PALAEOPELAGOS, 1994, 4: 47 - 59, Roma.

Tekkeina anatoliensis n.gen. n.sp., a new foraminifer from Susuz Dağ, Western Taurus, Turkey

Anna Farinacci* & Gülçin Yeniay**
*Dipartimento di Scienze della Terra, Università La Sapienza 00185 Roma
** Enis Behic Koryurek Sokak 10/1, Çankaya, 06690 Ankara

Abstract - A new species of Ammobaculinidae is here described from Susuz Dağ, the southern part of the Bey Dağlari, Taurus mountains, Turkey. Due to the presence of globotruncanids, this Cretaceous benthonic foraminifer has been well dated and its palaeoecology reconstructed. The presence of a foraminifer inside a specimen of *Tekkeina anatoliensis* is also recorded.

Key words: Santonian, foraminifers, ramp environment, Western Taurids, Turkey.

INTRODUCTION

In a ramp environment of the southern Bey Dağlari a new benthonic foraminifer has been found: *Tekkeina anatoliensis* n.gen. n.sp.; the Santonian age is controlled by globotruncanids. The transitional facies between the carbonate platform of Susuz Dağ and the pelagic shallow basin of the northern Bey Dağlari is characterized by a typical ramp assemblage of well preserved strong benthonic foraminifers and broken thin globotruncanids, without reworking of carbonate shelf organisms.

STRATIGRAPHY

The Tekke section

The Tekke section is situated on the western side of the Gulf of Antalya in the Bey Dağlari, the southern part of which is known as Susuz Dağ. The geographical subdivision is also valid in a sedimentological sense as for as the depositional environment of the Upper Cretaceous is concerned. The Tekke section belongs to the carbonate platform of Susuz Dağ and more specifically to the southern external transition, towards the pelagic basin of the shallow sea of the Bey Dağlari. The Upper Cretaceous portion of the Tekke section is formed of layered micritic limestones, changing from white to pinkish gray colour, crossed by reddish stylolites

(Beydag Formation). Cherts are found only at the top of the section, in the Upper Campanian pelagic "scaglia" type limestones (Akdağ Formation), above the sedimentary gap between Santonian and Late Campanian (fig. 1).

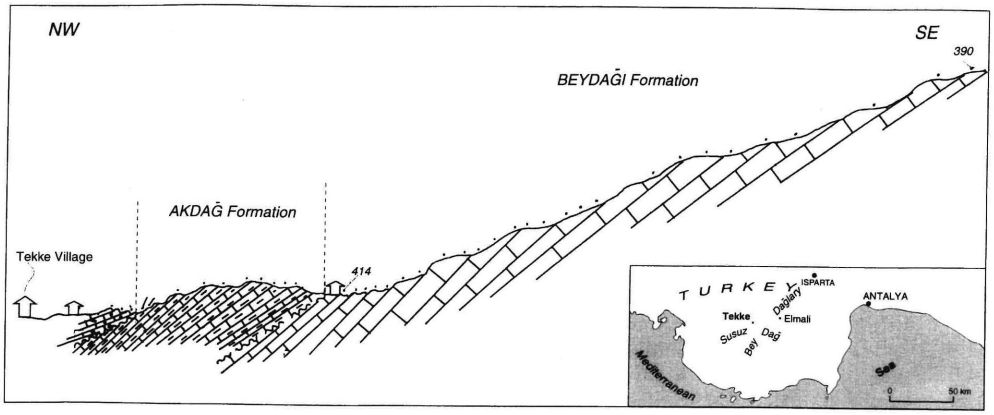


Fig. 1 - The Tekke section. The Santonian limestones of the Beydagi Formation underlie the Late Campanian cherty limestones of the Akdag Formation, beetween them is a very important sedimentary gap, marked by unconformity.
After A. Sait Bolukbasi.

Biostratigraphy

In the whole Tekke section the age is constrained by globotruncanids; typical assemblages of Santonian and Late Campanian have been recognized. A very important gap, marked by unconformity, exists between the Santonian and Upper Campanian limestones. Only the Santonian portion of the section has been taken into consideration, because in this interval the new foraminifer *Tekkeina anatoliensis* has been observed; the whole Tekke section has already been described (Farinacci & Yeniay, 1988). *Tekkeina anatoliensis* n.gen. n.sp. is limited to about 180 m of the Santonian limestones; it appears 100 m from the base of the section and ends at the unconformity. Above the gap, in the Upper Campanian cherty limestones, *Tekkeina anatoliensis* is absent.

Planktonic foraminifers

The Santonian age of the *Tekkeina* limestones is controlled by the following planktonic foraminifers:

Globotruncana bulloides Vogler
Globotruncana linneiana (d'Orbigny)
Rosita fornicata (Plummer)
Marginotruncana coronata (Bolli)
Marginotruncana marginata (Reuss)
Marginotruncana pseudolinneiana Pessagno
Dicarinella concavata (Brotzen)
Archaeoglobigerina cretacea (d'Orbigny)

In addition to this assemblage belong: *Globigerinelloides* sp., *Hedbergella* sp., Heterohelicidae.

Benthonic foraminifers

We have found together with the planktonic foraminifers, in the same assemblage:

Tekkeina anatoliensis n.gen. n.sp.
Goupillaudina sp.
"Rotalina" cayeuxi De Lapparent
Bolivinoides sp.
Small agglutinated uniserial and biserial forms.

Miliolacea are totally lacking.

The classification of the whole fauna was based only on thin sections of the limestones.

SYSTEMATICS

Order Foraminifera
Family Ammobaculinidae Saidova, 1981
Genus ***Tekkeina*** n.gen.

Description - Test free, irregularly planispiral coils, evolute, whorls partially overlapping on the lateral sides. Wall of two layers, the outer thick of coarse agglutinated sparry calcite grains, the inner thin of black material.

Type species - *Tekkeina anatoliensis* n.sp.

Derivation of name - From Tekke village, Western Taurus, Turkey.

Tekkeina anatoliensis n.sp.
Pls 1, 2, 3
Holotype Pl. 1, fig. 1
Paratypes Pl. 1, figs 2-4; Pl. 2, 3

Derivation of name - From Anatolia, Turkey.

Type level - Santonian.

Occurrence - *Tekkeina anatoliensis* has been found in the type locality together with *Globotruncana bulloides, G. linneiana, Rosita fornicata, Marginotruncana coronata, M. marginata, M. pseudolinneiana, Dicarinella concavata, Archaeoglobigerina cretacea, Hedbergella* sp., *Globigerinelloides* sp., Heterohelicidae, *"Rotalina" cayeuxi, Goupillaudina* sp., *Bolivinoides* sp., small agglutinated uni - biserial forms.

Type locality - Northern flank of the Susuz Dağ, immediately to the south of Tekke village, where the Santonian and Upper Campanian limestones crop out, underlying the Tertiary deposits.

Environment - Transitional ramp facies, between a carbonate shelf and an open sea floor.

Depository - Museo di Paleontologia, Collezione Micropaleontologica, Università La Sapienza, Roma. Holotype: NS33-45, paratypes NS33-46 - 60. Sample 403 of the Tekke section.

Description - Test free, coiled, ovoidal to subglobular, the first whorl streptospirally enrolled, later evolute and irregularly planispiral. About ten chambers per whorl, enlarging gradually and becoming relatively low. The three whorls of the adult stage partially overlapping each other on the lateral sides, the chambers taking a laterally curved shape lying on the sides. Septa rectilinear and perpendicular to the previous whorl. Wall of two layers, the outer very thick coarsely agglutinated with carbonate grains of sparry calcite, the inner thin and black, covering the internal surface of the chambers, being absent where the septa overlappe the previous whorl. Aperture simple on the base of the septa, presumed slit shape.

Dimensions of the holotype - Maximum diameter mm 2.35
Thickness of the wall mm 0.22

Remarks - *Tekkeina anatoliensis* is similar to *Navarella joaquini* Ciry & Rat of the same family, mainly in the very thick wall of the test and the irregular coiling, but many differences separate them. *Tekkeina anatoliensis* differs from *Navarella joaquini* in having a wall of agglutinated carbonate grains, instead of quartz grains of *Navarella,* being hyaline on both the walls. This differing feature could depend on the material present in the environments, the latter was found in flysch deposits and the former in micrites in which many skeletal grain were widespread. Therefore the main differences may be noticed in the morphology:

Navarella	*Tekkeina*
Involute coiling.	Evolute coiling partially embracing.
Septa strongly arched.	Septa rectilinear, perpendicular to the previous whorl.
Uncoiled in the last stage.	Always coiled.
Streptospirally enrolled, later uncoiling.	First whorl streptospirally enrolled, later planispiral.

PALAEOENVIRONMENT

Upper Cretaceous differences between Susuz Dağ and the northern Bey Dağlari facies have already been pointed out in our previous work (Farinacci & Yeniay, 1988) and subsequently incorporated in a geodynamic model (Farinacci, 1993). From Cenomanian to Maastrichtian the limestones in the Susuz Dağ area were deposited in a typical carbonate platform facies; while in the central and northern Bey Dağlari the depositional features changed at the base of the Turonian, becoming pelagic with gaps of different duration, with transgressions in the same pelagic facies. Between these two differentiated domains a large ramp was the topographical connection on which micritic limestones were deposited in a transitional typical

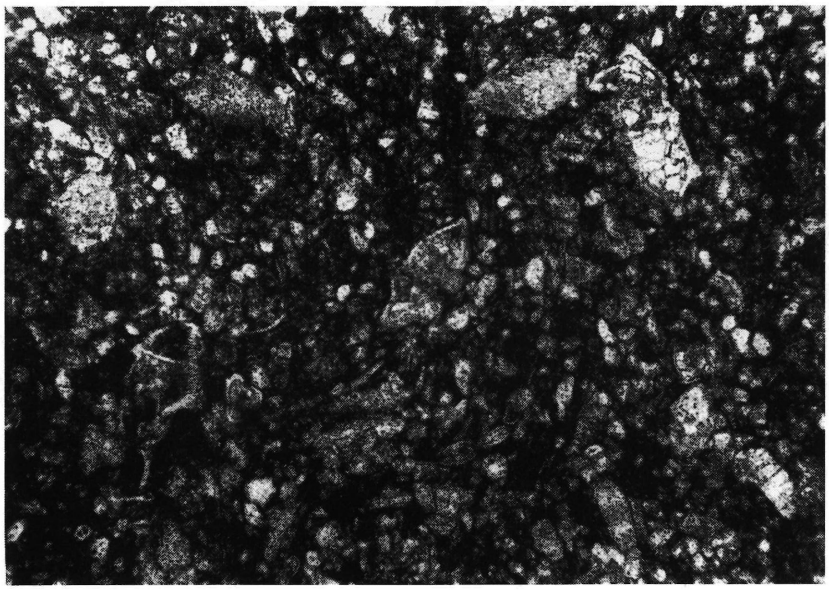
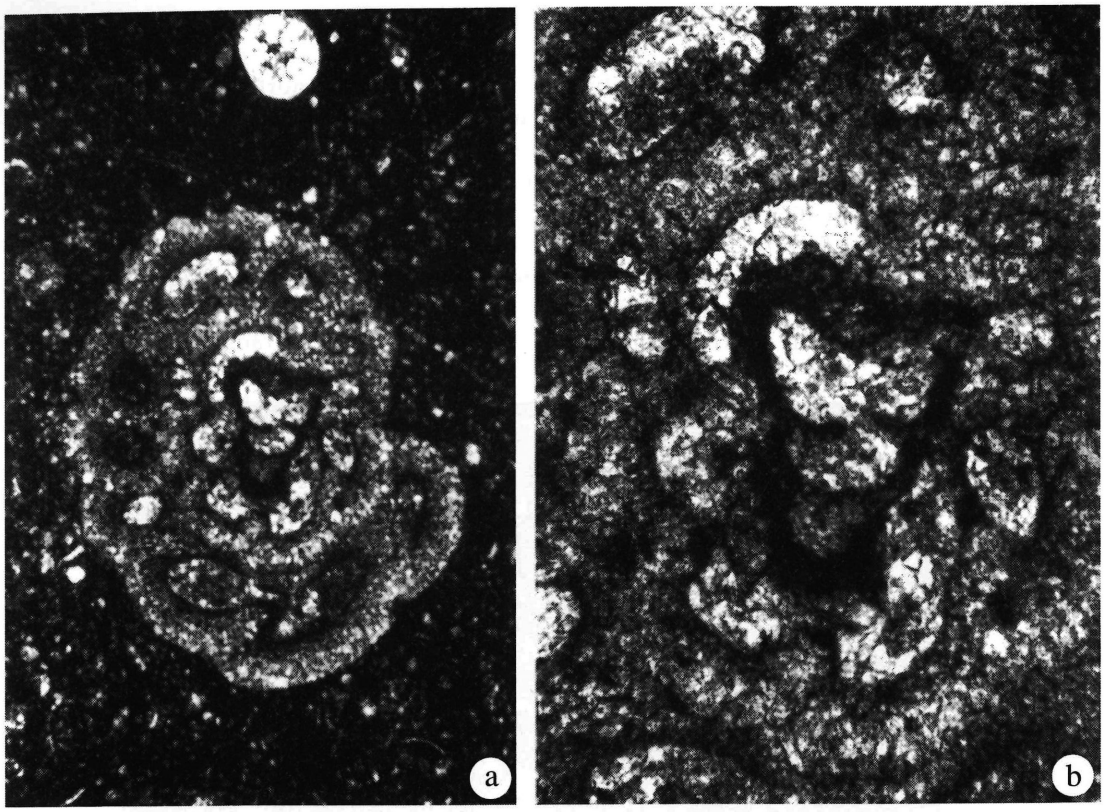


Fig. 2 - The lithofacies of the micrite limestone with bad preserved globotruncanids, also broken in small remains; x80. Sample 412 of the Tekke section, containing *Tekkeina anatoliensis*.

ramp facies. In fact, because of the low angle of inclination typical of a ramp (Burchette & Wright, 1992) no reworked fauna from shelf is present, not even characteristic algae and foraminifers commonly widespread on the carbonate platform, as Dasycladales and Miliolacea, but an assemblage of a facies in which, together with some species of badly preserved, broken globotruncanids (fig. 2), there are benthonic foraminifers which were ecologically deeper as goupillaudinids and rotaliids which are well preserved because of having strong thick tests (Pl. 4). The ramp facies is not readily preserved in the geological records, as in this case, because it was alternately built and destroyed, depending on its position between the carbonate build-up of the shelf and the pelagic deposition in the open sea. Therefore the thickness of the Santonian limestones of the Tekke section of about 180 m cropping out (the base is already Santonian and the top is truncated by



Figs 3a and 3b - *Tekkeina anatoliensis* n.gen., n.sp. in which a specimen of *?Ammobaculites* has grown inside (explanation in the text); 3a) x35, 3b) x80.

unconformity between Santonian and Late Campanian), may be controlled by an active subsidence of faulting tectonics on the platform (as explained in fig. 3 in Farinacci 1993).

Appendix Inside the test of a specimen of *Tekkeina anatoliensis* an agglutinated small foraminifer has been found, apparently grown together with the host (fig. 3). Several interpretations may be suggested, and few authors have dedicated time to consider different possibilities explaining the same phenomenon elsewhere and sometimes pointed out (see in Sampò, 1972, discussion and references). It is our opinion that the simplest and easiest cause to be suggested in solving a geological problem, is always the best. Therefore, we suppose the juvenile stage of the guest foraminifer was agglutinated with other foreign particles by *Tekkeina*. The live guest continued its growth, as did *Tekkeina*. But as soon as *Tekkeina* finished building its whorl, and reached its growing guest, the latter was incorporated inside, stopped its growth and was buried by the growing test of *Tekkeina*.

ACKNOWLEDGEMENT

Thanks are due to A. Sait Bolukbasi, geolog of the TPAO (Turkish Petroleum Corporation), for his work on the field and the collecting samples of the Tekke section. His collaboration has been of great help and we are indebted with him.

REFERENCES

BANNER F.T., 1971 - A new genus of the Planorbulinidae an endoparasite of another foraminifer. *Riv. Esp. Microp.*, **3/2:** 113-128.

BURCHETTE T.P. & WRIGHT V.P., (1992) - Carbonate ramp depositional systems. *Sedimentary Geology*, **79:** 3-57.

BARTENSTEIN VON H., 1952 - Taxonomische Bemerkungen zu den Ammobaculites, Haplophragmium, Lituola und verwandten Gattungen (For.). *Senckenbergiana*, **33,** 4/6: 297-343.

CIRY R. & RAT P., 1951 - Un foraminifère nouveau du Crétacé supérieur de la Navarre espagnole. *Bull. Sci. Bourgogne*, **13:** 81-85.

FARINACCI A. & YENIAY G., 1988 - Biostratigraphy and event analysis of the Cenomanian-Maastrichtian carbonates of the Bey Daglari (Western Taurus, Turkey). *Geologica Romana*, **25:** 257-284.

FARINACCI A. 1993 - Argolide (Grecia) e Bey Daglari (Turchia) : un preteso per l'utilizzazione delle facies nella comprensione della tettonica sinsedimentaria. *Paleopelagos*, **3:** 51-62.

KAEVER M., 1971 - Recherches sur le foraminifère Lituola irregularis (Roemer). *Soc. Geol. France, Compte Rendue*, **1:** 35-37.

KUPPER K., 1954 - Notes on Upper Cretaceous larger foraminifera. II, Genera of the subfamily Orbitoidinae with remarks on the microspheric generation of Orbitoides and Omphalocyclus. *Cush. Found. Foram. Res., Contr.*, **5/4:** 179-184.

MAYNC W., 1954 - The genus Navarella Ciry & Rat, 1951, in the Maastrichtian of Switzerland. *Cushman Found. Foram. Res., Contr.*, **5/3:** 139-142.

SAMPÒ M., 1972 - Macroforaminiferi (Navarella joaquini Ciry & Rat, Lituola grandis (Reuss) nella Scaglia rossa (Maastrichtiano) del Veronese. *Boll. Soc. Paleont. Ital.*, **11/1:** 100-117.

Plate 1

Figs 1-4 - *Tekkeina anatoliensis* n.gen., n.sp. x35; 1) holotype, NS33-45, sample 403-14, 101 metres from the base of the Tekke section; 2-4) paratypes, 2-NS33-46 - 48.

Plate 2

Figs 1-6 - *Tekkeina anatoliensis* n.gen., n.sp. x35; paratypes, NS33-49 - 54. x35.

Plate 3

Figs 1-6 - *Tekkeina anatoliensis* n.gen., n.sp. paratypes, NS33-55 - 60. x35.

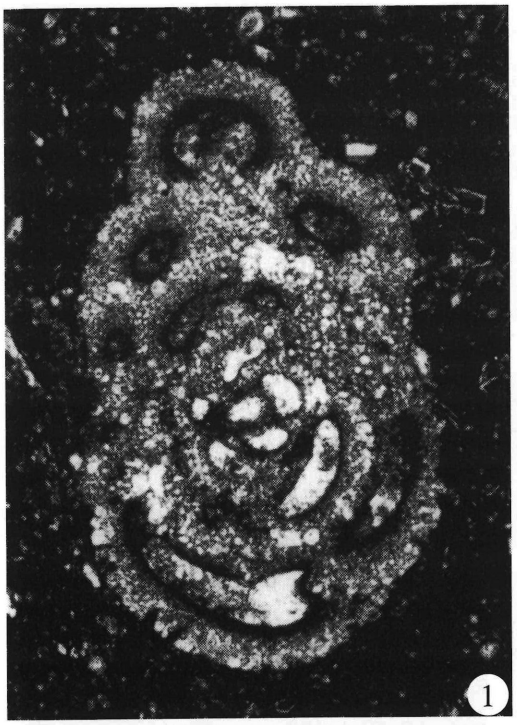
Plate 4

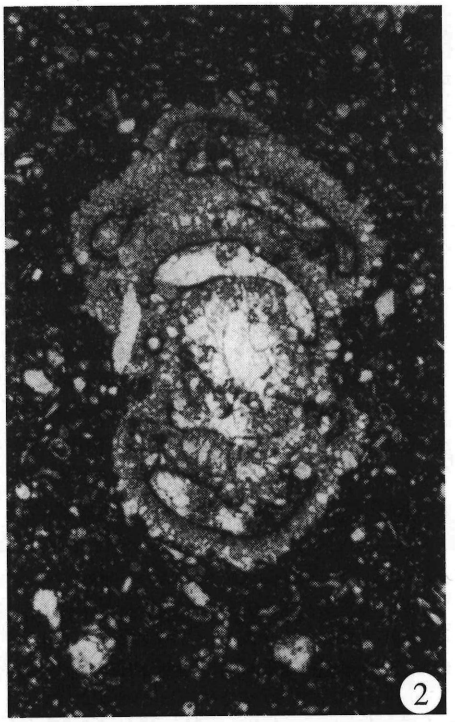
Figs 1-3 - *Ammobaculites* sp. x85.
Figs 4-6 - *Goupillaudina* sp. 4, 6) x95, 5) x80.
Fig. 7 - *"Rotalina" cayeuxi* De Lapparent and *?Marginotruncana* sp., x115.

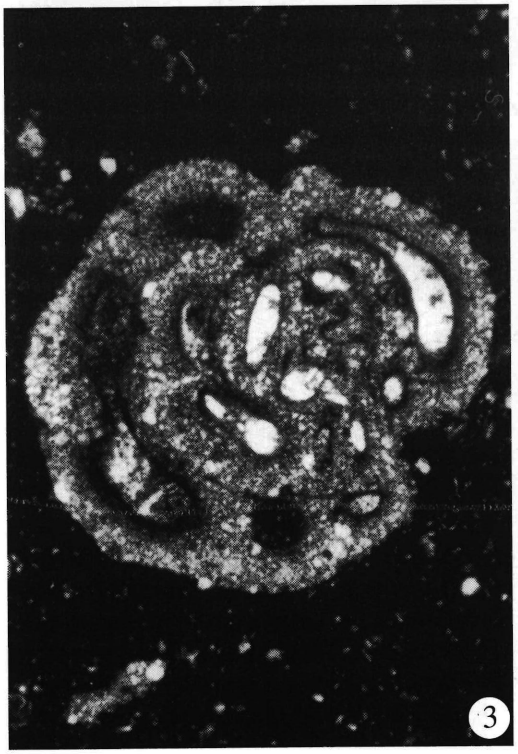
Plate 5

Fig. 1 - *Rosita fornicata* (Plummer).
Fig. 2 - *Marginotruncana pseudolinneiana* Pessagno.
Fig. 3 - *Globotruncana linneiana* d'Orbigny.
Fig. 4 - *Marginotruncana marginata* (Reuss).
Figs 5, 6, 7 - *Globotruncana bulloides* Vogler.
Figs 8, 9 - *Globigerinelloides* sp..
Fig. 10 - *Hedbergella* sp.
Figs 11, 12 - *Heterohelix* sp.
Fig. 13 - *Heterohelix* and *Bolivinoides* sp.
Fig. 14 - *Bolivinoides* sp.
All figures x145

Plate 1







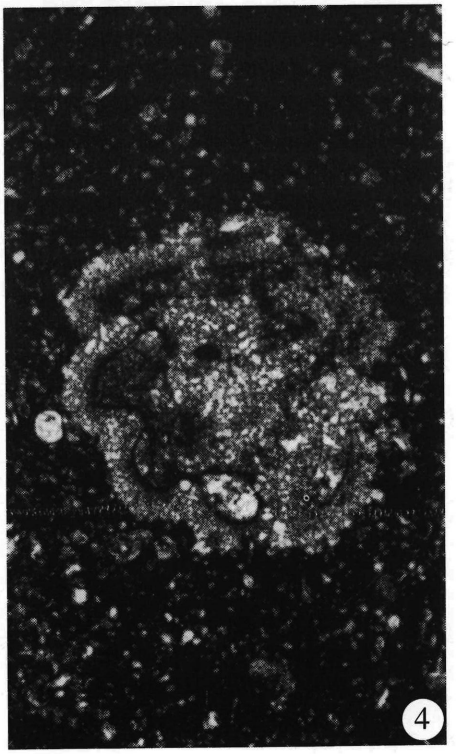
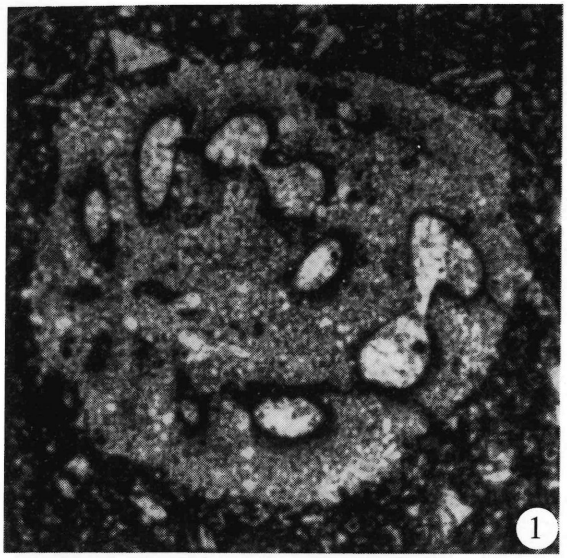
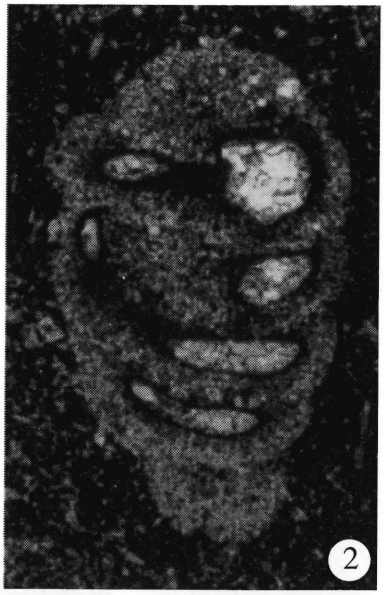
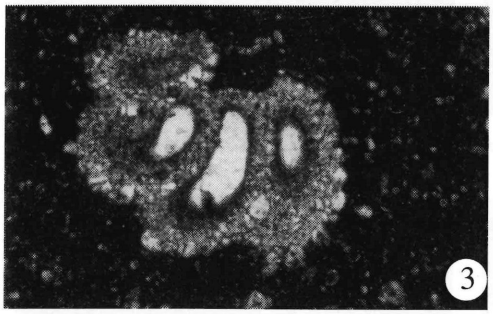
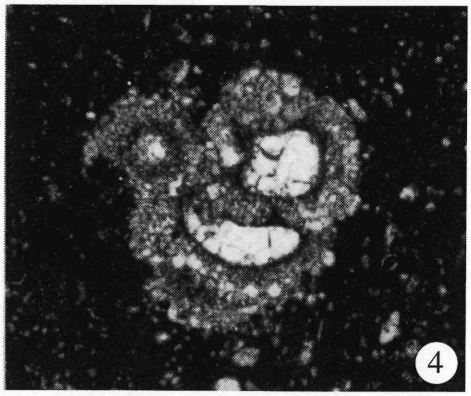


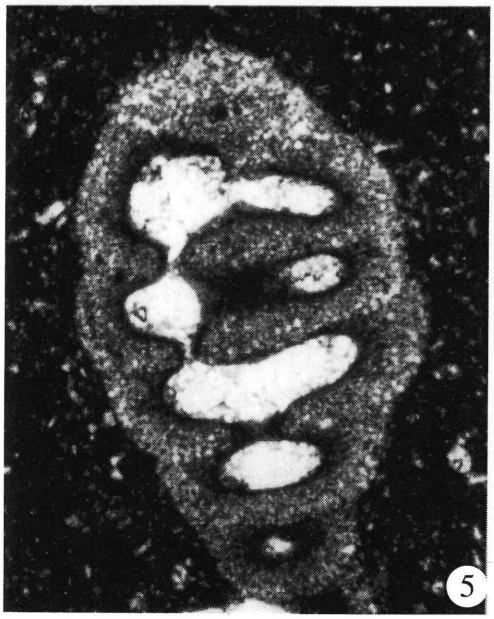
Plate 2











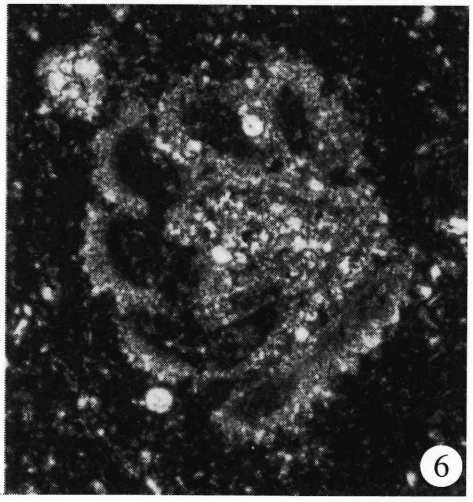
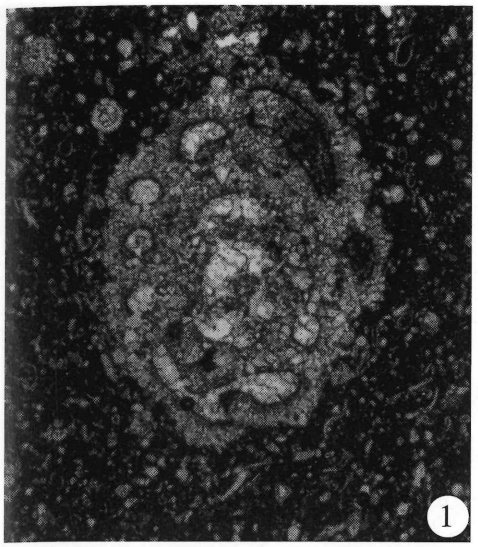
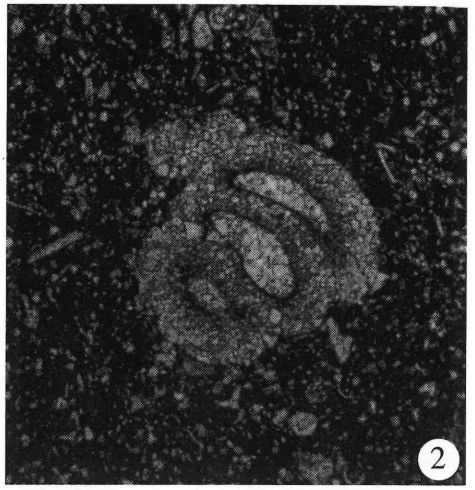
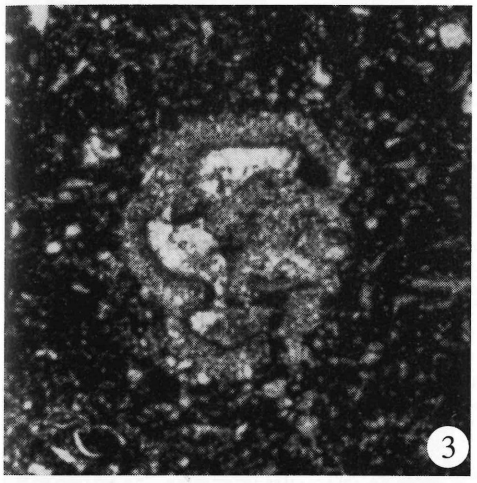
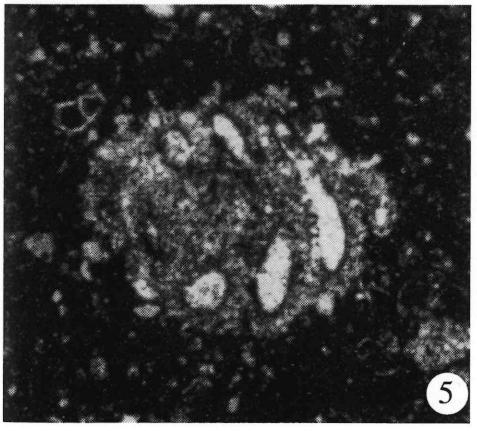


Plate 3









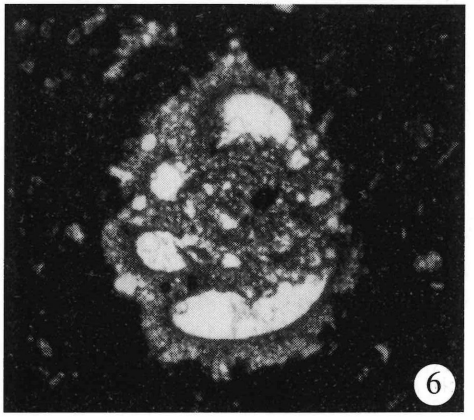
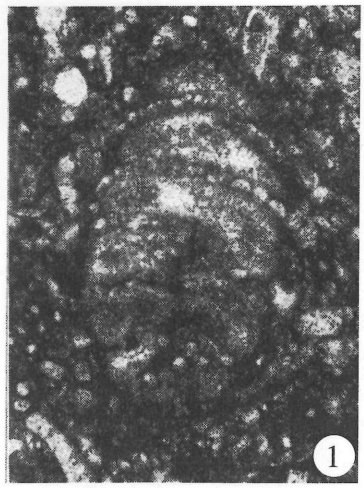
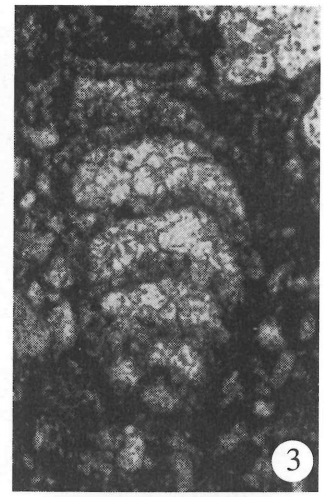


Plate 4


1


2


3

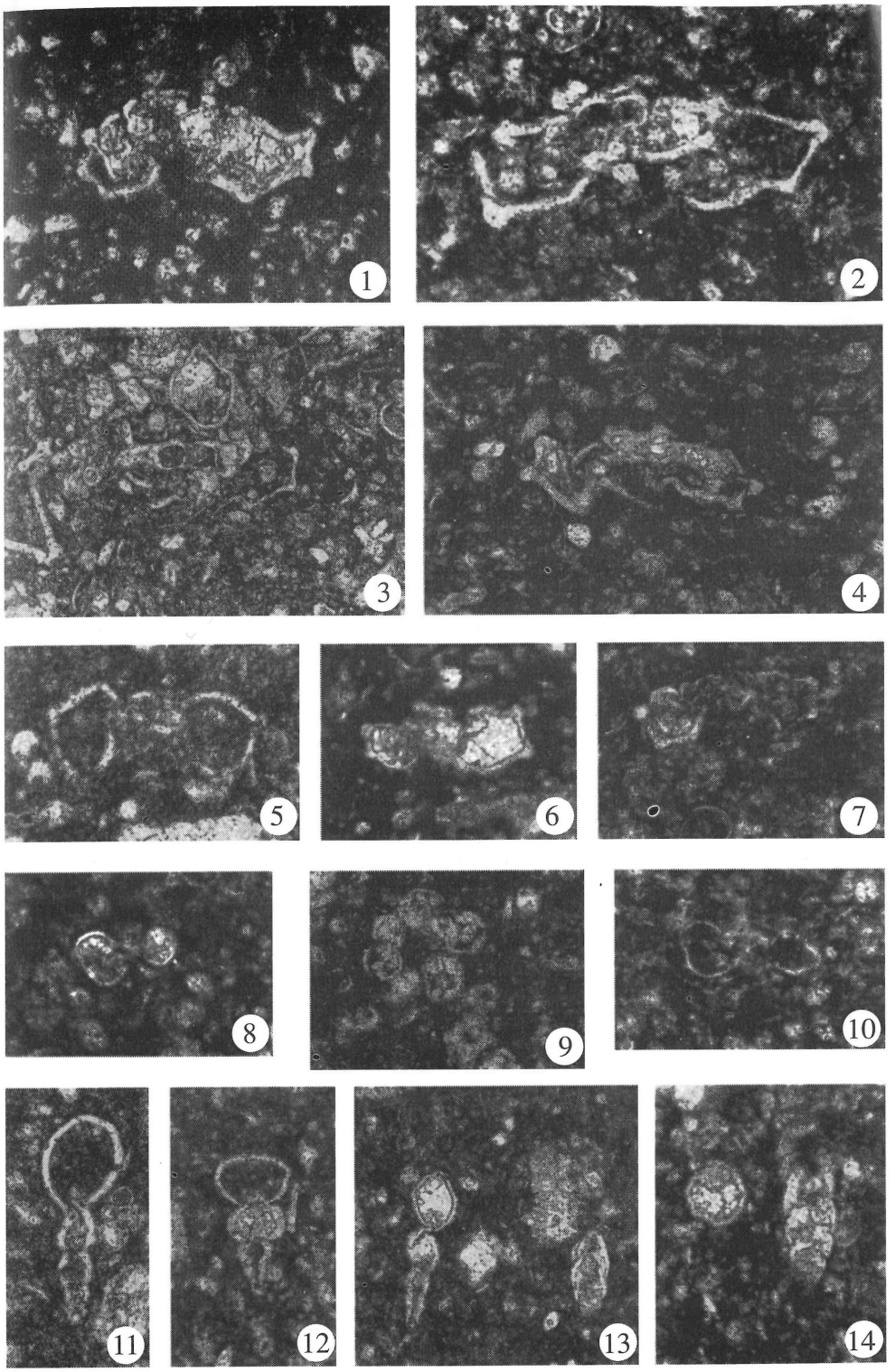

4


5


6


7

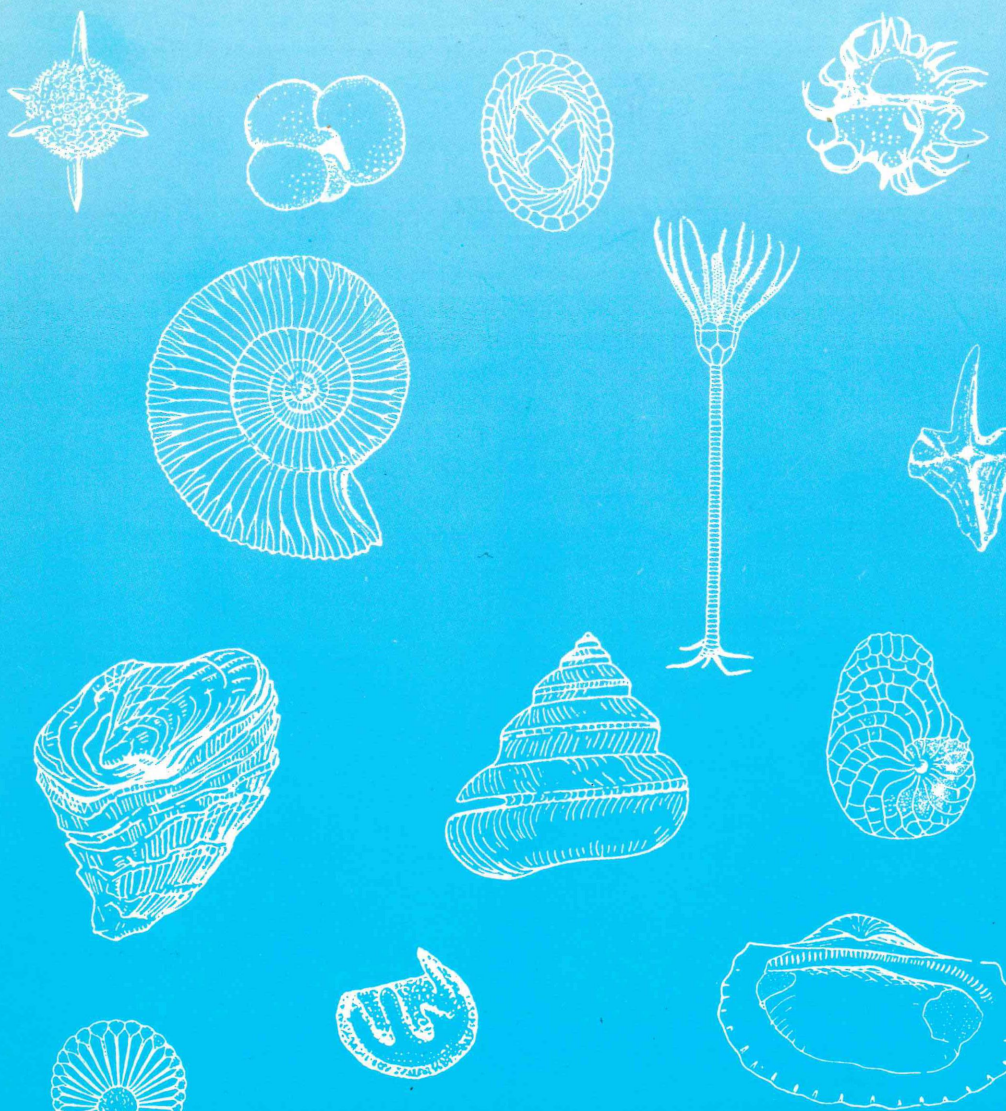
Plate 5



ISSN 1121 - 1393

PALAEOPELAGOS

Volume 4 - 1994



Università "La Sapienza" Roma

Coordinamento di PALAEOPELAGOS: Anna Farinacci
Dipartimento di Scienze della Terra
Università La Sapienza, 00185 Roma

PALAEOPELAGOS è stampato in 600 copie. I contributi scientifici hanno in aggiunta una tiratura supplementare di altre 100 copie per gli estratti.

La stampa di PALAEOPELAGOS Vol. 4 si avvale del contributo finanziario del C.N.R. (Contributo 1993, intestato al coordinatore).

PALAEOPELAGOS esce una volta all'anno e viene diffuso gratuitamente

La presente pubblicazione è depositata a norma di legge

Fotocomposizione a cura di Renato Tonielli

Università degli Studi di Roma "La Sapienza"
Piazzale Aldo Moro, 5 00185 - Roma

Licenziato alle stampe il 14 dicembre 1994
Finito di stampare Aprile 1995

Tipolitografia: River Press srl - Roma