Journal of

Al - Azhar University - Gaza

Natural Sciences

This special issue is released on the occasion of the International Conference on Basic and Aplied Sciences (ICBAS2010)
10-12 October 2010

A Refereed Scientific Journal

Published by
Deanship of Postgraduate Studies and Scientific Research
Al - Azhar University - Gaza
Palestine

ISSN 1810-6366

Volume: 12, ICBAS Special Issue

Lenticulina ennakhali n. sp. (Benthic foraminifera) from the Paleocene-Early Eocene Succession of Abu Zenima Section, Westcentral Sinai, Egypt (Misr)

Haidar Salim Anan
Geology Department, Vice President of Al Azhar University-Gaza, Gaza P. O. Box 1277,
Email: profanan@gmail.com

ABSTRACT: *Lenticulina ennakhali*, a new species of calcareous Lagenid benthic foraminifera is described from the Paleocene-Early Eocene Esna Shale of Abu Zenima section, westcentral Sinai, Egypt. It has an elongate (non circular) involute planispiral test with smooth surface, seven-ten chambers in the last whorl increasing gradually as added, flush sutures, acute periphery with faint keel and radiate terminal aperture at the tip tapering last chamber.
Key words: Benthic foraminifera, Rotaliid, Paleocene, Eocene, Sinai, Egypt.

INTRODUCTION

The Maastrichtian-Ypresian succession (about 85 m thick) of Abu Zenima section in the western Sinai, east Gulf of Suez, Egypt (Fig. 1) consists of the following formations, from older to younger: Maastrichtian Sudr Chalk (in Sinai, which is equivalent to Farafra Chalk in Farafra Oasis, Western Desert of Egypt), Danian-Selandian Dakhla Shale, Thanetian Tarawan Chalk, Thanetian-Ypresian Esna Shale and Ypresian Thebes Formation. The planktonic foraminiferal zonation of this section based on forty four samples collected from this succession was previously attempted by the present author (Anan [(1)]) according to the zonation of Toumarkine & Luterbacher [(2)]. It has been recently revised by Anan [(3)] according the planktic foraminiferal zonation of Berggren & Pearson [(4)] (Fig. 2). The other previous studies on the faunal content of Abu Zenima section (e.g. Anan [(5)], [(6)], [(7)], [(8)], [(9)]) are pertinent to the present study.

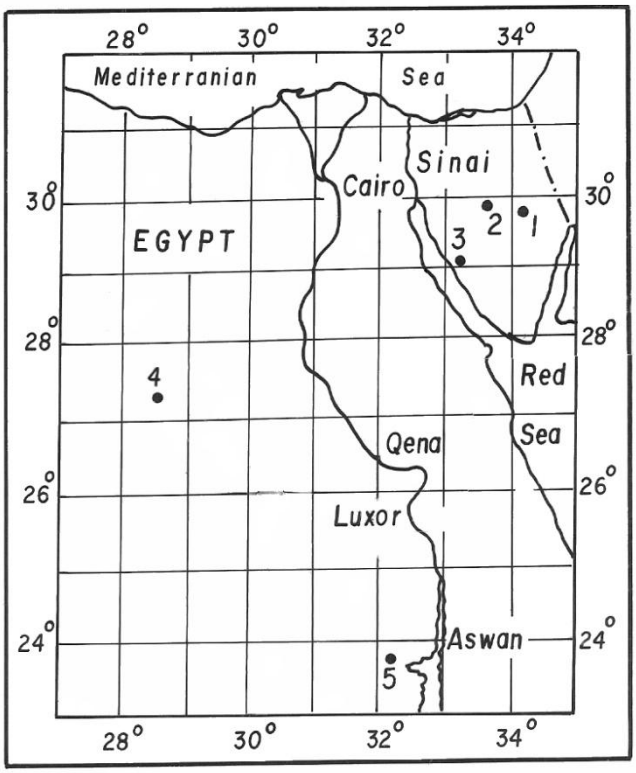

Fig. 1: Location map of the studied section (Abu Zenima), west central Sinai, and other sections used in this study in Egypt: 1. Themed (Ismail, [15]), 2. Nekhl and Giddi (Said & Kenawy, [12]), 3. Abu Zenima (this study), 4. Maqfi (LeRoy, [11]), 5. Garra-Kurkur area (Hewaidy, [13]).

TAXONOMY

The studied samples yielded well-preserved and diverse foraminiferal assemblages. The present investigation is based on forty four samples collected from the Maastrichtian-Early Eocene Esna Shale succession of Abu Zenima section which has furnished the type of the new species *Lenticulina ennakhali*. The classification followed here is that of Loeblich & Tappan[10].

Order Foraminiferida Eichwald, 1830
Suborder Lagenina Delage & Hérouard, 1896
Superfamily Nodosariacea Ehrenberg, 1838
Family Vaginulinidae Reuss, 1860
Subfamily Lenticulininae Cushman, Parker & Collins, 1934
Genus *Lenticulina* Lamarck, 1804
Type species *Lenticulina rotulatus* Lamarck, 1804
Lenticulina ennakhali n. sp.
Holotype: Illustrated specimen in Fig. 2.

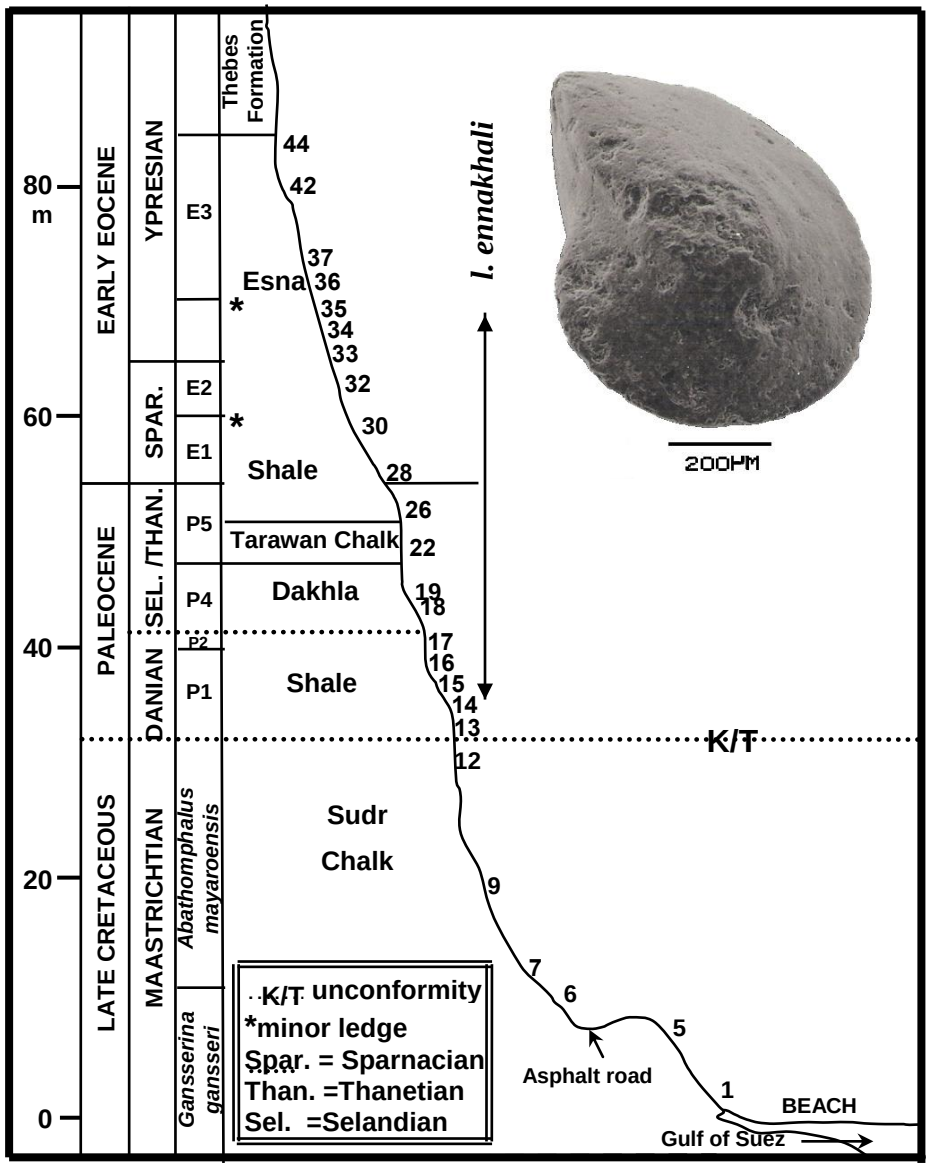

Fig. 2: Litho- and biostratigraphy of Abu Zenima section including the stratigraphic range and the figured specimen of the new species *Lenticulina ennakhali*.

Dimensions of the holotype: Length 0.8 mm, breadth 0.6 mm (l/b= 1. 33).

Type locality & level: Sample 19, Dakhla Shale of Abu Zenima section, Sinai, Egypt.

Stratigraphic range: Early Paleocene *Eoglobigerina edita* PRZ (P1) - Early Eocene *Morozovella marginodentata* Partial Range Zone (E3) of Berggren & Pearson [4].

Depositary: Geology Department, Al Azhar University-Gaza, Gaza, Palestine.

Etymology: In honor of the Palestinian paleontologist Prof. Hamed El-Nakhal.

Diagnosis: Test elongate with gradually added 7-10 smooth chambers, acute periphery with faint keel, curved flush sutures, radial aperture at the apex of a tapering elongate septal face. The most outstanding characteristics which differntiate of the *L. ennakhali* n. sp. from the other species of *Lenticulina* are the tapering last chamber in an elongate test (l/b= 1. 33), flush sutures and sharp periphery with faint keel.

Remarks: *L. ennakhali* n. sp. differs from the following illustrated specimens by different authors, as follows:

1. The Paleocene-Early Eocene *L. ennakhali* n. sp. differs from the type species of the Frensh Upper Cretaceous (Senonian) *L. rotulatus* (Loeblich & Tappan [10] (p. 405, pl. 446, figs. 1-2) by its lesser chambers in the last whorl, less circular test (than tapered last chamber in the n. sp.) and flush sutures than raised sutures in the type species.
2. The Early Eocene *Lenticulina budensis* (Hantken) of LeRoy [11] (p. 46, pl. 6, figs. 18, 19) differs from the new species by its partially evoluted test, slightly depressed to sometimes elevated sutures.
3. The figured Danian specimen as *Robulus pseudo-secans* Cushman of Said & Kenawy [12] (p. 130, pl. 2, fig. 8) from Nekhl section (northern Sinai) differs from the new species by its numerous more than 7 chambers, limbate raised sutures, mature keel and pronounced umbo.
4. The figured Paleocene specimen as *Lenticulina midwayensis* (with its flush sutures) by Hewaidy [13] (p. 68, fig. 12. 2, non of highly raised sutures of Plummer [14] from the Paleocene of Gabal Garra (south Egypt) appears closely related to the present new species. Based on the Paleocene form of Hewaidy [13] (p. 68, fig. 12. 2) which identical to the new species, it seems that the *L. ennakhali* n. sp. has a wide geographic distribution in Egypt (from north in west central Sinai to south in southwest Aswan), as well as wide stratigraphic range (from Early Paleocene of the latter area to Early Paleocene-Early Eocene in the studied section).
5. *L. ennakhali* is closely allied to the illustrated Campanian specimen *L. pseudomamilligera* of Ismail [15] (p. 252, fig. 8. 9, non the Paleocene with highly raised sutures form of Plummer [14] from the Themed section (east Sinai), but differs by its slightly raised sutures. If the faunal assemblage from the Campanian Themed section in east Sinai includes similar forms to those illustrated by Ismail [15] (p. 252, fig. 8. 9) but without raised sutures, the stratigraphic range of the new species can be safely extended to Campanian Stage.

REFERENCES

1. Anan, H. S. (1992): Maastrichtian to Ypresian stratigraphy of Abu Zenima section, west central Sinai, Egypt - Middle East Research Center, Ain Shams University, Earth Sciences Series, Cairo, 6: 62-68.
2. Toumarkine, M. & H. P. Luterbacher (1985): Paleocene and Eocene planktonic foraminifera. *In*: H. M. Bolli *et al.* (Eds.): Plankton Stratigraphy - Cambridge Earth Sci. Ser.: 87-154.

3. Anan, H. S. (2009): Early Eocene *Ellipsoglandulina arafati* n. sp. (benthic foraminifera) from Abu Zenima section, west central Sinai, Egypt - Egyptian Journal of Paleontology, 9: 111-117.
4. Berggren, W. A. & P. N. Pearson (2005): A revised tropical to subtropical Paleogene planktonic foraminiferal zonation - Journal of Foraminiferal Research, 35 (4): 279-298.
5. Anan, H. S. (1994): Contribution to the stratigraphy and paleobiogeography of some diagnostic Upper Cretaceous and Paleogene Foraminifera - N. Jb Geol. Paläont., H. 5: 257-266.
6. Anan, H.S. (2002): Two new benthic foraminiferal species from the Maastrichtian and Paleocene rocks of northern Egypt - M.E.R.C. Ain Shams Univ., Earth Sci. Ser., Cairo, 16: 141-144.
7. Anan, H. S. (2004): A lineage phylogeny for some Maastrichtian to Ypresian benthic foraminifera in Egypt - Egypt. Jour. Paleontol., 4: 39-57.
8. Anan, H. S. (2005): Maastrichtian agglutinated foraminifera in Egypt and other Tethyan countries - Egypt. Jour. Paleontol., 5: 75-92.
9. Anan, H. S. (2008): Latest Maastrichtian *Plummerita haggagae* and Paleocene *Pseudoclavulina hewaidyi*, two new foraminiferal species from Egypt - Egyptian Journal of Paleontology, 8: 245-254.
10. Loeblich, A. R. & H. Tappan (1988): Foraminiferal genera and their classification - Van Nostrand Reinhold (VNR) Company, New York, Part 1: 970 p., Part 2: 847 p.
11. LeRoy, L. W. (1953): Biostratigraphy of Maqfi section, Egypt - Memoir Series of the Geological Society of America, 54: 1-73.
12. Said, R. & A. Kenawy (1956): Upper Cretaceous and Lower Tertiary foraminifera from northern Sinai, Egypt - Micropaleontology, 2 (2): 105-173.
13. Hewaidy, A. A. (1994): Biostratigraphy and paleobathymetry of the Garra-Kurkur area, southeast Aswan,3 Egypt - Middle East Research Center, Ain Shams University, Earth Science Series, Cairo, 8: 48-73.
14. Plummer, H. J. (1927): Foraminifera of the Midway Formation in Texas - Bull. Univ. Texas, 2644: 3-206.
15. Ismail, A. A. (2000): Upper Cretaceous stratigraphy and micropaleontology of the western part of the Gulf of Aqaba, East Sinai - Middle East Research Center, Ain Shams University, Earth Science Series, Cairo, 14: 239-261.

مجـــــــلة

جامعة الأزهر - غزة

العلوم الطبيعية

عدد خاص بالمؤتمر الدولي الأول للعلوم الأساسية والتطبيقية
من ١٠-١٢ أكتوبر ٢٠١٠

مجلة علمية محكمة

تصدر عن

عمادة الدراسات العليا والبحث العلمي

جامعة الأزهر- غزة

فلسطين

ISSN 1810-6366

المجلد ١٢، عدد خاص