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Malatyna, a New Foraminiferal Genus from the Lutetian of Malatya Region (East Turkey)

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Key words: Systematics, Foraminifera (Riveroinidae), Lutetian, Malatya, Turkey

Abstract

Malatyna drobneae n.gen.n.sp., a new nautiloid miliolid with cribrate aperture is found in the shallow water limestone (Upper Lutetian) of the Yesilyurt area, SW of Malatya. Its associated foraminiferal assemblage is figured only.

1. INTRODUCTION

In the western part of the Malatya basin between Akcadag and Darende towns, the oldest Paleogene beds are represented by the Lutetian sediments which are transgressively deposited on Upper Cretaceous members of different age (AKKUS, 1971; SIREL, 1976), whereas in the studied area, Danian beds conformably overlie the Maastrichtian sediments (Figs. 1, 2). During the Middle Eocene different facies were deposited in the west part of the Malatya basin: the examined limestone samples with the new genus and its foraminiferal association developed in a shallow water environment and are confined to several small outcrops within the larger basin. The type locality of the new genus is located at Yesilyurt village, 10 km SW of Malatya city (Fig. 1). Similar small outcrops of the Lutetian deposited in a shallow water environment located at Darende town can be correlated with the examined limestone of the Yesilyurt area (SIREL, 1976, p. 101-103, fig. 3). The flysch deposits of the Middle and Upper Eocene are widespread in the Malatya region, and are composed of marls, sandstones and intercalating argillaceous limestones.

Unfortunately, so far, Eocene beds have not been adequately studied biostratigraphically, despite the fact that they have a very abundant microfauna with the predominant group of nummulitines in all levels.

2. THE STRATIGRAPHY OF THE YESILYURT AREA

The rock units of Mesozoic and Paleogene age crop out in the studied area. One profile measured from the

Yesilyurt valley demonstrates the general stratigraphy of the investigated area and the stratigraphic position of the limestone bearing *Malatyna drobneae* n.gen.n.sp. (Fig. 2). The type profile has a thickness of about 20 metres measured from the small outcrop of the Yesilyurt region. The entire sequence of beds consists of limestone with the following foraminiferal taxa: *Malatyna drobneae*, n.gen.n.sp. (planorbulinid type), *Rhapydionina malatyaensis* SIREL, *Halkyardia minima* (LIEBUS), *Fabiania cassis* (OPPENHEIM), *Chapmanina gassinensis* (SILVESTRI), *Planorbulina brönnimanni* BIGNOT & DECROUEZ, *Peneroplis* sp., *Orbitolites* sp. and indet. genus (cf. *Pilamminella*). This limestone sequence containing representatives of the new genus its conformably overlain by hard limestone with *Nummulites* sp. (*N. perforatus* group), *Alveolina* cf. *fusiformis* SOWERBY, *F. cassis*, *Asterigerina rotula* (KAUFMAN), *Sphaerogypsina globula* (REUSS), *Eorupertia* sp., *Linderina* sp., *Discocyclina* sp. and *Acervulina* sp.

3. SYSTEMATIC DESCRIPTION

Super Family: Miliolacea EHRENBERG 1839

Family: Riveroinidae SAIDOVA 1981

Genus: *Malatyna*, n.gen.

Type species: *Malatyna drobneae*, n.gen. n.sp.

Genus *Malatyna*, n.gen.

Derivation of name: Malatya is a city in East Turkey.

Diagnosis: Free, nautiloid complex miliolid with cribrate aperture of medium size, biumbilicate, early chambers in quinqueloculina arrangement in microspheric form (Pl. I, Figs. 3, 5), but triloculine arrangement in meglospheric form (Pl. I, Figs. 9, 12; Pl. II Fig. 5), later planispiral to oscillating, partially involute, dome-like adult chambers increasing rapidly in width and height (Pl. I, Figs. 5, 8, 9) and their number up to four to seven in the last whorl (Pl. I, Figs. 5, 9). Chamber interior subdivided by longitudinal subepidermal partitions that are continuous from the chamber floor to the roof and that disappear in the peripheral zone (Pl. I, Figs. 5, 10, 13; Pl. II, Figs. 1, 7-10). Occasional microspheric specimens may tend to uncoil (Pl. I, Figs. 3, 5). Aperture in quinqueloculine stage not observed but adult chambers have a terminal aperture as

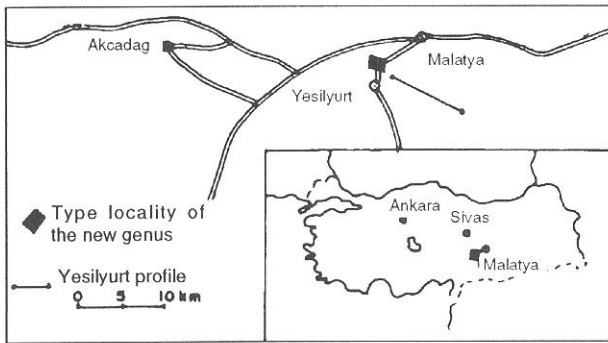


Fig. 1. Location map, showing type locality of *Malatyna drobneae* n.gen. n.sp. and the section line of the Yesilyurt profile.

trematophore pierced by numerous irregular openings (Pl. I, Figs. 1, 3-5, 7, 10, 12-15; Pl. II, Figs. 1-3, 6, 7-9). Dimorphism present but faint.

Differential diagnosis: The new genus has its quinqueloculine early stage, planispiral adult chambers with subepidermal partitions and its cribrate aperture thin common with the representatives (*Pseudohauerina* PONDER and *Pseudohauerinella* Mc CULLOCH, of the family Riveroinidae SAIDOVA). Therefore, the new genus is placed within this family. The Holocene genus *Riveroina* BERMUDEZ (BERMUDEZ, 1939) differs from *Malatyna* in lacking quinqueloculine early chambers and trematophore with many openings. The new genus has its quinqueloculine early, planispiral adult chamber, its aperture with many openings in common with *Pseudohauerina* PONDER (PONDER, 1972) and *Pseudohauerinella* Mc CULLOCH (Mc CULLOCH, 1977) but the new genus has complete subepidermal partitions (Pl. I/5, 10; Pl. II/1, 5-10) while *Pseudohauerina* and *Pseudohauerinella* have incomplete radial septulae that project inwards from the walls for about one-third of the breadth of the chamber (LOEBLICH & TAPPAN, 1988). The new genus differs from the Holocene genus *Polysegmentina* CUSHMAN (CUSHMAN, 1946) in having a quinqueloculine stage in the early ontogeny (Pl. I, Figs. 3, 5, 7-9) instead of a sigmolite stage; in addition, in the new genus, the chamber cavities are subdivided by longitudinal partitions. *Malatyna* has its quinqueloculine early chambers, its planispiral adult chambers and its cribrate aperture in common with *Hauerina* d'ORBIGNY (d'ORBIGNY, 1839), *Involvohauerina* LOEBLICH & TAPPAN (LOEBLICH & TAPPAN, 1955) and *Parahauerina* Mc CULLOCH (Mc CULLOCH, 1977) with a trematophore differs from the new genus by the lack of the quinqueloculine stage and subepidermal partitions. The new genus differs from *Pseudonummolucina* LE CALVEZ (LE CALVEZ, 1988) by the presence of a cribrate aperture with trematophore and complete subepidermal partitions, in addition: the new genus has inflated chambers in the planispiral stage while *Pseudonummolucina* has long and low chambers in the late ontogeny (LE CALVEZ, 1988, p. 397, Pl. I, Figs. 1, 8, 10, 16 and DE CASTRO, 1987, p. 112, Fig. 3).

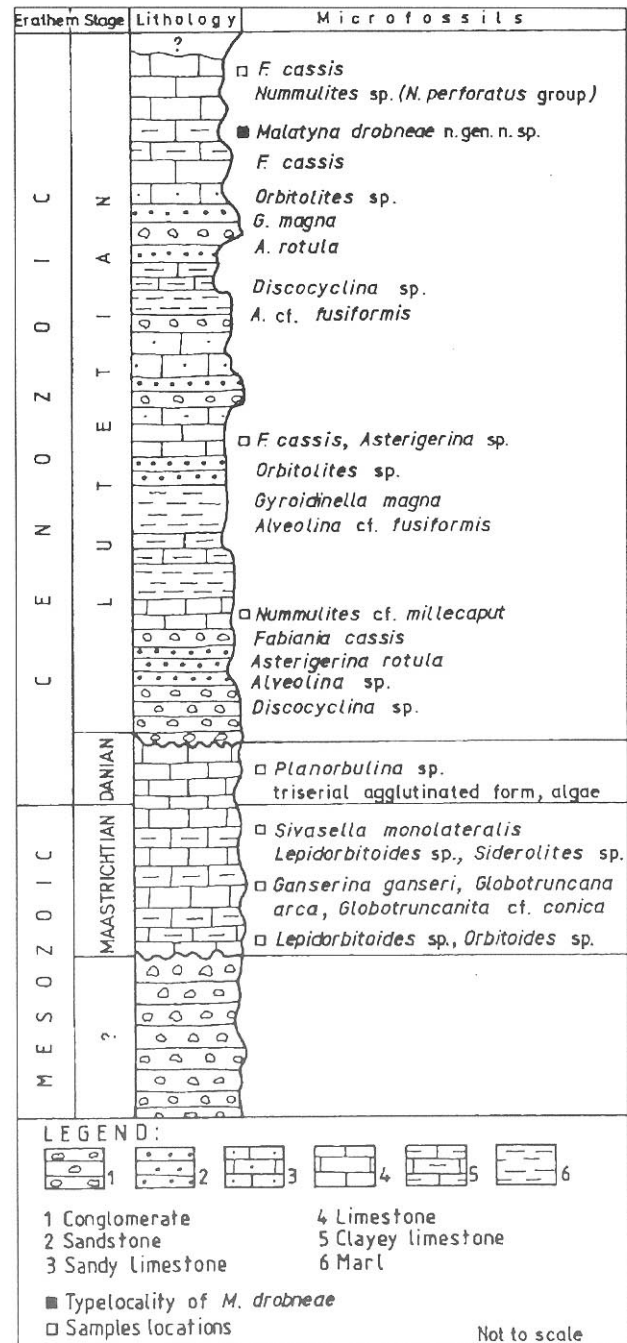


Fig. 2. Yesilyurt profile, showing stratigraphic position of *Malatyna drobneae* n.gen. n.sp.

Species *Malatyna drobneae*, n.sp.
(Pl. I, Figs. 1-15, Pl. II, Figs. 1-10)

Derivation of name: This species is dedicated to Katica Drobne, who has undertaken a lot of valuable micropaleontological research.

Holotype: Equatorial section of microspheric form, illustrated by Pl. I, Fig. 5 (MA-4).

Type locality: Yesilyurt village, 10 km SW of Malatya city, E Turkey.

Type level: Upper (?) Lutetian.

Depository: Holotype and figured paratypes are deposited in the collection of M.T.A. (Ankara) under the numbers (MA-1-25).

Description: Medium size, nautiloid miliolid, biumblicate, adult chambers are subdivided by loosely spaced longitudinal partitions and have a terminal aperture with trematophore pierced by numerous openings. Megalospheric forms reach 0.75 mm in diameter. Proloculus subspherical, diameter about 35x57 microns, bottle neck (goulot) not observed.

Early chambers undivided and arranged in a triloculine mode for 1-2 whorls (Pl. I, Figs. 7-9, 12), later domed chambers arranged in a planispiral, oscillating coil. Adult chambers increase rapidly in width and height in the last whorl (Pl. I, Figs. 7, 9, 12). The outer wall and septa are very thin and are approximately 17 μm and 35 μm thick respectively. Microspheric forms reach 1.2 mm in diameter. The proloculus is globular and 20 μm in diameter, the thickness of the wall 5 μm (measured in holotype). Early chambers undivided and arranged in quinqueloquiline mode for two whorls (in holotype, Pl. I, Fig. 5). The proloculus is followed by two planispiral whorls with nine very long chambers (Pl. I, Fig. 5). Later, the inflated chambers increase rapidly in width and height in the last whorl (Pl. I, Figs. 5, 13, 14). This generation may tend to uncoil in the final stage (Pl. I, Fig. 3). The outer wall and septa are very thin their thicknesses vary from 35 μm to 45 μm . Unfortunately, it was not possible to obtain isolated specimens for the preparations of oriented thin sections. Therefore the following description of the new genus is based exclusively on specimens which were found in rock sections. All thin sections containing the specimens described and figured in this paper are deposited in the collection of M.T.A., Ankara (number MA-1-49).

4. REMARKS

The family Riveroinidae was established for the first time as subfamily Riveroininae and supersubfamily Riveroininea by SAIDOVA (1981). Later on, these two taxa were transferred to the family Riveroinidae by LOEBLICH & TAPPAN (1982). Because of the characteristics of the mode of coiling (milioline, later planispiral patterns), the presence of the adult chambers with subepidermal partitions and of the cribrate aperture, this new genus has been considered to belong to the family Riveroinidae. The genera having the greatest structural affinities with *Malatyna* n.gen. are *Pseudohauerina* PONDER and *Pseudohauerinella* McCULLOCH. The former (type: *Hauerina occidentalis* CUSHMAN; CUSHMAN, 1946) was described for the first time from the Holocene of Florida. It has quinqueloquiline chambers in the early stage, one-half coil in length, later chambers becoming planispiral. There are more than two chambers in each adult whorl. The interior of the test is subdivided by numerous radial incomplete subepidermal partitions; the adult test has a complex trematophore with many openings. The latter genus (type: *Pseudohauerinella aissidens* McCULLOCH; McCULLOCH, 1977) was reported from the

Holocene of Mexico. It has quinqueloquiline early planispiral adult chambers with incomplete subepidermal partitions; a cribrate aperture is present at the terminal chambers. The Anatolian new genus represents the oldest representative of the family Riveroinidae by the presence of milioline chambers in a long series (triloculine arrangement in megalospheric, quinqueloquiline arrangement in microspheric) form and more inflated adult chambers with complete subepidermal partitions. An enigmatic foraminiferal genus with discoidal test, perforated wall and complex structure figured in Pl. III, Figs. 1-4 is associated with *Malatyna drobneae* n.gen.n.sp. in the type locality. Unfortunately, it was not possible to find equatorial sections of the microspheric form in spite of the fact that it is found abundantly in the lower and middle parts of the sequence. Only incomplete equatorial section of the megalospheric form have been obtained (Pl. III, Fig. 1). It has a large proloculus followed by a few primary spiral and annular chambers. The cyclical chambers and their subdivisions are not clear. According to the present authors, the axial and equatorial characters that were observed in a few specimens are not sufficient to establish a new taxon. For the present, it is described as an unknown planorbulinid form (probably a new taxon).

5. STRATIGRAPHIC POSITION

At the type locality, the entire sequence of the beds consists of soft clayey and hard limestones. The soft limestone beds that occur in the lower and middle parts of the section yielded a rich and important foraminiferal fauna including taxons such as *Malatyna drobneae*, *Rhapydionina malatyaensis*, *Halkyardia minima*, *Fabiania cassis*, *Chapmanina gassinensis*, *Planorbulina bronnimanni*, planorbulinid form n.gen?, n.sp., *Orbitolites* sp. and miliolids. These limestone beds with important foraminiferal species occur just below the hard limestones with *Alveolina* cf. *fusiformis*, *Fabiania cassis*, *Asterigerina rotula*, *Sphaerogypsina globula*, *Nummulites* sp. (*N. perforatus* group), *Linderina* sp., *Discocyclina* sp., *Eorupertia* sp., and *Acervulina* sp. There is an abundant microfauna dominated by the group of nummulitines (*Nummulites aturicus* JOLY & LEYMERIE) but not to the megalospheric form; therefore, this species of *Nummulites* is described as *Nummulites* sp. (*N. perforatus* group). *Alveolina* cf. *fusiformis* and *Nummulites* sp. indicate an Upper Lutetian age for the upper part of the sequence. According to LOEBLICH & TAPPAN (1988) the genera *Halkyardia* and *Chapmanina* which are associated with the new genus *Malatyna drobneae* do not occur before the Lutetian. Therefore an upper Lutetian age has been given to the lower and middle beds of the section containing the new genus and which occur below the hard limestone with *Alveolina* cf. *fusiformis* and *Nummulites* sp. (*N. perforatus* group).

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PLATE I

Lutetian, Yesilyurt village, SW Malatya

Figs. 1-15 *Malatyna drobneae* n.gen.,n.sp. (x70).

- 1 Megalospheric specimen, centered equatorial section (MA-1), showing cribrate aperture with trematophore in penultimate chamber.
- 2 Oblique section, non-centered (MA-2), note subepidermal partitions in ultimate and penultimate chambers.
- 3 Microspheric specimen, almost centered equatorial section (MA-3), showing quinqueloquiline, planispiral and uncoiled chambers.
- 4 Megalospheric specimen?, subequatorial section (MA-1), note sieve plate and subepidermal partitions in penultimate chamber.
- 5 Microspheric specimen, equatorial section, holotype (MA-4), showing two whorls of quinqueloquiline stage with microsphere and adult planispiral chambers with cribrate aperture, note subepidermal partitions in the last chamber.
- 6 Oblique section, almost centered (MA-5), note subepidermal longitudinal partitions in the last chamber.
- 7-12 Megalospheric specimens, equatorial sections (MA-1, 7,8,9,10,11 respectively), showing miliolin and planispiral stages.
- 13 Microspheric specimens, centered section (MA-13) note domelike adult chambers arranged in oscillating in position, longitudinal subepidermal partitions in ultimate, penultimate and antepenultimate chambers.
- 14 Microspheric specimen, almost centered section (MA-12), domelike adult chambers arranged in oscillating in position, note cribrate aperture with trematophore in penultimate and antepenultimate.
- 15 Subaxial section (MA-14), note sieve plate in penultimate whorl.

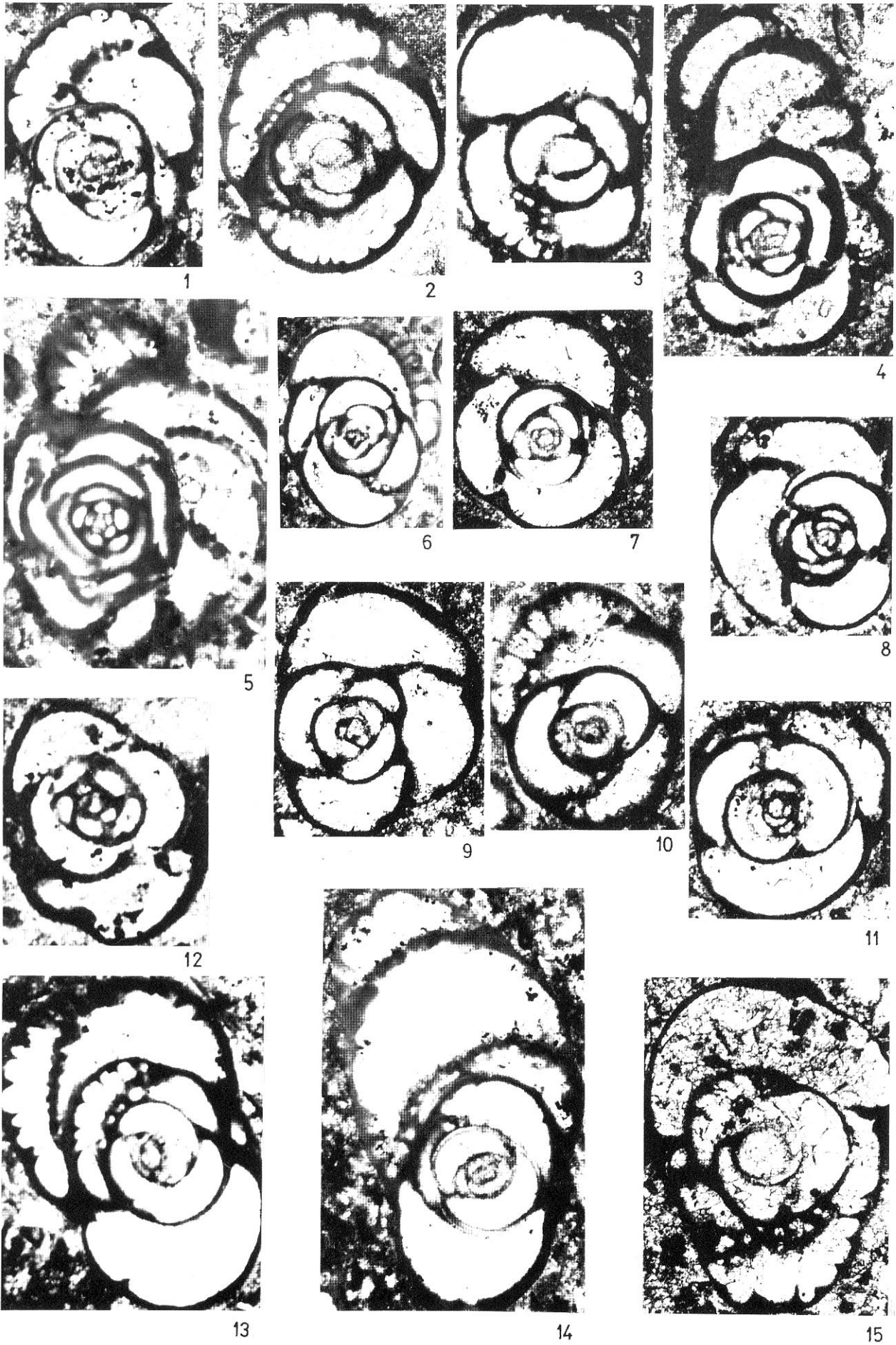


PLATE II

Lutetian, Yesilyurt village, SW Malatya.

Figs. 1-10 *Malatyna drobneae* n.gen.,n.sp. (x70)

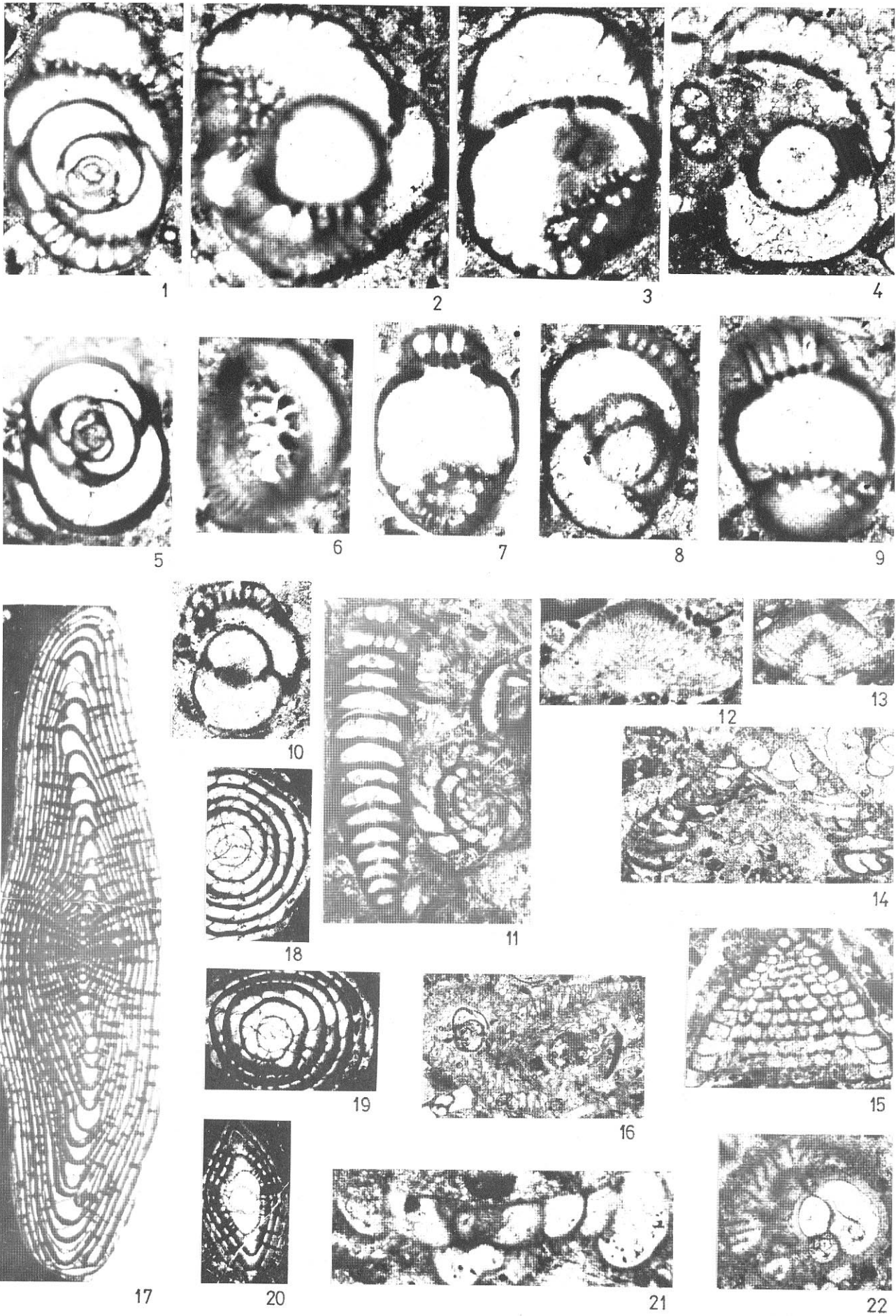
- 1 Microspheric specimen?, centered axial section (MA-5), note cribrate aperture and subepidermal partitions.
- 2, 3 Tangential sections (MA-15, MA-5 respectively), note sieve plates.
- 4 Tangential section (MA-16), through adult trematophore and subepidermal partitions.
- 5 Megalospheric specimen, axial section (MA-17), note subepidermal partitions in the last whorl only.
- 6 Tangential section (MA-18).
- 7-10 Tangential sections.
- 7, 9 Showing subepidermal partitions (MA-19, MA-1 respectively) 8, 10 - Showing sieve plate (MA-20, MA-21 respectively).
- 11 *Rhapydionina* sp., longitudinal section associated with *Peneroplis* sp. (at the left side of the picture) (MA-3), x30.
- 12, 13 *Halkyardia minima* (LIEBUS), x50.
- 12 Subaxial section
- 13 Axial section (MA-30).
- 14, 16, 22 *Fabiania cassis* (OPPENHEIM), x20.
- 14 Centered vertical section (MA-32).
- 16 Tangential section (MA-33), showing embryonic apparatus.
- 22 Vertical section non-centered (MA-33).
- 15 *Chapmanina gassiensis* (SILVESTRI), centered vertical section (MA-31), x31.
- 17-20 Axial section of microspheric test (MA-34).
- 18, 19 Equatorial sections of macrospheric forms (MA-35, MA-36).
- 20 Axial section of macrospheric form (MA-37).
- 21 *Planorbulina brommimanni* BIGNOT & DECROUEZ, almost axial section, x35 (MA-42).

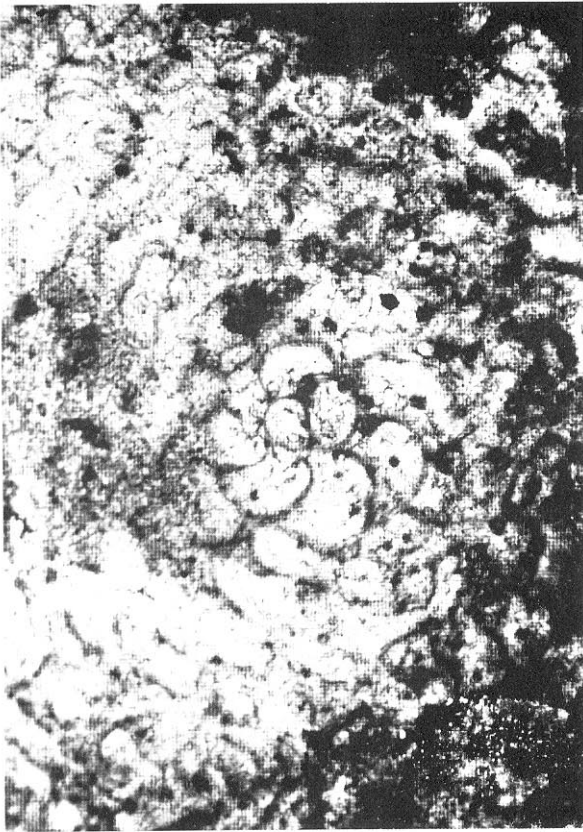
PLATE III

Lutetian, Yesilyurt village, SW Malatya

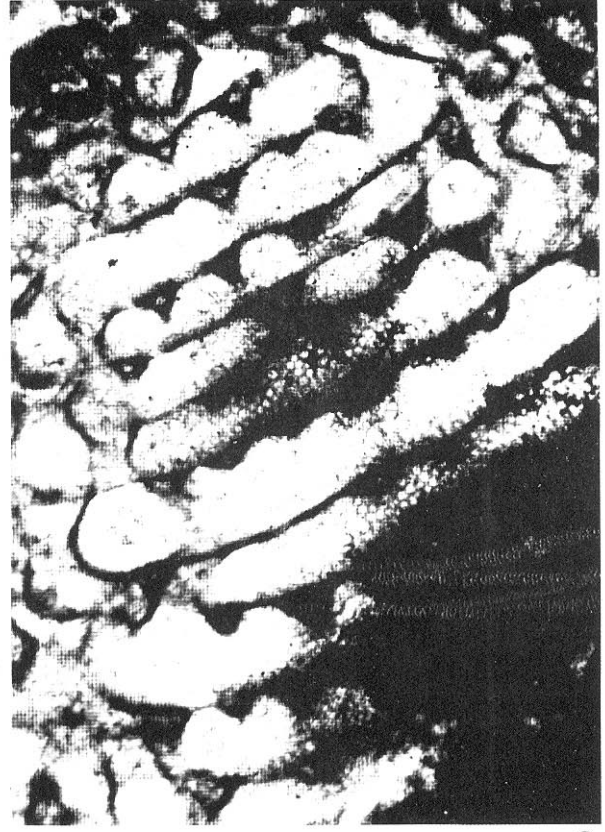
Figs. 1-4 n.gen?, n.sp. (planorbulinid form)

- 1 Megalospheric specimen, equatorial section (MA-22), showing planispiral early arrangement of chambers megalosphere, later annular chambers.
- 2 Tangential section (MA-23), note annular adult chamber arrangement and perforation on the external surface of the test.
- 3 Microspheric specimen subaxial section, non-centered (MA-24) showing median chambers and small chambers as lateral chambers.
- 4 Subaxial section (MA-28).
- 5-9 Indet gen. & sp. cf. *Pilaminella* SALAJ, x150.
- 5 Equatorial section, showing proloculus followed by streptospirally enroled early chambers and then with planispiral stage of three whorls, Lutetian, Yesilyurt area, (MA-38).
- 6 Centered axial section, Lutetian, Yesilyurt area, (MA-38).
- 7 Axial section of the adult specimen, Lutetian of Yesilyurt area, (MA-39).
- 8 Young specimen without planispiral chamber of tube, Oligocene, Develi profile, W of Malatya, (MA-40).
- 9 Young specimen, Oligocene, Develi profile, W of Malatya, (MA-40).
- 23 Orbitolites sp., x15, (MA-49).
- 17-19 *Rhapydionina malatyanensis* SIREL.
- 17 Transverse section, x91, (MA-17).
- 18 Almost axial section, x30, (MA-41).
- 19 Oblique section, x30, (MA-45).

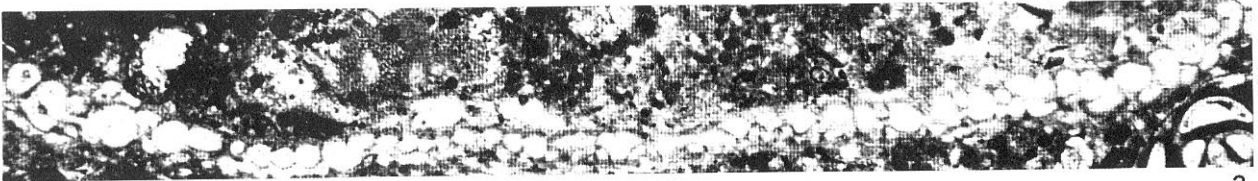




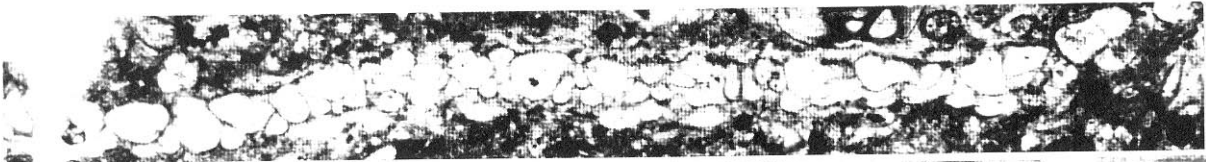
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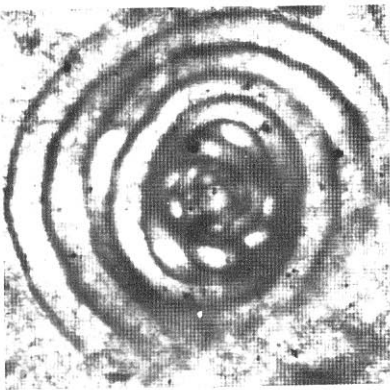
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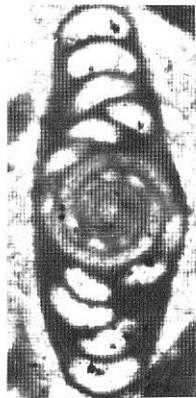
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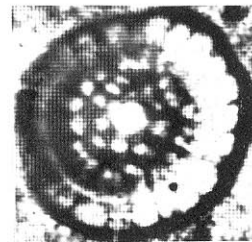
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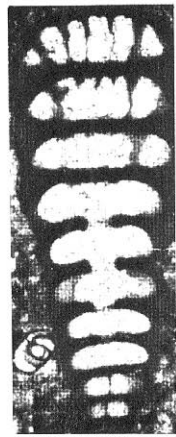
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