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RESEARCH ARTICLE

A NEW STRATIGRAPHIC RANGE OF *GLOBOTRUNCANA BULLOIDES* FROM NORTH IRAQ

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ABSTRACT

Globotruncana bulloides Vogler 1941 belongs to Class: Rotaliata which indicates Early Santonian-Middle Maastrichtian from the previous works. This genus is distributed in two formations in North Iraq, Kometan and Shiranish formations. The lithology of Kometan Formation is well bedded limestone and the author was found the new stratigraphic range of the genus in this formation. The stratigraphic range of *Globotruncana bulloides* is changed to start from Early Turonian with association present of *Whiteinella archaeocretacea* zone as indicated from Surdash section, and Late Turonian with association present of *Marginotruncana sigali* zone from Degala section, both of the previous sections are located northeast Iraq; and discriminated as Late Coniacian with association present of *Dicarinella concavata* zone from Kirkuk-246 borehole.

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INTRODUCTION

Globotruncana bulloides Vogler 1941 belongs to Class: Rotaliata Subclass: Globigerinana Order: Globigerinida Family: Globotruncanidae; this genus is distributed in the present study in Kometan Formation, which was studied in Surdash section, this section is located in Surdash area, Sulaimaniya Governorate, northeast Iraq. The coordinates of the section are (45° 06′ 26″ Long.), (35° 50′ 01″ Lat.); and Degala section which is located in the valley near the water well in Isamail Awa village near Degala Town, Erbil Governorate, northeast Iraq. The coordinates of the section are (44° 26′ 23″Long.), (36° 12′ 43″Lat.); and Kirkuk-246 borehole which is located in northeast flank of Baba dome, Kirkuk structure, at Kirkuk Governorate, north Iraq. The coordinates of the borehole are (44° 19′ 35″Long.), (35° 32′ 32″Lat.); Figure (1). The lithology of the Kometan Formation is grayish brown to yellowish brown, hard, stylolitic, well bedded limestone. The stylolites occurred along bedding planes of Kometan Formation throughout. The chert nodules occurred near the upper part of the formation.

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Previous work

Dunnington (1953) in: Bellen *et al*. (1959) was first described The Formation from the Kometan village near Endezah in NE Iraq. The formation comprises 120 m of light grey, Thin bedded, Glolobigerinal-oligosteginal limestone, locally silicified (with chert concretions in some beds), with a glauconitic bed at the base Bellen *et al*. (1959). The formation has a similar lithology throughout the Balambo-Tanjero Zone. However, to the W and SW it becomes increasingly argillaceous. The formation also contains varying proportions of globigerinal and oligosteginal limestone.

- Bellen *et al*. (1959) indicate the basal beds of the formation are of Turonian age (based on the presence of Globotruncana renzi, and that the overlying beds are of Santonian age.
- AL-Tememmy (1986) studied the Biostratigraphy of Kometan Formation and divided it into four biostratigraphic foraminiferal Zones, these are: Globotruncana renzi – Glt. sigali zone, Glt. concavata zone, Glt. Fornicate zone and Glt. fornicate – Glt. elevate – Glt. Stuartiformis assemblage zone.
- AL-Sheikhly *et al*. (1989) found five new species belong to the Kometan Formation; these are Spiroplectammina

sayyabi, S. rectangularis, Gaudryinella kometanensis, G. triqaudratus and Osangularia abnormis.

- Karim and Taha (2008) were re-studied the contact between Kometan and Shiranish Formations in the field and laboratory and divided the contact into three types: obvious gradational, burrowed and glauconitic and sharp contacts.
- Hashem (2010) study the Kometan Formation in Zewa and Azmer, NE Iraq and she gave the Coniacian - Campanian age to the formation according to the presence of Dicarinella primitiva (DALBIEZ) Dicarinella concavata(BROTZEN) range zone and Globotruncana elevata (BROTZEN) range zone. The deep marine is the depositional environment of the formation.

MATERIALS AND METHODS

There are 101 samples have been collected from two outcrops (Surdash and Degala sections in Erbil and Sulaimaniya governorates northeast Iraq respectively and one borehole (Kirkuk-246) located in Kirkuk governorate north Iraq, all these samples are belong to Kometan Formation; of which 201 slides were prepared in the workshop of department of Geology- College of Science- University of Baghdad. The slides were examined under microscope to discriminate the age and stratigraphic range of the fossils.

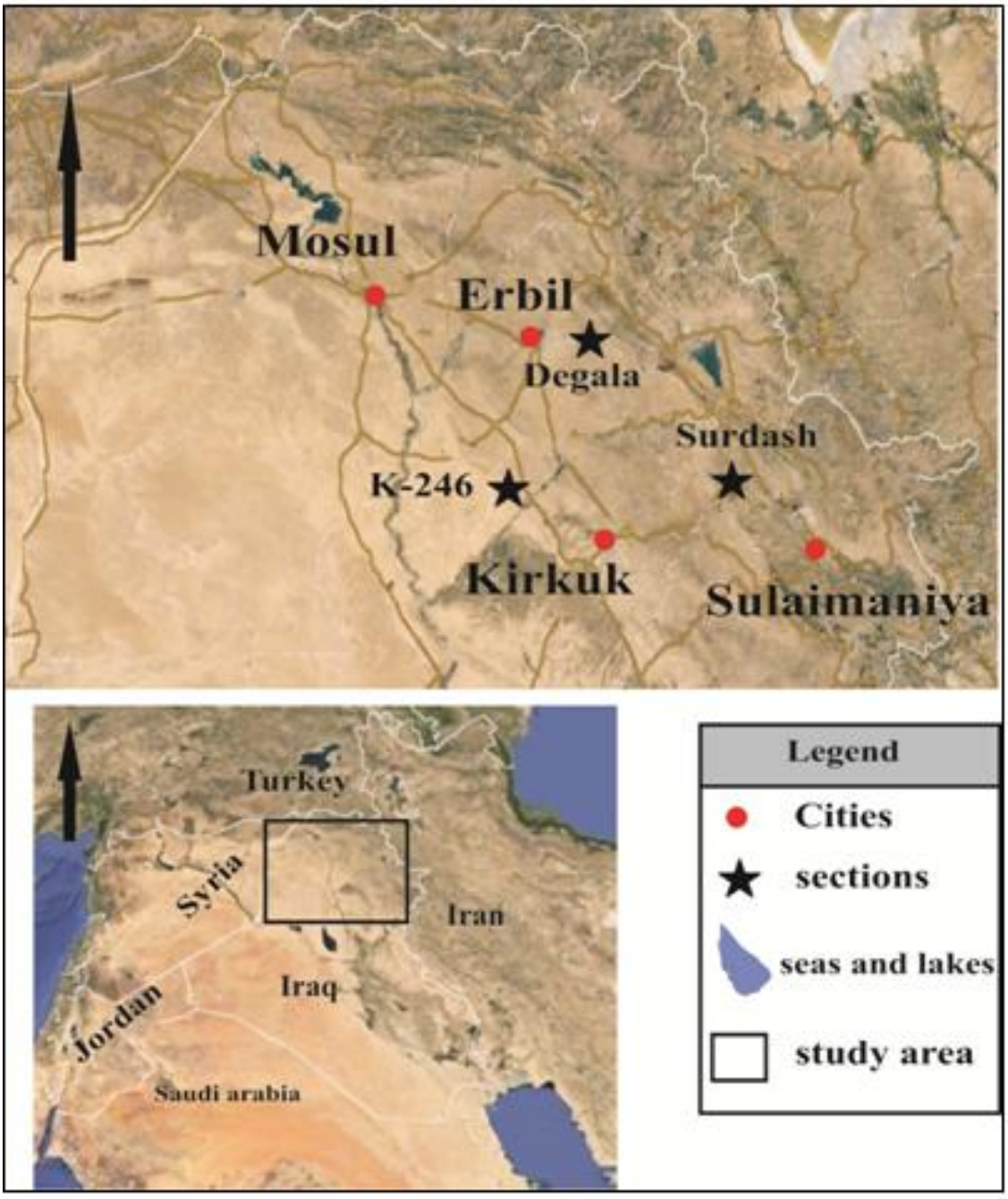


Figure 1. Satellite image showing the location map of the study area

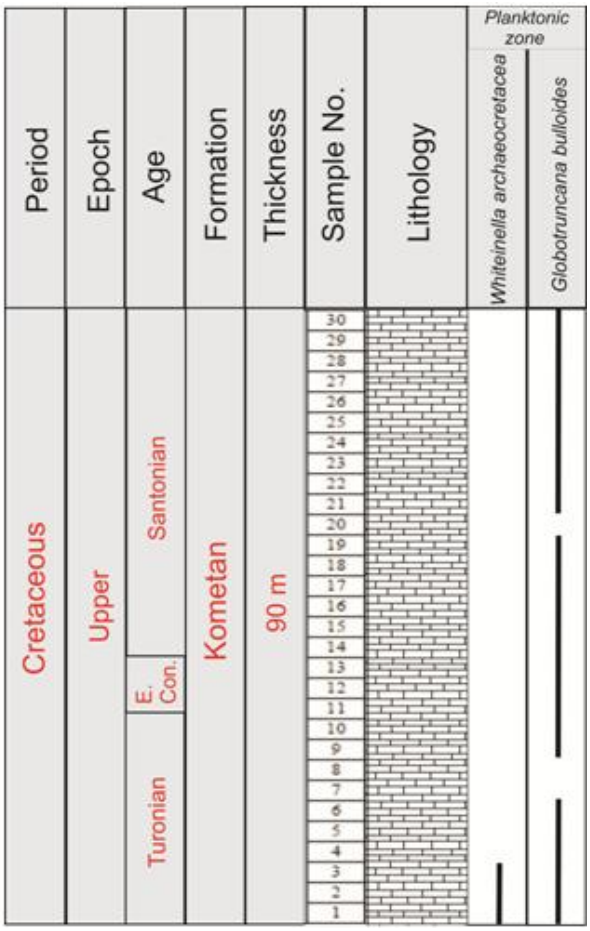


Figure 2. Biostratigraphic Range Chart of Foraminifera in Surdash section (not to scale)

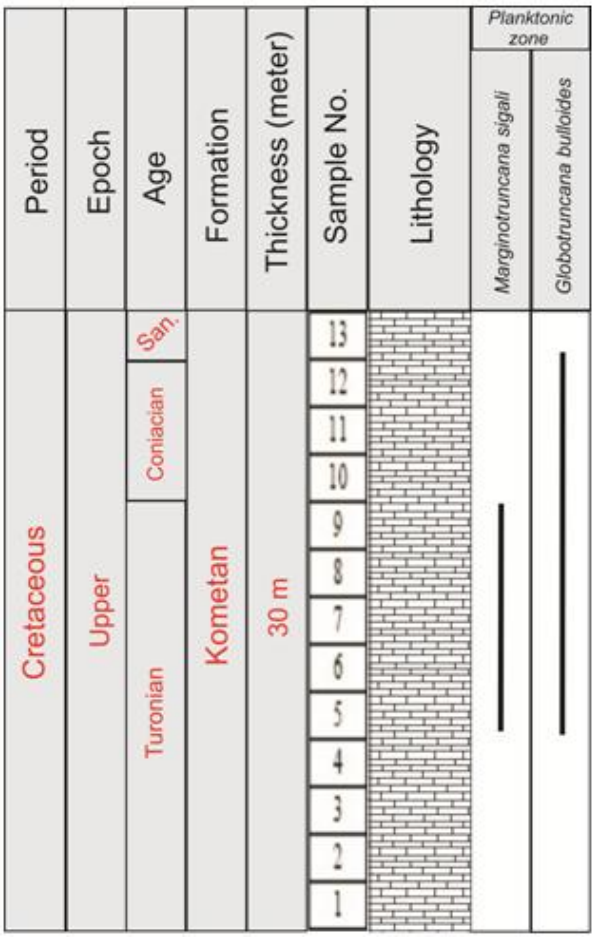


Figure 3. Biostratigraphic Range Chart of Foraminifera in Degala section (not to scale)

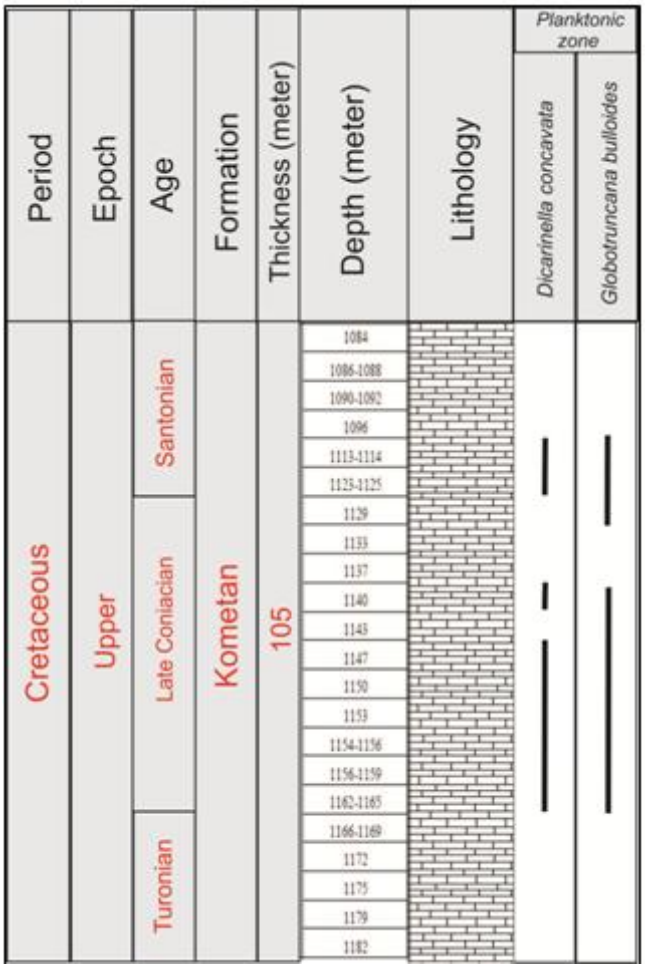
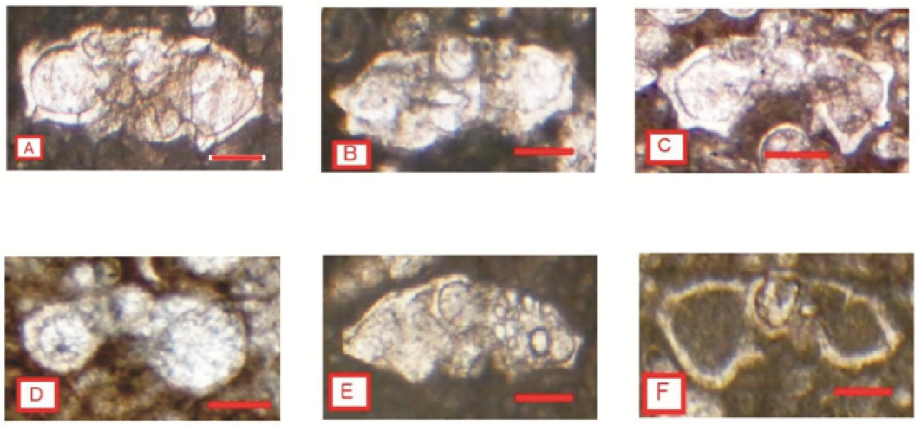


Figure 4. Biostratigraphic Range Chart of Foraminifera in Kirkuk well-246 (not to scale)

Legend

No.	Symbol	Explanation	No.	Symbol	Explanation
1.		limestone	2.	Con.	Coniacian
3.	San.	Santonian	4.	E.	Early

Plate 1



scale bar: 100 µm

A, B, C- *Globotruncana bulloides* Vogler, D- *Whiteinella archaeocretacea* Pessagno, E- *Marginotruncana sigali* Reichel, F- *Dicarinella concavata* Brotzen

DISCUSSION

Globotruncana bulloides was indicated as Santonian by Pessagno, (1967) in: AL-Tememmy, (1986), and indicates Campanian-Maastrichtian age as described by Youkhana (1976). Also indicates Early Campanian-Maastrichtian by Caron (1985) in: Bolli *et al.* (1985). *Globotruncana bulloides* indicates Middle Santonian-Middle Campanian as described by Nishi *et al*. (2003). But Sari (2006) described *Glt. Bulloides* from the Santonian age, and Li *et al*. (2009) described the species as Lower Santonian-Middle Maastrichtian from Zanda, southwestern Tibet of China, and as Middle Campanian-Maastrichtian in another research by Li *et al*. (2010) in Kangmar, southwestern Tibet of China, in the present study, the author found a new stratigraphic range of *Globotruncana bulloides* (Plate 1, Fig. A, B, C) starts from Early Turonian with association present of index fossil *Whiteinella archaeocretacea* zone (Plate 1, Fig. D) as indicated from Surdash section, Figure (2) and Late Turonian with association present of index fossil *Marginotruncana sigali* zone (Plate 1, Fig. E) from Degala section, figure (3) both of the previous sections are located northeast Iraq; and discriminated as Late Coniacian with association present of index fossil *Dicarinella concavata* zone (Plate 1, Fig. F) from Kirkuk-246 borehole, Figure (4) located in Kirkuk Dome, Kirkuk governorate, north Iraq.

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