

Two New Miospores Species from Triassic-Jurassic Boundary in Borehole Tel Hajar-1 South West Mosul City, Iraq

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(Received 26/1/2012 , Accepted 7/5/2012)

ABSTRACT

Two new species of miospores are described from Upper Triassic- Lower Jurassic Butmah Formation in borehole Tel-Hajar-1- northern Iraq. These are *Concavisporites baġjensis* sp.nov. and *Concavisporites mosulensis* sp. nov.

دراسة نوعين جديدين من السبورات من الحد الفاصل بين الترياسي- الجوراسي في بئر تل حجر- ١ جنوب غرب مدينة الموصل شمال العراق

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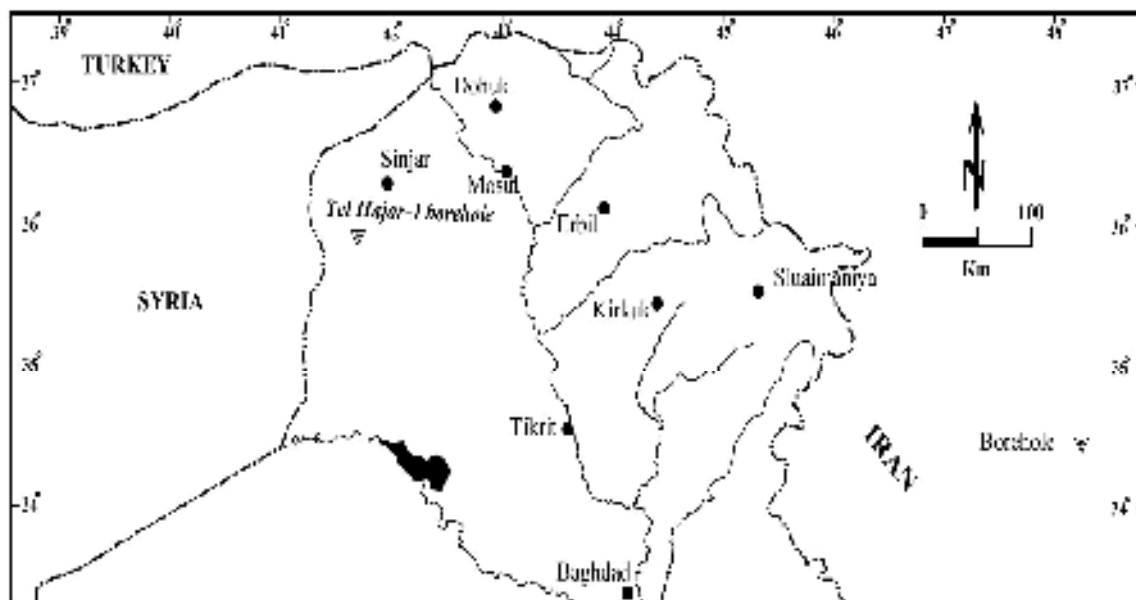
المخلص

تم وصف نوعين جديدين من السبورات الثلاثية الفتحات من السطح الفاصل بين الترياسي والجوراسي من تكوين بطمة في بئر تل حجر - ١ شمال العراق وهذان النوعان هما : *Concavisporites baġjensis* sp. nov. and *Concavisporites mosulensis* sp. nov.

INTRODUCTION

During the course of detailed palynological studies of Triassic and Jurassic strata of Butmah Formation in borehole Tel-Hajar-1 (41° 40' 20" L , 35° 50'40" W) south west Mosul city, Iraq. Two morphologically distinctive species of dispersed trilete spores have been encountered. Tel-Hajar-1 well was drilled on the Tel-Hajar structure which is located 30 Km. southwest of Sinjar town (Fig.1). The purpose of this paper

is to document these species systematically and to relate their occurrence to the palynostratigraphic sequences.



(Fig.1): Location map of borehole Tel Hajar-1

STRATIGRAPHY

The studied samples represent part of Butmah Formation which is penetrated in borehole Tel-Hajar-1. The Butmah Formation was first described by (Dunnington 1953 in Bellen *et al.*, 1959) from borehole Butmah -2 south west Mosul city (Since Butmah Formation is not recognized in surface exposures). The formation is a heterogeneous aggregate of sediment of calcareous - argillaceous and evaporitic rock suites (Fig. 2).

According to (Jassium and Goff, 2006) the upper (200m.) of the Butmah Formation in the type section consist of oolitic and detrital limestone with beds of argillaceous limestone, shale and anhydrites. The middle part (180m.) is oolitic, argillaceous and dolomitic with sandstone and shale bed. The lower part (120m.) is composed of limestone with bedded anhydrite. The lithofacies and faunal assemblages indicate that Butmah Formation was deposited in shallow water lagoonal and sabkha environment.

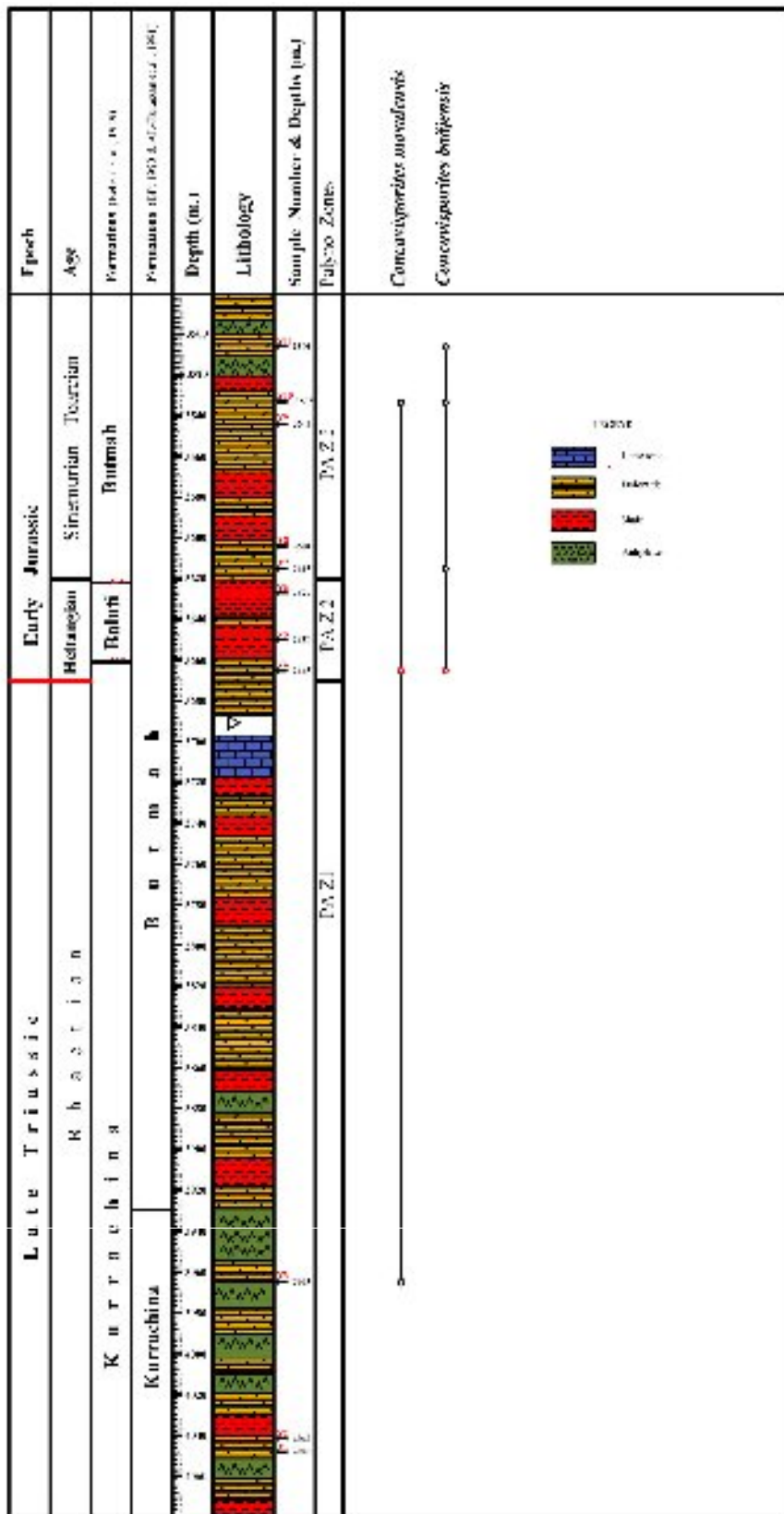


Fig. 2: Stratigraphic Succession, Sample Position and Range of the New Species in Borehole Tel-Hajar-1 (Kddo, 2011).

SYSTEMATIC PALAEONTOLOGY

Anteturma: PROXIMEGERMINANTES Potoniè, 1970.

Turma: TRILETES Reinsch emend. Dettmann, 1963.

Suprasubturma: ACAVATITRILETES Dettmann, 1963.

Subturma: AZONOTRILETES Lubber emend. Dettmann, 1963.

Infraturma: LAEVIGATI Bennie and Kidston emend. Potoniè, 1956.

Genus: *Concavisporites* Pflug in Thomson and Pflug 1953, *emend.* Delcourt and Sprumont, 1955.

Type Species: *Concavisporites rugulatus* Thomson and Pflug 1953, Pl.1, Fig.19.
Concavisporites baājensis sp. nov.

Pl. 1 , Figs.1-4

2009 *Concavisporites* sp. Götz *et al* , P.407, Pl. I, Fig. g.

2011 *Concavisporites* sp.1. in Kddo, P. 23 , Pl.3 , Figs. 6,7.8 and Pl. 4, Fig.1.

Diagnosis: Miospores radial, Trilete. Amb triangular, sides concave, angles broadly rounded. Laesurae distinct, simple, straight, often accompanied by narrow lips(1 µm.) or less in width sometimes opened, 3/4 - 4/5 of spore radius in length. Tori distinct (3-5 µm.) wide, fading towards the apices. A distinct ribbon-like folds around the amb developed. These bulbous folds when coincide with amb the margin became undulat. Exine acavate, laevigate, often show minor convolute folds on the proximal and distal surface.

Size: 42 (47.5) 53 µm.

Holotype: Borehole /Tel Hjar-1 /Sample No. (Y4)/ Depths 3665(2)/ R.110.8, 2.2.

Name derivation: After baāj county in Mosul Governorate.

Comparison: *Concavisporites* sp. figured by (Götz *et al.*, 2009) Pl.1, Fig. g , but not described , from the Triassic - Jurassic boundary in Hangary look very similar to our

new species. *Concavisporites baājensis* is different from other members of the genus by the presence of convolute folds around the amb.

Stratigraphic importance: This species appears at the turnover boundary between Triassic and Jurassic boundary in Iraq and Hungary, so it is potentially index species for this age.

Natural affinity: Filicopsida.

Age range: Triassic - Jurassic boundary and Lower Jurassic.

Concavisporites mosulensis sp.nov.

Pl. 1, Figs. 5 - 8

2011 *Concavisporites* sp.2. in Kddo, P. 23, Pl. 4, Figs. 2, 3, 4.

Diagnosis: Miospores, radial, trilete, Amb triangular, sides straight, angles narrowly rounded, Laesurae simple, usually opened, 3/4-4/5 of spore radius in length. Tori distinct 2-4 μm . wide around the laesurae in the inter radial regions, radial regions free from tori. Exine acavate, laevigate, numerous convolute folds present on the proximal and distal surface, these folds may connect to form pseudoreticulum ornamentation, often forming a ribbon like, reflected at the margin of the spores giving the appearance of undulate margin.

Size: 36(61)59 μm .

Holotype: Borehole Tel Hjar-1/3665(1)/ R.133.5, 8.2/Size:45 μm .

Name derivation: After Mosul city.

Comparison: This species is distinguished from *Concavisporites baājensis* by its straight sides and narrow angles and the absence of the tori at the radial regions.

Stratigraphic importance: This species appears at the turnover boundary between Triassic and Jurassic boundary in Iraq and Hungary, so it is potentially index species for this age.

Natural affinity: Filicopsida.

Age range: Triassic – Jurassic boundary and Lower Jurassic.

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Plate 1

- Fig.1: *Concavisporites baājensis* / Tel Hjar-3665(2)/ R.110.8, 2.2/Size:53µm.
- Fig.2: *Concavisporites baājensis* / Tel Hjar-3665(2)/ L.109.5, 9/Size:42µm.
- Fig.3: *Concavisporites baājensis* / Tel Hjar-3665(1)/ R.114.6, 2.7/Size:48µm.
- Fig.4: *Concavisporites baājensis* / Tel Hjar-3506(1)/ R.112.6, 7.9/Size:51µm.
- Fig.5: *Concavisporites Mosulensis* / Tel Hjar-3665(1)/ R.131.7, 5/Size:59µm.
- Fig.6: *Concavisporites Mosulensis* / Tel Hjar-3665(1)/ R.133.5, 8.2/Size:45µm.
- Fig.7 *Concavisporites Mosulensis* / Tel Hjar-3665(1)/ R.102.1, 2.2/Size:36µm.
- Fig.8: *Concavisporites Mosulensis* / Tel Hjar-3615(2)/ L.115.4, 10.7/Size:47µm.

Plate 1

