies regional relations and distribution are important in the interpretation of the stratigraphic relations and subdivision. e). In reviewing and redefining the stratigraphic situation of any unit, we must differentiate between lithostratigraphy, biofacies, and lithofacies. Formal units are defined solely by their lithostratigraphic characters. f). Formal classification of the stratigraphic units of the Zagros Suture Zone becomes increasingly necessary.

Keywords: Iraq; stratigraphy; revision; lithostratigraphy; stratigraphic units.

1. Introduction

The establishment of the stratigraphic record of Iraq went back to the early thirties after proven discoveries of oil resources in Iraq. However, the formal classification and identification of Iraq stratigraphy was made in 1959 after publishing the Stratigraphique Lexicon of Iraq volume. A statement of the stratigraphic synthesis was published by Dunnington, Wetzel, and Morton for Paleozoic and Mesozoic units and by Bellen for the Tertiary units (Bellen et al., 1959). This pioneering work is sponsored by the Commission on Stratigraphy at the International Geological Congress. Nomenclature for the oilfields of the Basra area, published in a recent paper by Owen & Nasr (1958), has been incorporated, and supplemented to some extent in the Lexique book of Iraq. This comprehensive and excellent work was conducted mainly by

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petroleum geologists of the former Iraqi Petroleum Company and associated companies. Thus, subsurface geology constitutes an important part of this contribution. In fact, 50 of the established formations (46% of the total formations of Iraq) are recognized from subsurface occurrences with type localities represented by oil wells (Table 1). The prevalently oil-directed investigations caused the unevenness of the investigations both regionally and thematically. Areas that are not prospective for oil (e.g. the western part of the western desert, the internal Zagros ranges ...etc.) were relatively neglected during the investigations (Buday, 1980). Consequently, stratigraphic data collected from these subsurface units are largely, based on cutting samples and subsurface well logging data. Conceivably, the stratigraphic data of these units rely heavily on biostratigraphic analysis as compared to other lithostratigraphic data. These practices lead to localizing the stratigraphic aspects of each unit, which leads in turn into further individualize the classification scheme with further subdivision of the stratigraphic record.

Table 1. The number and percentages of surface verses subsurface type-sections of the formal Phanerozoic lithostratigraphic units of Iraq (After Bellen et al., 1959).

No.	Surface Fm.	No.	Subsurface Fm.	Type well	No.	Surface Fm.	No.	Subsurface Fm.	Type well
1	Anah	**1**	Aaliji	K-109	**33**	Mirga Mir	**33**	Najma	Nj-29
2	Aqra	**2**	Adaiy	Ad-1	**34**	Msad	**34**	Palani	K-85
3	Azkand	**3**	Ahmadi	Bu-62	**35**	Muhaiwir	**35**	Pilsener	Jw-2
4	Balambo	**4**	Alan	Aa-1	**36**	Mulussa	**36**	Qurna	Zu-3
5	Baluti	**5**	Avanah	K-116	**37**	Naokelekan	**37**	Ratawi	Zu-3
6	Barsarin	**6**	Baba	K-109	**38**	Nijili	**38**	Rumaila	Zu-3
7	Bedduh	**7**	Bajwan	K-109	**39**	Ora	**39**	Rus	Zu-3
8	Bekhme	**8**	Butmah	Bm-2	**40**	Pila Spi	**40**	Sa'di	Zu-3
9	Chalki	**9**	Dammam	Zu-3	**41**	Pirispiki	**41**	Shuaiba	Zu-3
10	Chia Gara	**10**	Dibdibba	Zu-3	**42**	Qamchuqa	**42**	Sulaiy	Rt-1
11	Chia Zari	**11**	Digma	An-1	**43**	Rutba	**43**	Tanuma	Zu-3
12	Dhiban	**12**	Fahad	Nf-1	**44**	Sargelu	**44**	Tarjil	K-85
13	Dokan	**13**	Ghar	Zu-3	**45**	Sarki	**45**	Umm Er Radhuma	Zu-3
14	Euphrates	**14**	Gir Bir	Ma-1	**46**	Sarmord	**46**	Wara	Bu-113
15	Ga'ara	**15**	Gotnia	Aw-5	**47**	Sehkaniyan	**47**	Yamama	Rt-1
16	Garagu	**16**	Hammar	Zu-31	**48**	Serikagni	**48**	Yamama/ Sulaiy	Rt-1
17	Geli Khana	**17**	Hatha	Zu-3	**49**	Shaikh Alas	**49**	Zangura	Aw-5
18	Gercus	**18**	Ibrahim	Ib-1	**50**	Shiranish	**50**	Zubair	Zu-24
19	Govanda	**19**	Jawan	Jw-2	**51**	Shurau			
20	Gulnreri	**20**	Jibab	An-1	**52**	Sinjar			
21	Hadiena	**21**	Karimia	K-109	**53**	Tanjero			
22	Harur	**22**	Khasib	Zu-3	**54**	Tayarat			
23	Jaddala	**23**	Khurmala	K-114	**55**	Ubaid			
24	Jeribe	**24**	Mahilban	NF-1	**56**	Upper Bakhtiari			
25	Kaista	**25**	Makhul	Mk-1	**57**	Upper Fars			
26	Khabour	**26**	Maotsi	Nf-1	**58**	Zahra			
27	Kolosh	**27**	Mauddud	Bu-62	**59**	Zor Hauran			
28	Kometan	**28**	Middle Fars	Nf-1					
29	Kurra Chine	**29**	Mishrif	Zu-3					
30	Lower Bakhtiari	**30**	Mus	Bu-2	**Total**	**59**	**Total**	**50**	
31	Lower Fars	**31**	Mushorah	Ms-1	**%**	**54 %**	**%**	**46 %**	
32	Mergi	**32**	Nahr Umr	Nu-1					

The first stratigraphic revision of the (Bellen et al., 1959) work, is suggested by Owen & Nasr (1958), which introduces a newly defined Safawi and Kifl formations. The other early revision efforts are suggested by Chatton & Hart (1961) in an unpublished report by introducing new formations of southern parts of Iraq.

Stratigraphic studies continued by re-describing and redefining the already established units, until the comprehensive work of (Buday, 1980) on the regional stratigraphy of Iraq. In this work, many formations were removed, others were unified into other formations and others were considered facies changes of other formations (Table 2). The result of this revision is removing many units and reducing the number of the formal stratigraphic units.

Table 2. Modifications of the lithostratigraphic record of Iraq (Buday, 1980).

AGE	ORIGINAL UNITS (Bellen et al., 1959)	NEW MODIFIED UNITS (Buday 1980)
Late Jurassic – Early Cretaceous	Zangura/ Yamama	Yamama
	Makhul/ Sarmord	Sarmord
Early Cretaceous	Sarmord	Upper Sarmord (Albian) Lower Sarmord (Late Barremian-Aptian)
	Rim/ Nahr Umr/ Sarmord	Sarmord
	Mauddud/ Jawan	Tongue of Qamchuqa
Late Cretaceous	Mahilban/ Fahad/ Maotsi? Rumaila	Rumaila
		Kifl
	M'sad/ Mergi/ Gir Bir	Facies of Mishrif
	Pilsener/ Sa'di	Sa'di
	Mashorau	Upper Balambo
	Hartha/ Tayarat	Tayarat
	Aqra/ Bekhme	Aqra-Bekhme
	Jibab/ Shiranish	Shiranish
Tertiary	Phosphatic Umm Er Radhuma	Akashat
	Phosphatic Dammam	Ratga

The second important revision of the stratigraphic status of Iraq came by publishing a paper, which introduced new names and type-sections of the Middle Miocene-Pliocene units instead of the old names (Al-Rawi et al., 1992).

The third revision of the stratigraphic units in Iraq resulted from the detailed and intensive geological survey of the Western Desert of Iraq during the 70's, 80's, and 90's. These efforts led to the establishment of new formations especially those associated with the phosphate facies (Al-Azzawi, 1997; Al-Bassam & Karim, 1997; Al-Juboury et al., 1997; Al-Mubarak, 1996; Hassan, 1997; Karim et al., 1997; Sessakian, 1997; Tamar-Agha, Al-Mubarak, 1997).

The continuous and increasing number of studies on the stratigraphy of Iraq raises the necessity to revise the stratigraphic status of this record. Recently this demand became a comprehensive campaign and was adopted by the Iraqi Geological Union. In order to accomplish this work in a systematic and organized format, the union took the responsibility of forming the "Iraqi National Stratigraphic Commission" to resume this mission.

The purpose of this study is to put forward a few suggested points, to be considered when attempting any revision in the formal stratigraphic classification and nomenclature of Iraq. These points include:

1. Unification and reduction are favorable over subdivision and expansion.
2. All Changes must follow the standard procedures set by the Code of Stratigraphic Nomenclatures of the International Commission on Stratigraphy.
3. Modification of the stratigraphic setting must consider the cyclic nature of the stratigraphic record and the eustatic controls on sedimentation "Sequence Stratigraphic Framework".
4. Basin-wide facies regional relations and distribution are to be considered.
5. In reviewing and redefining the stratigraphic situation of any unit, we must differentiate between lithostratigraphy, biofacies, and lithofacies.
6. Completing the formal stratigraphic classification of the Zagros Suture and Imbricate Zone units.

2. Location and Geology of the Study Area

During the processes of revision, the mechanisms, procedures, and practices, must be established clearly and scientifically by the Iraqi National Stratigraphic Commission. It is important to organize this process in order to make sure that its decisions and rules are set following the International Stratigraphic Guide of Nomenclatures (Hedburg, 1976). However, there is an important set of considerations that must be taken into account to make sure that the revision provides a new practical, and efficient vision of the stratigraphic status of Iraq. Among these:

2.1. Unification and reduction favored splitting and addition

The stratigraphic record of Iraq due to its early establishment history is characterized by an unnecessary expansion, subdivision, and branching. To show the degree of exaggeration in the stratigraphic subdivisions, an example is given here by comparing the Oligocene- Miocene formal units in Iraq and their equivalents in Iran. Both units belong to the same chronostratigraphy and are deposited in the same Zagros basin. In Iraq, the Oligocene carbonate units include (Shurau, Sheikh Alas, Bajwan, Baba, Anah, and Azkand formations) and the Miocene carbonate units are represented by the (Euphrates and Jeribe formations), both groups of formations are equivalent to only one formal stratigraphic unit, which is the Asmari Formation of Iran.

The degree of this over-partitioned scheme can be evaluated by comparing the stratigraphic subdivision of Iraq with the subdivision of equivalent units of the same chronostratigraphic interval in the neighboring countries (Table 3).

Table 3. Examples of the "over-differentiated" formal lithostratigraphic units of Iraq as compared to their equivalents in the neighboring countries (Sources: Bellen et al., 1959 Altinli, 1966; Beydoun, 1991; James & Wynd, 1965).

COUNTRY	UNIT NOMENCLATURE	EQUIVALENT UNITS IN IRAQ
Turkey	Goyan	Mirga Mir/ Beduh/ Geli Khana
	Midyat	Pila Spi/ Avanah
	Kermav	Gercus/ Kolosh/ Tanjero
	Firat	Euphrates/ Serikagni/ Jeribe
Saudia Arabia	Minjur	Malussa/ Zor Hauran/ Kurra Chine
	Mirrat	Alan/ Mus/ Adaiyah
Jordan	Umm Sabeihi	Alan/ Mus/ Adaiyah
Syria	Chilou	PilaSpi/ Avanah/ Kirkuk Group
	Jaddala	Jaddala/ Sinjar
	Kermav	Kolosh/ Tanjero
Iran	Ilam	Kometan/ Dokan
	Amiran	Tanjero/ Kolosh
	Pebdeh	Aaliji/ Jaddala/ Tarjil/ Palani/ Ibrahim/ Serikagni
	Asmari	Bajwan/ Baba/ Shurau/ Shiekh Alas/ Azkand/ Anah/ Euphrates/ Jeribe

The revision processes should seriously consider this important fact. We should work hard to make the stratigraphy of Iraq easy to examine and study, and simply, correlatable in different areas in Iraq and with the neighboring countries.

This doesn't mean that we should not add or introduce a new unit, but this must be done in necessary situations with carefulness and caution.

2.2. Revision should adhere to international stratigraphic rules

The processes of stratigraphic revision must follow the mechanism and the provided procedures suggested for the changing of the stratigraphic status of any formal unit. This should be done by complying with standard international rules set for stratigraphic division and classifications.

Lithostratigraphic units mainly formations and members are formal rock units, identified, recognized, delimited, nominated, and distinguished from other likewise units based on general lithologic characters and stratigraphic position (NACSN, 1983). The North American Commission on Stratigraphic Nomenclature was a pioneer in setting the rules and bases of how to identify and recognize certain lithostratigraphic units (Hedberg & Nomenclature, 1952), ACSN 1961, NACSN 1983, and NACSN 2005). These rules have remained the same since the fifties and no changes had been made to this definition. It shows the importance of the lithostratigraphic characters in recognizing formal lithostratigraphic units. The International Commission on Stratigraphy (ICS) followed similar steps, approaches, and restrictions on this rule. They define lithostratigraphic units as "A Lithostratigraphic unit is a body of rocks that is defined and recognized based on its lithologic properties or combination of lithologic properties and stratigraphic relations (Hedburg, 1976; Murphy & Salvador, 1999; Salvador, 1983).

Both commissions (the ASC and ISC) emphasize lithostratigraphic characters in defining lithostratigraphic units.

The naming, establishing, revising, and redefining of a new formal lithostratigraphic unit (i.e., Group, Formation, Member) should satisfy certain requirements as explained in Article 3, of the definition of formal units (NACSN, 2005):

- Intent to designate or modify a formal unit
- Designation of category and rank of unit
- Selection and derivation of the name
- Specification of stratotype (where applicable)
- Description of unit:
  - Name
  - Type locality and type section
  - Thickness
  - Lithology
  - Fossil contents
  - Age
  - Description of boundaries
  - Other locations
  - Remarks
- Historical background
- Dimensions, shape, and other regional aspects;
- Correlations; and possibly genesis (where applicable)
- Publication in recognized scientific media at a Conference

These requirements apply to subsurface and offshore, as well as exposed, units. The misuse of these requirements might lead to confusion and misidentification among closely, stratigraphically related units. Al-Qayim (2023) gave a good example of the misidentification between closely and stratigraphically related units when defining these units on bases other than lithologic characters such as lithofacies, biofacies, or depositional environment.

2.3. Cyclostratigraphy and the eustatic controls on sedimentation “Sequence Stratigraphic Framework” is an important tool in differentiating the stratigraphic record

The cyclic nature of the stratigraphic record of Iraq was discussed first by Buday (1980). He had divided the Phanerozoic record into (15) major cycles. These cycles were defined using major unconformities which, however, resulted from major tectonic events (Global tectonics). An attempt has also, been made to define the basic units of the sedimentary cycles (Al Naqib, 1963), but at a different time.

In recent years, it has been proven that the major global geologic factor controlling cyclic sedimentation is the eustatic cycles rather than tectonic cycles “Global Eustatic Cycles”. Sharland et al. (2001) revised the Arabian Plate Stratigraphy with a new scheme of stratigraphic cycles in a detailed sequence stratigraphic framework. They divided the Arabian plate stratigraphic sequence into 11 tectonostratigraphic megasequences (AP1 – AP11) with 63 secondary sequences, each defined by important sequence boundaries and well-preserved Maximum Flooding Surface (MFS).

The sedimentary patterns of Iraq show clear diachronous relations following epiorogenic cycles in western and central parts of Iraq and diastrophic and orogenic movements in northern and northeastern parts of Iraq. Most of the unconformities within the stratigraphic record of Iraq are of disconformity type, which, had been overlooked, or missed frequently by stratigraphic workers. This causes the under-stressing of the concept of the cyclic stratigraphy and the eustatic controls on sedimentation.

Sequence stratigraphy is now widely accepted as providing a more robust surface and subsurface stratigraphic framework. This is because it is more effective at representing and predicting the 4-dimensional distribution of basin lithologic units and facies. Sequence stratigraphic interpretations are most useful at the exploration and appraisal scale and, also have important applications during field development. It provides a readily accessible interpretation to the development of both new ideas (such as new plays), and the ready exchange of subsurface views (Sharland et al., 2001).

This contribution with the following sequence of stratigraphic studies on the Arabian Plate in general and specifically Iraq, opens the doors to reconsider the classification and subdivision of the stratigraphic record in a new vision and theme.

2.4. Basin-wide and regional facies relations are an important factor in stratigraphic classification

At each scale of observation, depositional systems provide the link between the scopes of sedimentology and stratigraphy (i.e., the result in sedimentology, and the starting point in stratigraphy). The study of depositional systems is intimately related to the facies concepts, facies associations, and facies models (Catuneanu et al., 2011). Facies analysis is an essential method for the reconstruction of paleo-depositional environments, as well as for understanding broader aspects that influence the evolution of a sedimentary basin, such as the subsidence history and the underlying climatic conditions. Facies analysis and interpretation in a basin-wide framework, are important in correlating sedimentary strata and constructing a regional stratigraphic scheme for a basin. Such a framework, in conjunction with the sedimentology of the strata, is fundamental for interpreting paleogeography and depositional history. The ultimate goal of facies analysis is the reconstruction of depositional systems, which are the largest units of sedimentology, and the building blocks of systems tracts in stratigraphy.

A depositional system is the product of sedimentation in a specific depositional environment; hence, it consists of a three-dimensional (3D) assemblage of strata whose facies and geometry are related by processes that operate within a common environment of deposition. Having established the facies, succession, and geometries of certain lithologic groups, one can proceed to define the tectonic nature of the basin investigated (Einsele, 1992).

In large sedimentary basins like the Zagros Foreland Basin, facies type can be changed laterally and vertically in a wide area, which could lead to segregation and differentiation of the

classified lithostratigraphic units. An example of this practice is the identification of the Sinjar Formation of coralgal reef carbonates. The Sinjar Formation is recognized from the southeast Sulamaniyah (Serwan Valley and Sartaq Bamo) to Zakho in the Dohuk areas and Sinjar Mt. in the northwest. It also extends into Syria with the same name and characters (Al-Qayim, 2023). The basic lithology is the same with the same lithofacies (coralgal reef, Nummulitic shoals, miliolid lagoonal limestone). Within the same sedimentary cycle (Paleocene – Early Eocene), the Rus Formation of the Western Desert is stratigraphically equivalent and consists of anhydrite and unfossiliferous limestone. At the High Folded zone, the Khurmala Formation is another equivalent of the Sinjar Formation and consists mainly of dolostone and dolomitic limestone. The three units belong to the same basin, and the same sedimentary cycle, but have different lithologies and are thus designated as three different formations (Figure 1).

It is therefore, considered as an acceptable stratigraphic practice to recommend that the similar lithofacies (With similar lithologic characters) of the same sedimentary cycle (3rd and 4th order) within the same sedimentary basin be classified as the same lithostratigraphic unit.

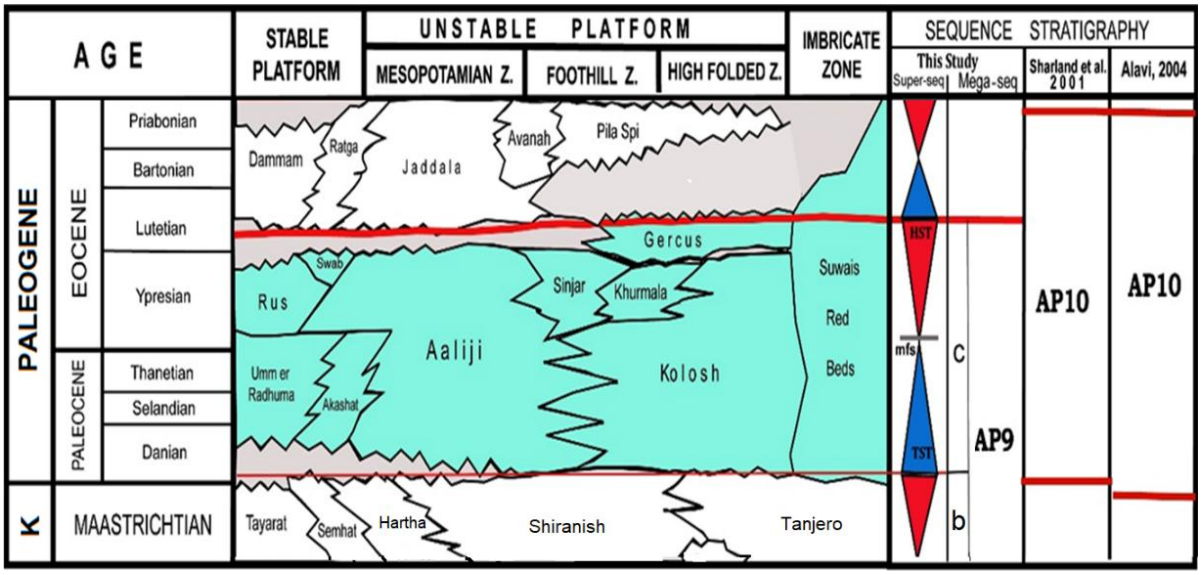

Figure 1. Chronostratigraphic chart of the Paleogene sequence, Zagros Foreland Basin, Iraq, showing the stratigraphic relationship between Sinjar Formation and its chronostratigraphic equivalents (From Al-Qayim, 2024).

2.5. Reviewing, differentiating, and defining formal lithostratigraphic units, should mainly depend on their lithostratigraphic characters

Lithostratigraphic units according to the American Commission on Stratigraphic Nomenclature (ACSN 1961, NACSN 1983, and NACSN 2005), and the International Commission on Stratigraphic Classification (Hedburg, 1976; Murphy & Salvador, 1999; Salvador, 1983) should be defined, classified, and differentiated based on lithologic characters. In addition, stratigraphic relation must be also considered, however, lithology remains the prime factor in the identification of formal lithostratigraphic units. In some cases, people tend to use lithofacies

depositional environment or even biofacies instead of basic lithology as the defining factor of a certain lithostratigraphic unit. This is an unusual practice in stratigraphy and could lead to confusion, misidentification, and undesirable results, especially during geological surveys or mapping campaigns.

(Al-Qayim, 2023) has given a good example of this misapplication of stratigraphic principles, which is reviewed here. The case study dealt with the misidentification between two closely related the Sinjar and Khurmala formations. The first consists mainly of fossiliferous limestone, while the second is dominated by dolostone and dolomitic limestone. Both are carbonates and include lagoonal facies, but the lithology is different. Since the defining factor is lithology, then we must adhere to this basic lithostratigraphic principle and differentiate between the two units accordingly. Unfortunately, some previous studies misidentify these units using the depositional environment as an identifying factor (Table 4), which indeed leads to uncalled confusion.

Table 4. Listing of example localities of Sinjar-Khurmala formations showing their facies type, main lithologic characters, original stratigraphic status, and the newly suggested stratigraphic assignment (Al-Qayim, 2023).

SERIES	YEAR	AUTHOR	LOCALITY	FACIES	MAIN LITHOLOGY	FORMATION	THIS STUDY FORMATION
1	1970	Al-Syyab & Al-Siddiki	Sinjar	Algal Reef	Limestone	Sinjar	Sinjar
2	1973	Al-Omari & Sadik	J. Maqlub	Lagoon	Marly Limestone	Khurmala	Sinjar
3	1975	Al-Shaikh et al.	Harrir	Lagoon	Limestone	Khurmal	Sinjar
4	1978	Kassab	K-117	Shoal/ Lagoon	Marly Lst. & D Limestone	Khurmal Sinjar	Khurmala Sinjar
5	1985	Mallick & Al-Qayim	Taslujah	Reef/ Shoal	Limestone	Sinjar	Sinjar
6	1986	Al-Qayim & Salman	Shaqlawa	Lagoon	Marly Limestone	Khurmala	Sinjar
7	1988	Al-Qayim et al.	Haibat Sultan	Lagoon	Marly Limestone	Khurmala	Sinjar
8	1990	Al-Qayim & Nissan	Koysanjaq	Lagoon	Limestone	Khurmala	Sinjar
9	1993	Al-Sordashy & Lawa	Al-Sulaimaniyah	Shoal/ Reef	Limestone	Sinjar	Sinjar
10	1995	Al- Qayim & Al-Shaibani	Bekhme Gorge	Lagoonal	Limestone	Khurmala	Sinjar
11	1995	Al-Qayim	Aqra	Lagoonal	Dolostone	Khurmala	Khurmala
12	1995	Al-Qayim	KoiSanjaq	Lagoonal	Limestone	Khurmala	Sinjar
13	1997	Karim	Sartak - Bamo	Shoal/ Lagoon	Limestone	Sinjar	Sinjar
14	2001	Al-Sordashi	Sulaimaniyah	Reef/ Lagoon	Limestone	Sinjar	Sinjar
15	2005	Amen et al.	Sinjar	Reef/ Shoal	Limestone	Sinjar	Sinjar
16	2006	Law	Sulaimaniyah	Reef/ Shoal	Limestone	Sinjar	Sinjar
17	2006	Al-Banna et al.	Bakhair Mt.	Tidal/ lagoon	Limestone	Khurmala	Sinjar
18	2009	Salih & Yaseen	W. Sulaimaniyah	Reef	Limestone	Sinjar	Sinjar

2.6. Stratigraphic units of the Zagros Suture and Imbricate Zones need to be formalized

The Zagros Suture Zone occupies a narrow strip of the extreme northeastern part of Iraq. This zone extends into the Iranian territory and constitutes the most complex zone of the Zagros

orogenic belt. Lithologically, the zone includes units of sedimentary, igneous, and metamorphic rocks. Efforts were made to stratigraphically classify these units beginning with the pioneer work of C. M. Bolton (1956). This work set the foundation of the stratigraphy of this zone with several important reports and mapping of the area. This work was followed by further detailed mapping of the Russian team (the sixties) and the Czech team during the seventies. Jassim and Goff (2006) gave a good review of the stratigraphic units of the zone further detailing Bolten's work. Since the sixties, much research has been conducted on the area with a general focus on rock types, genesis ore geology, and tectonostratigraphic evolution. No serious attempt is made to reclassify these units in accordance with the rules of the International Commission on Stratigraphic Nomenclature in a formal stratigraphic format.

3. Summary and Conclusions

More than six decades have passed since the formal establishment of the Iraqi stratigraphic record. Although this pioneering work deserves a great deal of appreciation for its detailed, accurate, and extensive coverage. However, the development of new concepts in geology, and the large volume of recent stratigraphic work and studies urge the requirement to review and revise the stratigraphic classification of Iraq. This process required national, qualified, and authorized efforts with few necessary considerations to be regarded during the revision processes. These points are discussed here and include:

1- Unification and reduction of the Iraqi formal lithostratigraphic units is more required than further subdivision and addition or expansion of the stratigraphic record, which already suffers from exaggerated subdivisions.

2- All changes must follow the standard procedures set by the Code of Stratigraphic Nomenclatures of the International Commission on Stratigraphy. These changes must be amended by the Iraqi National Stratigraphic Commission and published in a reputable source and should be followed by all governmental and non-governmental Iraqi firms.

3- Modification of the stratigraphic setting must consider the cyclic nature of the stratigraphic record and the eustatic effect and controls on sedimentation.

4- Basin-wide facies regional relations and distribution are important in the interpretation of the stratigraphic relations and subdivision. It is considered an acceptable stratigraphic practice to recommend that similar lithofacies (With similar lithologic characters) of the same sedimentary cycle (3^{rd} and 4^{th} order) within the same sedimentary basin be classified as the same lithostratigraphic unit.

5- In reviewing and redefining the stratigraphic situation of any stratigraphic unit, we must differentiate between lithostratigraphy, biostratigraphy, and lithofacies. Formal units should be defined solely, by their lithostratigraphic characters.

6- The stratigraphic units of the Zagros Suture Zone and some units of the Imbricate Zone need to be formally classified according to the International stratigraphic rules and nomenclature.

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