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Nannaostratigraphic Study of Kometan Formation (U. Turonian – L. Campanian), in Kosrat anticline, Northern Iraq

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Abstract

The study Kometan Formation is widley distribution throghout the upper Turonian to lower Campanian at northern and central iraq. The studied area in Kosrat anticline, North eastern Iraq, its display at southern limb of Kosrat fold. Gulneri Fm. is documented underlying the Kometan Fm. with an unconformable surface, while at the overlying it is limited unconformably by a Shiranish Formation. The formation is originated of limestone and dolomitic Lst., cherts nodules attend. We identified five nannobiozones, *Micula staurophora* Biozone (CC14); *Reinhardites anthophorus* Biozone (CC15); *Lucianorhabdus cayeuxii* Biozone (CC16); *Calculites obscurus* Biozone (CC17); *Brosonia parca* Biozone (CC18). Scientists have determined that these fossils originate from the Upper Turonian to Lower Campanian.

Introduction:

In northern and central Iraq, the study formation is very spanned between the L. Turonian to E. Campanian [1]. Moreover, it may be found subsurfacely in the following wells: Kirkuk well no. 116, Najmah well no. 29, Demirdagh well no. 29, and Qarachoq well no. 1 [2]. The development of a Kometan was initially reported by [3] selected near the northeastern Iraqi towns of Kometan area and Ain Dazah, northern of the city of Rania. Specifically, this part is situated in Northeastern Iraq along the Kosrat anti-line.

The [3] states that the type section's formation is around 36 meters deep and is made up of sparsely stratified strata of light gray chalky limestone. In certain strata, the partial silicification process also affects the formation rocks, resulting in chert nodules and occasionally dispersed conglomerates. Glauconite minerals are presence in some of the beds of the formation. [3] define the age E. Turonian - Santonian for the formation based on the exist of crowds of fossils, They also indicated that the two border are unconformable.

Depending on position and character of the formation underneath it, researchers' perspectives vary about the inherently of the lower border of Kometan Fm. in northern Iraq. revealed that there is a sedimentary gap between the Kometan Fm. and the Balamo Fm. in northern Iraq, causing the lowest contact surface between them to be nonconformable. and the instance of microorganisms and pits on the upper surface of the Dokan Fm. attests to the not compatible surface between the Dokan and Kometan formations. [4] determine that, as a result of the persistence of sedimentation and the lack of an erosional surface, the touch between

Dokan and Kometan Fms. is conformable. [3] refer that the border sited between the formation and Shiranish Fm. Unconformable. [4] mentioned that the border sited between the formation and Shiranish Fm. May seems a gradual nature, as is the case in the chaqchaq valley, and Azmir Tourism valley sections or appeared as a Burrowed-Glauconitic Contact, as is the case in the passages the upper Dokan, the lower Dokan, Kometan and the Hezob bridge sections. The third type is acute, as is the case in the Wadi Qumchuqa section. There are many studies that dealt with determining the age of formation (L. Turonian – E. Campanian) including : [6][7] [8].

Geological Setting:

The section is lies at Kosrat anticline in the High Folded Zone, northeastern Iraq (Fig. 1). The formation is displayed on S W wing of the Kosrat fold, Northeastern Iraq. It extends N-W to S-E about 85 km length and 5 km width As the formation (88m.) thick, Directions longitude (44 58 12) east and latitude (35 54 36) north, west of Dukan lake, and northwest toward the settlement of Qallat village

Dolomitic limestone and limestone make up the majority of the formation. Chert nodules are scattered throughout the formation in certain levels and close to the contact beds. The Gulneri Fm. is situated under the Kometan Fm.. Its interface is nonconformable due to chert and glauconite nodules, and its upper boundary is restricted by the Shiranish Formation, which is nonconformable due to glaugonite colored lenses that run parallel to the strata' surfaces. The research region is lies in the Foothill Zone and the H. folded zone on a tectonic scale [9] [10].

One of the formations that were occur in the lower AP9 (L. Cretaceous – E. Palaeogene, 92 - 63 Ma) is the Kometan Fm. [11]. The tiny - continents had split off from the arabian plate in the L. Tithonian approached the intra-oceanic reduction realm trench in the L. Cenomanian–E. Turonian epoch (Fig. 1).

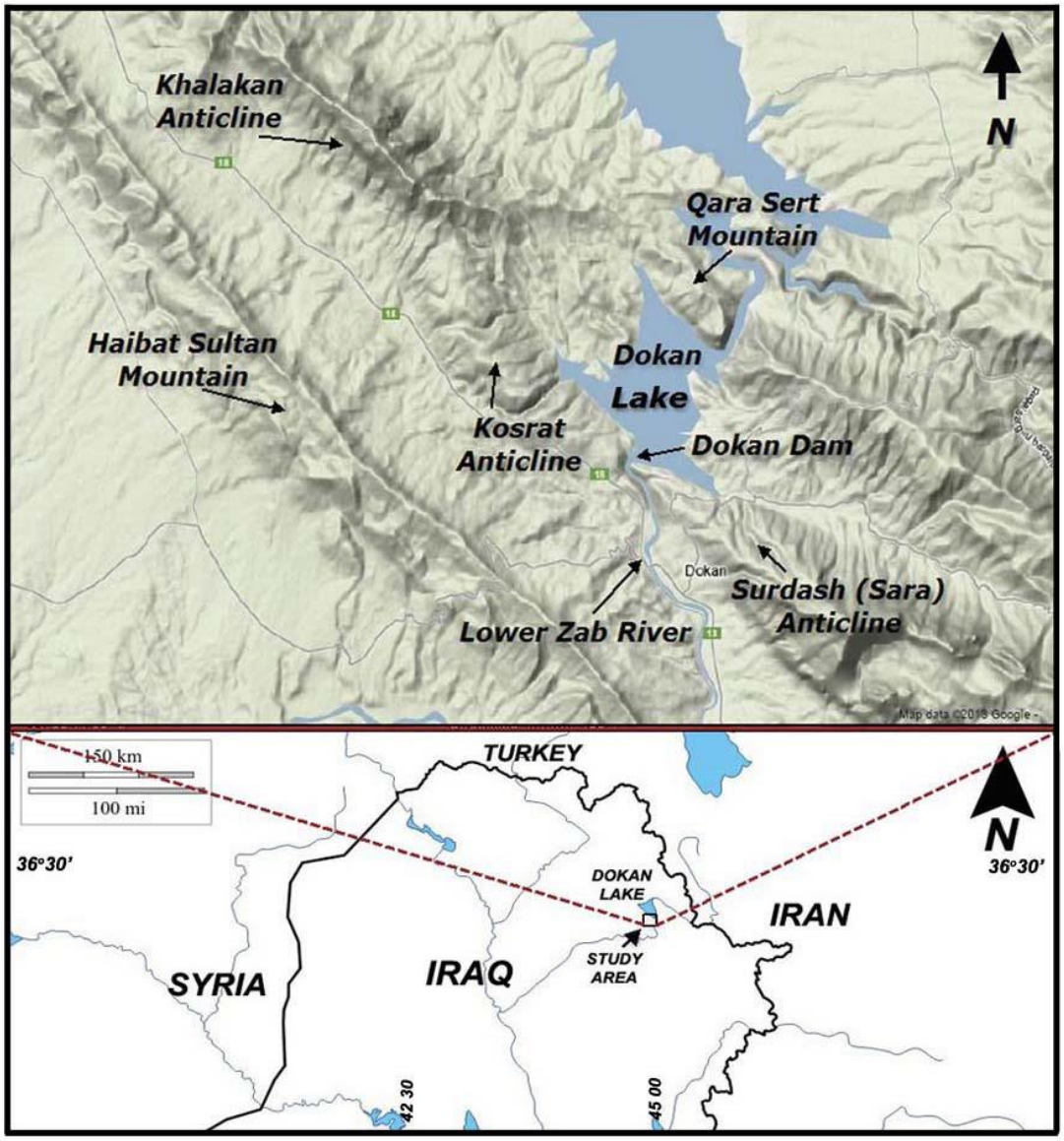

Fig. 1 *site of the studied section,*

The Kometan Formation was deposited after the initial ophiolite obduction into the Arabian Plate's formerly passive northeast frontier, which resulted in fault renewal and elevation of the plate's northeastern edge [11]. A foreland basin (L. Turonian E. Campanian) developed at the arabian plate Northern border as a result of multiple subsequent ophiolite obductions along the plate margins. This was caused by loading the crust by substance plate created as a outcome of squeeze [10]. The Kometan Formation was formed during the last stages of Neo-Tethyan subduction in a foreland basin [9]. Then came the cracked and deployment of Aden Gelf and raise of the Zagros belt.

The lowest portion of the AP9 [10] is accounted by the Khasib, Tanuma, Sa'di, and Kometan formations (Fig. 2). The L. Turonian-E. Campanian isopach displays two depocenters: the inner shelf and lagoonal facies (Khasib, Tanuma, and Sa'di fm.); the outer shelf and basinal facies of Kometan Formation. These facies are the two primary ones found in the series.

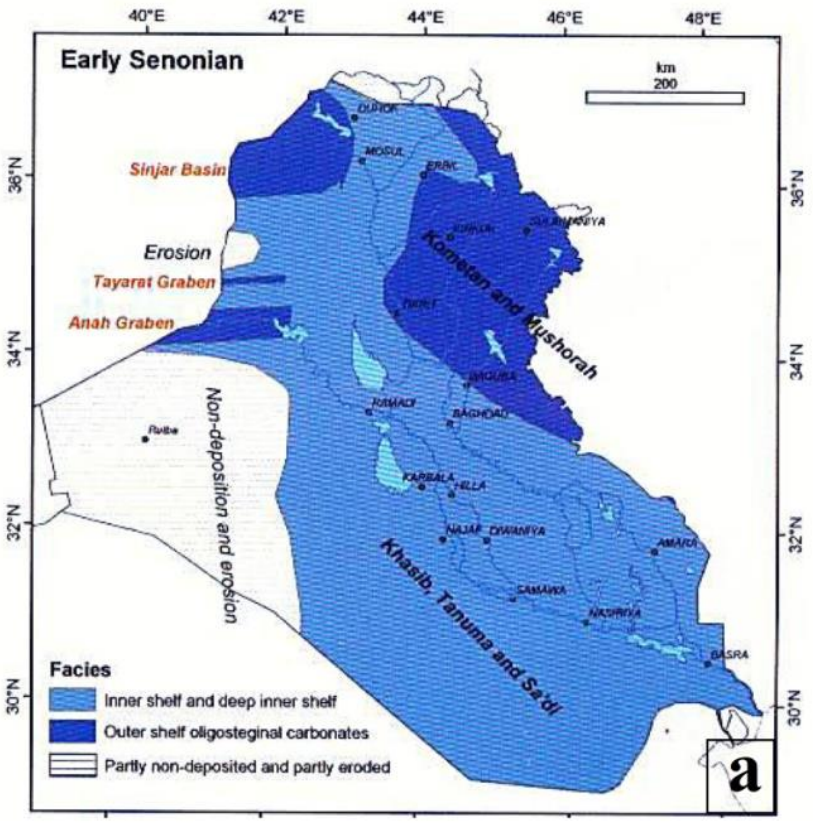

Fig. 2 *Paleogeography distribution of the Coniacian – Santonian formations in Iraq* [10]

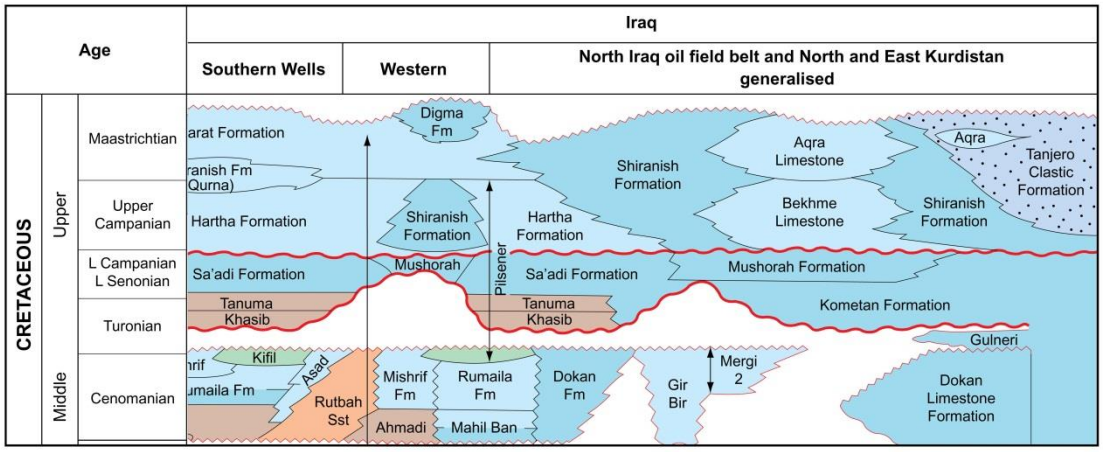

Fig. 3 *Schematic regional rock unit correlation* [12]

Materials and methods:

All field phenomena in the outcrops were described as part of the field work, and the description concentrated on finding the beds thickness, examining the type of border between them, assessing their hardness, colour, tracking the beds' side and vertical changes, and documenting any potential sedimentary structures.

Thirty-eight rock samples were tokened from the Kometan Fm. at Kosrat anticline, using for the studying of the calcareous nannofossils based on the thin slices (under transmitted-light microscope), which are reproduced by using the method (H) [13].

Result and Discussion:

Five following biozones are identified invoked on the stratigraphic parsing of the registered species, the:

- *Micula staurophora* Interval Zone (CC14)

Thickness: (7.5) meters samples(9-12)
Discussion: The biozone is compared by the zone (CC14) (*Marthasterites decussate* Biozone) by [14] and compared by the zone UC10 biozone which is studied by [15] thus we proposed the Coniacian[16].

- *Reinharditesanthophorus* Interval Zone (CC15)

Thickness: (17.5) meters samples(13-20)
Discussion: The biozone is compared by the zone (CC15) (*Reinhardites anthophorus* Biozone) by [14] then compared upper portion by the zone UC10 and lower part of UC 11biozones which is examined by [15] hence we proposed the E. Santonian[16].

- *Lucianorhabdus cayeuxii* Interval Zone (CC16)

Thickness: (23) meters samples(21-29)
Discussion: The biozone is compared by the zone (CC16) (*Lucianorhabdus cayeuxii* Biozone) by [14] then compared lower portion by the zone UC 11 and upper part of UC 12biozones which is examined by [15] hence we proposed the M. - L. Santonian[16].

- *Calculitesobscurus*Interval Zone (CC17)

Thickness: (8) meters samples(30-32)
Discussion: The biozone is compared by the zone (CC17) (*Calculitesobscurus* Biozone) by [14] and compared upper portion by the zone UC 12 and lower part of UC 13biozones which is studied by [15] hence we proposed the E. Campanian[16].

- *Brosoniaparca* Interval Zone (CC18)

Thickness: (16) meters samples(33-38)
Discussion: The biozone is compared by the zone (CC18) (*Brosoniaparca* Biozone) by [14] and compared by the zone UC 14biozone which is studied by [15] hence we proposed the E. Campanian[16].

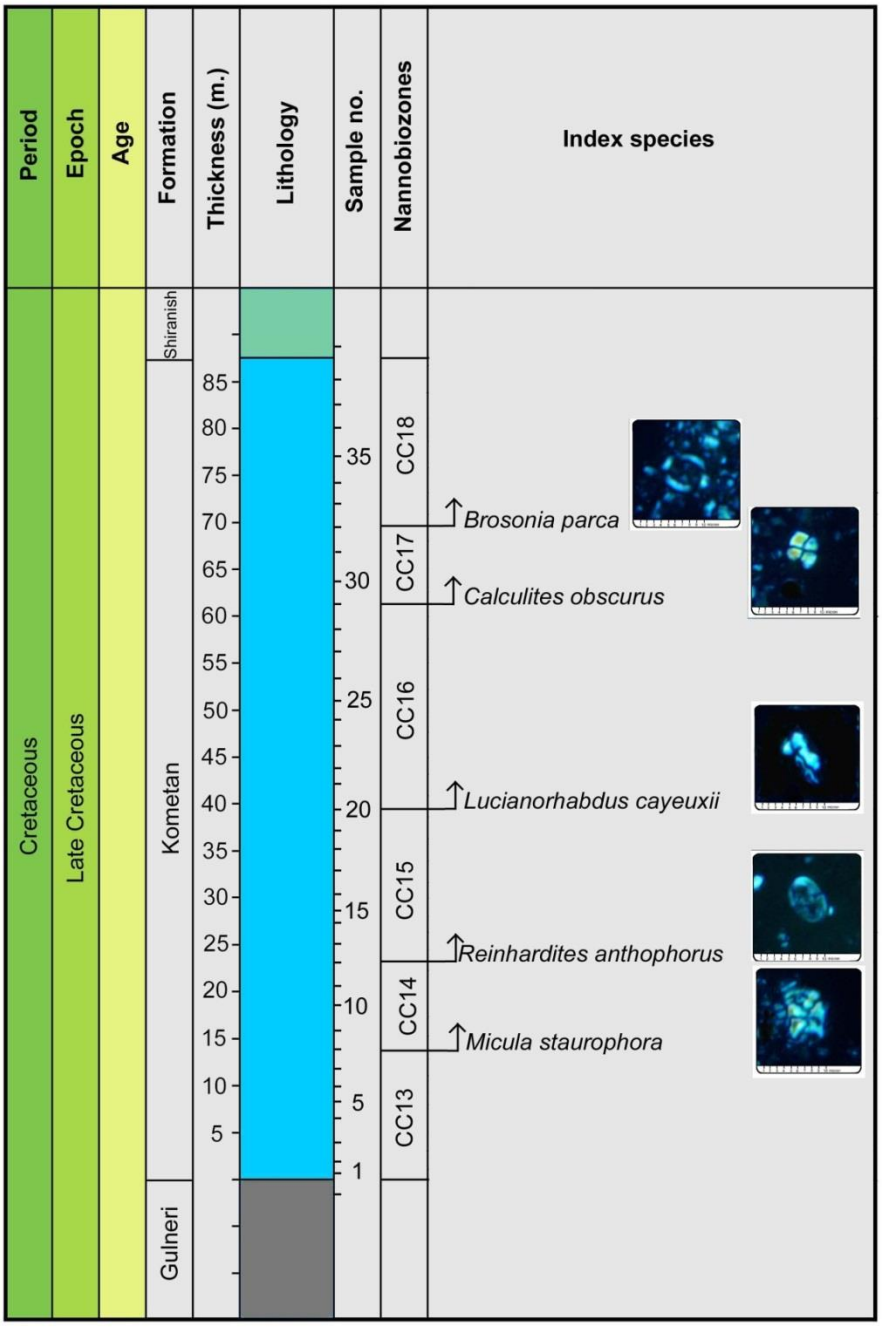

Fig.4 *Index taxa of Calcareous Nannofossils of study section*

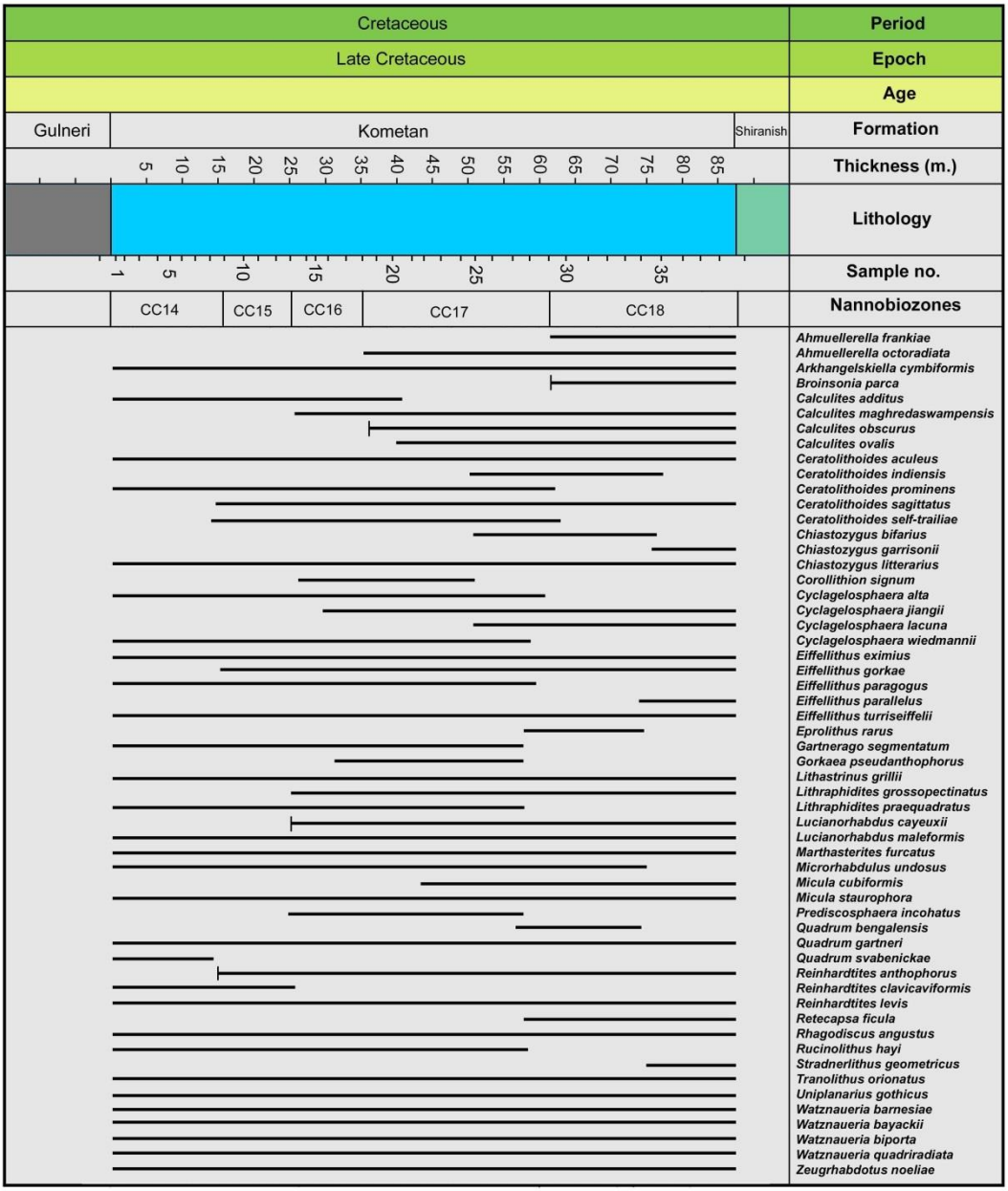

Fig.5 *Nannobiozones of Calcareous Nannofossils of study section*

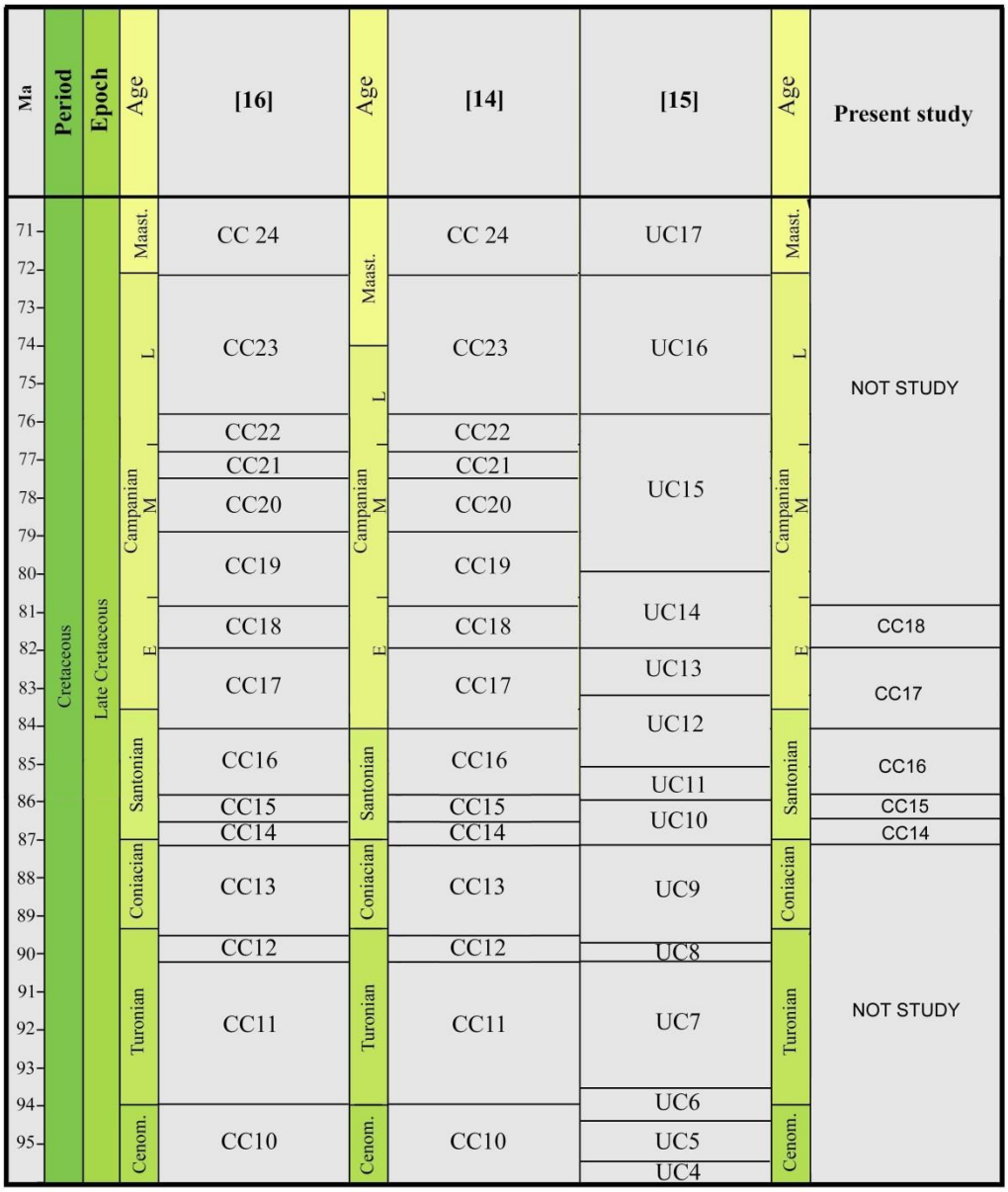

Fig.6 Age *compared diagram of Calcareous Nannofossils Biozones of studied section*

Conclusions:

This study Kometan Formation at Dokan area, Northern Iraq are aged upper Turonian – lower Campanian according to the principle of stratigraphic ranges of the calcareous nannfossils biozones that ranked from older to younger as follows:

Micula staurophora Biozone
Reinhardites anthophorus Biozone
Lucianorhabdus cayeuxii Biozone
Calculites obscurus Biozone
Brosonia parca Biozone

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دراسة الطباقية الحياتية لمتحجرات النانو الكلسية لتكوين كوميتان(التورونيان الاعلى- الكامبانيان الاسفل)، في طية كوسرت، شمالي العراق

رنا عبدالاله الحيالي ، عمر احمد البدراني*، زيد عبدالوهاب ملك
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معلومات المؤلف

الايميل:

الخلاصة:
ينتشر تكوين كوميتان بصورة واسعة خلال التورونيان المتاخر الى الكامبانيان المبكر في شمالي ووسط العراق.تقع منطقة الدراسة في طية كوسرت، شمالي العراق.حيث ينكشف على الجناح الجنوبي من الطية المحدبة. يتالف التكوين من الحجر الجيري والحجر الجيري المتدلمت الذي يمتلك عقد الصوان خلال تتابعاته. يقع تكوين كولنيري في اسفله بحد غير متوافق بينما يتحدد في اعلاه مع تكوين شرانش بصورة غير متوافقة ايضا.تم تحديد خمسة انطقة حياتية هي:
Micula staurophora Interval Zone (CC14); *Reinhardites anthophorus* Interval Zone (CC15); *Lucianorhabdus cayeuxii* Interval Zone (CC16); *Calculites obscurus* Interval Zone (CC17); *Brosonia parca* Interval Zone (CC18)
ان مضاهاة هذه الانطقة مع مثيلاتها المحلية والاقليمية سمحت لنا بتحديد عمر التكوين بالتورونيان المتاخر الى الكامبانيان المبكر