

RESEARCH ARTICLE

SPATIO-TEMPORAL VARIABILITY OF THE UVIGERINID MEMBERS AND OTHER RELATED TAXA IN THE SOUTHERN TETHYS

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ARTICLE DETAILS

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ABSTRACT

Spatio-temporal variability of thirty-one Maastrichtian-Neogene Uvigerinid benthic foraminiferal species and other related taxa in seventeen localities in the Southern Tethys (Chile, Argentina, Ecuador, Venezuela, Ivory Basin, Nigeria, Tunisia, Libya, Egypt, Jordan, UAE, Qatar, Iran, Pakistan, Japan, Australia, southwest Pacific) are presented. Two of these species are treated here as new: *Uvigerina tusmanica* and *Uvigerinella tunisica*. The prominent environment of the recorded assemblage are ranged from the Outer shelf-bathyal environment.

KEYWORDS

Uvigerinid Benthic Foraminifera, Maastrichtian,, Paleogene, Neogene, Southern Tethys

1. INTRODUCTION

Thirty-one Maastrichtian-Neogene Uvigerinid species of nine genera from 17 localities in the Southern Tethys have been illustrated and discussed. Ten species of the d assemblage are recorded from Egypt (~32%), four from each of UAE and southwest Pacific (~17%), tree from Chile and Nigeria (~9%), two from Ivory Basin, Libya and Pakistan (~6%), one only from each of Argentina, Ecuador, Venezuela, Tunisia, Jordan, Qatar, Iran, Japan, Australia (~3%). Some of the recorded species are recorded from three or more localities (i.e. *Uvigerina gallowayi*, *U. jacksonensis*, *U. rippensis* and *Uvigerinatella peregrina*), while the others are endemic to their original description.

2. MATERIAL OF STUDY

The Uvigerinid species have good preservation, which are distributed all over the world, including the Middle East.

3. SYSTEMATIC PALEONTOLOGY

The modern taxonomical consideration of the Uvigeriniid benthic foraminiferal genera and its species are treated in this study. The taxonomy of Loeblich & Tappan (1988) is used, and illustrated in Plate 1.

4. PALEOENVIRONMENT

The open marine environment Lagenid benthic foraminiferal species supports the open Mediterranean Current in all directions, suggested a neritic environment, about 200-300 m water depth (Figure 2).

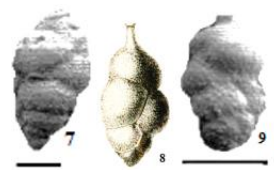


Figure1 : 1. *Eouvigerina aegyptiaca* Nakkady (1950), 2. *Pseudouvigerina sinaensis* Said and Kenawy (1956), 3. *Rectuvigerina argentinica* Anan (2023), 4. *Rectuvigerina lakiensis* (Haque, 1956), 5. *Rectuvigerina maqfiensis* (LeRoy, 1953), 6. *Euuuigerina subproboscidea* (Haque, 1956), 7. *Euuuigerina subproboscidea* (Haque, 1956), 8. *Neouuigerina auberiana* (d'Orbigny, 1839), 9. *Neouuigerina helali* Anan (2024), 10. *Neouuigerina hispida* (Schwager, 1866), 11. *Neouuigerina proboscidea* (Schwager, 1866), 12. *Uvigerina cocoaensis* (Cushman, 1925), 13. *Uvigerina compressa* (Ansary, 1955), 14. *Uvigerina conica* Anan (2024), 15. *Uvigerina fadeli* (Bou Dagher, 1988), 16. *Uvigerina gallowayi* (Cushman, 1929), 17. *Uvigerina globosa* Anan (2024), 18. *Uvigerina jacksonensis* (Cushman, 1925), 19. *Uvigerina lakiensis* Haque (1956), 20. *Uvigerina mediterranea* (Hofker, 1932), 21. *Uvigerina rippensis* (Cole, 1927), 22. *Uvigerina spinosa* Boersma (1984), 23. *Uvigerina tusmanica* Anan, n. sp., 24. *Uvigerinella arabica* Hewaidy & Al Hitmi (1994), 25. *Neouuigerina auberiana* (d'Orbigny 1839), 26. *Uvigerinella hofkeri* (Said & Kenawy, 1956), 27. *Uvigerinella jordanica* Anan (2024), 28. *Uvigerinella nakkadyi* Anan (1994), 29. *Uvigerinella tunisica* Anan, n. sp., 30. *Uvigerinita senticosa* (Cushman, 1927), 31. *Uvigerinatella peregrina* (Cushman, 1923)

Plate 1

(Scale bar =100µm)

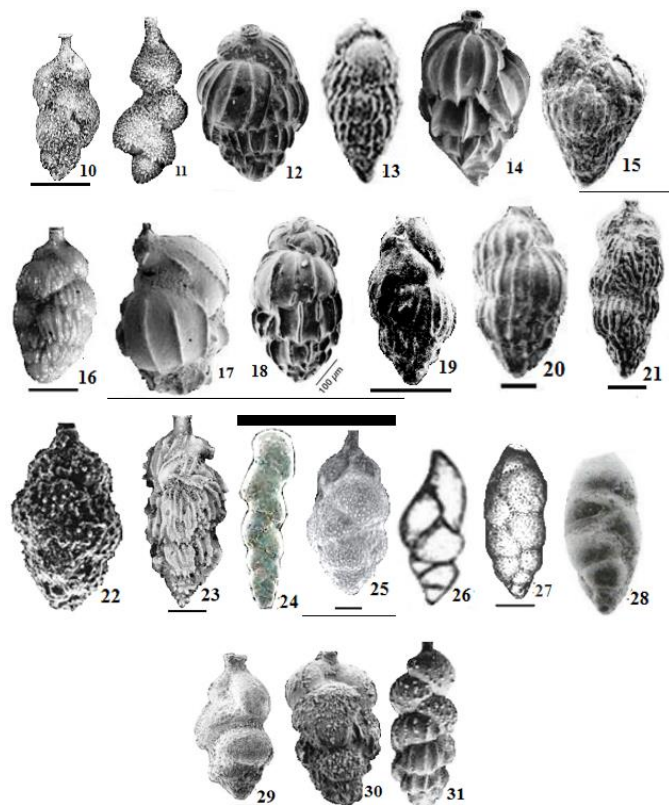
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3.1 Genus Eouvigerina Cushman, 1926 .

- *Eouvigerina aegyptiaca* Nakkady, 1950. Maastrichtian, Egypt, UAE.

3.2 Genus Pseudouvigerina Cushman, 1927.

- *Pseudouvigerina sinaensis* Said and Kenawy, 1956. Maastrichtian-Paleocene. Egypt.

3.3 Genus Rectuvigerina Mathews, 1945.

- *Rectuvigerina argentinica* Anan, 2023. Eocene, Argentina
- *Rectuvigerina lakiensis* (Haque, 1956, *Uvigerina lakiensis*). Paleocene- Eocene. Pakistan.
- *Rectuvigerina maqfiensis* (LeRoy, 1953, *Uvigerina maqfiensis*). Eocene. Egypt.

3.4 Genus Euuvigerina Thalmann, 1952

- *Euuvigerina subproboscidea* (Haque, 1956, *Uvigerina subproboscidea*). Paleocene-Eocene, Pakistan, Egypt.

3.5 Genus Neouvigerina Thalmann, 1952

- *Neouvigerina* (ahmadi Anan, 2024, *Eouvigerina aegyptiaca* - Ali, 2003). Maastrichtian. Egypt.
- *Neouvigerina auberiana* (d'Orbigny, 1839, *Uvigerina auberiana* - Ridha et al, 2019). Miocene. Chile, southwest Pacific.
- *Neouvigerina* (helali Anan, 2024, *Eouvigerinella* sp. Ali, 2003). Early Eocene. Egypt.
- *Neouvigerina hispida* (Schwager, 1866, *Uvigerina hispida*). Oligocene-Miocene. southwest Pacific.
- *Neouvigerina proboscidea* (Schwager, 1866, *Uvigerina proboscidea*). Miocene. southwest Pacific.

3.6 Genus Uvigerina d'Orbigny, 1826

- *Uvigerina cocoaensis* (Cushman, 1925). Eocene, Egypt, UAE.
- *Uvigerina compressa* (Ansary, 1955, Eocene, Egypt.
- *Uvigerina conica* Anan, 2024 (= *Uvigerina bifurcata* - Aturamu, 2016). Miocene. Nigeria.
- *Uvigerina fadeli* (Bou Dagher, 1988). Eocene, Tunisia, Egypt

- *Uvigerina gallowayi* (Cushman, 1929). Eocene. Ecuador, Venezuela, Chile, Libya.
- *Uvigerina globosa* Anan, 2024, p. 109, pl. 2, figure. 3 (= *Uvigerina bifurcata* - Aturamu, 2016). Miocene. Nigeria.
- *Uvigerina jacksonensis* (Cushman, 1925). Eocene. Libya, Egypt, UAE.
- *Uvigerina lakiensis* Haque, 1956. Paleocene. Pakistan.
- *Uvigerina mediterranea* (Hofker, 1932). Eocene. Egypt, Iran.
- *Uvigerina rippensis* (Cole, 1927). Eocene-Miocene. Ivorian Basin, Libya, Egypt, UAE.
- *Uvigerina spinosa* Boersma, 1984. Eocene. Ivorian Basin, southwest Pacific.
- *Uvigerina tusmanica* (= *Uvigerina peregrina* - Ridha et al, 2019). Plate 1, figure. 22.

Etymology: after Australian Tasmania Island, ODP Hole 1168A (Figure. 2).

Stratigraphic level: Miocene. (Figure. 3).

Diagnosis: This new species has finely perforate calcareous wall with elongate triserial test, chambers nearly globular increasing graduly as added, surface ornamented with wrinkles not irregularly anastomosing ribs.

Remarks: It has non- irregularly anastomosing ribs, than other members of *Uvigerina*.

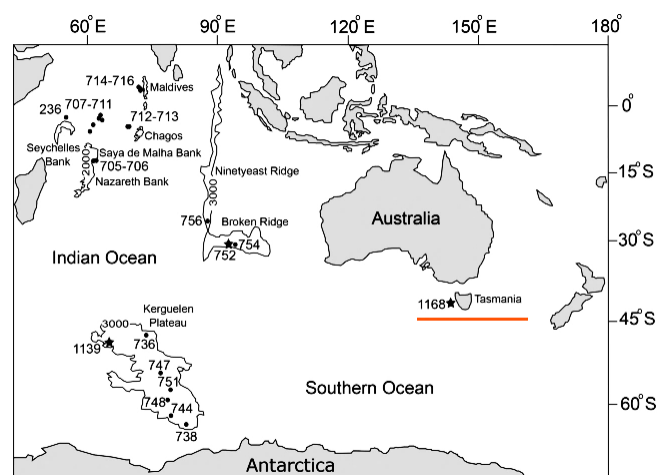


Figure 2. Location map of the *Uvigerina tusmanica*, ODP Hole 1168A, Australian Tasmania Island.

Oligocene	Miocene					Plio.	EPOCH
	Aquitainian	Burdigallian	Langhian	Serravallian	Tortonian	Messin	
Chattian							
							<i>Uvigerina tusmanica</i>

Figure2 : Stratigraphic range of the *Uvigerina tusmanica* Anan, n. sp., ODP Hole 1168A, Australian Tasmania Island.

3.7 Genus Uvigerinella Cushman, 1926

- *Uvigerinella arabica* Hewaidy and Al Hitmi, 1994. Cenomanian, Qatar.
- *Neouvigerina auberiana* (d'Orbigny 1839, *Uvigerina auberiana* of Finger, 2013). Miocene. Chile.
- *Uvigerinella hofkeri* (Said and Kenawy, 1956, *Eouvigerina hofkeri*). Paleocene, Egypt.
- *Uvigerinella jordanica* Anan, 2024. Eocene, Jordan
- *Uvigerinella nakkadyi* Anan, 1994. Eocene. Egypt.
- *Uvigerinella tunisica* Anan, n. sp. (*Uvigerinella* sp. - Karoui-Yaakoub, 2006, p. 582, pl. 1, figure. 14). Plate 1, figure. 29.

Stratigraphic range: Paleocene-Eocene. the cup of Ellès, Tunisia (Figure 4, AB).

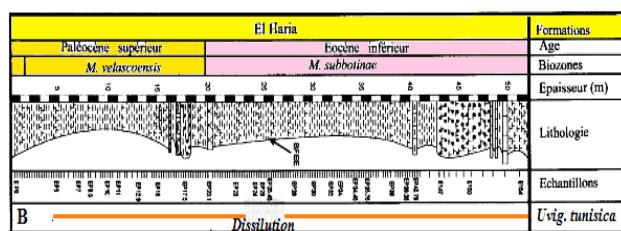
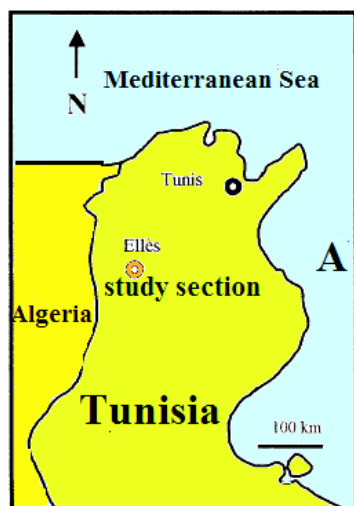


Figure 3 : A) Location map of Ellès section, Tunisia, **B)** stratigraphic range of *Uvigerina tunisica* Anan, n. sp.

Remarks: It has small coarse papillae surface, and diagnostic apertural neck.

3.8 Genus *Uvigerina* Anan, 2024

- Uvigerina senticosa* (Cushman, 1927, *Uvigerina senticosa* - Aturamu, 2016). Miocene. Nigeria, Australia.

3.9 Genus *Uvigerinatella* Anan, 2024

- Uvigerinatella peregrina* (Cushman, 1923, *Uvigerina peregrina* - Aturamu, 2016). Miocene. Chile, Nigeria, Japan.

4. PALEO GEOGRAPHY

The recorded species are distributed in the Southern Tethys: South America, Africa, Asia, and Pacific, which proved the connected of the Atlantic Ocean with the Indo-Pacific Ocean throughout the Maastrichtian-Neogene (Figure. 5).



Figure 4 : The Paleogene-Neogene Neo-Tethys Ocean including Tethyan Circumglobal Current (TCC).

5. PALEOENVIRONMENT

As noted by many authors (e.g. Karoui-Yaakoub, 2006; Finger, 2013; Aturamu, 2016; Anan, 2023) the Southern Tethyan recorded taxa are related to open marine neritic-bathyal water depth, with normal salinity sea water (Figure. 6).

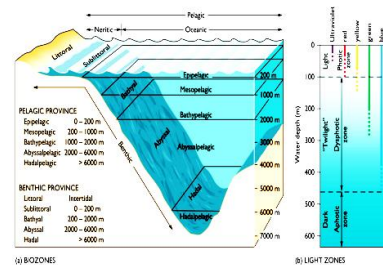


Figure 5 : The pelagic and benthic provinces and light zones of the marine environment.

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